Chapter 2: Alternatives

This chapter describes two alternatives for fire management in Everglades National Park. Alternative A is the no action alternative which would continue current management. Current management practices operate under the most recent Federal Wildland Fire and National Park Service policies and the existing 1995 fire management plan. The most recently approved fire management plan is referred to as the 1995 fire management plan. This plan and the associated environmental assessment were completed in 1991 with a fire management plan update in 1995. Current fire management practices differ in some areas from what is described in the 1995 fire management plan due to changes in policies and requirements. Alternative A describes current fire management practices.

The National Park Service also developed one action alternative. This alternative would manage fire under the proposed *Fire Management Plan for Everglades National Park, 2014*.

TERMINOLOGY COMMON TO BOTH ALTERNATIVES

VEGETATION COMMUNITIES

Everglades National Park consists of approximately eight major vegetation communities, including the following:

- Sawgrass marshes;
- Marl prairies;
- Pine rocklands;
- Hardwood hammocks/tree islands;
- Cypress swamps;
- Mangrove/buttonwood forest;
- Coastal prairies; and
- Freshwater slough.

Fire Regime

Fire regime is a description of an area's fire return interval combined with the severity of fire on the landscape. A fire return interval is the number of years between fires at a specific location or plant community. A fire return interval range is the span of years between the shortest and longest periods between natural and anthropogenic fires.

Fire-Adapted Communities

Certain vegetation communities require periodic fire to maintain a healthy, resilient condition. These areas are characterized as fire-adapted.

ALTERNATIVE A: NO ACTION / CONTINUE CURRENT MANAGEMENT

Alternative A: No Action / Continue Current Management would continue current management practices operating under the most recent Federal Wildland Fire and National Park Service policies and the existing 1995 fire management plan.

Under Alternative A, unplanned wildfires would continue to be managed under an appropriate fire management strategy. A variety of fire management strategies would be available to manage unplanned wildfires, including:

- Full Suppression – a strategy used to achieve control of a fire and prevent it from exceeding a defined perimeter;
- Point/Zone protection – a variety of suppression actions taken to protect a specific point or areas from fire, usually by tactics which constrain progressive fire encroachment away from identified values at risk; and
- Monitor/Confine/Contain – management actions conforming to a strategy that periodically checks the fire to ensure it continues to meet established objectives.

In 2008, park managers decided that prescribed fire would no longer be approved and implemented under the outdated Environmental Assessment for the 1995 FMP. Until a new FMP and EA are completed, prescribed burns would be planned and approved annually under the available Categorical Exclusions (CE's) in the NPS Director's Order 12 Handbook for implementing the National Environmental Policy Act (NPS 2001a).

Under Alternative A, prescribed fire treatments would be planned on an annual basis for hazardous fuel reduction and exotic vegetation management. Exotic vegetation prescribed fire treatments would be conducted under categorical exclusion 3.4 E(2). These treatments are planned in conjunction with the Exotic Plant Management Team (EPMT) on an annual basis. There are no acreage limitations for exotics prescribed burns. Hazardous fuel reduction prescribed fire treatments would be conducted only outside of designated wilderness areas within Everglades National Park under categorical exclusion 3.4 G(1). A maximum of 4,500 acres would be treated each year for hazardous fuel reduction. Project-specific Endangered Species Act consultation, National Historic Preservation Act consultation, and Wilderness Minimum Requirements Analysis would occur annually.

The Use of Healthy Forest Initiative Hazardous Fuels Reduction Categorical Exclusion Memorandum dated April 24, 2012 directs the NPS to phase out use of categorical exclusion 3.4 G(1) over the next three years, so after April 24, 2015, Everglades National Park would no longer use prescribed fire for hazardous fuel reduction until a new FMP and EA are approved.

Project-specific Endangered Species Act consultation, National Historic Preservation Act consultation, and Wilderness Minimum Requirements Analysis would occur annually.

Alternative A is the baseline to which the action alternative is compared.

DEVELOPMENT

The 1995 fire management plan is not a single document. Instead, it consists of the following:

- Everglades National Park Fire Management Plan and Environmental Assessment, September 16, 1991 (NPS 1991a). This comprehensive document, approved in September 1991, has 15 sections and eight appendices totaling about 170 pages.

- Fire Management Plan and Environmental Assessment Yearly Update, Everglades National Park, 1994 (NPS 1994). This document updates 31 pages of the 1991 document by page removal and replacement. It was approved in April 1995.

The 1995 fire management plan was based on the then-current fire management guidance from the National Park Service and other federal land management agencies. These included the following:

- NPS-18, Wildland Fire Management Guideline (NPS 1991b);
- NPS *Management Policies* 1988 (NPS 1988);
- Bob Marshall Wilderness Complex, Guidebook on Prescribed Natural Fire (USFS 1990);
- Greater Yellowstone Postfire Assessment (USDI 1989a); and
- Interagency Wildfire Task Force Guidelines (USDI 1989b).

Current fire management practices are guided by and are implemented in accordance with Federal wildland fire policy and guidance. The list of documents can be found in Chapter 1: Fire Management Guidance.

COOPERATION AND COLLABORATION

Under Alternative A, Everglades National Park would maintain a fire management interdisciplinary team (IDT) composed of subject matter experts from a variety of fields and divisions. The interdisciplinary team would consist of (but may not be limited to) the fire management officer, a fire ecologist, a prescribed fire specialist, the chief of the biological resource division, a park botanist, the chief of cultural resources, a member from the park's environmental compliance division, and the regional fire planner. The team would continue to coordinate during planning, implementation, and response operations. The interdisciplinary team would continue to meet annually to review fire management's scope of work for the following year.

Interagency interdisciplinary working groups and learning networks would continue to meet, including the following: the Cape Sable Seaside Sparrow Working Group, the Pine Rocklands Working Group, the Imperiled Butterfly Working Group, the Florida and Caribbean Fire and Invasives Learning Network. The Cape Sable Seaside Sparrow Working Group comprises inter-agency partners. The other working groups consist of federal and state agencies, academic institutions, NGOs and private land owners. These groups would continue to meet periodically to provide updates on special status species, state-wide management concerns, share management practices, and discuss lessons learned.

The National Park Service, U.S. Fish and Wildlife Service, and the Florida Forest Service would maintain their partnerships in a statewide cooperative fire management agreement. Under this agreement, these entities and Miami-Dade County Fire Rescue would continue to conduct joint fire management activities in accordance with an annual operating plan.

The National Park Service would continue to participate in a statewide cooperative fire management agreement consisting of federal, state, tribal, municipal, and private organizations (including Everglades National Park, Big Cypress National Preserve, Seminole Tribe of Florida, Florida Panther National Wildlife Refuge, Loxahatchee National Wildlife Refuge, and Florida Forest Service).

Everglades National Park would continue to participate on the South Florida Fire Management Council, which consists of federal, state, tribal, municipal, and private organizations. Primary goals of this council, which the park has participated in since the 1980s, are information exchange, training, and public education and prevention efforts.

PARK-WIDE FIRE MANAGEMENT GOALS AND STRATEGIES

Existing wildfire management objectives, which would continue under Alternative A, include the following:

- Conduct all fire management activities in a manner that maintains the safety of firefighters and the public.
- Protect human life and property both within and adjacent to park areas.
- Protect natural and cultural resources from adverse effects of fire and fire management activities.
- Maintain or improve the quality of the native fire adapted vegetation communities that occur within Everglades National Park.
- Maintain a framework of adaptive management to ensure a responsive, efficient, safe, and accountable fire management organization.
- Allow natural processes to continue by managing fires through monitoring with little or no suppression action to the maximum extent feasible to achieve resource benefits.
- Use planned ignitions to supplement the natural role of fire as an ecosystem process, achieve resource management objectives, reduce hazardous fuel accumulations, reduce threats to WUI from wildfires, protect park resources, maintain fire adapted ecosystems, treat exotic plants, and to secure the park boundary.
- Use science based fire management to maintain a healthy and sustainable ecosystem. To the degree possible, achieve a healthy range of variation in the fire return interval, fire size, fire behavior, fire effects, and other characteristics of the fire regime using the best available science.
- Use science based fire management to maintain and enhance the wilderness character of the Marjory Stoneman Douglas Wilderness and any lands found eligible for wilderness designation.

The constraints associated with operating an annual prescribed fire program under documented categorical exclusions would affect the fire management program's ability to implement treatments and achieve the goals listed above as well as the objectives specific to each FMU. These constraints would also limit the fire management program's ability to implement mitigations associated with the use of planned ignition treatments.

Under current management, Everglades National Park has chosen fire return intervals based on peer reviewed literature, internal technical reports, institutional knowledge and decisions made by the interdisciplinary team. These are displayed in Table 1. The fire return intervals identified below would not be maintained in all areas where these communities occur due to the constraints associated with the annual prescribed fire program and use of documented categorical exclusions to comply with NEPA.

Table 1: Fire Return Intervals under the 1995 Fire Management Plan and Current Management Practices, as Dictated by Community Type

Community Type / FMU	Fire Return Interval Range (years)	Notes
Coastal Prairie FMU 1	2-10	
Sawgrass FMU 2 / FMU 4 / FMU 3	3-12	Includes habitat within FMU 3 south of Pine Blocks and HID
Muhly Grass - Marl Prairie FMU 2 / FMU 4 / FMU 3I	3-12	
Pine Rockland FMU 3	3-7	Includes pine rockland and embedded prairie communities

Most of the 1995 fire management plan dates from 1991. Language and emphasis on specific objectives has changed with changes in policy and a national focus on safety. Additionally, as knowledge and experiences have been obtained, prescribed fire and resource management objectives have changed with restrictions on prescribed fire implementation and changes in available wildfire management options. Operational guidance regarding wildfire preparedness, operations and staffing has been updated through federal wildfire policies; however, the direction described in the 1995 fire management plan remains the same.

Historically, the park has treated between 8,000 – 45,000 acres a year with prescribed fires (see Figure 2). These burns have generally been restricted to coastal prairies in the southern portion of the park and habitats near park boundaries. Due to the limitations of burning under CE's, prescribed fire cannot be carried out in many fire dependent habitats, including some utilized by listed species. Under Alternative A, it is expected that the amount of acres treated annually would be less than or similar to 8,000 -- 45,000 acres per year.

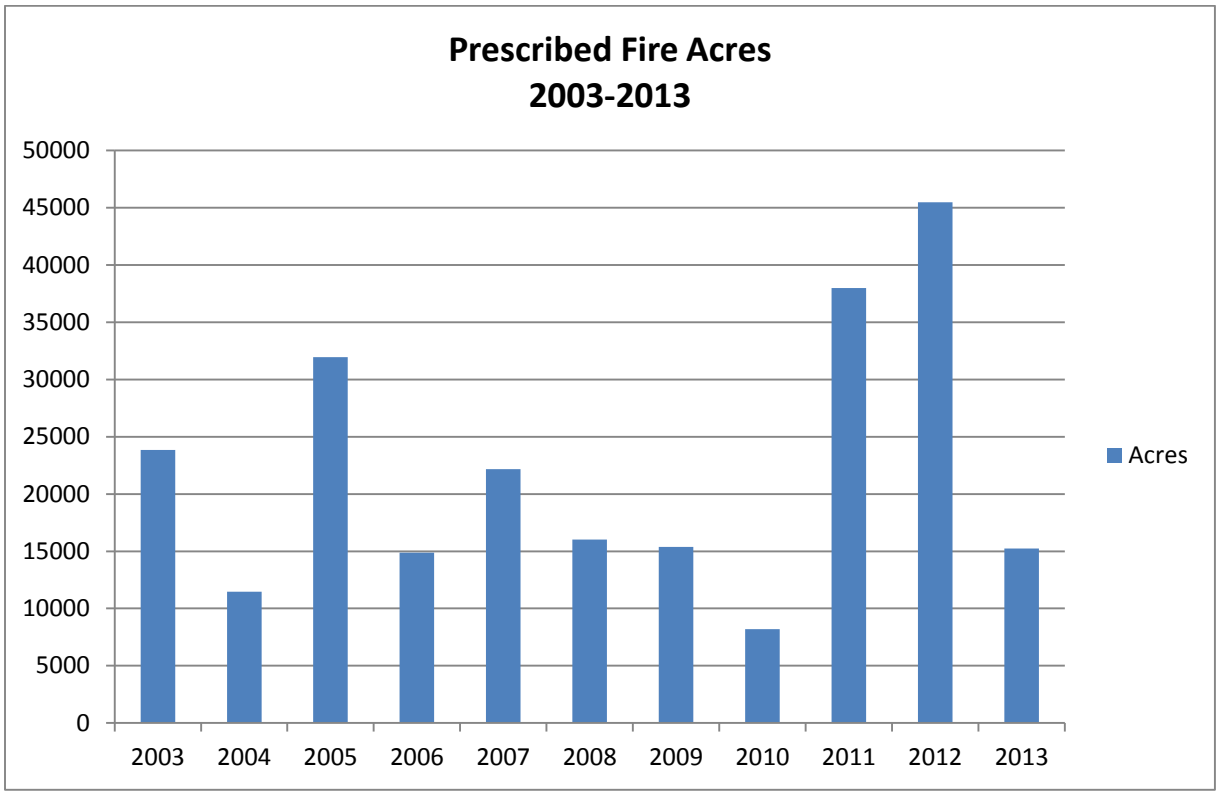

Figure 2: Annual Acres of Prescribed Fire within Everglades National Park from 2003-2013

Between 2003 and 2013, approximately 93,715 acres in the park were burned by wildfire ranging from 200 acres to over 40,000 acres in a year (see Figure 3, next page).

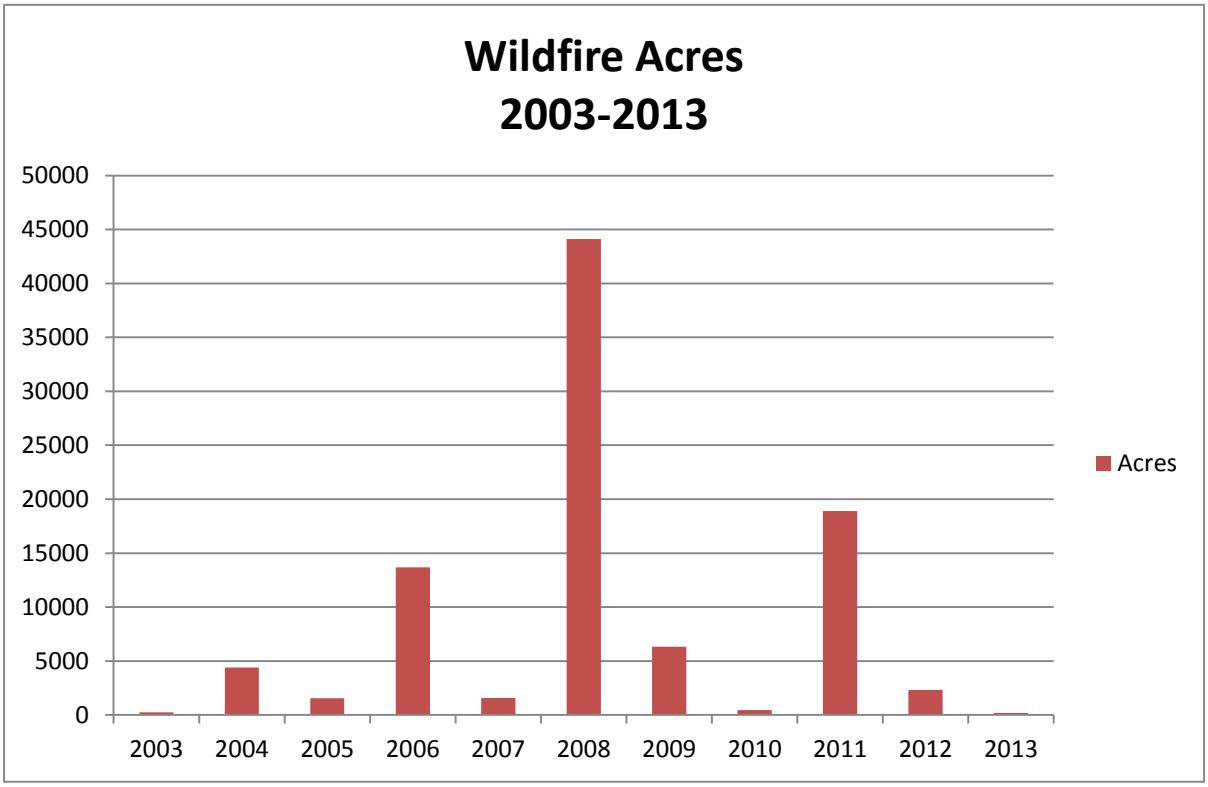

Figure 3: Annual Acres of Wildfire within Everglades National Park from 2003-2013

In addition to park-wide fire management objectives, specific objectives exist for each of the four FMUs in the Park. Those objectives are included in the descriptions of the FMUs, below.

FIRE MANAGEMENT UNITS

Under Alternative A, the FMUs are defined by a combination of vegetation community as well as existing fire breaks where present. FMU 4 is defined by the boundaries of the East Everglades Expansion Area acquired in 1989.

In all FMUs, wildfires (unplanned ignitions) would be managed using an appropriate fire management strategy. A range of fire management strategies can be used to manage a wildfire, including full suppression, point/zone protection, or monitor/confine/contain. In selecting a fire management strategy, managers first evaluate potential impacts and risks to public safety and property. Fire response decisions are based on current and forecasted weather conditions, fire behavior, resource availability, natural barriers, impacts to management values, and risk to fire fighters. Cost is also considered when making a final decision regarding selection and implementation of an effective management strategy.

Prescribed fire treatments would be planned on an annual basis for hazardous fuel reduction and exotic vegetation management. Exotic vegetation prescribed fire treatments are planned in conjunction with the EPMT. Hazardous fuel reduction prescribed fire treatments, which would not exceed 4,500 acres annually under this alternative, would be conducted only outside of designated wilderness areas within Everglades National Park. Prescribed fire treatments would be conducted in accordance with DO-12 (NPS 2001a).

The present FMUs in Everglades National Park are illustrated in Figure 4. Management values identified in Alternative A include, not in priority order, cultural resources, natural resources, wilderness character, visitor use and experience, wildland urban interface, community resources, and air quality. As new values are recognized or identified they would be incorporated into fire management planning and decision-making as described above. Park notifications would occur prior to prescribed fire treatments and coordination would occur with appropriate resource managers regarding unplanned wildfire incidents.

Alternative A implements operational mitigations to protect sensitive natural, cultural, social, and wilderness resource values within and adjacent to Everglades National Park. These mitigations apply across all FMUs and are described in the "Mitigation Measures" section of chapter 2, below. Constraints associated with operating an annual prescribed fire program under documented categorical exclusions to comply with NEPA, would limit the fire management program's ability to implement mitigations associated with the use of planned ignition treatments.

For each FMU, appropriate fire management strategies would be evaluated based on:

- Ability to meet park management goals and objectives; and
- Factors including safety, fire cause, weather, fire behavior and effects, values to be protected, resource availability, and cost effectiveness.

Management considerations and constraints for the FMUs are an important component of Alternative A. Management considerations and constraints for each FMU are presented in Table 2. The fire management objectives for each FMU are listed in Table 3.

Figure 4: Fire Management Units for Alternative A: No Action / Continue Current Management

Fire Management Unit 1: Coastal Prairies

This unit would include the areas on the south and west portions of Everglades National Park. Fire adapted acreage is approximately 99,371 acres out of a total of 106,964 terrestrial acres in the unit. Fire-adapted areas include estuarine marshes composed of nearly pure stands of cordgrass (*Spartina spartinae and S. bakeri*), black needle-rush (*Juncus roemerianus*), saltgrass (*Distichlis spicata*), or sawgrass (*Cladium jamaicense)*. In addition, beach dune communities occur landward of East, Middle and Northwest Cape Sable. These upland graminoid communities are likely fire-adapted, although fire return intervals have not yet been established. Approximately 10,328 fire-adapted acres are located outside of designated wilderness in FMU 1.

Figure 5: Coastal Prairie

Fires in this unit often burn in emergent vegetation, spreading over inundated areas. These fires are usually naturally extinguished within 8 to 12 hours, although some have been observed to burn for three days or more. The fire return interval for FMU 1 would be 2-10 years with a 2-year return interval for planned exotic plant treatments and a 6-year return interval assigned for all other areas maintainable only outside of designated wilderness areas.

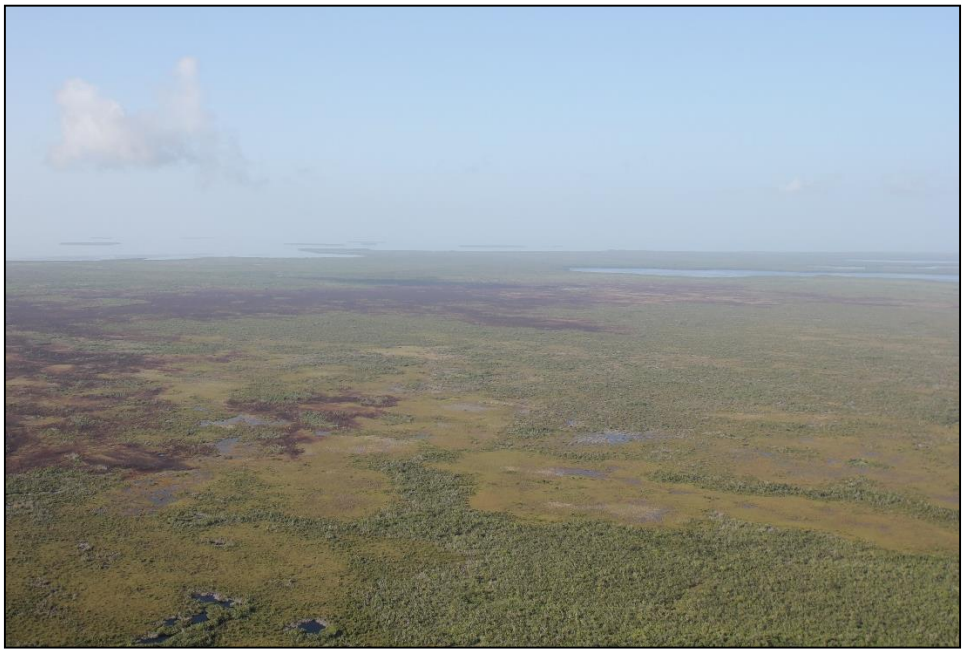

Figure 6: Coastal Prairie (Post Fire), Aerial View

Detailed descriptions of the vegetation communities and the interactions with and adaptations to fire are included in Chapter 3: Affected Environment and Environmental Consequences, and in section 3.1.2.1 of the Fire Management Plan ("Fire Adapted Vegetation Communities").

In FMU 1, unplanned ignitions would be managed using an appropriate fire management strategy to protect life and property. Whenever possible, fires would be managed to achieve resource benefits, consistent with the objectives identified for this FMU.

Prescribed fire treatments would be limited to invasive exotic Old World climbing fern (*Lygodium microphyllum*) treatments and hazardous fuel reduction treatments in areas outside of designated wilderness. Hazardous fuel reduction treatments could occur until 2015, when use of the categorical exclusion for hazardous fuel reduction prescribed fire treatments would no longer be allowed.

Management considerations and constraints (Table 2) related to fire management activities and fire management objectives (Table 3) are identified for FMU 1. Constraints associated with operating an annual prescribed fire program under documented categorical exclusions would affect the ability of the fire management program to achieve the objectives for FMU 1.

Special values in this unit are maintained in a GIS database. These include archeological sites, cultural sites, endangered or threatened species, wading bird colonies, backcountry campsites, research sites, and wilderness character. However, the database notes that most of these values are in areas rarely impacted by fire.

Detailed descriptions of significant resources are found in Chapter 3: Affected Environment and Environmental Consequences. Mitigation measures designed to minimize impacts to these resources are fully described in the "Mitigation Measures" section of chapter 2, below.

Figure 7: Fire Management Unit 1 Coastal Prairies No Action/Continue Current Management

Management values displayed in the above map are a representation of the current conditions (2013). Management values would be updated as needed.

Fire Management Unit 2: River of Grass

FMU 2 covers 390,521 acres in Everglades National Park, 321,641 of which are fire-adapted. The fire return interval range for vegetation communities within FMU 2 is 3-12 years. A three year fire return interval would be maintained for areas within the wildland urban interface and an eight year fire return interval would be maintained for the remaining fire-adapted vegetation communities within FMU 2 located outside of designated wilderness areas. These fire return intervals would also apply for units treated for exotic species management. Approximately 16,507 acres of fire-adapted acreage are located outside of designated wilderness in FMU 2.

Figure 8: River of Grass (Post Fire)

The fire-adapted vegetation communities of FMU 2 consist of sawgrass *(Cladium jamaicense)* prairies and marl prairies. Tall sawgrass strands will burn over standing water and sparse sawgrass and marl prairies typically burn in somewhat drier conditions. Associated habitats include tree islands, tropical hardwood hammocks, fresh water sloughs and emergent plant communities. FMU 2 also contains cypress and small scattered pine islands. The southern boundary of this FMU is generally the zone where mangrove communities replace freshwater marshes. Other communities in FMU 2, including tropical hardwood hammocks and sloughs, burn only under rare conditions and otherwise serve as natural barriers to the spread of fire. Exotic vegetation present in the area includes Brazilian pepper, melaleuca (*Melaleuca quinquenervia*), Australian pine (*Casuarina equisetifolia)* and Old World climbing fern.

Figure 9: River of Grass

Detailed descriptions of the vegetation communities and the interactions with and adaptations to fire are included in Chapter 3: Affected Environment and Environmental Consequences and in section 3.1.2.1 of the Fire Management Plan ("Fire Adapted Vegetation Communities").

In FMU 2, unplanned ignitions would be managed using an appropriate fire management strategy to protect life and property. Whenever possible, fires would be managed to achieve resource benefits consistent with the objectives identified for this FMU.

Prescribed fire treatments would be limited to invasive exotic melaleuca treatments and hazardous fuel reduction treatments located outside of designated wilderness areas, until 2015 when use of the categorical exclusion for hazardous fuel reduction prescribed fire treatments would no longer be allowed.

Management considerations and constraints (Table 2) related to fire management activities and fire management objectives (Table 3) are identified for FMU 2. The constraints associated with operating an annual prescribed fire program under documented categorical exclusions would affect the fire management program's ability to achieve the objectives for FMU 2.

Special values in this unit are maintained in a GIS database. These include threatened and endangered species, other species of concern, rare habitats, wading and migrating bird populations, archeological and cultural resources, wildland urban interface, park and adjacent infrastructure, and wilderness character.

Occupied habitat of the endangered Cape Sable seaside sparrow represents a significant portion of the River of Grass unit, and the protection and management of this habitat requires specific operational consideration. Fire management strategies will comply with the Cape Sable Seaside Sparrow Fire Management Strategy, which is reviewed and updated annually through collaboration among Everglades Fire Management, the USFWS, and appropriate partners. In addition, hardwood hammocks scattered through the River of Grass are fire intolerant and are frequently used by rare,

threatened, and endangered plant and animal species. Constraints associated with an annual prescribed fire program approved with the use of categorical exclusions would constrict the ability to use planned ignitions to reduce fuel loading adjacent to hardwood hammock, tree islands, and cultural resource sites to provide protection from unwanted fire spread.

Cultural and archeological sites are also found on a number of the hardwood hammocks in the unit. Cultural and natural resource specialists would be consulted during the planning and implementation of fire management activities as a management consideration.

Detailed descriptions of significant resources are found in Chapter 3: Affected Environment and Environmental Consequences. Mitigation measures designed to minimize impacts to these resources are fully described in the "Mitigation Measures" section of chapter 2, below.

Wildland urban interface values within and adjacent to FMU 2 consist of the Miccosukee Reserved Area, on the north boundary of the unit, which is a nationally identified wildland urban interface community at risk. Everglades National Park coordinates with the Miccosukee Tribe of Indians of Florida to minimize threats of wildfire to the Miccosukee Reserved Area and greater Miccosukee Community. Additional wildland urban interface values consist of Shark Valley tram tour concessions and visitor center, airboat and restaurant businesses, U.S. Highway 41, park campsites, and Loop Road Environmental Education Center within Big Cypress National Preserve (see Figure 10: Fire Management Unit 2 River of Grass No Action/Continue Current Management).

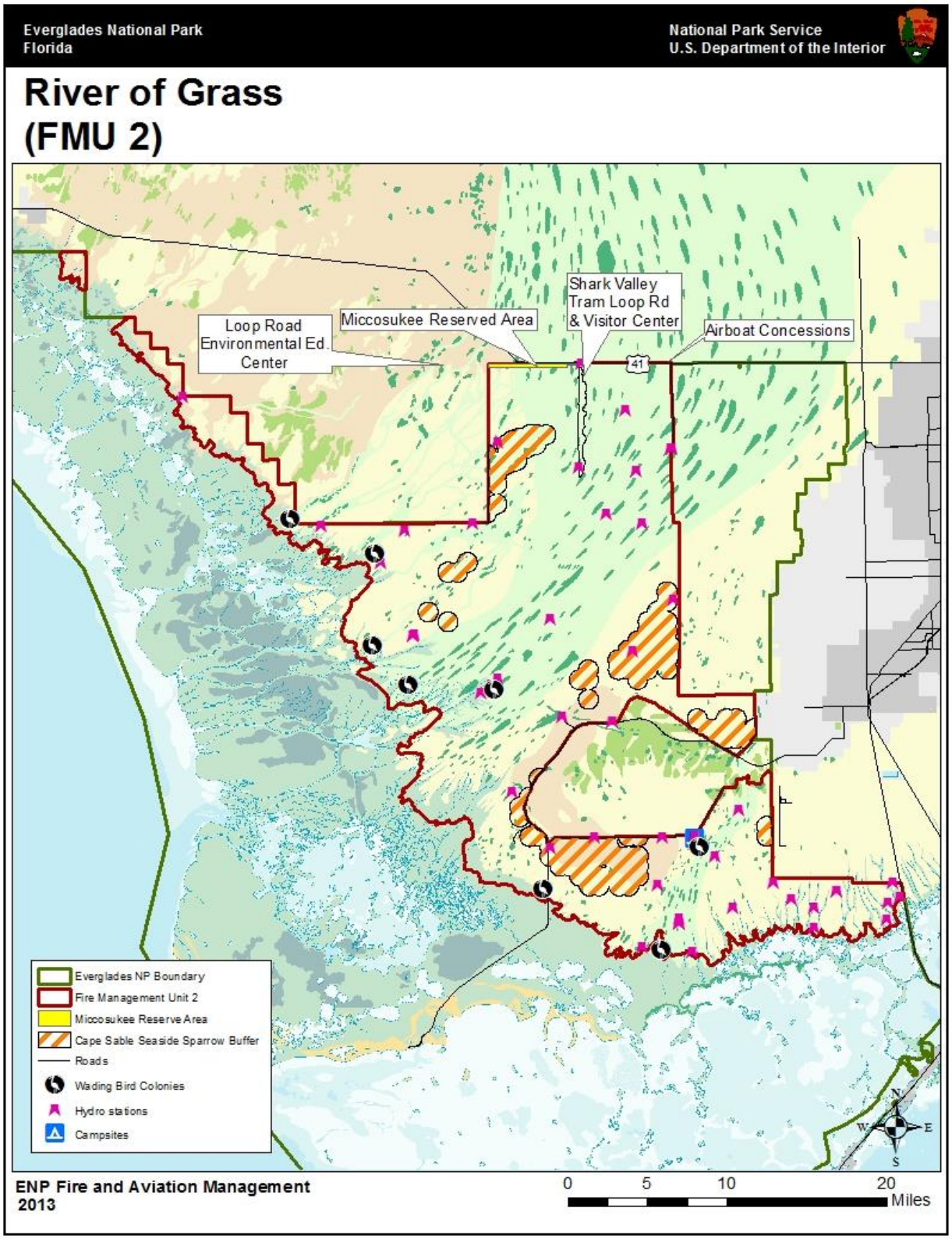

Figure 10: Fire Management Unit 2 River of Grass No Action / Continue Current Management

Management values displayed in the above map are a representation of the current conditions (2013). Management values would be updated as needed.

Fire Management Unit 3: Pine Rocklands

FMU 3 is a complex of pine rocklands and seasonally flooded prairies. FMU 3 includes the park's two major pine rockland areas: Long Pine Key and Pine Island. The pine rocklands include about 44,956 fire-adapted acres out of a total of 55,131. South Florida slash pine (*Pinus elliottii var. densa*), tropical and temperate shrubs and palms, and a species rich herbaceous layer with numerous rare and endemic species make up the fire-adapted pine rocklands habitat. The pine rocklands habitat, which is restricted in the United States to southeastern Florida, is designated as a globally imperiled habitat by the Florida Natural Areas Inventory (FNAI 2010). The former farmland known as Hole-in-the-Donut is included within FMU 3, located in Long Pine Key. This area is currently undergoing restoration and exotic species eradication.

Figure 11: Pine Rocklands

Areas of this FMU located outside of designated wilderness would be maintained on a three year fire return interval using prescribed fire. Approximately 15,718 fire-adapted acres are located outside of designated wilderness in FMU 3. The remaining areas, which make up the majority of the FMU, are not treated with prescribed fire under Alternative A. Tropical hardwood hammocks also contained within this FMU will burn only under extreme conditions. FMU 1.

Figure 12: Pine Rocklands, Aerial View

Detailed descriptions of the vegetation communities and the interactions with and adaptations to fire are included in Chapter 3: Affected Environment and Environmental Consequences, and in section 3.1.2.1 of the Fire Management Plan ("Fire Adapted Vegetation Communities").

Prescribed fire activities would continue for hazardous fuel reduction in areas outside of designated wilderness, including the Long Pine Key campground, Pine Island Housing Area, Camp Everglades Boy Scout Camp and Pine Block AA until 2015, when use of the categorical exclusion for hazardous fuel reduction prescribed fire treatments is no longer allowed. Prescribed fire treatments in the hole in the donut would be implemented for exotic species management and restoration. In FMU 3, unplanned ignitions would be managed using an appropriate fire management strategy to protect life and property. Whenever possible, fires would be managed to achieve resource benefits consistent with the objectives identified for this FMU.

Management considerations and constraints (Table 2) related to fire management activities and fire management objectives (Table 3) are identified for FMU 3. The primary park management strategy in this unit has been prescribed fire; however, under Alternative A the majority of FMU 3 would not be treated with prescribed fire due to the constraints associated with operating an annual prescribed fire program under documented categorical exclusions. These constraints would affect the fire management program's ability to achieve the objectives for FMU 3.

Values in the pine rocklands unit are maintained in a GIS database. These include threatened or endangered species, other species of concern, re-introduced species, wading and migrating bird populations, rare habitats, cultural resources, wildland urban interface, park and adjacent infrastructure, wilderness character, wetlands and tree islands, hardwood hammocks, and one private inholding: Camp Everglades, owned by the Boy Scouts of America.

The Cape Sable seaside sparrow requires specific operational consideration in this unit. Fire management strategies would comply with the Cape Sable Seaside Sparrow Fire Management Strategy the same as described under FMU 2. In addition, hardwood hammocks occur throughout the pine rocklands in FMU3. These plant communities are fire intolerant and provide habitat for a variety of threatened and endangered species. Constraints associated with an annual prescribed fire

program approved with the use of documented categorical exclusions would limit the ability to use planned ignitions to reduce fuel loading adjacent to hardwood hammock to provide protection from unwanted fire spread. Natural resource specialists would be consulted during the planning and implementation of fire management activities as a management consideration.

Detailed descriptions of significant resources are found in Chapter 3: Affected Environment and Environmental Consequences. Mitigation measures designed to minimize impacts to these resources are fully described in the "Mitigation Measures" section of chapter 2, below.

The wildland urban interface values within and adjacent to FMU 3 consist of Pine Island residential housing and administrative complex, Beard and Robertson buildings, Coe and Royal Palm visitor centers, Anhinga Trail boardwalk, Hidden Lake Education Center, Boy Scout in-holding, Long Pine Key campground, Coe campground, Nike HM-69 Missile Base, main park road, entrance stations, and Old Ingraham Highway (see Figure 13: Fire Management Unit 3 Pine Rocklands No Action/Continue Current Management).

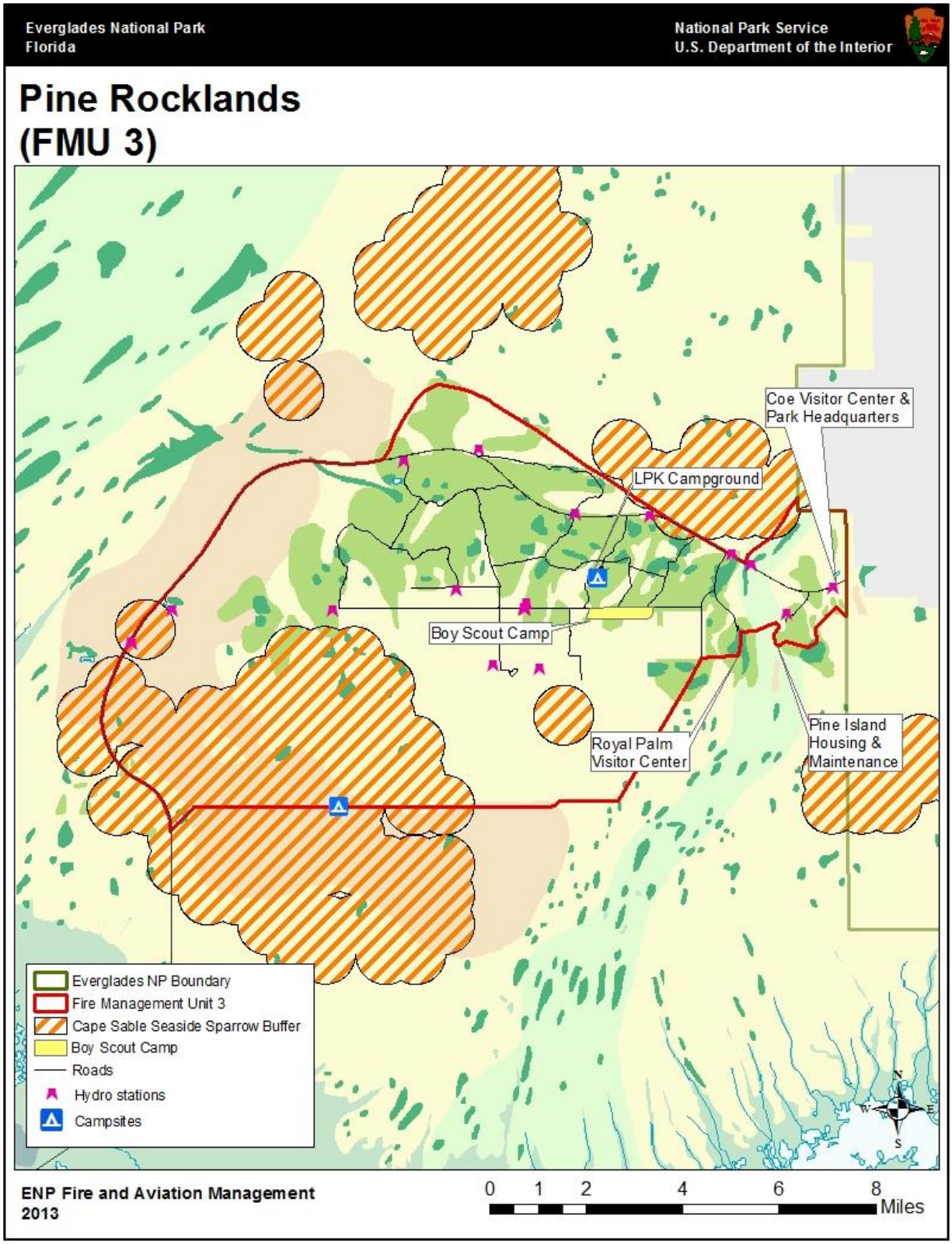

Figure 13: Fire Management Unit 3 Pine Rocklands No Action/Continue Current Management

Management values displayed in the above map are a representation of the current conditions (2013). Management values would be updated as needed.

Fire Management Unit 4: East Everglades

FMU 4 encompasses the 106,964-acre East Everglades Expansion Area, of which 99,371 acres are fire-adapted. FMU 4 includes sawgrass and marl prairies, sloughs, tropical hardwood hammocks, and areas invaded with exotic plants such as Brazilian pepper, melaleuca, Australian pine, and Old World climbing fern. In FMU 4 there are large continuous areas of flammable vegetation with a mix of long and short hydro-period prairies that create conditions for fire spread. The entire East Everglades Expansion Area is a wilderness study area with no designated wilderness in the FMU at this time. All of FMU 4 is within the wildland urban interface and would be maintained on a three-year fire return interval. This fire return interval would be maintained via annual hazardous fuel reduction treatments. (As noted earlier, annual hazardous fuel reduction would be capped at 4,500 acres park-wide, and no treatments could occur in designated wilderness.) This fire return interval would also apply to units being treated for exotic species management.

Figure 14: Marl Prairie

In FMU 4, unplanned ignitions would be managed using an appropriate fire management strategy to protect life and property. Whenever possible, fires would be managed to achieve resource benefits consistent with the objectives identified for this FMU.

Prescribed fire treatments would be limited to invasive exotic melaleuca treatments and hazardous fuel reduction treatments in areas outside of designated wilderness. Hazardous fuel reduction treatments could occur until 2015, when use of the categorical exclusion for hazardous fuel reduction prescribed fire treatments would no longer be allowed.

Detailed descriptions of the vegetation communities and the interactions with and adaptations to fire are included in Chapter 3: Affected Environment and Environmental Consequences, and in section 3.1.2.1 of the Fire Management Plan ("Fire Adapted Vegetation Communities").

Florida Power and Light Company owns a 7.5 mile long, 330-370-foot wide strip within the boundary of East Everglades Expansion Area. Prescribed fire treatments would be conducted with

coordination and consent of FPL. Under Alternative A, prescribed fire treatments would be conducted after advance notification of burns to FPL, as authorized by the state "Hawkins Bill." Everglades National Park management would seek to enter into a formal agreement with FPL governing the use of FPL lands by Everglades National Park during prescribed burns and other park activities.

Management considerations and constraints (Table 2) related to fire management activities and fire management objectives (Table 3) are identified for FMU 4. The constraints associated with operating an annual prescribed fire program under documented categorical exclusions would affect the fire management program's ability to achieve the objectives for FMU 4.

Special values in this unit are maintained in a GIS database. These include threatened or endangered species, rare habitats, archeological and cultural resources, wildland urban interface, former private camps, park and adjacent infrastructure, and eligible wilderness.

The Cape Sable seaside sparrow requires specific operational consideration in this FMU. Fire management strategies would comply with the Cape Sable Seaside Sparrow Fire Management Strategy the same as described under FMU 2. Tropical hardwood hammocks are embedded throughout the unit, particularly in the short hydroperiod prairies. Constraints associated with an annual prescribed fire program approved with the use of categorical exclusions would constrict the ability to use planned ignitions to reduce fuel loading adjacent to hardwood hammock, tree islands, and cultural resource sites to provide protection from unwanted fire spread.

Hammocks are used by rare, threatened, or endangered plant and animal species. Significant cultural and archeological sites of particular concern are also found on a number of these hammocks. In addition to these sites, historic hunt camps may be present in this FMU. Cultural and natural resource specialists would be consulted during the planning and implementation of fire management activities as a management consideration.

Detailed descriptions of significant resources are found in Chapter 3: Affected Environment and Environmental Consequences. Mitigation measures designed to minimize impacts to these resources are fully described in the "Mitigation Measures" section of chapter 2, below.

Wildland urban interface areas and park infrastructure are within and adjacent to FMU 4. Chekika Recreation Area, visitor use areas, park infrastructure, and hunt camps are in this FMU. The 8.5 Square Mile Area, just outside the park's east boundary, is a nationally identified wildland urban interface community at risk. Along the U.S. Highway 41 corridor, within the unit, there are private inholdings and commercial establishments, radio towers, and the Osceola Indian Camp. There are extensive plant nurseries and fruit orchards along the east park boundary that could incur substantial economic losses from fires. Two prison facilities are outside the park adjacent to this unit (see Figure 15: Fire Management Unit 4 East Everglades No Action/Continue Current Management and Figure 4: Management Units for Alternative A: No Action / Continue Current Management).

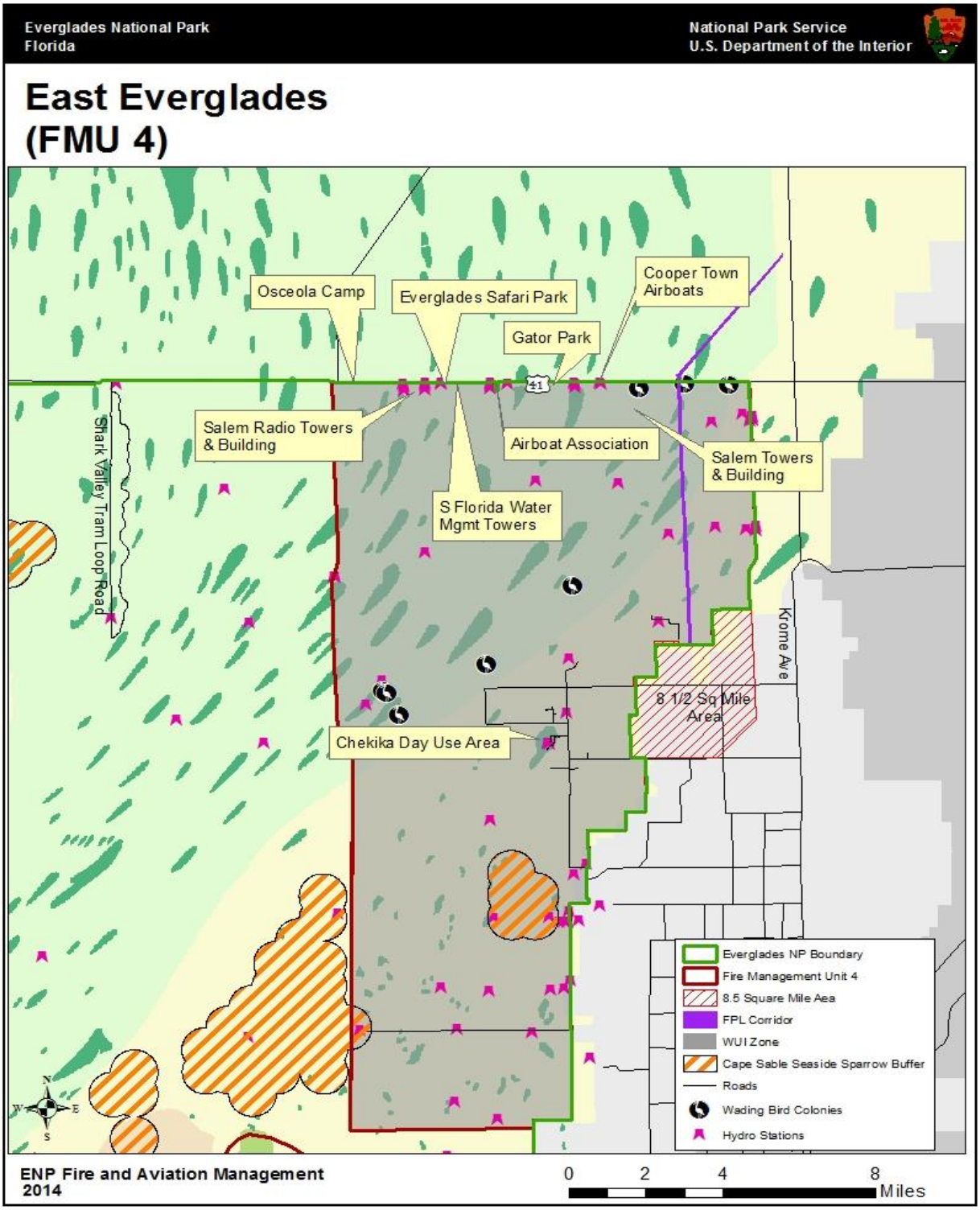

Figure 15: Fire Management Unit 4 East Everglades No Action/Continue Current Management

Management values displayed in the above map are a representation of the current conditions (2013). Management values would be updated as needed.

Table 2: Management Considerations and Constraints for Each Fire Management Unit

Management Consideration or Constraint	FMU 1: Coastal Prairies	FMU 2: River of Grass	FMU 3: Pine Rocklands	FMU 4: East Everglades
The FMU is in a Class I airshed but smoke impacts to the overall airshed are negligible.	X	X	X	X
Fire operations in designated wilderness would be managed in accordance with a minimum tool analysis.	X	X	X	X
The spread of exotic species would be limited through conducting fire operations in support of the exotic plant management program.	X	X	X	X
In the event that research identifies the need, prescribed fire could be used to achieve future resource management objectives.[1]	X	X	X	X
Recommendations from resource specialists would be considered during planning and implementation of fire management activities.	X	X	X	X
Threatened and endangered species, rare habitats, species of special concern, park infrastructure, and archeological and cultural resources would require protection.	X	X	X	X
In addition to the prescribed fire notification process for the park and cooperators, advanced notification of planned fire operations would be provided at visitor access points, permitting stations, visitor centers, and/or entrance stations (based on fire locations).	X	X	X	X
Prior to planned ignitions, reconnaissance would be conducted to verify that that no backcountry users, campers, or visitors would be adversely impacted.	X	X	X	X
A burn authorization would be obtained from the Florida Forest Service for each prescribed fire.	X	X	X	X
Any fires that span the Big Cypress National Preserve boundary would receive the appropriate level of management approval from both Big Cypress National Preserve and Everglades National Park.	X	X		
Park and private infrastructure and transportation corridors represent an additional management consideration	X	X	X	X
When safe, fire management strategies would require actions to exclude fire from untreated stands of melaleuca and Australian pine.		X		X
A significant safety concern involves hazardous materials illegally disposed in this FMU.				X

[1] A likely example with respect to future restoration activities would involve the combined use of prescribed fire and water management to create preferential flowpaths. This action could be particularly appropriate in areas with dense sawgrass where fire and increased hydroperiod may aid in transition to slough vegetation.

Table 3: Fire Management Objectives for Each Fire Management Unit

Fire Management Objectives	FMU 1: Coastal Prairies	FMU 2: River of Grass	FMU 3: Pine Rocklands	FMU 4: East Everglades
Planned ignition treatments would be used to help manage the spread of Old World Climbing fern (*Lygodium microphyllum*) and inhibit the encroachment of Brazilian pepper (*Schinus terebinthifolius*)	X	X	X	X
Planned ignition treatments would be used in conjunction with chemical and mechanical treatments to manage exotic vegetation populations identified by the Exotic Vegetation Management Program.	X	X	X	X
Fires would be managed using the full range of management strategies to protect, restore, or maintain resources in the park.	X	X	X	X
Planned ignition treatments would be used to reduce hazardous fuels to protect park values.	X	X	X	X
Planned ignition treatments would be used to create mosaic patterns to break up the fuel continuity and maintain habitat diversity, and provide species refugia.	X	X	X	X
Planned ignition treatments would be used to reduce fuel loading adjacent to hardwood hammock, tree islands, and cultural resource sites to provide protection from unwanted fire spread.	X	X	X	X
Unplanned ignitions would be managed in order to protect life and property and whenever possible achieve resource benefits.	X	X	X	X
Unplanned ignitions would be evaluated using a decision support process that examines the full range of management responses under the following conditions; strategies and tactics would consider firefighter and public safety first, fire cause, current and predicted weather, current and potential fire behavior and effects, values to be protected, sensitive tree island and hammocks, archeological and/or cultural resources, proximity to wildland urban interface areas and park infrastructure, untreated stands of melaleuca (*Melaleuca quinquenervia*), and Australian pine (*Casuarina equisetifolia)*, resource availability, and cost effectiveness.	X	X	X	X
It would be ensured that all fire management activities comply with the annual Cape Sable Seaside Sparrow fire management strategy.		X	X	X
Planned ignition treatments would be used to restore natural fire processes in areas in the Hole-in-the-Donut identified by resource management			X	

The constraints associated with operating an annual prescribed fire program under documented categorical exclusions would limit the fire management program's ability to implement treatments and achieve the fire management objectives specific to each FMU identified under Alternative A.

WILDLAND FIRE OPERATIONAL GUIDANCE

For ease of comparison between the two alternatives, differences in fire management strategies based on fire type and situation are described in Table 7 following the description of Alternative B.

Under Alternative A, wildfire operational guidance goals would follow the goals and objectives of Everglades Fire Management. These include the following:

- Firefighter and public safety is the first priority of all fire management activities.
- Comply with national, regional, and local legislation, orders, and policies.
- Conduct all fire management activities in accordance with approved management plans for Everglades National Park.
- Maintain the necessary staffing, equipment, training, qualifications in accordance with National Wildfire Coordinating Group standards and agency policy.
- Maintain safe and effective fire readiness according to established plans, protocols, and guidelines to prevent, detect, and take effective management actions on all wildfires.
- Continue cooperative management efforts and agreements with state, local, and other federal agencies to provide efficient, cost effective wildland fire management activities.

Alternative A would use the full range of wildfire management strategies throughout the park, regardless of ignition source or FMU. Strategy selection would be based on achieving the park land management goals.

Unplanned Ignitions

All unplanned wildfires will continue to be managed using an appropriate fire management strategy. A full range of strategies may be selected, including:

- Full suppression – a strategy used to achieve control of a fire and prevent it from exceeding a defined perimeter;
- Point/zone protection – a variety of suppression actions taken to protect a specific point or areas from fire, usually by tactics which constrain progressive fire encroachment away from identified values at risk; and
- Monitor/confine/contain – management actions conforming to a management strategy that periodically checks the fire to ensure it continues to meet established objectives.

Wildfire resulting from unplanned ignitions, regardless of source, would be evaluated to determine the appropriate response, based on park management goals and objectives. Unplanned ignitions would be managed to protect life and property and whenever possible achieve resource benefits. Management strategies may consist of full suppression, point/zone protection, or monitor/confine/contain strategies. Unplanned ignitions would be evaluated using a decision support process that examines the full range of management responses under the following conditions: Strategies and tactics would consider firefighter and public safety first;

- Fire cause;
- Current and predicted weather;
- Current and potential fire behavior and effects;
- Values to be protected;
- Sensitive tree islands and hammocks;
- Archeological and/or cultural resources;
- Proximity to wildland urban interface areas and park infrastructure;
- Proximity to untreated stands of melaleuca and Australian pine;
- Resource availability; and

- Cost effectiveness.

Planned Ignitions

Under **Alternative A (No action – continue current management),** the NPS would continue to plan and approve prescribed fire treatments on an annual basis. Because the 1995 FMP and its NEPA environmental assessment are out-of-date, prescribed fire treatments are currently limited to those which can be authorized under NEPA documented categorical exclusions. Treatments would be planned for exotic plant management and hazardous fuel reduction objectives. Hazardous fuel reduction burns would be limited to a maximum of 4,500 acres in non-designated wilderness annually until completion of a new FMP and EA, or until April 2015 at which point hazardous fuel reduction burns would no longer be allowed using a documented categorical exclusion. Under current management, Everglades National Park has treated 8,000 - 45,000 acres with prescribed fire per year between 2003 and 2013. These burns have generally been restricted to coastal prairies in southern Everglades National Park and habitats near the park boundaries. Prescribed fire cannot be carried out in many fire dependent habitats, including those utilized by listed species. Under Alternative A, it is expected that the amount of acres treated would be the same or less and the areas proposed for treatment would be similar or less than those in 2003-2013.

Planned ignition treatments for exotic vegetation management would be combined with chemical and mechanical treatments to manage exotic vegetation populations identified by the Exotic Vegetation Management Program.

Annual coordination with the South Florida Natural Resource Center, the interdisciplinary team, subject matter experts, and external stakeholders would provide valuable input in planning prescribed fire projects annually. Planned ignition treatments would be implemented under an agency administrator approved prescribed fire plan.

Project-specific Endangered Species Act consultation, National Historic Preservation Act consultation, and Wilderness Minimum Requirements Analysis would occur on an annual basis.

Non-Fire Treatments

- Non-fire treatments would be guided by park planning procedures and consultation with appropriate management staff.
- At this time fire management does not implement non-fire treatments. If planned, these treatments would occur under documented categorical exclusion G(1) in accordance with the NPS DO-12 Handbook. A maximum of 1,000 acres would be treated annually in areas outside of designated wilderness with mechanical hazardous fuel reduction treatments. These treatments would continue until April 24, 2015 at which time the categorical exclusion for hazardous fuel reduction prescribed fire treatments will expire. Chemical hazardous fuel reduction treatments are excluded from approval under the hazardous fuel reduction categorical exclusion.

SAFETY

Operational guidance directs all fire management activities to provide for firefighter and public safety, mitigate risk from unwanted wildfire and provide resource benefit. Threats to safety include those that are directly fire-related, including hazards from firing devices, flammable materials, smoke, and carbon monoxide and indirect threats, such as dehydration, heat exhaustion, and heat stroke; the presence of poisonous plants, snakes, and insects; irregular ground surface; and hazards of working around vehicles and heavy equipment. All operational documents would address both public and employee safety. Potential effects of all projects on employees and public would be considered. Fire management involves a variety of risks associated with its operations.

Guidance for Implementation of Federal Wildland Fire Management identifies sound risk management as the foundation for all fire management activities. Risks and uncertainties relating to fire management activities are understood, analyzed, communicated and managed as they relate to the cost of either doing or not doing and activity. Net gains to the public are an important component of the decisions.

Under Alternative A, areas that would be identified for potential effects from any fire operation would include:

- Transportation corridors;
- Urban interface and park infrastructure;
- Visitor use;
- Park operations; and
- Park neighbors.

Alternative A would include an initial list of measures to address safety issues associated with each of these areas, as follows:

- Conduct planned ignition treatments to reduce hazard fuel accumulation to the extent possible given the constraints associated with operating an annual prescribed fire program under documented categorical exclusions to comply with NEPA.
- Notify and update residents and employees of proposed and/or ongoing operations.
- Respond to fires in the mutual response zone.
- Reference pre-attack plans to identify key items to be considered in initial attack.
- Monitor urban expansion adjacent to NPS boundaries to identify new communities at risk.
- Maintain the necessary staffing, equipment, training, and qualifications in accordance with National Wildfire Coordinating Group standards and National Park Service policy.
- Manage an efficient wildfire preparedness organization according to plans, protocols and guidelines to prevent and detect wildfires, and take effective management actions on all wildfires.

As new or modified approaches were developed, they would be incorporated.

STAFFING

The 1995 plan provides an organizational chart showing individuals with key fire management roles and lists the responsibilities of each key position. Updates to the fire management organization are reflected in the organizational chart maintained in the fire management offices. Fire management position descriptions can be found in the NPS Reference Manual # 18 (NPS 2008b).

The Step-up Plan describes minimum staffing levels for Fire Management staff within the park based on fire danger ratings. Interagency coordination is achieved through a state-wide cooperative agreement specific to the management of wildfire. Within the mutual response zone along the eastern boundary of the park, all agencies may take initial response actions. Everglades National Park coordinates with the Miccosukee Tribe of Indians of Florida to minimize threats of wildfire to the Miccosukee Reserved Area and greater Miccosukee community, a nationally recognized wildland urban interface Community at Risk.

PREVENTION AND EDUCATION

The objectives of the park's prevention program would be to mitigate damages and losses from unwanted, severe wildfires, reduce human caused ignitions, reduce suppression costs, mitigate the risks of wildfire to private property and park resources, and protect the lives of firefighters and the public. Fire management staff would work closely with the park public information officer and interpretative staff to provide information on ongoing fire incidents, fire prevention, and fire ecology for Everglades National Park.

Fire management would take the following actions to provide information regarding fire events and in support of education and outreach:

- Timely and accurate information will be provided to the media and park visitors regarding the status of fire actions and wildland fire management actions.
- Informational materials explaining the fire management program will be prepared and updated as necessary. During periods when planned ignition treatment operations are occurring, these handouts will be distributed to park visitors and general public, as appropriate.
- Ongoing fire operations will be discussed in informal contacts with park personnel, park neighbors and visitors.
- Adjacent landowners will be notified when wildfire is a threat to residential areas.
- Fire management will maintain an internet and intranet website which will be used to educate the public and park staff on fire operations and activities.
- Fire management will participate in fire education outreach activities include participation in local community events, special presentations, on-site/off-site activities with educational groups, and participation in other interagency activities.
- Urban expansion proximate to NPS boundaries will be monitored and fire management will continue to assess increasing needs for fire information, prevention and education.
- Fire management will request smoke advisories to be broadcast on NOAA weather radio when appropriate.

MINIMUM REQUIREMENTS IN WILDERNESS

Alternative A would include the use of a variety of mechanized vehicles and equipment necessary to insure public health and safety and to achieve the fuel treatment and resource management objectives of the plan. Use of motorized vehicles and equipment would be as prescribed in a minimum requirements analysis for both unplanned wildfires and planned ignitions (prescribed fires). (Under Alternative A, prescribed fire could only be undertaken in wilderness for the purpose of restoring native species and controlling exotics. See categorical exclusions 3.4(E)(2) and 3.4(G)(1) in the DO-12 Handbook.) The minimum requirements analysis for planned ignitions would be undertaken on an annual project- specific basis. Authorized vehicles and equipment would be the minimum necessary to safeguard public safety and meet plan objectives while at the same time minimizing adverse impact to the park's wilderness character.

Aviation use often offers the least impact and least invasive means of access to carry out research, fire and resource management, law enforcement, and search and rescue activities. With approximately 90 percent of Everglades National Park designated as wilderness, helicopter landings for planned fire management activities would be conducted in accordance with the Wilderness Act. The following paragraphs describe fire management activities that may involve otherwise prohibited uses.

The vehicles and equipment that are typically authorized annually differ by FMU, as follows:

- FMU 1: Helicopter landings, use of motorized weed eaters to reduce fuel loading and create defensible space. (Defensible space is an area either natural or manmade where material capable of causing a fire to spread has been treated, cleared, reduced, or changed to act as a barrier between an advancing wildland fire and the loss to life, property, or resources.) Rebar could be used for marking monitoring plots. These authorizations would extend to prescribed fire and fuels management and fire management monitoring. Their use would be subject to minimum impact suppression tactics. Mitigation: improved helispots generally prohibited unless on-site decision-maker determines that conditions dictate otherwise; fire breaks limited in size; natural and/or existing firebreaks used where possible.
- FMU 2: Helicopter landings, use of specified mechanized vehicles (airboats, all terrain vehicles, and utility terrain vehicles). Authorized motorized equipment consisting of weed eaters, portable pumps, mowers, rock drills, and power drills. (The rock drills would be used to install rebar for marking monitoring plots. Power drills would be necessary for maintaining above-ground monitoring stations.) These vehicles and tools would be authorized for conducting prescribed fire and for fuels management and fire management monitoring. Their use would be subject to minimum impact suppression tactics. Mitigation: improved helispots generally prohibited unless on-site decision-maker determines that conditions dictate otherwise; no specialized vehicles allowed; airboat use restricted to prescribed fire and prohibited for monitoring activities; fire breaks would be limited in size; natural and/or existing firebreaks would be used where possible.
- FMU 3: Trucks, fire engines, all terrain vehicles, utility terrain vehicles, and passenger vehicles. Motorized equipment would consist of weed eaters, portable pumps, and chainsaws. These vehicles and tools would be for conducting prescribed fire and fuels and fire management monitoring. Their use would be subject to minimum impact suppression tactics. Mitigation: improved helispots generally prohibited unless on-site decision-maker determines that conditions dictate otherwise; no specialized vehicles allowed; airboats prohibited for monitoring activities; fire breaks limited in size; natural and/or existing firebreaks used where possible; off road travel for all terrain vehicles and utility terrain vehicles generally restricted to travel along fire breaks; other vehicles to remain on roads; chainsaws used only to remove logs that may carry fire across a fire break, and only when the logs cannot be removed manually.
    - FMU 3, Hole-in-the-Donut Sub-area: engines, passenger vehicles, all terrain vehicles, and utility terrain vehicles. Motorized equipment would consist of weed eaters, portable pumps, and chainsaws. These vehicles and tools would be for conducting prescribed fire and fuels management operations. Mitigation: improved helispots generally prohibited unless on-site decision-maker determines that conditions dictate otherwise; no vehicles allowed; specialized fire breaks limited in size; natural and/or existing firebreaks used where possible; off road travel for all terrain vehicles and utility terrain vehicles generally restricted to travel along fire breaks; chainsaws used only to remove logs that may carry fire across a fire break, and only when the logs cannot be removed manually.
- FMU 4: Helicopter landings, use of specified mechanized vehicles (airboats, trucks, fire engines, all terrain vehicles, utility terrain vehicles, and passenger vehicles). Specialized vehicles (bombardiers). Motorized equipment would consist of weed eaters, portable pumps, chainsaws, rock drills, and power drills. These vehicles and tools would be for conducting prescribed fire and fuels and fire management monitoring. Their use would be subject to minimum impact suppression tactics. Mitigation: improved helispots generally prohibited

unless on-site decision-maker determines that conditions dictate otherwise; airboats to use existing trails where possible in creating holding lines; airboats prohibited for monitoring activities; bombardiers generally to be used along agricultural roads, and to go off road only when all terrain vehicles or utility terrain vehicles are insufficient in prescribed fire operations; fire breaks limited in size; natural and/or existing firebreaks used where possible; off road travel for all terrain vehicles and utility terrain vehicles generally restricted to travel along fire breaks; chainsaws used only to remove logs that may carry fire across a fire break, and only when the logs cannot be removed manually.

Unplanned response activities would operate under the minimum tool analyses unless the on-site decision maker determines in his/her professional judgment that the conditions require additional emergency response activities.

MONITORING AND EVALUATION

Alternative A would conduct fire behavior and fire effects monitoring in the fire-adapted areas within Everglades National Park. Results would provide fire and resource managers with data to support fire management, and to assess whether, and the degree to which, fire management objectives were being achieved. Monitoring would enable managers to compare actual prescribed fire effects with stated burn objectives and to assess and validate or refine current management prescriptions and techniques. In addition, existing practices would be formalized, often with standardized procedures and forms, for the following:

- Short-term monitoring during prescribed fire operations;
- Historic fuel treatments, which would be digitized and incorporated into the fire geographical information system database;
- After-action review of fire operations; and
- Documenting and reporting actions and results, and reviewing lessons learned.

The fire program implements four levels of monitoring, including environmental, fire behavior, short-term, and long-term fire effects. Alternative A would continue the use of an expanded monitoring program in conformance with Reference Manual # 18 and the *Fire Monitoring Handbook* (NPS 2003b).

Environmental monitoring includes weather, hydrological, fuel and soil moisture monitoring. These factors impact decisions regarding prescribed fire implementation as well as selection of wildfire response management strategies. Considerations in the decision making process include evaluation of environmental conditions, expected fire behavior and potential impacts to park natural and cultural resource values. In addition to environmental monitoring, fire behavior monitoring occurs during all prescribed fire treatments. Fire behavior monitoring includes assessing smoke, flame lengths, spread rates, and consumption. In prescribed fire implementation environmental and fire behavior monitoring is used to assess prescription parameters and determine if desired fire effects are likely to be achieved.

Fire effects vegetation monitoring occurs in long term and temporary plots in the fire-adapted vegetation communities: sawgrass marshes, marl prairies, pine rocklands, and coastal prairies. Effect of fire on fuel loading, herbaceous and woody plant cover, pine and butterfly host plants, and exotic plant monitoring occurs as well as post-fire severity assessments. Surveys for species of concern and cultural resources may occur in support of natural and cultural resources inventory and monitoring programs in Everglades National Park. Fire Management staff would work closely with cultural and natural resource specialists and record any cultural or historic sites or structures and fire effects upon them or sightings of species of concern observed during prescribed fire planning, implementation, and post fire monitoring activities. Observations would be reported to Everglades

National Park cultural or natural resource specialists. Fire effects monitoring could contribute to an assessment of how fire is affecting wilderness character. In particular, monitoring would allow park staff to assess whether the fire program is serving to preserve natural conditions in wilderness.

The fire effects monitoring program would emphasize the use of an adaptive management approach to evaluate actions, make adjustments, and learn from work in the park and the work of others. It recognizes that monitoring is central to the understanding needed to successfully guide adaptive management. Components would include the following:

- An ecological model of the park;
- Descriptions of the park's fire-adapted communities;
- Specific resource goals and mitigations;
- Fire monitoring design, including environmental parameters and fire observation monitoring;
- Fire effects monitoring actions in each FMU and vegetation type using long-term monitoring plots;
- Data management, analysis, and reporting;
- Roles and responsibilities; and
- Use of the data for adaptive management.

Some ecological monitoring programs would be long term. Others could be short-term and would end after adequate management data were collected.

Proposed methods and techniques would include aircraft to transport personnel and equipment for fire management monitoring activities. Rebar installation could occur to mark locations of new fire effects monitoring plots where additional fire effects plot installation was required. Additional plot installations could be required to further study the effects of fire on exotic plant species. All monitoring activities within Wilderness would conform to the minimum requirements decision guide for the annual program of work.

FIRE CRITIQUES / AFTER ACTION REVIEWS

Under Alternative A, After Action Reviews would be conducted for all wildfires including single burning period incidents, extended attack incidents, and prescribed fires. It would also provide provisions for the incident management team to meet with park representatives and the superintendent to review and close-out incident, and to obtain regional or national review, if warranted. AARs would specifically conform to the review procedures outlined in *Wildland Fire Management, Reference Manual 18* (NPS 2008b) and the Interagency Standards for Fire and Fire Aviation Operations (Red book) (National Interagency Fire Center 2014) or any guidance that replaced or updated these documents.

PLAN REVIEWS AND UPDATES

The 1995 plan specified that the fire management plan would be reviewed annually, with any required updating added and distributed as an appendix, and would be updated every five years. Since its initial approval in 1991, the plan was only formally updated once, in 1995. Current NPS policy requires that fire management plans be reviewed annually. Plans are to be updated as determined by the results of the annual review.

Fire management program reviews are conducted according to interagency preparedness review checklists. Programs within fire management that are reviewed include aviation, engine operations,

dispatch and administrative program management. The reviews identify areas for program improvement to be implemented during the following year.

Under current management, prescribed fires are conducted under the annual prescribed fire program. Beginning in 2008, prescribed fire treatments have been planned on an annual basis and documented and approved with the use of NEPA categorical exclusions. NEPA compliance is done for the annual program of work, which typically consists of 5-7 prescribed fire treatment projects.

ALTERNATIVE B: PROPOSED FIRE MANAGEMENT PLAN

Alternative B, NPS' preferred alternative, would implement a new fire management plan for Everglades National Park. This comprehensive document would reflect current federal regulations and guidance, the most modern knowledge and practices regarding fire management in the Everglades ecosystem, and also codify practices implemented over the years, deleting obsolete features of the 1995 plan. Alternative B would provide a flexible range of options and activities that could be used to respond to changes in environmental conditions and the specific needs of individual firefighting efforts. As under Alternative A, a variety of fire management strategies would be available to manage unplanned wildfires. These include:

- Full Suppression – a strategy used to achieve control of a fire and prevent it from exceeding a defined perimeter;
- Point/Zone protection – a variety of suppression actions taken to protect a specific point or areas from fire usually by tactics which constrain progressive fire encroachment away from identified values at risk; and
- Monitor/Confine/Contain – management actions conforming to a strategy that periodically checks the fire to ensure it continues to meet established objectives.

Under Alternative B, prescribed fire fuels treatments would be planned for multiple years and would occur as part of a moving 'window' of current and out-year treatments in a multi-year fuels treatment plan. This fuels treatment plan would be extended annually as part of the annual Fire Management Plan (FMP) review and update.

Wildfire management would remain unchanged under this alternative and Altentaive A; however, the FMP under Alternative B could function at the programmatic level and accommodate changes in policy guidance and practices from ongoing improvements in the science of wildfire management.

DEVELOPMENT OF PROPOSED FIRE MANAGEMENT PLAN

A key factor in the formulation of Alternative B was to design a fire management plan that could function at the programmatic level, be adaptable to changing fire policy, and include a multi-year fuels treatment plan. The proposed fire management plan would allow managers to implement recent federal fire policy and plan prescribed fire treatments over multiple years. As a result, the fire management plan proposed under Alternative B would be able to accommodate advanced burn planning and annual burn plan updates as well as changes in guidance and practices from ongoing improvements in the science of wildland fire management. The fire management plan would be reviewed and revised annually in response to factors such as changing federal regulations and guidelines, research results, lessons learned in the field, budgets, staffing needs, and administrative changes within and outside the National Park Service. In addition, annual updating would occur for plan elements such as, but not limited to, the pre-attack plan, step-up plan, multi-year fuels plan, Cape Sable seaside sparrow strategy, fire effects monitoring plan, and cooperative operating plan.

The proposed fire management plan was developed in accordance with federal wildland fire policy and guidance. Relevant documents are listed in Chapter 1: Fire Management Guidance.

COOPERATION AND COLLABORATION

The following cooperation and collaboration activities are the same as described in Alternative A with the exception of (a) interdisciplinary team meetings to review and update the FMP, and (b) the multi-year fuels treatment plan and associated activities.

Alternative B would maintain a fire management interdisciplinary team consisting of subject matter experts from a variety of fields and divisions in the park. The interdisciplinary team would consist of (but may not be limited to) the fire management officer, a fire ecologist, a prescribed fire specialist, the chief of the biological resource division, a park botanist, the chief of cultural resources, a member from the park's environmental compliance division, and the regional fire planner. The team would continue to coordinate during planning, implementation, and response operations. The interdisciplinary team would meet annually to review and update the FMP and multi-year fuels treatment plan, adding one additional out-year to the representative scope of work. The interdisciplinary team would determine whether impacts from the changes and actions proposed to the plan are within the scope of impacts analyzed in this environmental assessment or if supplemental compliance is required.

Interagency interdisciplinary working groups and learning networks would continue to meet, including the following: the Cape Sable Seaside Sparrow Working Group, the Pine Rocklands Working Group, the Imperiled Butterfly Working Group, the Florida and Caribbean Fire and Invasives Learning Network. The Cape Sable Seaside Sparrow Working Group comprises inter-agency partners. The other working groups consist of federal and state agencies, academic institutions, NGOs and private land owners. These groups would continue to meet periodically to provide updates on special status species, state management concerns, share management practices, and discuss lessons learned. The National Park Service, U.S. Fish and Wildlife Service, and the Florida Forest Service would maintain their partnerships in a statewide cooperative fire management agreement. Under this agreement, these entities and Miami-Dade County Fire Rescue would continue to conduct joint fire management activities in accordance with an annual operating plan.

The National Park Service would continue to participate in a statewide cooperative fire management agreement consisting of federal, state, tribal, municipal, and private organizations (including Everglades National Park, Big Cypress National Preserve, Seminole Tribe of Florida, Florida Panther National Wildlife Refuge, Loxahatchee National Wildlife Refuge, and Florida Forest Service).

Everglades National Park would continue to participate on the South Florida Fire Management Council, which consists of federal, state, tribal, municipal, and private organizations. The primary goals of this council, which the park has participated in since the 1980s, are information exchange, training, and public education and prevention efforts.

PARK-WIDE FIRE MANAGEMENT GOALS

Fire management goals for Everglades National Park under Alternative B would include the following:

- Conduct all fire management activities in a manner that maintains the safety of firefighters and the public.
- Protect human life and property both within and adjacent to Park areas.
- Protect natural and cultural resources from adverse effects of fire and fire management activities.
- Maintain or improve the quality of the native fire-adapted vegetation communities that occur within Everglades National Park.
- Maintain a framework of adaptive management to ensure a responsive, efficient, safe, and accountable fire management organization.
- Allow natural processes to continue by managing fires through monitoring with little or no suppression action to the maximum extent feasible to achieve resource benefits.

- Use planned ignitions to supplement the natural role of fire as an ecosystem process, achieve resource management objectives, reduce hazardous fuel accumulations, reduce threats to WUI from wildfires, protect park resources, maintain fire adapted ecosystems, treat exotic plants, and to secure the park boundary.
- Use science based fire management to maintain a healthy and sustainable ecosystem. To the degree possible, achieve a healthy range of variation in the fire return interval, fire size, fire behavior, fire effects, and other characteristics of the fire regime using the best available science.
- Use science based fire management to maintain and enhance the wilderness character of the Marjory Stoneman Douglas Wilderness.

The above Park wide fire management goals are the same as park-wide fire management goals under Alternative A, with the exception of the last goal to use science based fire management to maintain and enhance the wilderness character of the Marjory Stoneman Douglas Wilderness.

Based on peer reviewed literature, internal technical reports, institutional knowledge and decisions made by the interdisciplinary team, Everglades National Park has chosen fire return intervals displayed in Table 1. These are the same fire return intervals used in Alternative A. Under Alternative B, all areas planned for prescribed fire treatment would be managed with the goal of maintaining a planning fire return interval based on the fire return interval range. Wildland urban interface and Pine Rocklands would be maintained on a minimum fire return interval to maintain low fuel loading reducing the risks of severe uncontrollable fire. In the wildland-urban interface (WUI) the incidence and probability of human caused fire is higher and infrastructure and communities are present. In the Pine Rocklands hazardous fuel accumulations have been observed along with increased hardwood plant encroachment at the mean fire return interval. Exotic plant prescribed fire treatments would be based on a minimum fire return interval. As under Alternative A, research and monitoring would occur to identify the most effective timing of burning and fire return interval through the fire management fire effects monitoring program and Exotic Vegetation Management Program. All other areas would be maintained on a mean fire return interval.

Table 4: Fire Return Intervals under the Alternative B Fire Management Plan, as Dictated by Community Type

Community Type / Fire Management Unit (FMU)	Fire Return Interval Range (years)	Notes
Coastal Prairie FMU 1	2-10	Exotic treatment areas maintained on a 2- year FRI, all other areas maintained on a 6-year FRI
Sawgrass FMU 2 / FMU 4 / FMU 3	3-12	Includes habitat within FMU 3 south of Pine Blocks and HID WUI areas and FMU 3 maintained on a 3-year FRI; all other areas maintained on an 8-year FRI
Muhly Grass - Marl Prairie FMU 2 / FMU 4 / FMU 3	3-12	WUI areas and FMU 3 maintained on a 3-year FRI; all other areas maintained on an 8-year FRI
Pine Rockland FMU 3	3-7	Includes pine rockland and embedded prairie communities All areas maintained on a 3-year FRI

Under **Alternative B,** implementation of a multi-year fuels treatment plan would allow prescribed fire treatments to be planned as part of a revolving five-year scope of work that would be reviewed and updated annually. The process would include the prioritization, selection, review, and update of fuels treatment projects. Prioritization values include fire return interval departure, fuel loading,

proximity to Cape Sable seaside sparrow populations, proximity to wildland urban interface and park boundary values, and exotic plant presence management values. Prescribed fires would take place in wilderness and non-wilderness. Wilderness would be considered within the multi-year fuels treatment plan with an associated programmatic minimum requirements analysis. This environmental assessment would serve as the NEPA compliance document for the multi-year fuels treatment plan. Under Alternative B, between 237,000 and 258,000 acres would be proposed for treatment annually. The actual amount of acres treated would likely be somewhat less than the number proposed, but Alternative B is expected to result in a substantial increase in the amount of acres treated when compared to current management. In addition, prescribed fire treatments would be carried out in fire dependent communities where such treatments are currently restricted.

For illustrative proposes, the multi-year fuels treatment plan is included as Appendix C of this EA. The multi-year fuels treatment plan illustrates a representative scope of work for a five year planning period. This scope of work will be reviewed and revised annually and is included here as a representative example.

Historically, the park has treated between 8,000 – 45,000 acres a year with prescribed fires. The annual range of prescribed fire acres from 2003-2013 is displayed above in Figure 2 of this chapter. Between 2003 and 2013, approximately 93,715 acres in the park were burned by wildfires that ranged from 200 acres to over 40,000 acres in a year. Figure 3 above displays the annual range of wildfire acres from 2003-2013.

In addition to park-wide fire management objectives, specific objectives exist for each of the four fire management units in the park. Those objectives are included in the descriptions of the FMUs, below.

FIRE MANAGEMENT UNITS

FMUs would be the same in Alternative B as in Alternative A. FMUs are defined by a combination of vegetation community as well as existing fire breaks where present. FMU 4 is defined by the boundaries of the East Everglades Expansion Area acquired in 1989.

In all FMUs, wildfires are managed the same as in Alternative A, using an appropriate management strategy. A range of management strategies can be used to manage a wildfire, including full suppression, point/zone protection, or monitor/confine/contain. In selecting a fire management strategy, managers first evaluate potential impacts and risks to public safety and property. Fire response decisions are based on current and forecasted weather conditions, fire behavior, resource availability, natural barriers, impacts to management values, and risk to fire fighters. Cost is also considered when making a final decision regarding selection and implementation of an effective management strategy.

Prescribed fire treatments will be planned and implemented under a multi-year fuels treatment plan, as opposed to the annual planning and approval in Alternative A. The FMUs in Everglades National Park under Alternative B are illustrated in Figure 16, Management Units for Alternative B: The National Park Service Proposed Fire Management Plan.

Management values identified in Alternative B are the same as existing management values in Alternative A and include, not in priority order, cultural resources, natural resources, wilderness character, visitor use and experience, wildland urban interface and community resources, and air quality. As new values are recognized or identified they will be incorporated into fire management planning and decision-making as described above. Park notifications would occur prior to prescribed fire treatments and coordination would occur with appropriate resource managers regarding unplanned wildfire incidents. Additionally, under Alternative B as opposed to Alternative A, interdisciplinary team involvement in annual Fire Management Plan reviews would ensure fire management has the most up to date information regarding management values.

In addition, under Alternative B, wildland urban interface zones have been developed and identified for protection of life and property along the north and east boundary of Everglades National Park,

not including the shared boundary with Big Cypress National Preserve. The fire spread model Behave was used to determine areas at risk from unwanted fire spread along the boundary. Areas along the boundary that could be impacted by fire encroachment within one operational (8-hour) period are defined as the WUI zone. To have the least impact on the landscape, natural or pre-existing fuel breaks were used to determine the WUI zone unit boundaries.

Alternative B identifies and outlines specific operational mitigations to protect sensitive natural, cultural, social and wilderness resource values within and adjacent to Everglades National Park. These mitigations apply across all FMU's and are similar to those implemented under Alternative A. However, as opposed to Alternative A, Alternative B contains additional cultural resource mitigations in the form of a *GIS Model for Archeological Site Prediction and Survey Planning at EVER* (Appendix H of the proposed fire management plan). Fire Management would work with the Cultural Resource Branch to utilize this archeological site probability model in fire management planning. Additionally, mitigations under Alternative B associated with the use of planned ignition treatments can be fully implemented. (Under Alternative A, constraints associated with operating an annual prescribed fire program under documented categorical exclusions would affect the fire management program's ability to implement mitigations associated with the use of planned ignition treatments.) Mitigations for Alternative B are described in the "Mitigation Measures" section of this chapter, below.

For each FMU, appropriate fire management strategies would be evaluated based on:

- Ability to meet park management goals and objectives; and
- Factors including safety, fire cause, weather, fire behavior and effects, values to be protected, resource availability, and cost effectiveness.

As in Alternative A, management considerations and constraints for the FMUs are an important component of Alternative B. Management considerations and constraints for each FMU are presented in Table 5. Fire management objectives for each FMU are listed in Table 6.

Figure 16: Fire Management Units for Alternative B: The National Park Service Proposed Fire Management Plan

Fire Management Unit 1: Coastal Prairies

As under Alternative A, this unit would include the areas on the south and west portions of Everglades National Park. Fire-adapted acreage includes approximately 99,371 acres out of a total of 106,964 terrestrial acres in the unit. Fire-adapted areas include estuarine marshes composed of nearly pure stands of cordgrass (*Spartina spartinae* and *S. bakeri*), black needle-rush (*Juncus roemerianus*), saltgrass (*Distichlis spicata*), or sawgrass (*Cladium jamaicense)*. In addition, beach dune communities occur landward of East, Middle, and Northwest Cape Sable. These upland graminoid communities are likely fire-adapted, although fire return intervals have not yet been established.

Fires in this unit often burn in emergent vegetation, spreading over inundated areas. These fires are usually naturally extinguished within 8 to 12 hours, although some have been observed to burn for three days or more. The fire return interval for FMU 1 would be 2-10 years with a 2-year return interval for planned exotic plant treatments and a 6-year return interval assigned for all other areas. The proposed fire management plan acknowledges the presence of exotic invasive species and the importance of fire in their management, particularly Old World climbing fern, in addition to Brazilian pepper and Australian pine.

Detailed descriptions of the vegetation communities and the interactions with and adaptations to fire are included in Chapter 3: Affected Environment and Environmental Consequences, and in section 3.1.2.1 of the Fire Management Plan ("Fire Adapted Vegetation Communities").

In FMU 1, under Alternative B as under Alternative A, unplanned ignitions would be managed using an appropriate wildfire management strategy to protect life and property. Whenever possible, fires would be managed to achieve resource benefits, consistent with the objectives identified for this FMU.

Prescribed fire treatments would be used to support exotic plant control efforts, restore and maintain native plant communities, and reduce hazardous fuel accumulations.

The proposed fire management plan identifies management considerations and constraints (Table 5) related to fire management activities and fire management objectives (Table 6) for FMU 1.

The proposed fire management plan identifies and maps special values in this unit. These special values are maintained in a GIS database. They include archeological sites, cultural sites, endangered or threatened species, wading bird colonies, backcountry campsites, and research sites. However, the plan recognizes that most of these values are in areas rarely impacted by fire (see Figure 17: Fire Management Unit 1 Coastal Prairies Proposed Fire Management Plan).

Detailed descriptions of significant resources are found in Chapter 3, Affected Environment. Mitigation measures designed to minimize impacts to these resources are fully described in the "Mitigation Measures" section of Chapter 2, below.

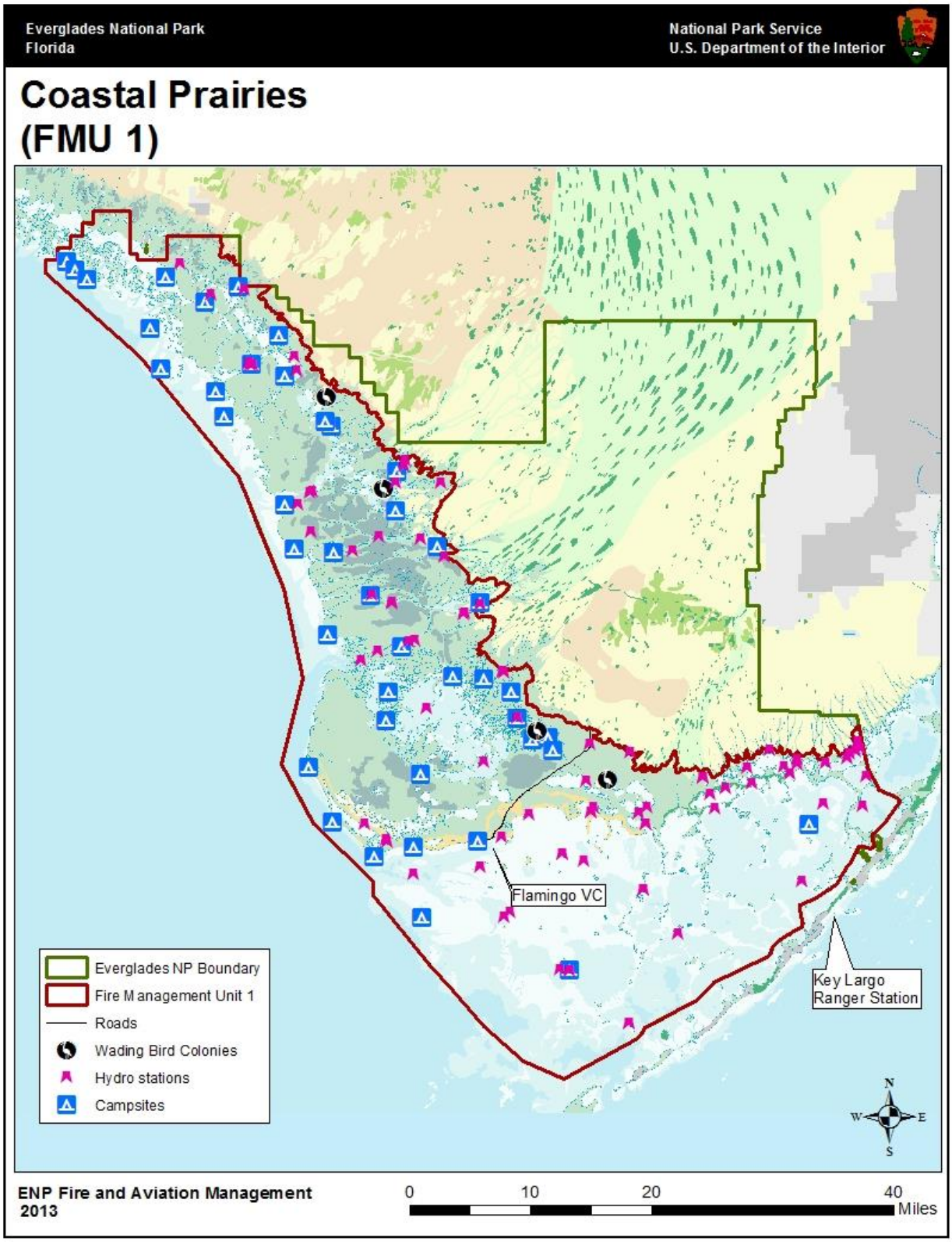

Figure 17: Fire Management Unit 1 Coastal Prairies Proposed Fire Management Plan

Management values displayed in the above map are a representation of the current conditions (2013). Management values will be updated annually during the Fire Management Plan review and update.

Fire Management Unit 2: River of Grass

FMU 2 covers 390,521 acres in Everglades National Park, 321,641 of which are fire-adapted. The fire return interval range for vegetation communities within FMU 2 is 3-12 years. A 3-year fire return interval would be maintained for areas within the wildland urban interface, and an 8-year fire return interval would be maintained for the remaining fire-adapted vegetation communities within FMU 2.

The fire-adapted vegetation communities of FMU 2 consist of sawgrass *(Cladium jamaicense)* prairies and marl prairies. Tall sawgrass strands will burn over standing water and sparse sawgrass and marl prairies typically burn in somewhat drier conditions. Associated habitats include tree islands, tropical hardwood hammocks, fresh water sloughs, and emergent plant communities. FMU 2 also contains cypress and small scattered pine islands. The southern boundary of this FMU is generally the zone where mangrove communities replace freshwater marshes. Other communities in FMU 2, including tropical hardwood hammocks and sloughs, burn only under rare conditions and otherwise serve as natural barriers to the spread of fire. Exotic vegetation present in the area includes Brazilian pepper, melaleuca, Australian pine, and Old World climbing fern.

Detailed descriptions of the vegetation communities and the interactions with and adaptations to fire are included in Chapter 3: Affected Environment and Environmental Consequences, and in section 3.1.2.1 of the Fire Management Plan ("Fire Adapted Vegetation Communities").

In FMU 2, under Alternative B as under Alternative A, unplanned ignitions would be managed using an appropriate wildfire management strategy to protect life and property. Whenever possible, fires would be managed to achieve resource benefits consistent with the objectives identified for this FMU.

Prescribed fire treatments would be used to support exotic plant control efforts, restore and maintain native plant communities, and reduce hazardous fuel accumulations.

The proposed fire management plan identifies management considerations and constraints (Table 5) related to fire management activities and fire management objectives (Table 6) for FMU 2.

The proposed fire management plan identifies and maps special values in this unit. These special values are maintained in a GIS database. They include threatened and endangered species, other species of concern, rare habitats, wading and migrating bird populations, archeological and cultural resources, wildland urban interface, park and adjacent infrastructure, and wilderness character (see Figure 18: Fire Management Unit 2 River of Grass Proposed Fire Management Plan).

With regard to special values, occupied habitat of the endangered Cape Sable seaside sparrow represents a significant portion of the River of Grass unit, and the protection and management of this habitat requires specific operational consideration. Fire management strategies will comply with the Cape Sable Seaside Sparrow Fire Management Strategy (attached as Appendix E to the proposed fire management plan). This plan is reviewed and updated annually through collaboration among Everglades Fire Management, USFWS, and appropriate partners. In addition, hardwood hammocks scattered through the River of Grass are fire intolerant and are frequently used by rare, threatened, and endangered plant and animal species. Planned ignitions will be used to reduce fuel loading adjacent to hardwood hammock, tree islands, and cultural resource sites to provide protection from unwanted fire spread.

Cultural and archeological sites are also found on a number of the hardwood hammocks in the unit. Coordination with cultural and natural resource specialists would occur during planning and implementation of fire management activities as a management consideration.

Detailed descriptions of significant resources are found in Chapter 3: Affected Environment and Environmental Consequences. Mitigation measures designed to minimize impacts to these resources are fully described in the "Mitigation Measures" section of chapter 2, below.

Wildland urban interface values within and adjacent to FMU 2 consist of the Miccosukee Reserved Area on the north boundary of the unit, which is a nationally identified wildland urban interface

community at risk. Everglades National Park coordinates with the Miccosukee Tribe of Indians of Florida to minimize threats of wildfire to the Miccosukee Reserved Area and greater Miccosukee Community. Additional wildland urban interface values consist of the Shark Valley tram tour concessions and visitor center, airboat and restaurant businesses, U.S. Highway 41, park campsites, and Loop Road Environmental Education Center within Big Cypress National Preserve.

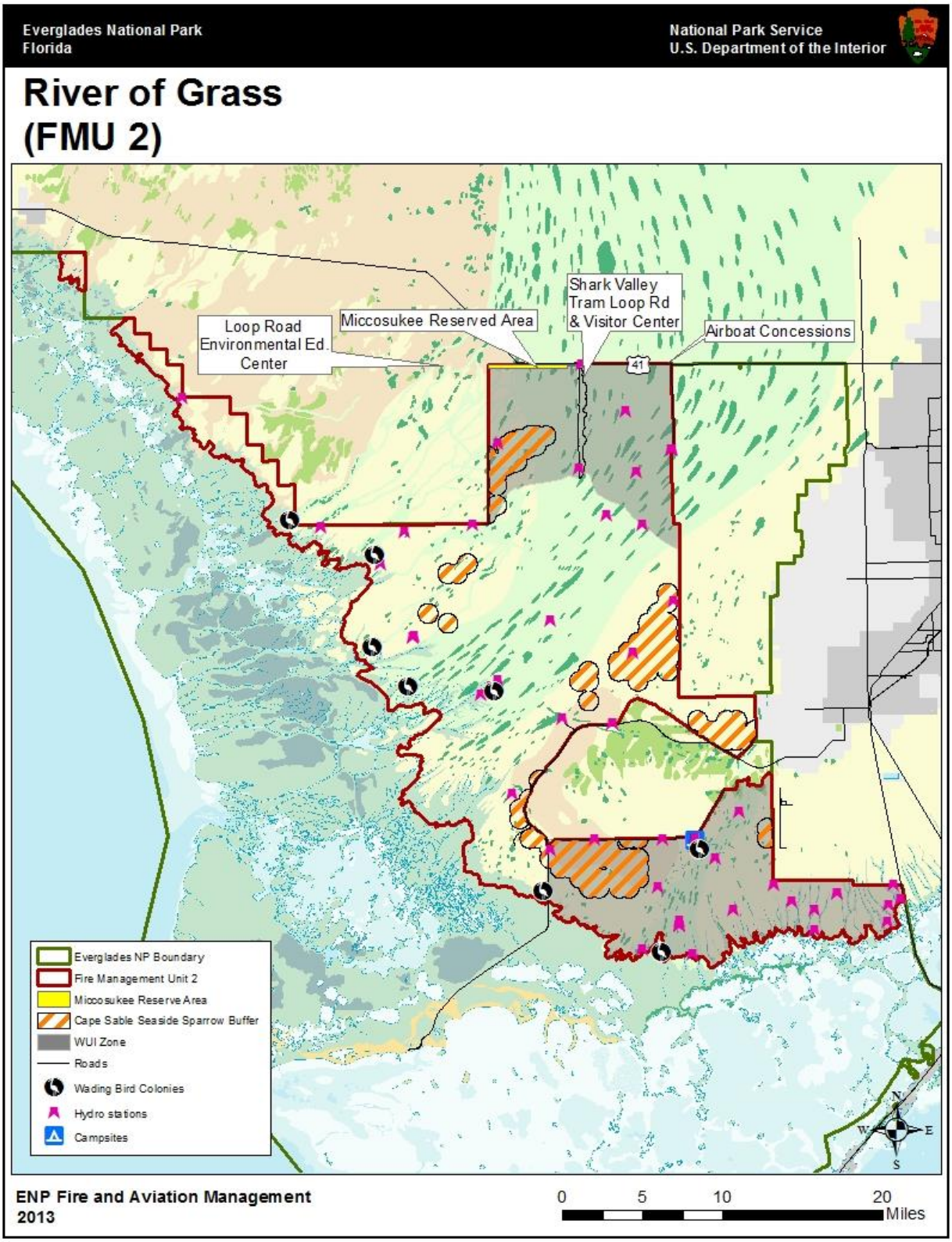

Figure 18: Fire Management Unit 2 River of Grass Proposed Fire Management Plan

Management values displayed in the above map are a representation of the current conditions (2013). Management values will be updated annually during the Fire Management Plan review and update.

Fire Management Unit 3: Pine Rocklands

FMU 3 is a complex of pine rocklands and seasonally flooded prairies. This FMU would include the park's two major pine rockland areas: Long Pine Key and Pine Island. The pine rocklands include about 44,956 fire-adapted acres out of a total of 55,131. South Florida slash pine (*Pinus elliottii var. densa*), tropical and temperate shrubs and palms, and a species rich herbaceous layer with numerous rare and endemic species make up the fire-adapted pine rockland habitat. The pine rocklands habitat, which is restricted in the United States to southeastern Florida, is designated as a globally imperiled habitat by the Florida Natural Areas Inventory (FNAI 2010). The former farmland known as Hole-in-the-Donut is included within FMU 3, located in Long Pine Key. This area is currently undergoing restoration and exotic species eradication.

FMU 3 would be maintained on a three year fire return interval. Tropical hardwood hammocks also contained within this FMU will burn only under extreme conditions.

The proposed fire management plan recognizes Brazilian pepper as an invasive species of concern and identifies additional non-native species, many of which are fire-adapted, that pose concerns in this unit. This alternative would include monitoring and treatment as necessary. Treatment could involve using fire, mechanical, or chemical methods, depending on each species' distribution and susceptibility or adaptations to fire. Treatments completed by fire management to manage exotic vegetation would be undertaken in conjunction with the Everglades Exotic Vegetation Management Program.

Detailed descriptions of the vegetation communities and the interactions with and adaptations to fire are included in Chapter 3: Affected Environment and Environmental Consequences.

Under the proposed fire management plan, prescribed fire treatments would be planned on a multi-year, landscape scale, implementing a multi-year fuels treatment plan. This is in contrast to Alternative A, where prescribed fire planning is done on an annual basis documented under categorical exclusions, the constraints of which prevent the majority of this FMU from being treated with prescribed fire. Within FMU 3, adjacent Long Pine Key pine block units would not be treated within one year of each other. This proposed mitigation measure is designed to improve the likelihood of recolonization of Bartram's hairstreak and Florida leafwing butterflies. Additionally, pine blocks would be burned with the goal of creating mosaic-patterned burns leaving unburned refugia and vegetative cover.

In FMU 3, under Alternative B as under Alternative A, unplanned ignitions would be managed using an appropriate wildfire management strategy to protect life and property. Whenever possible, fires would be managed to achieve resource benefits, consistent with the objectives identified for this FMU. Prescribed fire treatments would be used to support exotic plant control efforts, restore and maintain native plant communities, and reduce hazardous fuel accumulations.

The proposed fire management plan identifies management considerations and constraints (Table 5) related to fire management activities and fire management objectives (Table 6) for FMU 3 (see Figure 19 Fire Management Unit 3 Pine Rocklands).

Special values in the pine rocklands unit are identified by the proposed fire management plan and are maintained in a GIS database. These include threatened or endangered species, other species of concern, re-introduced species, wading and migrating bird populations, rare habitats, cultural resources, wildland urban interface, park and adjacent infrastructure, wilderness character, wetlands and tree islands, hardwood hammocks, and one private inholding: Camp Everglades, owned by the Boy Scouts of America.

With regard to special values, the Cape Sable seaside sparrow requires specific operational consideration in this unit. Fire management strategies would comply with the Cape Sable Seaside Sparrow Fire Management Strategy the same as described under Alternative B, FMU 2. In addition, hardwood hammocks occur throughout the pine rocklands in FMU3. These plant communities are fire intolerant and provide habitat for a variety of threatened and endangered species. Planned

ignitions would be used to reduce fuel loading adjacent to hardwood hammocks to provide protection from unwanted fire spread. Coordination with cultural and natural resource specialists would occur during planning and implementation of fire management activities as a management consideration.

Detailed descriptions of significant resources are found in Chapter 3: Affected Environment and Environmental Consequences. Mitigation measures designed to minimize impacts to these resources are fully described in the "Mitigation Measures" section of chapter 2, below.

The wildland urban interface values within and adjacent to FMU 3 consist of the Pine Island residential housing and administrative complex, Beard and Robertson buildings, Coe and Royal Palm visitor centers, Anhinga Trail boardwalk, Hidden Lake Education Center, Boy Scout inholding, Long Pine Key campground, Coe campground, Nike HM-69 Missile Base, Main Park Road, entrance stations, and Old Ingraham Highway.

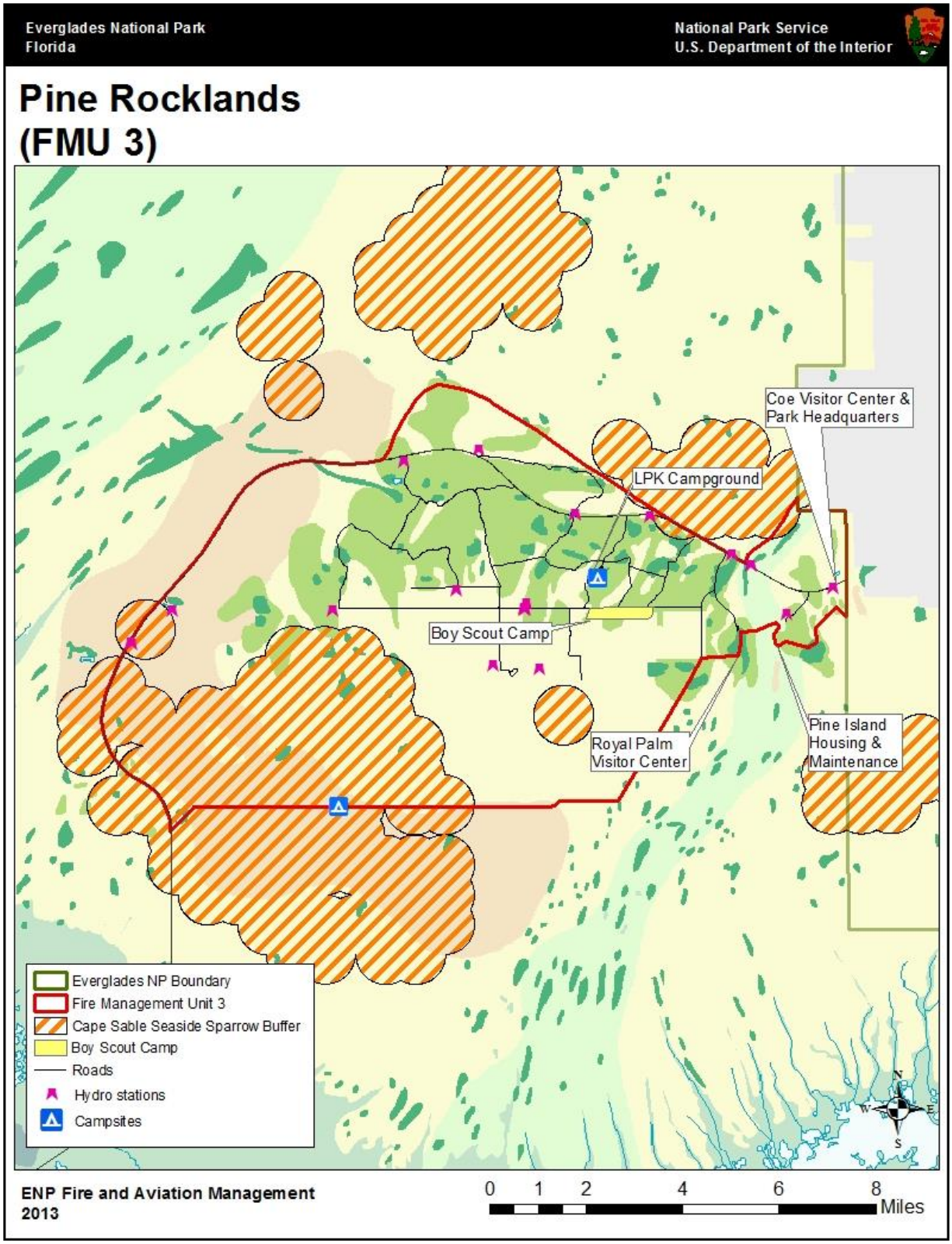

Figure 19: Fire Management Unit 3 Pine Rocklands

Management values displayed in the above map are a representation of the current conditions (2013). Management values will be updated annually during the Fire Management Plan review and update.

Fire Management Unit 4: East Everglades

FMU 4 encompasses the 106,964 acre East Everglades Expansion Area, of which 99,371 acres are fire-adapted. The boundary of this unit would be the same as FMU 4 under Alternative A. It includes sawgrass and marl prairies, sloughs, tropical hardwood hammocks, and areas invaded with exotic plants such as Brazilian pepper, melaleuca, Australian pine, and Old World climbing fern. In FMU 4 there are large continuous areas of flammable vegetation with a mix of long and short hydro-period prairies that create conditions for fire spread. All of FMU 4 is within the wildland urban interface and would be maintained on a 3-year fire return interval.

In FMU 4, unplanned ignitions would be managed using an appropriate wildfire management strategy to protect life and property. Whenever possible, fires would be managed to achieve resource benefits, consistent with the objectives identified for this FMU.

Prescribed fire treatments would be used to support exotic plant control efforts, restore and maintain native plant communities, and reduce hazardous fuel accumulations.

Detailed descriptions of the vegetation communities and the interactions with and adaptations to fire are included in Chapter 3: Affected Environment and Environmental Consequences.

Florida Power and Light Company (FPL) owns a 7.5-mile long, 330-370-foot wide strip within the boundary of East Everglades Expansion Area. Prescribed fire treatments would be conducted in coordination with and the consent of FPL. Under Alternative B, prescribed fire treatments would continue to be conducted after advance notification of burns to FPL, as authorized by the state Hawkins Act. Everglades National Park management would seek to enter into a formal agreement with FPL governing the use of FPL lands by Everglades National Park during prescribed burns and other park activities.

The proposed fire management plan identifies management considerations and constraints (Table 5) related to fire management activities and fire management objectives (Table 6) for FMU 4.

The proposed fire management plan identifies and maps special values in this unit. These values are maintained in a GIS database. They include threatened or endangered species, rare habitats, archeological and cultural resources, wildland urban interface, former private camps, park and adjacent infrastructure, and eligible wilderness (see Figure 20: Fire Management Unit 4 East Everglades).

With regard to special values, the Cape Sable seaside sparrow requires specific operational consideration. Fire management strategies would comply with the Cape Sable Seaside Sparrow Fire Management Strategy, the same as described under Alternative B, FMU 2. Tropical hardwood hammocks are embedded throughout the unit, particularly in the short hydroperiod prairies. Planned ignitions will be used to reduce fuel loading adjacent to hardwood hammock, tree islands, and cultural resource sites to provide protection from unwanted fire spread. Hammocks are used by rare, threatened, or endangered plant and animal species. Significant cultural and archeological sites of particular concern are also found on a number of these hammocks. In addition to these sites, historic hunt camps may be present in this FMU. Coordination with cultural and natural resource specialists would occur during planning and implementation of fire management activities as a management consideration.

Detailed descriptions of significant resources are found in Chapter 3: Affected Environment and Environmental Consequences. Mitigation measures designed to minimize impacts to these resources are fully described in the "Mitigation Measures" section of chapter 2, below.

Wildland urban interface areas and park infrastructure are located within and adjacent to FMU 4. The Chekika Recreation Area, visitor use areas, park infrastructure, and hunt camps are found in this FMU. The 8.5-Square Mile Area, just outside the park's east boundary, is a nationally identified wildland urban interface community at risk. Along the U.S. Highway 41 corridor, within the unit, there are private inholdings and commercial establishments, radio towers, and the Osceola Indian Camp. Along the east park boundary, there are extensive plant nurseries and fruit orchards that

could incur substantial economic losses from fires. Two prison facilities are outside the park adjacent to this unit.

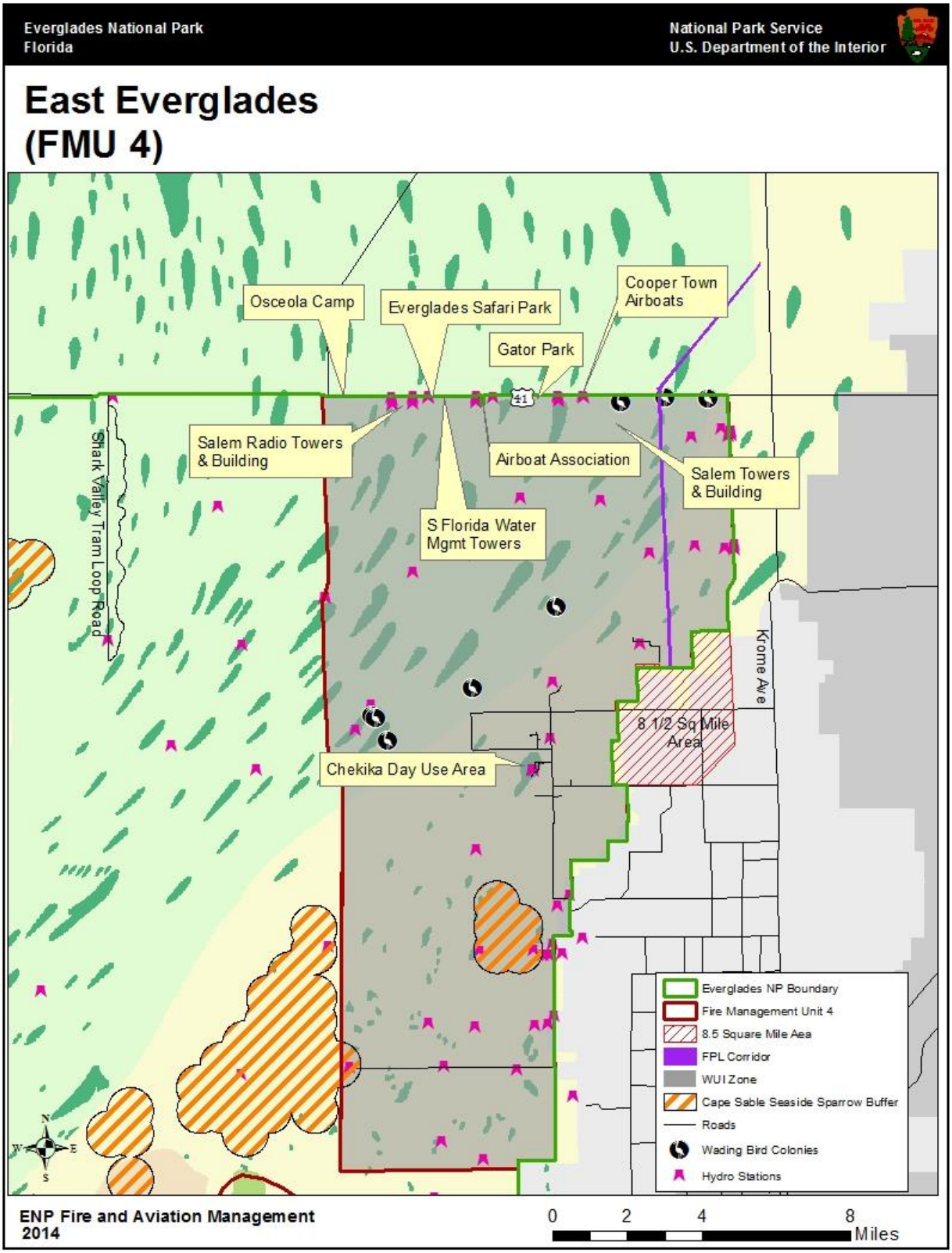

Figure 20: Fire Management Unit 4 East Everglades

Management values displayed in the above map are a representation of the current conditions (2013). Management values would be updated as needed.

Table 5: Management Considerations and Constraints for Each Fire Management Unit

Management Consideration or Constraint	FMU 1: Coastal Prairies	FMU 2: River of Grass	FMU 3: Pine Rocklands	FMU 4: East Everglades
The FMU is in a Class I airshed but smoke impacts to the overall airshed are negligible.	X	X	X	X
Fire operations in designated wilderness would be managed in accordance with the minimum tool analysis presented in Appendix F of the fire management plan.	X	X	X	X
The spread of exotic species would be limited through conducting fire operations in support of the exotic plant management program.	X	X	X	X
In the event that research identifies the need, prescribed fire could be used to achieve future resource management objectives.[2]	X	X	X	X
Recommendations from resource specialists would be considered during planning and implementation of fire management activities.	X	X	X	X
Threatened and endangered species, rare habitats, species of special concern, park infrastructure, and archeological and cultural resources would require protection.	X	X	X	X
During wood stork nesting season, bucket operations would be prohibited at Paurotis Pond.	X	X	X	X
In addition to the prescribed fire notification process for the park and cooperators, advanced notification of planned fire operations would be provided at visitor access points, permitting stations, visitor centers, and/or entrance stations (based on fire locations).	X	X	X	X
Prior to planned ignitions, reconnaissance would be conducted to verify that that no backcountry users, campers, or visitors would be adversely impacted.	X	X	X	X
A burn authorization would be obtained from the Florida Forest Service for each prescribed fire.	X	X	X	X
Any fires that span the Big Cypress National Preserve boundary would receive the appropriate level of management approval from both Big Cypress National Preserve and Everglades National Park.	X	X		
Park and private infrastructure and transportation corridors represent an additional management consideration	X	X	X	X
When safe, fire management strategies would require actions to exclude fire from untreated stands of melaleuca and Australian pine.		X		X
A significant safety concern involves hazardous materials illegally disposed in this FMU.				X

Management considerations and constraints for each fire management unit are the same in Alternative B as in Alternative A.

[2] A likely example with respect to future restoration activities would involve the combined use of prescribed fire and water management to create preferential flowpaths. This action could be particularly appropriate in areas with dense sawgrass where fire and increased hydroperiod may aid in transition to slough vegetation.

Table 6: Fire Management Objectives for Each Fire Management Unit

Fire Management Objectives	FMU 1: Coastal Prairies	FMU 2: River of Grass	FMU 3: Pine Rocklands	FMU 4: East Everglades
Planned ignition treatments would be used to help manage the spread of Old World climbing fern (*Lygodium microphyllum*) and inhibit the encroachment of Brazilian pepper (*Schinus terebinthifolius*)	X	X	X	X
Planned ignition treatments would be used in conjunction with chemical and mechanical treatments to manage exotic vegetation populations identified by the Exotic Vegetation Management Program.	X	X	X	X
Fires would be managed using the full range of management strategies to protect, restore, or maintain resources in the park.	X	X	X	X
Planned ignition treatments would be used to reduce hazardous fuels to protect park values.	X	X	X	X
Planned ignition treatments would be used to create mosaic patterns to break up the fuel continuity and maintain habitat diversity, and provide species refugia.	X	X	X	X
Planned ignition treatments would be used to reduce fuel loading adjacent to hardwood hammock, tree islands, and cultural resource sites to provide protection from unwanted fire spread.	X	X	X	X
Unplanned ignitions would be managed in order to protect life and property and whenever possible achieve resource benefits.	X	X	X	X
Unplanned ignitions would be evaluated using a decision support process that examines the full range of management responses under the following conditions; strategies and tactics would consider firefighter and public safety first, fire cause, current and predicted weather, current and potential fire behavior and effects, values to be protected, sensitive tree island and hammocks, archeological and/or cultural resources, proximity to wildland urban interface areas and park infrastructure, untreated stands of melaleuca (*Melaleuca quinquenervia*), and Australian pine (*Casuarina equisetifolia),* resource availability, and cost effectiveness.	X	X	X	X
It would be ensured that all fire management activities comply with the annual Cape Sable Seaside Sparrow fire management strategy.		X	X	X
Planned ignition treatments would be used to restore natural fire processes in areas in the Hole-in-the-Donut identified by resource management			X	
Planned ignition treatments would be used to maintain pine rockland habitat within the park.			X	
Use science based fire management to maintain and enhance the wilderness character of the Marjory Stoneman Douglas Wilderness and lands eligible for wilderness designation	X	X	X	X

Fire Management Objectives for each fire management unit are the same in Alternative B as in Alternative A with the exception of the last objective, which would use science based fire management to maintain and enhance the wilderness character in both the Marjory Stoneman Douglas Wilderness and lands eligible for wilderness designation.

WILDLAND FIRE OPERATIONAL GUIDANCE

For a comparison of fire management strategies under the two alternatives based on fire type and situation, please refer to Table 7 below.

Under Alternative B, wildfire operational guidance goals would follow the goals and objectives of Everglades Fire Management, which are the same goals and objectives under Alternative A. These are listed in the proposed fire management plan, and include the following:

- Firefighter and public safety is the first priority of all fire management activities.
- Comply with national, regional, and local legislation, orders, and policies.
- Conduct all fire management activities in accordance with approved management plans for Everglades National Park.
- Maintain the necessary staffing, equipment, training, qualifications in accordance with National Wildfire Coordinating Group standards and agency policy.
- Maintain safe and effective fire readiness according to established plans, protocols, and guidelines to prevent, detect, and take effective management actions on all wildfires.
- Continue cooperative management efforts and agreements with state, local, and other federal agencies to provide efficient, cost effective wildland fire management activities.

Alternative B would use the full range of wildfire management strategies throughout the park, regardless of ignition source or FMU. Strategy selection would be based on achieving park land management goals.

Unplanned Ignitions

As under Alternative A, all unplanned wildfires will continue to be managed using an appropriate management strategy. A full range of strategies may be selected. These include:

- full suppression – a strategy used to achieve control of a fire and prevent it from exceeding a defined perimeter;
- point/zone protection – a variety of suppression actions taken to protect a specific point or areas from fire usually by tactics which constrain progressive fire encroachment away from identified values at risk; and
- monitor/confine/contain – management actions conforming to a strategy that periodically checks the fire to ensure it continues to meet established objectives.

Wildland fire resulting from unplanned ignitions, regardless of source, would be evaluated to determine the appropriate response, based on park management goals and objectives. Unplanned ignitions would be managed to protect life and property and whenever possible achieve resource benefits. Management strategies may consist of full suppression, point/zone protection, or monitor/confine/contain strategies. Unplanned ignitions would be evaluated using a decision support process that examines the full range of management responses under the following conditions:

- Strategies and tactics would consider firefighter and public safety first;
- Fire cause;
- Current and predicted weather;
- Current and potential fire behavior and effects;
- Values to be protected;
- Sensitive tree islands and hammocks;
- Archeological and/or cultural resources;
- Proximity to wildland urban interface areas and park infrastructure;
- Proximity to untreated stands of melaleuca;
- Resource availability; and
- Cost effectiveness.

Planned Ignitions

Planned ignitions (prescribed fire) would continue to be used to achieve hazard fuel reduction objectives, protect wildland urban interface, and to meet resource management goals of the National Park Service. Annual coordination with the South Florida Natural Resource Center, the interdisciplinary team, subject matter experts, and external stakeholders would provide valuable input for adapting the fire management program as needed. Planned ignition treatments would be implemented under an agency administrator approved prescribed fire plan. Implementation of a multi-year fuels treatment plan would allow prescribed fire treatments to be planned as part of a revolving five-year scope of work that would be reviewed and updated annually. The process would include the prioritization, selection, review, and update of fuels treatment projects. Prioritization values include fire return interval departure, fuel loading, proximity to Cape Sable seaside sparrow populations, proximity to wildland urban interface and park boundary values, and exotic plant presence management values. Prescribed fires would take place in wilderness and non-wilderness. Wilderness would be considered within the multi-year fuels treatment plan with an associated programmatic minimum requirements analysis. This environmental assessment would serve as the NEPA compliance document for the multi-year fuels treatment plan. Under Alternative B, between 237,000 and 258,000 acres would be proposed to burn annually. The actual amount of acres burned would likely be somewhat less than the number proposed, but Alternative B is expected to result in a substantial increase in the amount of acres burned when compared to current management. In addition, prescribed burns will be carried out in fire dependent communities where burning is currently restricted. The method developed to implement the multi-year fuels plan provides a dynamic and adaptable program of work.

Non-Fire Treatments

Non-fire treatments, including mechanical and chemical treatments, could be performed in locations where the use of planned ignitions would not be feasible. Use of non-fire treatments would be guided by park planning procedures and consultation with appropriate management staff. At the present time there are no proposed non-fire applications within the proposed fire management plan and current multi-year fuels treatment plan projects.

SAFETY

Operational guidance directs all fire management activities to be conducted to provide for firefighter and public safety, mitigate risk from unwanted wildfire and provide resource benefit. Threats to safety include those that are directly fire-related, such as hazards from firing devices, flammable materials, smoke, and carbon monoxide. Indirect threats include such things as dehydration, heat exhaustion, and heat stroke; the presence of poisonous plants, snakes, and insects; irregular ground surface; and hazards of working around vehicles and heavy equipment. All operational documents

will address both public and employee safety. Potential effects of all projects on employees and the public will be considered. Fire management involves a variety of risks associated with its operations.

Guidance for implementation of federal wildfire management identifies sound risk management as the foundation for all fire management activities. Risks and uncertainties relating to fire management activities are understood, analyzed, communicated and managed as they relate to the cost of either doing or not doing an activity. Net gains to the public are an important component of the decisions.

Under Alternative B, as under Alternative A, areas that would be identified for potential effects from any fire operation would include:

- Transportation corridors;
- Urban interface and park infrastructure;
- Visitor use;
- Park operations; and
- Park neighbors.

Alternative B would include an initial list of measures to address safety issues associated with each of these areas. These are the same in Alternative A and are as follows:

- Conduct planned ignition treatments to reduce hazard fuel accumulation.
- Notify and update residents and employees of proposed and/or ongoing operations.
- Respond to fires in the mutual response zone.
- Reference pre-attack plans to identify key items to be considered in initial attack (Appendix L of the proposed fire management plan).
- Monitor urban expansion adjacent to NPS boundaries to identify new communities at risk.
- Maintain the necessary staffing, equipment, training, and qualifications in accordance with National Wildfire Coordinating Group standards and National Park Service policy.
- Manage an efficient wildfire preparedness organization according to plans, protocols and guidelines to prevent, detect, and take effective management actions on all wildfires.

As new or modified approaches were developed, they would be incorporated.

STAFFING

Staffing positions under Alternative B would be similar to those described under Alternative A. The proposed fire management plan would include a description of duties for positions added since the 1995 plan was written. These include a prescribed fire specialist, fire ecologist, and support positions. The plan includes staff qualifications and numbers for the first year of implementation, but calls for reviews and adjustments based on an annual needs assessment.

The step-up plan describes minimum staffing levels for Fire Management staff within the park based on fire danger ratings. Interagency coordination is achieved through a state-wide cooperative agreement specific to the management of wildfire. Within the mutual response zone along the eastern boundary of the park, all agencies may take initial response actions. Everglades National Park coordinates with the Miccosukee Tribe of Indians of Florida to minimize threats of wildfire to the Miccosukee Reserved Area and greater Miccosukee Community, a nationally recognized wildland urban interface Community at Risk. This is the same as under Alternative A.

PREVENTION AND EDUCATION

The objectives and actions taken under the park's prevention program would be the same in Alternative B as in Alternative A. Objectives would be to mitigate damages and losses from unwanted severe wildfires, reduce human caused ignitions, reduce operational costs, mitigate the risks of wildfire to private property and park resources, and protect the lives of firefighters and the public. Fire management staff would work closely with the park public information officer and interpretative staff to provide information on ongoing fire incidents, fire prevention, and fire ecology for Everglades National Park.

Fire management would take the following actions to provide information regarding fire events and in support of education and outreach.

- Timely and accurate information will be provided to the media and park visitors regarding the status of fire actions and wildland fire management actions.
- Informational materials explaining the fire management program will be prepared and updated as necessary. During periods when planned ignition treatment operations are occurring, these handouts will be distributed to park visitors and general public, as appropriate.
- Ongoing fire operations will be discussed in informal contacts with park personnel, park neighbors and visitors.
- Adjacent landowners will be notified when wildfire is a threat to residential areas.
- Fire management will maintain an internet and intranet website which will be used to educate the public and park staff on fire operations and activities.
- Fire management will participate in fire education outreach activities include participation in local community events, special presentations, on-site/off-site activities with educational groups, and participation in other interagency activities.
- Urban expansion proximate to NPS boundaries will be monitored and fire management will continue to assess increasing needs for fire information, prevention and education.
- Fire management will request smoke advisories to be broadcast on NOAA weather radio when appropriate.

MINIMUM REQUIREMENTS IN WILDERNESS

Alternative B would include the use of a variety of mechanized vehicles and equipment necessary to insure public health and safety and to achieve the fuel treatment and resource management objectives of the plan, similar to Alternative A. Authorized vehicles and equipment are the minimum necessary to safeguard public safety and meet plan objectives while at the same time minimizing adverse impact to the park's wilderness character. A programmatic minimum requirements analysis would occur under Alternative B. This is in contrast to Alternative A where a minimum requirements analysis would occur on an annual project specific basis.

Aviation use often offers the least impact and least invasive means of access to carry out research, fire and resource management, law enforcement, and search and rescue activities. With approximately 90 percent of Everglades National Park designated as wilderness, helicopter access and additional otherwise prohibited uses for planned fire management activities would be conducted in accordance with the minimum requirements analysis/determination. The following paragraphs describe fire management activities that may involve otherwise prohibited uses.

The vehicles and equipment authorized by Alternative B are the same as those typically authorized annually under Alternative A and differ by FMU, as follows:

- FMU 1: Helicopter landings would be authorized, as would the use of motorized weed eaters to reduce fuel loading and create defensible space. Rebar could be used for marking monitoring plots. These authorizations would extend to prescribed fire and fuels management and fire management monitoring. Their use would be subject to minimum impact suppression tactics. Mitigation: improved helispots generally prohibited unless on-site decision-maker determines that conditions dictate otherwise; fire breaks limited in size; natural and/or existing firebreaks used where possible.
- FMU 2: Helicopter landings would be authorized, as would the use of specified mechanized vehicles (airboats, all terrain vehicles, and utility terrain vehicles). Authorized motorized equipment would consist of weed eaters, portable pumps, mowers, rock drills, and power drills. (The rock drills would be used to install rebar for marking monitoring plots. Power drills would be necessary for maintaining above-ground monitoring stations.) These vehicles and tools would be authorized for conducting prescribed fire and for fuels management and fire management monitoring. Their use would be subject to minimum impact suppression tactics. Mitigation: improved helispots generally prohibited unless on-site decision-maker determines that conditions dictate otherwise no specialized vehicles allowed; airboat use restricted to prescribed fire and prohibited for monitoring activities; specialized fire breaks would be limited in size; natural and/or existing firebreaks would be used where possible.
- FMU 3: Trucks, fire engines, all terrain vehicles, utility terrain vehicles, and passenger vehicles would be authorized. Authorized motorized equipment would consist of weed eaters, portable pumps, and chainsaws. These vehicles and tools would be authorized for conducting prescribed fire and fuels management and fire management monitoring. Their use would be subject to minimum impact suppression tactics. Mitigation: improved helispots generally prohibited unless on-site decision-maker determines that conditions dictate otherwise; no specialized vehicles allowed; airboats prohibited for monitoring activities; specialized fire breaks limited in size; natural and/or existing firebreaks used where possible; off road travel for all terrain vehicles and utility terrain vehicles generally restricted to travel along fire breaks; chainsaws used only to remove logs that may carry fire across a fire break, and only when the logs cannot be removed manually.
    - FMU 3, Hole-in-the-Donut Subarea: engines, passenger vehicles, all terrain vehicles, and utility terrain vehicles would be authorized. Authorized motorized equipment would consist of weed eaters, portable pumps, and chainsaws. These vehicles and tools would be authorized for conducting prescribed fire and fuels management operations. Mitigation: improved helispots generally prohibited unless on-site decision-maker determines that conditions dictate otherwise; no specialized vehicles allowed; specialized fire breaks limited in size; natural and/or existing firebreaks used where possible; off road travel for all terrain vehicles and utility terrain vehicles generally restricted to travel along fire breaks; chainsaws used only to remove logs that may carry fire across a fire break, and only when the logs cannot be removed manually.
- FMU 4: Helicopter landings would be authorized, as would the use of specified mechanized vehicles (airboats, trucks, fire engines, all terrain vehicles, utility terrain vehicles, and passenger vehicles). Specialized vehicles (bombardiers) would also be allowed. Authorized motorized equipment would consist of weed eaters, portable pumps, chainsaws, rock drills, and power drills. These vehicles and tools would be authorized for conducting prescribed fire and fuels management and fire management monitoring. Their use would be subject to minimum impact suppression tactics. Mitigation: improved helispots generally prohibited

unless on-site decision-maker determines that conditions dictate otherwise; airboats to use existing trails where possible in creating holding lines; airboats prohibited for monitoring activities; bombardiers generally to be used along agricultural roads, and to go off road only when all terrain vehicles or utility terrain vehicles are insufficient in prescribed fire operations; specialized fire breaks limited in size; natural and/or existing firebreaks used where possible; off road travel for all terrain vehicles and utility terrain vehicles generally restricted to travel along fire breaks; chainsaws used only (a) to remove logs that may carry fire across a fire break, and only when the logs cannot be removed manually, and (b) on exotic trees during training exercises.

During the life of the plan, the need may arise for the park to use different nonconforming tools in individual FMUs. In addition, conditions may arise that require the tools prescribed for individual FMUs to be used at levels greater than described in the park's approved minimum requirements analysis. In both instances, the fire management division would consult with the park's wilderness committee, and would submit for approval a supplemental, project-specific minimum requirements analysis. Efforts will also be made by fire management staff to periodically evaluate fire management practices and reduce prohibited uses in wilderness where possible.

As under Alternative A, unplanned response activities would operate under the minimum tool analyses unless the on-site decision maker determines in his/her professional judgment that the conditions require additional emergency response activities.

MONITORING AND EVALUATION

Alternative B would conduct fire behavior and fire effects monitoring in the same way as described in Alternative A. Results would provide fire and resource managers with data to support fire management, and to assess whether, and the degree to which, fire management objectives were being achieved. Monitoring would enable managers to compare actual prescribed fire effects with stated burn objectives and to assess and validate or refine current management prescriptions and techniques. In addition, existing practices would be formalized, often with standardized procedures and forms, for the following:

- Short-term monitoring during prescribed fire operations;
- Historic fuel treatments, which would be digitized and incorporated into the fire geographical information system database;
- After-action review of fire operations; and
- Documenting and reporting actions and results, and reviewing lessons learned.

The fire program implements four levels of monitoring including environmental monitoring, fire behavior monitoring, and short-term and long-term fire effects monitoring. Alternative B would formalize the use of an expanded monitoring program in conformance with Reference Manual # 18 and the *Fire Monitoring Handbook* (NPS 2003b).

Environmental monitoring includes weather, hydrological, fuel, and soil moisture monitoring. These factors impact decisions regarding prescribed fire implementation as well as selection of wildfire response management strategies. Considerations in the decision making process include evaluation of environmental conditions, expected fire behavior, and potential impacts to park, natural, and cultural resource values. In addition to environmental monitoring, fire behavior monitoring occurs during all prescribed fire treatments. Fire behavior monitoring includes assessing smoke, flame lengths, spread rates, and consumption. In prescribed fire implementation environmental and fire behavior monitoring is used to assess prescription parameters and determine if desired fire effects are likely to be achieved.

Fire effects vegetation monitoring occurs in permanent and temporary plots in the fire-adapted vegetation communities: sawgrass marshes, marl prairies, pine rocklands, and coastal prairies. Also monitored are the effects of fire on fuel loading, herbaceous and woody plant cover, pine, and butterfly host plants. Exotic plant monitoring occurs as well, as do post-fire severity assessments. Surveys for species of concern and cultural resources may occur in support of natural and cultural resources inventory and monitoring programs in the park. Fire Management staff would work closely with cultural and natural resource specialists and record any cultural or historic sites or structures and fire effects upon them or sightings of species of concern observed during prescribed fire planning, implementation, and post-fire monitoring activities. Observations would be formally reported to Everglades National Park cultural or natural resource specialists. Fire effects monitoring could contribute to an assessment of how fire is affecting wilderness character. In particular, monitoring would allow park staff to assess whether the fire program is serving to preserve natural conditions in wilderness.

The fire effects monitoring program would emphasize the use of an adaptive management approach to evaluate actions, make adjustments, and learn from work in the park and the work of others. It recognizes that monitoring is central to the understanding needed to successfully guide adaptive management. Components would include the following:

- An ecological model of the park;
- Descriptions of the park's fire-adapted communities;
- Specific resource goals and mitigations;
- Fire monitoring design, including environmental parameters and fire observation monitoring;
- Fire effects monitoring actions in each FMU and vegetation type using long-term monitoring plots;
- Data management, analysis, and reporting;
- Roles and responsibilities; and
- Use of the data for adaptive management.

Some ecological monitoring programs would continue throughout the duration of the fire management plan. Others could be short-term and would end after adequate management data were collected.

Proposed methods and techniques would include aircraft to transport personnel and equipment for fire management monitoring activities. Rebar installation could occur to mark locations of new fire effects monitoring plots where additional fire effects plot installation was required. Additional plot installations could be required to further study the effects of fire on exotic plant species. All monitoring activities within wilderness would conform to the minimum requirements decision guide for the proposed fire management plan.

AFTER ACTION REVIEWS

After-action reviews under Alternative B would be the same as those described under Alternative A. After Action Reviews would be conducted for all wildfires including single burning period incidents, extended attack incidents, and prescribed fires. It would also provide provisions for the incident management team to meet with park representatives and the superintendent to review and close-out incident, and to obtain regional or national review, if warranted. After Action Reviews would specifically conform to the review procedures outlined in *Wildland Fire Management, Reference Manual 18* (NPS 2008b) and the Interagency Standards for Fire and Fire Aviation Operations (Red

book) (National Interagency Fire Center 2014) or any guidance that replaced or updated these documents.

PLAN REVIEWS AND UPDATES

Under Alternative B, the Everglades National Park fire management plan would be designed to be dynamic, with annual updates to maintain currency for features such as federal regulations and guidelines, fire management best practices, safety, mitigations, and knowledge of Everglades ecology.

Annual updates would conform to the process described in *Wildland Fire Management, Reference Manual 18* (NPS 2008b) and are intended to keep the document current with policy and incorporate an adaptive management approach.

Monitoring is essential to the understanding needed to guide adaptive management. The fire effects monitoring program at Everglades National Park would be a key component in implementing and maintaining adaptive management in the fire program. Data collected by the fire effects program along with information gathered from park managers and researchers would be integrated into fire management priorities, decisions, and actions. Fire management would use the best available science to review and adjust fire management practices as needed to achieve fire and park management goals and objectives.

The proposed fire management plan would be intended to include annual updating to conform to current laws, objectives, procedures, strategies and terminology. Plan elements including, but not limited to, the pre-attack plan, step-up plan, fire prevention plan, monitoring plan, cooperative agreements, and key contacts would be included in the form of appendices to facilitate updating.

The multi-year fuels plan will be reviewed and updated annually to ensure existing scheduled projects and additional fuels projects included in the representative scope of work reflect current needs to meet objectives of the park's fire management program and are consistent with environmental compliance requirements.

A fire management interdisciplinary team consisting of subject matter experts from a variety of fields and divisions would meet annually to confirm that the changes and actions proposed to the plan are within the scope of the companion environmental assessment for the fire management plan, or if supplemental compliance is required.

A comprehensive review would occur every seven years, or more often if the annual review and update indicates a need. The review would conform to the process described in the current version of *Wildland Fire Management, Reference Manual 18.* Purposes of the comprehensive review are similar to the annual updates and would include a more intensive interdisciplinary approach to evaluating the fire management plan and program. The comprehensive review would include broader consideration of new park planning direction, changing environmental or social conditions, new science and information, and adaptive feedback from fire effects monitoring programs. The comprehensive review would result in a determination of whether a major revision of the fire management plan would be required and/or if new or additional environmental compliance would need to be initiated.

ALTERNATIVE A AND ALTERNATIVE B FIRE MANAGEMENT STRATEGIES BASED ON FIRE TYPE AND SITUATION

Table 7, below, compares fire management strategies of both alternatives based on the fire type and situation.

Table 7: Comparison of Fire Management Strategies Based on Fire Type and Situation

Alternative A: No Action / Continue Current Management	Alternative B: NPS Preferred Alternative
Management of Unplanned Ignitions	
As described above, Alternative A would manage all unplanned wildfires using an appropriate management strategy. A full range of strategies may be selected. These include: (a) full suppression -- a strategy developed to achieve control of a fire and prevent it from exceeding a defined perimeter; (b) point/zone protection – a variety of suppression action(s) taken to protect a specific point or area from fire, usually by directing the fire movement away from identified values at risk; and (c) monitor/confine/contain -- a management strategy that periodically checks the fire to ensure it continues to meet objectives. Objectives for the management of unplanned ignitions in all FMUs include: • Unplanned ignitions will be managed in order to protect life and property and whenever possible achieve resource benefits. • Unplanned ignitions will be evaluated using a decision support process that examines a full range of management responses. Response strategies and tactics will be developed considering the following: firefighter and public safety (as the first priority), fire cause, current and predicted weather, current and potential fire behavior and effects, values to be protected, sensitive tree island and hammocks, archeological and/or cultural resources, proximity to WUI areas & Park infrastructure, untreated stands of melaleuca (*Melaleuca quinquenervia*), and Australian pine (*Casuarina equisetifolia*), resource availability, and cost effectiveness.	Alternative B would differ little from Alternative A in the area of general implementation procedures. However, a primary difference would be that the proposed fire management plan could function at the programmatic level and be adaptable to changing fire policy. As a result, the proposed fire management plan would be able to accommodate changes in guidance and practices from ongoing improvements in the science of wildfire management. All sections of the fire management plan would be reviewed and revised annually in response to factors such as changing federal regulations and guidelines, research results, lessons learned in the field, budgets, staffing needs, and administrative changes within and outside the National Park Service. In addition a comprehensive review would occur every seven years or more often if needed. In addition, annual updating would occur for plan elements that guide or impact management of unplanned ignitions, including but not limited to, the pre-attack plan, step-up plan, Cape Sable seaside sparrow strategy, and cooperative operating plan.
PREPAREDNESS Preparedness activities under Alternative A would include the following: • Under Alternative A, the fire management officer would ensure that an annual training program was established that meets interagency fire program management qualification standards for fire program personnel. • Wildland fire and aviation preparedness reviews would continue to be conducted annually in late January. Standards for preparedness reviews would be based on the *Interagency Standards for Fire and Fire Aviation Operations* guide (Red Book), and reviews would be conducted according to the Interagency Preparedness Review Guide (2012). • Pre-suppression activities would prepare park staff to respond quickly and effectively to wildfires. These activities would include fire training, equipment and cache maintenance, record-keeping, and pre-attack planning.	**PREPAREDNESS** Preparedness under Alternative B would involve the same activities as under Alternative A. However, Alternative B would also include a preparedness plan that would be incorporated into the fire management plan as an appendix to the document. The preparedness plan would provide management direction for wildfire operations.

Table 7: Comparison of Fire Management Strategies Based on Fire Type and Situation

Alternative A: No Action / Continue Current Management	Alternative B: NPS Preferred Alternative
• A description would be maintained of the use of the Burning Index from the National Fire Danger Rating System for establishing staffing classes. Modifications would be based on water level at hydrology station NP44 and soil moisture at three pine rockland hammocks. (Note: these locations could change in the future as appropriate.) Consideration would be given to high lightning probability, threat of incendiary activity, or major recreational events in fire-prone areas. Fire weather and fire danger evaluation would be based on monitoring capabilities, technologies for data evaluation and sharing, and results of research on how to interpret results. Monitoring would be accomplished as follows: o Everglades National Park currently maintains two remote automated weather stations: Cache and Chekika. These instruments collect, store, and forward data to a computer system at the National Interagency Fire Center via the geostationary operational environmental satellite. o Surface water level readings would be monitored daily at hydrology station NP44 and on an as-needed basis at multiple hydrology stations. (Again, these locations could change in the future.) This data could be obtained at: http://mangrove/hydrology/ o Current and recent weather activities would be monitored through the National Oceanic and Atmospheric Administration weather website at http://radar.srh.noaa.gov/fire/. Lightning strike data would be accessed and monitored with the lightning detections website. https://www.nifc.blm.gov/cgi/Lightning.cgi • The criteria for applying "adjective classes," ranging from I – Low to V – Extreme would be used to convey fire danger level to the public. • Procedures would be in place for the period beyond initial attack, including use of a decision support system for selecting management actions. • Extended attack procedures would be in place. • Procedures would be established for determining the need for an incident management team, designating the team, supporting the team, and delegating authority to the team.	

STAFFING/STEP-UP PLAN Daily staffing class would be determined by using the burning index from the National Fire Danger Rating System in combination with standing water levels at hydrology station NP44, and lightning activity levels. Factors such as minimum relative humidity, dispersion index, maximum temperature, and days since last rain also would be used as indicators of potential fire behavior and fire danger. All unplanned ignitions would be evaluated to determine the appropriate response based on the criteria designed to meet the park management goals and objectives. As a result, initial attack response would vary, as follows:	**STAFFING/STEP-UP PLAN** Daily staffing would be determined under Alternative B in the same way as under Alternative A. In addition, a step up plan would be incorporated into the fire management plan as an appendix to the document. The step-up plan would outline the procedures used in determining daily staffing class and required resources in relation to staffing class.
INCIDENT MANAGEMENT FMUs 1, 2, 3, and 4 would be designated as units in which unplanned ignitions would be managed to protect life and property and whenever possible achieve resource benefits, consistent with the objectives identified for each FMU. In all FMUs, the primary objective would be public and firefighter safety. The following would be evaluated on each incident, as appropriate. • Public and firefighter safety; • Endangered or threatened species and species of concern; • Associated habitat for endangered or threatened species and species of concern; • Cultural resource values; • Natural resource values; • Urban interface communities at risk; • Sensitive tree islands and hammocks; • Transportation corridors; • Park infrastructure; • Archeological and cultural sites; • Untreated stands of melaleuca and Australian pine; • Rookeries and significant nesting and denning sites; • Other values at risk; and • Park boundary.	**INCIDENT MANAGEMENT** Incident management would occur under Alternative B in the same way as under Alternative A.
WILDERNESS Under Alternative A, a wilderness minimum requirement analysis would occur annually for specific planned fire management activities including prescribed fire and monitoring activities. Otherwise prohibited uses would be approved when administratively necessary for planned fire management activities. Planned and unplanned response activities would operate in accordance with the approved minimum tool analyses unless the on-site decision maker were to determine in his/her professional judgment that the conditions require additional emergency response activities.	**WILDERNESS** Alternative B would include a programmatic minimum requirements analysis that would comprehensively addresses equipment restrictions and special concerns associated with wilderness and potential wilderness. Alternative B would maintain the guidelines outlined in Alternative A and apply them programmatically for a five year scope of work.

Table 7: Comparison of Fire Management Strategies Based on Fire Type and Situation

Alternative A: No Action / Continue Current Management	Alternative B: NPS Preferred Alternative
Minimum impact suppression tactics would be implemented in all wildfire response activities according to Director's Orders #18, "Methods used to suppress wildfires should minimize impacts of the suppression action and the fire, commensurate with effective control and resource values to be protected." Under Alternative A, fire retardant foam could only be used with authorization from the park Superintendent.	Minimum suppression tactics would be implemented, and authorization for use of retardant would be required, the same as described in Alternative A.
Emergency Stabilization / Burned Area Emergency Rehabilitation	
Alternative A would include localized rehabilitation and restoration as part of ongoing fire operations. These actions may include stabilization, repair, replacement, or construction of improvements to prevent degradation to natural or cultural resources. Everglades' fire management would comply with the policies and direction in RM18 for all burned area emergency rehabilitation. If a burned area emergency rehabilitation team were required, a park archeologist, cultural resource specialist, and/or natural resource specialist would be a part of the team.	Rehabilitation and restoration would occur in Alternative B, the same as described in Alternative A.
Prescribed Fire / Management of Planned Fuels Treatments (Fire)	
Under Alternative A, prescribed fire treatments would be planned on an annual basis for hazardous fuel reduction and exotic vegetation management. Exotic vegetation prescribed fire treatments would be conducted under categorical exclusion 3.4 E(2) in accordance with the NPS DO-12 Handbook. These treatments are planned in conjunction with the Exotic Plant Management Team on an annual basis. Hazardous fuel reduction prescribed fire treatments would be conducted only in areas outside of designated wilderness within Everglades National Park under categorical exclusion 3.4 G(1) in accordance with the NPS DO-12 Handbook. A maximum of 4,500 acres would be treated each year for hazardous fuel reduction until April 24, 2015, at which time use of categorical exclusion 3.4 G(1) is no longer allowed. The constraints associated with operating an annual prescribed fire program under documented categorical exclusions would affect the fire management program's ability to implement treatments and achieve the goals listed above as well as the objectives specific to each FMU. These constraints would also limit the fire management program's ability to implement mitigations associated with the use of planned ignition treatments.	Alternative B would approve prescribed fire treatments that could be used to reduce hazard fuel accumulations, reduce threats to wildland urban interface form wildfires, maintain fire dependent ecosystems, treat exotic plants, and to secure the park boundary. Planned ignition treatments would be described in a multi-year fuels treatment plan. This environmental assessment would serve as the NEPA compliance document for the multi-year fuels treatment plan. Implementation of a multi-year fuels treatment plan would enhance the program's ability to meet stated goals and objectives and expand the acreage and locations treated with prescribed fire. Hazardous fuel reduction treatments would be conducted both in and outside of designated wilderness. These treatments would continue after April 24, 2015 and would not be subject to an acreage limitation. **MULTI-YEAR FUELS TREATMENT PLAN** The Everglades Multi-Year Fuels Treatment Plan was written to provide a projected work plan that would assist managers in planning and implementing treatments designed to reduce the risk and impacts of unwanted fire through planned ignition treatments, while restoring and maintaining fire-adapted ecosystems in the park. The plan outlines a projected scope of work for the park's fire management program and the process used in the prioritization, selection, review, and update of fuels treatment projects. Prioritization values included fire return interval departure, fuel loading, proximity to Cape Sable seaside sparrow populations, proximity to wildland urban interface and park boundary values, and exotic plant presence management values.

Table 7: Comparison of Fire Management Strategies Based on Fire Type and Situation

Alternative A: No Action / Continue Current Management	Alternative B: NPS Preferred Alternative
	The Multi-Year Fuels Treatment Plan is a revolving five-year plan that would be reviewed and updated annually by the interdisciplinary team. The interdisciplinary team would consist of (but may not be limited to) the fire management officer, a fire ecologist, a prescribed fire specialist, the chief of the biological resource division, a park botanist, the chief of cultural resources, a member from the park's environmental compliance division, and the regional fire planner. Alternative B would have an annual prescribed fire meeting and on-going planning and consultation that would occur as needed to provide for revisions based on internal reviews and input from other subject matter experts. Alternative B would continue the existing air quality and smoke management program. The new plan would not include management actions for the Cape Sable seaside sparrow with regard to prescribed fire. Instead, the fire management strategy for this habitat would be determined annually by Fire Management working in consultation with USFWS and appropriate partners. At present, there are no plans for prescribed fire in Cape Sable seaside sparrow habitat.
Non-Fire Fuel Treatment Applications / Management of Planned Fuels Treatments (Non-fire)	
Alternative A would not include the use of non-fire fuel treatments. If planned, these treatments would occur under documented categorical exclusion G(1) in accordance with the NPS DO-12 Handbook. A maximum of 1,000 acres would be treated annually in areas outside of designated wilderness with mechanical hazardous fuel reduction treatments until April 24, 2015 at which time the categorical exclusion for hazardous fuel reduction prescribed fire treatments will expire. Chemical hazardous fuel reduction treatments are excluded from approval under the hazardous fuel reduction categorical exclusion.	In accordance with current federal guidance, non-fire fuel treatments would be addressed in the proposed fire management plan under the heading of planned fuel treatments (fire/non-fire). Under this approach, planned fire treatments and planned non-fire treatments would have similar management and planning requirements. Non-fire treatment could include mechanical and/or chemical methods. Currently, chemical and mechanical exotic plant treatment and mowing occur within Everglades National Park under the Exotic Vegetation Management Program and Maintenance division. Planning for non-fire treatment projects would be similar to those required for burn plans, with the same types of internal and external reviews and approvals. Post-treatment monitoring would also be similar to that done for burn treatments.

MITIGATION MEASURES

Mitigations are actions or approaches designed to prevent or minimize adverse impacts during and after project implementation. The following measures would be implemented during implementation of Alternative B, as needed. All of the approaches are based on best professional judgment and available science and may be changed as new information is obtained. Mitigations or protective measures that are required as part of formal consultation with the US Fish and Wildlife Service (USFWS) will not change unless changes are made in coordination with the USFWS.

In addition to the specific measures described below, Fire and aviation management, in consultation with South Florida Natural Resources Center, would consult periodically with appropriate regulatory authorities as conditions change or as new information becomes available in order to ensure protection of resources.

The National Park Service would commit to the mitigation measures identified in this section as a part of implementing prescribed fire projects under the new fire management plan. Impacts for the action alternative in chapter 3 were determined with these mitigation measures in place, with tailoring to meet site-specific conditions.

Unplanned ignition activities and emergency situations may arise. In these situations the mitigation measuress described below would still be adhered to unless the on-site decision maker determined in his/her professional judgment that the conditions required activities that may supersede the relevant mitigation measures.

Many of the following mitigations measures would be implemented in Alternative A as well as Alternative B. However, constraints associated with operating an annual prescribed fire program under documented categorical exclusions to comply with NEPA, would limit the fire management program's ability to implement mitigations associated with the use of planned ignition treatments. Additionally Alternative B would provide additional mitigations regarding monitoring of plant populations and use of the *GIS Model for Archeological Site Prediction and Survey Planning at EVER* in fire management planning.

AIR QUALITY

Everglades National Park enjoys a Class I clean air status and as such the following mitigation measures would be followed:

- Burn authorizations or permits would be obtained from the Florida Forest Service once they determine that air quality and fire danger are favorable for safe burning.
- Day of burn weather forecasts and fuel types would be used to generate plume trajectory maps.
- Forecasted plume trajectories must not impact smoke-sensitive receptors in order for burn permits to be issued. Smoke management maps shall be printed and included with the permanent fire record.
- Smoke screening tools would be used to determine smoke vector paths for planned ignition treatments and unplanned incidents as appropriate.
- Smoke dispersal would be monitored by Fire Effects Monitors during planned ignition treatments and unplanned incidents as appropriate.
- Caution signs would be placed where smoke may impact transportation corridors.

- Traffic control measures would be implemented as appropriate by Fire Management or requested personnel.
- Advanced notifications of planned ignition treatments would be provided to all park staff and park interpretative staff to have at visitor access points and permitting stations.

SOILS

- The use of Minimum Impact Suppression Tactics (Appendix G of the proposed fire management plan) would be employed at all times to minimize substrate and soil disturbance.
- Planned ignition treatments would be used to reduce fuel loading adjacent to hardwood hammocks and tree islands to provide protection from unwanted fire spread.
- Soil moisture levels would be monitored and considered in the planning and implementation of planned ignition treatments to ensure conditions are within the prescription parameters to prevent fire spread into the organic soils of tree islands and hammocks.
- Planned ignition treatments would be used to reduce fuel loading, thereby reducing subsequent fire intensity and severity to lessen the effect of fire on organic soil and periphyton substrates.
- Specialized equipment, such as rolligons, would be used only when an operation could not be safely completed and/or impacts to values could not be mitigated, and not without prior approval from the superintendent. All off road vehicles would only be used in instances where travel by other means is impracticable.
- Under drought conditions when organic fires in sloughs are possible, a full suppression management strategy would be used.
- Fire management would support research and incorporate new information regarding fire effects on soils and organic substrates in Everglades National Park.
- Fire Management would work with the South Florida Natural Resources Center and the park's Cultural Resource Branch to obtain and use the best available science to plan, review, and adjust fire management practices as needed to mitigate impacts to soils.
- Fire management would be conducted in coordination with restoration projects as they are implemented.

HYDROLOGY AND WATER QUALITY

- Fire retardant would be used only when an operation cannot be safely completed and/or impacts to values could not be mitigated without the use of retardant. Superintendent approval would be required prior to use.
- Specialized equipment, such as rolligons, would be used only when an operation could not be safely completed and/or impacts to values could not be mitigated without the use of this equipment. Additional approval from the superintendent would be required prior to the use of retardant or specialized equipment, such as rolligons.

- Class A foam (surfactant) would only be used to protect life and property. Engines operated by Everglades Fire Management would be flushed to eliminate residual foam in pump equipment that would be used in park fire operations.
- The water tanks of air tankers would be rinsed prior to use in the park to eliminate residual substances being transferred through the water being dropped.
- Solution holes would not be used as helicopter dip sites.
- During fire management operations, funnels and spouts would be used when dispensing fuel and/or oil, spill containment berms would be used during portable pump operations, and containers would be filled to the appropriate level to prevent overflow and spills.
- Fire Management would work with the South Florida Natural Resources Center to obtain and use the best available science to plan, review and adjust fire management practices as needed to mitigate impacts to water resources.
- Fire management would be conducted in coordination with restoration projects as they are implemented.

EXOTIC VEGETATION

- South Florida Natural Resources Center would provide Fire and Aviation Management the most current information and data regarding exotic species.
- During fire management operations, vehicles and equipment would be washed to prevent increased spread of exotics as a result of fire management actions.
- Untreated stands of melaleuca would not be treated with planned ignition treatments without prior approval from the exotic vegetation management program.
- In consultation with the South Florida Natural Resources Center, Fire and Aviation Management would use planned ignition treatments as tool to treat, manage, and reduce the presence and spread of exotic species invasions in the park to the maximum extent feasible.
- Fire Management would work with the South Florida Natural Resources Center to obtain and use the best available science to plan, review, and adjust fire management practices as needed to manage and reduce the spread of exotic plant populations.
- Fire management would be conducted in coordination with restoration projects as they are implemented.

WILDLIFE, SPECIAL STATUS SPECIES, AND THEIR HABITATS

- Planned ignition treatments would be used to reduce fuel loading adjacent to hardwood hammocks tree islands and other fire sensitive habitats to provide wildlife protection from unwanted fire spread.
- Soil moisture levels would be monitored and considered in the planning and implementation of planned ignition treatments to ensure conditions are within the prescription parameters to prevent fire spread into tree islands and hammocks.

- Planned ignition treatments would be implemented to restore and maintain the pine rockland and wetland prairie ecosystems to benefit wildlife and plant species associated with these habitats.
- Planned ignition treatments would be implemented with the goal of creating a mosaic pattern of burned and unburned habitat to provide some on-site refugia for imperiled species and to facilitate recolonization of sites following fire.
- NPS would use planned ignition treatments of varying intensity and intervals to the extent practicable using an adaptive management approach.
- Planned ignition treatments will be implemented using firing patterns that provide escape routes for wildlife.
- South Florida Natural Resources Center would provide Fire and Aviation Management the most current information and data regarding rare and important vegetation communities.
- Fire effects monitoring in the pine rockland and prairie ecosystems would continue to inform fire managers and support adaptive management in fire operations.
- Fire Management personnel would be educated to recognize listed species and where those species occur in a burn unit to the extent practicable. Vehicle and equipment operators would be notified to avoid impacts to listed species. If encountered, species would be allowed to leave the immediate area before operations are resumed.
- If dead, sick or injured listed species are encountered, fire management would contact the South Florida Ecological Service Field Office and the ENP Biological Resources Branch Chief.
- When constructing firebreaks, boundary fire breaks would be limited to up to 30 ft. maximum width and interior firebreaks would be limited to up to 20 ft. maximum width. Avoid scattering debris on listed species or their nests, dens or cover.
- South Florida Natural Resources Center would provide Fire and Aviation Management the most current information and data regarding species of special concern.
- Fire Management would work with the South Florida Natural Resources Center and the U.S. Fish and Wildlife Service to obtain and use the best available science to plan, review, and adjust fire management practices as needed to help maintain or expand the population size or numbers of populations of species of special concern and rare and important vegetation communities.
- Where possible the use of mechanical or herbicide treatments in combination with planned ignition treatments would be minimized or avoided. In some cases the combined use of fire and herbicide is the most effective treatment.
- Fire management personnel would, to the extent practicable, record the locations of any covered species and nests, dens, cover sites, or tracks. This information would be made available to the USFWS upon request.
- NPS would construct temporary fuel breaks, if needed, using methods that have the least likelihood of creating soil disturbance when appropriate.
- Fire breaks or staging areas would not be placed through known populations of listed plant

species for planned ignition activities. Occasionally, listed plants occur on or adjacent to hiking trails, administrative roads, or similar features, and hiking, administrative uses, including maintaining firebreaks, may result in impacts to individuals.

- Specific mitigations for species of special concern would include the following:

Cape Sable seaside sparrow

- Everglades National Park would host and attend meetings on the Cape Sable seaside sparrow to establish fire management strategies and collaborate with species experts. Attendees would include Fire Management, USFWS, and appropriate partners.
- Everglades National Park would continue to work with the U.S. Fish and Wildlife Service to improve the Cape Sable seaside sparrow fire management strategy (see Appendix E of proposed fire management plan).
- Fire Management activities would adhere to the Cape Sable seaside sparrow fire management strategy.
- Everglades Fire Management would use prescribed fire treatments to reduce the effects of unwanted fire, to maintain natural fire regimes, reduce hazardous fuel loading, prevent woody plant encroachment, and limit exotic plant invasions adjacent to occupied Cape Sable seaside sparrow habitat.
- Everglades Fire Management would use objective-dependent fire effects plots, environmental sampling, fire behavior monitoring and detailed mapping protocols to evaluate mitigations and objectives as part of an adaptive management strategy.

Wood stork and wading birds

- South Florida Natural Resource Center would provide to Fire Management the most current wood stork and wading bird nesting colony locations and buffer size requirements.
- Everglades Fire Management would avoid management actions during nesting season within a 1,300ft buffer around exposed known active wood stork and other wading bird nesting colony sites and within a 700ft buffer around colonies protected by vegetative cover or where no birds are observed, to prevent disturbance of active nests.
- When possible, the park would avoid burning in close proximity to active wood stork and wading bird colonies, and under some circumstances this may not be practicable.
- Planned ignition treatments would use smoke dispersal data from weather forecast and smoke modeling tools to reduce impacts from smoke to active nests.
- Everglades Fire Management would use prescribed fire treatments to reduce the effects of unwanted fire, to maintain natural fire regimes, reduce hazardous fuel loading, prevent woody plant encroachment, and limit exotic plant invasions within and adjacent to wood stork and other wading bird habitat.
- Everglades Fire Management would use objective-dependent fire effects plots, environmental sampling, fire behavior monitoring and detailed mapping protocols to evaluate mitigations and objectives as part of an adaptive management strategy.

Everglade Snail Kite

- The U.S Fish and Wildlife Service, University of Florida, and South Florida Natural Resource Center would provide to Fire Management the most current snail kite nest locations.
- Everglades Fire management would avoid management actions within a 500 foot buffer around known active snail kite nests to prevent disturbance of active nests.
- Planned ignition treatments would use smoke dispersal data from weather forecast and smoke modeling tools to reduce impacts from smoke to active nests.
- Everglades Fire Management would use prescribed fire treatments to reduce the effects of unwanted fire, to maintain natural fire regimes, reduce hazardous fuel loading, prevent woody plant encroachment, and limit exotic plant invasions within and adjacent to snail kite habitat.
- Everglades Fire Management would use objective-dependent fire effects plots, environmental sampling, fire behavior monitoring and detailed mapping protocols to evaluate mitigations and objectives as part of an adaptive management strategy.

Eastern Indigo Snake

- Everglades National Park would conduct planned ignition treatments in fire adapted prairies adjacent to mangrove areas to prevent impacts to primary indigo snake mangrove habitat.
- Planned ignition treatments would be implemented with the objective of creating mosaic patterned burns, leaving unburned refugia and vegetative cover for use by adult and hatchling indigo snakes that may potentially be present.
- In addition to within unit refugia, landscape scale mosaic patterns and unburned refugia would be created by prescribed fire in adjacent Long Pine Key pine rockland management blocks being separated by a minimum of at least one year.
- Ignition techniques would be used that lessen the likelihood of wildlife entrapment; ring fires would not be used.
- Everglades Fire Management would use prescribed fire treatments to reduce the effects of unwanted fire, to maintain natural fire regimes, reduce hazardous fuel loading, prevent woody plant encroachment, and limit exotic plant invasions within and adjacent to indigo snake habitat.
- Soils moisture levels would be monitored and considered in the planning and implementation of prescribed fire treatments to ensure conditions are within the prescription parameters to prevent fire spread into hammocks where indigo snakes may occur.
- In the event that vehicle access to uplands for planned fire management activities is required, surveys for burrows would occur concurrently with these activities. If a burrow is encountered, operations would either continue in a way that avoids disturbing the burrow or operations would stop.
- Crews would be instructed to not harm or kill snakes unless the snake is definitively identified as a Burmese python or other nonnative species.
- Eastern indigo snakes would not be handled or moved.

- Where snakes bearing a resemblance to indigo snakes are encountered, all operations would be ceased and the snake allowed to move away.
- Debris piles created from exotic plant management prescribed fire activities would be removed promptly to prevent eastern indigo snakes from inhabiting those temporary piles and thereby reduce the potential for burning dens.
- Fire Management personnel would record and report any sightings of Eastern indigo snakes. If an eastern indigo snake were encountered during fire management operations, observations would be reported to the park wildlife biologist through the use of an observation log.
- Everglades Fire Management would contact the South Florida Ecological Service Office and the ENP Biological Resources Branch Chief if a dead eastern indigo snake were discovered.
- If large snake skins were found that may have been shed by an eastern indigo snake, they would be collected and sent to the park Wildlife biologist.
- Everglades Fire Management would use objective-dependent fire effects plots, environmental sampling, fire behavior monitoring and detailed mapping protocols to evaluate mitigations and objectives as part of an adaptive management strategy.

Florida Panther

- The park would conduct planned ignition treatments to reduce fuel loading adjacent to hardwood hammocks to provide protection from unwanted fire spread.
- Everglades Fire Management would use prescribed fire treatments to reduce the effects of unwanted fire, to maintain natural fire regimes, reduce hazardous fuel loading, prevent woody plant encroachment, and limit exotic plant invasions within and adjacent to Florida panther habitat.
- Soils moisture levels would be monitored and considered in the planning and implementation of prescribed fire treatments to ensure conditions are within the prescription parameters to prevent fire spread into tropical hardwood hammocks.
- Planned ignition treatments would be used to improve forage for white tailed deer.
- Everglades Fire Management would use objective-dependent fire effects plots, environmental sampling, fire behavior monitoring and detailed mapping protocols to evaluate mitigations and objectives as part of an adaptive management strategy.

Florida leafwing

- Planned ignition treatments would be used to maintain croton host plant populations and pine rockland habitat for the Florida leafwing butterfly.
- In addition to within unit refugia, landscape scale mosaic patterns and unburned refugia would be created by prescribed fire in adjacent Long Pine Key pine rockland management blocks being separated by a minimum of at least one year.
- Planned ignition treatments would be implemented with the objective of creating mosaic patterned burns leaving unburned refugia for use by adult and larvae Florida leafwing butterflies that may potentially be present.
- A mosaic pattern burn of 50-75% burned, 25-50% unburned, of pine rockland habitat within a unit, is a goal for planned ignition treatments in non-WUI pine

rockland burn units. Achieving a specific percentage of burned vs unburned is impossible to assure and this numerical value is considered a goal, not an objective.

- NPS would, in coordination with the U.S. Fish and Wildlife Service, continue to implement monitoring protocols to evaluate the seasonal and annual abundance of the Florida leafwing populations and assess the abundance and distribution of the Florida leafwing within FMU 3 annually prior to conducting burn activities.
- Everglades Fire Management would use prescribed fire treatments to reduce the effects of unwanted fire, to maintain natural fire regimes, reduce hazardous fuel loading, prevent woody plant succession, and limit exotic plant invasions within and adjacent to pine rockland habitat.
- Fire management and South Florida Natural Resources Center would monitor fire effects monitoring plots to ascertain the effects of fire on croton and post-fire larval presence. Pre- and post-fire monitoring would be conducted.
- Everglades Fire Management would use objective-dependent fire effects plots, environmental sampling, fire behavior monitoring and detailed mapping protocols to evaluate mitigations and objectives as part of an adaptive management strategy.

Bartram's scrub-hairstreak

- Planned ignition treatments would be used to maintain croton host plant populations and pine rockland habitat for the Bartram's scrub-hairstreak butterfly.
- In addition to within unit refugia, landscape scale mosaic patterns and unburned refugia would be created by prescribed fire in adjacent Long Pine Key pine rockland management blocks would be separated by a minimum of at least one year.
- Planned ignition treatments would be implemented with the objective of creating mosaic patterned burns leaving unburned refugia for use by adult and larvae Bartram's scrub-hairstreak butterflies that may potentially be present.
- A mosaic pattern burn of 50-75% burned, 25-50% unburned, of pine rockland habitat within a unit, is a goal for planned ignition treatments in non-WUI pine rockland burn units. Achieving a specific percentage of burned vs unburned is impossible to assure and this numerical value is considered a goal, not an objective.
- Everglades Fire Management would use prescribed fire treatments to reduce the effects of unwanted fire, to maintain natural fire regimes, reduce hazardous fuel loading, prevent woody plant succession, and limit exotic plant invasions within and adjacent to pine rockland habitat.
- Fire management and South Florida Natural Resources Center would monitor fire effects monitoring plots to ascertain the effects of fire on croton and post fire larval presence and re-colonization. Pre- and post-fire monitoring would be conducted.
- NPS would, in coordination with the U.S. Fish and Wildlife Service, continue to implement monitoring protocols to evaluate the seasonal and annual abundance of the Bartram's scrub-hairstreak populations and assess the abundance and distribution of the Bartram's scrub-hairstreak within FMU 3 annually prior to conducting burn activities.
- Everglades Fire Management would use objective-dependent fire effects plots, environmental sampling, fire behavior monitoring and detailed mapping protocols to evaluate mitigations and objectives as part of an adaptive management strategy.

Florida bonneted bat

- Planned ignition treatments would be implemented with the objective of creating mosaic patterned burns leaving unburned refugia and vegetative cover for use by Florida bonneted bats that may potentially be present.
- Refugia would be provided by retaining stumps, snags, large cavity trees with hollows or cavities, and woody debris during activities. Snags and woody debris would be retained if they do not burn to provide habitat and escape cover.
- Where bonneted bats are known to occur, cavity trees, old or large trees, and snags would be retained. If these trees must be removed, because of firebreak integrity or for human safety concerns, they would be examined before removal to make sure they are not being used by roosting bats.
- Any known or suspected Florida bonneted bat roosts would be marked and avoided.
- Old trees and snags with hollows or cavities where bonneted bats are known to occur would be protected from fire. Vegetation around the base of known or suspected roost sites would be raked and/or cleared to remove fuel load before conducting prescribed burns.
- Prescribed burns would be conducted carefully in known or suspected occupied areas for bonneted bats, especially during the Florida bonneted bat breeding season (Jan-Mar; June-Oct). Where prescribed fire is to be used near known active or suspected roosts, consideration would be given to avoiding these areas if there are high fuel loads, to reduce the risk of losing roosts during intense fires.
- Everglades Fire Management would use objective-dependent fire effects plots, environmental sampling, fire behavior monitoring and detailed mapping protocols to evaluate mitigations and objectives as part of an adaptive management strategy.

- Rare and important vegetation communities mitigations would include the following:
  - Planned ignition treatments would be used to reduce fuel loading adjacent to hardwood hammocks and tree islands to provide protection from unwanted fire spread.
  - Soil moisture levels would be monitored and considered in the planning and implementation of prescribed fire treatments to ensure conditions are within the prescription parameters to prevent fire spread into tree islands and hammocks. These parameters would be periodically reviewed by fire management and South Florida Natural Resources Center staff to ensure that they are serving a protective function.
  - Planned ignition treatments would be implemented to restore and maintain the pine rockland and fire-adapted wetland ecosystems to benefit wildlife and plant species associated with these habitats.
  - South Florida Natural Resources Center would provide fire and aviation management the most current information and data regarding rare and important vegetation communities.
  - Fire effects monitoring in the pine rockland and prairie ecosystems would continue to inform fire managers and support adaptive management in fire operations.
  - Fire Management would work with the South Florida Natural Resources Center (SFNRC) to obtain and use the best available science to plan, review and adjust fire

management practices as needed to help maintain and protect rare and important vegetation communities.

- Plant species of special concern mitigations would include the following:

  Blodgett's silverbush

  - Planned ignition treatments will be implemented to restore and maintain the pine rockland habitat for Blodgett's silverbush.
  - Everglades Fire Management would use prescribed fire treatments to reduce the effects of unwanted fire, to maintain natural fire regimes, reduce hazardous fuel loading, prevent woody plant succession and limit exotic plant invasions within and adjacent to pine rockland habitat.
  - All available measures would be taken to avoid placement of fire breaks or staging areas for planned ignition treatment through known Blodgett's silverbush populations.
  - If fire breaks or staging areas are required where Blodgett's silverbush populations occur, temporary fire breaks or staging areas would be created to allow plants to seed into the area. Once the plant population has successfully moved the original planned fire break or staging area may be constructed.
  - Unplanned ignition activities and emergency situations may arise. In these situations the above two mitigations would be adhered to unless the on-site decision maker determined in his/her professional judgment that conditions required activities that may supersede these mitigations.
  - Planned ignition treatments would be implemented with the objective of creating mosaic patterned burns leaving unburned refugia within burn units. It is expected that this would prevent the burning of entire populations of Blodgett's silverbush during a prescribed fire.
  - In addition to within unit refugia, landscape scale mosaic patterns and unburned refugia would be created by prescribed fire in adjacent Long Pine Key pine rockland management blocks being separated by a minimum of at least one year.
  - Everglades Fire Management would use objective-dependent fire effects plots, environmental sampling, fire behavior monitoring and detailed mapping protocols to evaluate mitigations and objectives as part of an adaptive management strategy.

  Pineland Sandmat

  - Planned ignition treatments would be implemented to restore and maintain the pine rockland habitat for pineland sandmat.
  - Everglades Fire Management would use prescribed fire treatments to reduce the effects of unwanted fire, to maintain natural fire regimes, reduce hazardous fuel loading, prevent woody plant succession, and limit exotic plant invasions within and adjacent to pine rockland habitat.
  - All available measures would be taken to avoid placement of fire breaks or staging areas for planned ignition treatment through known Pineland sandmat populations.
  - If fire breaks or staging areas are required where Pineland sandmat populations occur, temporary fire breaks or staging areas would be created to allow plants to seed into the area. Once the plant population has successfully moved the original planned fire break or staging area may be constructed.

- Unplanned ignition activities and emergency situations may arise. In these situations the above two mitigations would be adhered to unless the on-site decision maker determined in his/her professional judgment that conditions required activities that may supersede these mitigations.
- Planned ignition treatments would be implemented with the objective of creating mosaic patterned burns leaving unburned refugia within burn units. It is expected that this would prevent the burning of entire populations of Pineland sandmat during a prescribed fire.
- In addition to within unit refugia, landscape scale mosaic patterns and unburned refugia would be created by prescribed fire in adjacent LPK pine rockland management blocks being separated by a minimum of at least one year.
- Everglades Fire Management would use objective-dependent fire effects plots, environmental sampling, fire behavior monitoring and detailed mapping protocols to evaluate mitigations and objectives as part of an adaptive management strategy.

Garber's spurge

- Planned ignition treatments would be implemented to restore and maintain the pine rockland and beach dune habitat for Garber's spurge.
- Everglades Fire Management would use prescribed fire treatments to reduce the effects of unwanted fire, to maintain natural fire regimes, reduce hazardous fuel loading, prevent woody plant succession, and limit exotic plant invasions within and adjacent to pine rockland and beach dune communities.
- All available measures would be taken to avoid placement of fire breaks or staging areas for planned ignition treatment through known Garber's spurge populations.
- If fire breaks or staging areas are required where Garber's spurge populations occur, temporary fire breaks or staging areas would be created to allow plants to seed into the area. Once the plant population has successfully moved the original planned fire break or staging area may be constructed.
- Unplanned ignition activities and emergency situations may arise. In these situations the above two mitigations would be adhered to unless the on-site decision maker determined in his/her professional judgment that conditions required activities that may supersede these mitigations.
- Planned ignition treatments would be implemented with the objective of creating mosaic patterned burns leaving unburned refugia within burn units. It is expected that this would prevent the burning of entire populations of Garber's spurge during a prescribed fire.
- In addition to within unit refugia, landscape scale mosaic patterns and unburned refugia would be created by prescribed fire in adjacent LPK pine rockland management blocks being separated by a minimum of at least one year.
- Everglades Fire Management would use objective-dependent fire effects plots, environmental sampling, fire behavior monitoring and detailed mapping protocols to evaluate mitigations and objectives as part of an adaptive management strategy.

Florida pineland crabgrass

- Planned ignition treatments would be implemented to restore and maintain the pine rockland and marl prairie finger glade habitat and the pineland-prairie ecotone for Florida pineland crabgrass.
- Weather patterns and hydrologic trends would be used to determine appropriate timing of prescribed fire treatment implementation to avoid possible fire-flood interactions.
- Everglades Fire Management would use prescribed fire treatments to reduce the effects of unwanted fire, to maintain natural fire regimes, reduce hazardous fuel loading, prevent woody plant succession, and limit exotic plant invasions within and adjacent to pine rockland habitat.
- All available measures would be taken to avoid placement of fire breaks or staging areas for planned ignition treatment through known Florida pineland crabgrass populations.
- If fire breaks or staging areas are required where Florida pineland crabgrass populations occur, temporary fire breaks or staging areas would be created to allow plants to seed into the area. Once the plant population has successfully moved the original planned fire break or staging area may be constructed.
- Unplanned ignition activities and emergency situations may arise. In these situations the above two mitigations would be adhered to unless the on-site decision maker determined in his/her professional judgment that conditions required activities that may supersede these mitigations.
- Planned ignition treatments would be implemented with the objective of creating mosaic patterned burns leaving unburned refugia within burn units. It is expected that this would prevent the burning of entire populations of Florida pineland crabgrass during a prescribed fire.
- In addition to within unit refugia, landscape scale mosaic patterns and unburned refugia would be created by prescribed fire in adjacent LPK pine rockland management blocks being separated by a minimum of at least one year.
- Everglades Fire Management would use objective-dependent fire effects plots, environmental sampling, fire behavior monitoring and detailed mapping protocols to evaluate mitigations and objectives as part of an adaptive management strategy.

Everglades bully

- Planned ignition treatments would be implemented to restore and maintain the pine rockland habitat for Everglades bully.
- Weather patterns and hydrologic trends would be used to determine appropriate timing of prescribed fire treatment implementation to avoid possible fire-flood interactions.
- Everglades Fire management would use prescribed fire treatments to reduce the effects of unwanted fire, to maintain natural fire regimes, reduce hazardous fuel loading, prevent woody plant succession, and limit exotic plant invasions within and adjacent to pine rockland habitat.
- All available measures would be taken to avoid placement of fire breaks or staging areas for planned ignition treatment through known Everglades bully populations.

- If fire breaks or staging areas are required where Everglades bully populations occur, temporary fire breaks or staging areas would be created to allow plants to seed into the area. Once the plant population has successfully moved the original planned fire break or staging area may be constructed.
- Unplanned ignition activities and emergency situations may arise. In these situations the above two mitigations would be adhered to unless the on-site decision maker determined in his/her professional judgment that conditions required activities that may supersede these mitigations.
- Planned ignition treatments would be implemented with the objective of creating mosaic patterned burns leaving unburned refugia within burn units. It is expected that this would prevent the burning of entire populations of Everglades bully during a prescribed fire.
- In addition to within unit refugia, landscape scale mosaic patterns and unburned refugia would be created by prescribed fire in adjacent LPK pine rockland management blocks being separated by a minimum of at least one year.
- Everglades Fire Management would use objective-dependent fire effects plots, environmental sampling, fire behavior monitoring and detailed mapping protocols to evaluate mitigations and objectives as part of an adaptive management strategy.

CULTURAL RESOURCES

- Fire Management would work with the Cultural Resource Branch to obtain and use the best available science to plan, review, and adjust fire management practices as needed, to mitigate impacts to cultural resources.
- The park Cultural Resource Branch would provide fire and aviation management the most current data of cultural and archeological sites.
- In consultation with the Cultural Resources Branch, fire and aviation management would assure that appropriate actions are taken to protect cultural resource sites.
- Cultural resource protection and mitigations would be a consideration in every fire management action.
- The use of minimum impact suppression tactics (in Appendix G of the proposed fire management plan) would be employed at all times to minimize ground disturbance to any known or unknown cultural resource sites.
- Prior to the use of ground disturbing equipment or techniques in planned ignition operations, the Cultural Resource Branch would be consulted and consultation with the State Historic Preservation Office and affiliated Tribes would be undertaken if necessary.
- Planned ignition treatments would be used to reduce fuels adjacent to cultural sites to provide protection from unwanted fire spread.
- During periods of high fire risk, fire management would implement prepositioning of wildfire operational resources for the protection of cultural resources.
- Soil moisture levels would be monitored and considered in the planning and implementation of planned ignition treatments to ensure conditions are within the prescription parameters to prevent fire spread into high probability cultural site, including tree islands and hammocks.

- Fire management would request resource advisor or technical specialist assistance as required for planning and implementing fire management activities related to cultural resource sites.
- Consultation with the Miccosukee and Seminole Tribes would occur to ensure that Tribal cultural values are protected.
- Fire Management would work with the Cultural Resource Branch to utilize the *GIS Model for Archeological Site Prediction and Survey Planning at EVER* (Appendix H) in fire management planning (Appendix B of this EA and Appendix H of the proposed Fire Management Plan).
- Fire Management would work with the Cultural Resource Branch to identify currently unidentified archeological and historical resources threatened by burn activities. Survey strategies will be designed to both identify and protect resources threatened by prescribed burns and to further refine and modify the *GIS Model for Archeological Site Prediction and Survey Planning at EVER* (Appendix B of this EA and Appendix H of the proposed Fire Management Plan).
- With regard to Fire Management Planning, in the vast majority of cases, planned ignitions are expected to occur only in areas (Pine Rockland, Sawgrass Prairie, Muhly Prairie, and Coastal Prairie) which can be characterized as generally impacting only low or very low archeological and historical site probability areas since the currently identified moderate probability zones (Mixed Mangroves and Mud areas) and the high probability zones (Subtropical Hardwood Hammocks and Bayheads) (see Appendix B below) are not normally affected by planned ignitions. Since only low to very low probability areas are normally subjected to planned ignitions, and are unlikely to result in serious harm to below ground archeological resources when burned within prescription - i.e. within controlled low intensity and low soil temperature conditions (Sturdevant 2009), it is the potential loss of above ground flammable resources that might exist at unidentified nineteenth to twentieth century historic sites that is of most concern. For this reason, pedestrian survey (under the guidance of the park cultural resources branch or regional archeological partners) would be conducted pre-burn in order to identify above-ground fire-threatened resources in burn units in areas described in the *GIS Model for Archeological Site Prediction and Survey Planning at EVER* (Appendix B below) as low or very low archeological and historical site probability areas.
- In the unlikely event that prescribed burning is to extend into areas other than low or very low archeological and historical site probability areas, then the Cultural Resource Branch would be consulted for pre-burn survey recommendations and consultation with the State Historic Preservation Office (SHPO) and affiliated Tribes would be undertaken.
- When appropriate resources are available and conditions identified in the *GIS Model for Archeological Site Prediction and Survey Planning at EVER* (Appendix B below) are met, the park and/or regional cultural resource partners would conduct metal detecting and subsurface archeological survey in specified low or very low archeological and historical site probability areas after selected planned ignition treatments to document sites and fire effects on them and/or confirm/further refine the probability model included within the *GIS Model for Archeological Site Prediction and Survey Planning at EVER* (Appendix B below). The strategy for these opportunistic surveys is described in the *GIS Model for Archeological Site*

Prediction and Survey Planning at EVER (Appendix B below). The results of these surveys would be shared with the State Historic Preservation Office (SHPO).

WILDERNESS CHARACTER

- All planned fire management operations that involve otherwise prohibited uses would be conducted in accordance with an approved Minimum Requirements Decision Guide (found in the appendix of the proposed fire management plan).
- Use of specialized equipment, such as rolligons, in planned fire management operations would require preparation of a new Minimum Requirements Decision Guide, review by the Wilderness committee, and approval by the Superintendent prior to implementation.
- All unplanned fire response actions would be conducted using the minimum impact suppression tactics (see Appendix G of the proposed fire management plan) to minimize impacts to the wilderness character of the park.
- Fire Management would work with the South Florida Natural Resources Center, the Cultural Resource Branch, and other park divisions to obtain and use the best available science to plan, review, and adjust fire management practices as needed to mitigate impacts and enhance wilderness character to the maximum extent feasible.
- Planned ignition treatments and science based fire management would be implemented to maintain and enhance the natural wilderness character of Everglades National Park.
- Fire Management would work with the South Florida Natural Resources Center and the Cultural Resource Branch to obtain and use the best available science to plan, review, and adjust fire management practices as needed to mitigate impacts and enhance wilderness character to the maximum extent feasible.

VISITOR USE AND EXPERIENCE

- Fire Management would consider the safety of public, personnel, and fire crews as the highest priority for all fire management activities.
- Reconnaissance would be conducted prior to planned fire operations to verify that no backcountry users, campers, or visitors would be adversely impacted.
- Advanced notifications of planned ignition treatments would be provided to Park interpretative staff to have at visitor access points and permitting stations.
- Fire management would coordinate with the park's interpretive staff to provide educational and interpretative opportunities regarding fire management activities and fire ecology.

PARK OPERATIONS AND WILDLAND URBAN INTERFACE

- Fire management would consider the safety of the public, park personnel, and fire crews as the highest priority for all fire management activities.
- Park staff would be notified of all planned and unplanned fire management activities with the potential to impact park operations.

THE NATIONAL PARK SERVICE PREFERRED ALTERNATIVE AND ENVIRONMENTALLY PREFERABLE ALTERNATIVE

THE ALTERNATIVE PREFERRED BY THE NATIONAL PARK SERVICE

Alternative B, consisting of implementation of the proposed fire management plan, is the National Park Service's preferred alternative. The existing fire management plan was written in 1990 and 1991 and approved in September 1991. Since its approval, the plan was formally updated once, in 1995. Over the past two decades, the National Park Service periodically updated fire management practices and procedures in Everglades National Park in response to changes in NPS management policies, interagency fire management guidelines, resource management direction, changing conditions in the park, and a growing knowledge of the effects and the ecological role of fire in plant communities. However, these updates were not formalized in the park's fire management plan. Due to the age of the existing fire management plan and changes in procedures and policies in recent years, management under the proposed and up to date fire management plan included in Alternative B would have the greatest benefit for Everglades National Park.

THE ENVIRONMENTALLY PREFERABLE ALTERNATIVE

According to the U.S. Department of the Interior regulations in 43 *Code of Federal Regulations* section 46.30 that implement the National Environmental Policy Act, the environmentally preferable alternative "causes the least damage to the biological and physical environment and best protects, preserves, and enhances historical, cultural, and natural resources. The environmentally preferable alternative is identified upon consideration and weighing by the responsible official of long-term environmental impacts against short-term impacts in evaluating what is the best protection of these resources."

Alternative B is the environmentally preferable alternative for several reasons. It would provide a programmatic framework for the long-term use of fire in the fire-adapted vegetation communities of the park, which would be more effective in helping to restore and maintain the natural Everglades ecosystem. The ability to use small, frequent fires to preclude large, destructive fires would help protect the park's historical and other cultural resources and allow for more efficient use of resources.

Alternative A, which would continue current management, is not environmentally preferable. The prescribed fire program would continue to be approved with documented categorical exclusions. Areas requiring hazardous fuel management would remain untreated and the constraints would continue to affect the ability to achieve stated goals and objectives.

ALTERNATIVES AND ACTIONS DISMISSED FROM FURTHER CONSIDERATION

Some approaches suggested during scoping were not incorporated into this environmental assessment. Alternative approaches for fire management planning in Everglades National Park focused on emphasizing a single technique with implementation of other fire management methods only in small areas. These approaches and the justifications for eliminating them from further study are provided below.

Predominant Use of Wildland Fire

Everglades National Park is a highly flammable fragment of a larger ecosystem. It is bounded to the east by private property (since the east everglades expansion of 1989), and contains visitor facilities, other infrastructure, and historic properties that are susceptible to fire damage or destruction. It also hosts several species classified as endangered or threatened, primarily because of habitat loss elsewhere in the region. For these species, a major wildfire that alters their remaining habitat in the park could have severe consequences. The predominant use of wildfire would conflict with goals of preventing fires from crossing the park's boundary to the north or east, protecting visitors and infrastructure, and maintaining or enhancing habitat for endangered or threatened species. Therefore, the use of wildfire as the predominant management approach is not considered further.

Predominant Use of Prescribed Fire

Naturally occurring fire is a major factor in maintaining the Everglades and their biodiversity. An experimental program implemented under the 1995 fire management plan found that overuse of prescribed fires resulted in compartmentalization of the landscape that was inconsistent with the mandate in the park's establishing legislation to maintain "the essential primitive natural conditions now prevailing in this area." Therefore, this management approach was eliminated from further consideration.

Predominant Use of Chemical Fuel Reduction

In accordance with section 4.4.2.4 of NPS *Management Policies 2006* (NPS 2006a), the use of chemicals, such as herbicides, is not an acceptable practice for managing natural landscapes in parks. Herbicides are allowed only for use in the management of exotic species, and then only as part of an integrated management program. Moreover, herbicides can have unintended consequences for non-target species such as aquatic vegetation in freshwater and marine systems within and outside the park. The continuously recurring costs of buying and applying herbicides over the park's 1.5 million acres would be prohibitively expensive. For all these reasons, a program predominantly using chemical methods to reduce fuels was dismissed from further consideration.

Predominant Use of Mechanical Fuel Reduction

Most of Everglades National Park's 1.5 million acres are unroaded, a large portion is seasonally or permanently inundated, and more than 85 percent of the park is designated wilderness where the use of mechanized equipment is not allowed. The East Everglades Expansion Area is a wilderness study area. The large land area involved, the hydrologic and other physical conditions, and the prohibition on mechanized equipment use would make large-scale mechanical fuel reduction impractical. Moreover, unless it involved offsite hauling and disposal, such as in a landfill, mechanical actions would not reduce fuel loading and associated wildfire risk in treatment areas. Mechanical treatment could only be used seasonally due to wet conditions and therefore the park would be unable to accomplish management objectives at a large scale. This approach also would be

inconsistent with the legislative mandate to maintain essential primitive natural conditions in the park. Therefore, an alternative that primarily involved mechanical fuel reduction was not considered further.

Predominant Use of Wildland Fire Suppression

Widespread suppression of wildfires would have the same types of logistical problems cited for mechanical control, including lack of access and prohibitions on the use of mechanized equipment. This approach also would not reduce fuel loading and associated wildfire risk. Moreover, the Everglades is a fire-adapted ecosystem, and wide-scale suppression would cause ecological changes that would be contrary with the legislative mandate to maintain the park's essential primitive natural conditions. As a result, no further consideration was given to an approach that primarily involved wildfire suppression.

SUMMARY COMPARISON OF THE ALTERNATIVES

Table 8 compares the important features of the alternatives described earlier in this chapter. Table 9 summarizes the environmental impacts that are greater than minor that would result from each alternative. A more detailed explanation of the impacts is presented in Chapter 3: Affected Environment and Environmental Consequences.

Table 8: Important Differences in the Alternatives

Feature	Alternative A: No Action / Continue Current Management	Alternative B: NPS Preferred Alternative
Concept of Alternative	Alternative A would implement existing Federal Wildland Fire and National Park Service policies and the 1995 fire management plan.	Alternative B would be adaptable to changing fire policy and would function programmatically. It includes a multi-year fuels treatment plan that would allow managers to implement recent federal fire policy and plan prescribed fire treatments over multiple years.
Cooperation and Collaboration	Park interdisciplinary team consisting of subject matter experts would coordinate during planning, implementation, and response operations. Park would meet periodically with interagency interdisciplinary working groups and learning networks to provide updates on special status species, learn state management concerns, share management practices, and discuss lessons learned.	Same as Alternative A, plus park IDT would meet to review and update the FMP and multi-year fuels treatment plan and associated activities.
Park-wide Fire Management Goals	Protect human life and property; protect natural and cultural resources; maintain or improve the quality of the native fire-dependent and fire-maintained vegetation communities; manage adaptively; manage fires through monitoring to the maximum extent feasible, with little or no suppression action; use planned ignitions to supplement the natural role of fire as an ecosystem process, achieve resource management objectives, reduce hazardous fuel accumulations, reduce threats to WUI from wildfires, protect park resources, maintain fire adapted ecosystems, treat exotic plants, and to secure the park boundary; use science based fire management to maintain a healthy and sustainable ecosystem; work to achieve a healthy range of variation in fire return interval, fire size, fire behavior, fire effects, and other characteristics of the native fire regime.	Same as Alternative A, plus Alternative B would use science-based fire management to maintain and enhance the wilderness character of the Marjory Stoneman Douglas Wilderness.
Fire Management Units	Boundaries are defined by a combination of vegetation community as well as existing fire breaks where present. FMU 4 is defined by the boundaries of the East Everglades Expansion Area acquired in 1989. Four FMUs are identified.	Same as Alternative A. Boundaries of the FMUs are identical to those in Alternative A.

Table 8: Important Differences in the Alternatives (continued)

Feature	Alternative A: No Action / Continue Current Management	Alternative B: NPS Preferred Alternative
Unplanned ignitions	Unplanned fires would be addressed via a variety of management strategies, including full suppression, point/zone protection, and monitor/confine/contain.	Generally the same as Alternative A, except that the proposed fire management plan could function at the programmatic level and be adaptable to changing fire policy. As a result, the proposed fire management plan would be able to accommodate changes in guidance and practices from ongoing improvements in the science of wildfire management.
Planned ignitions	Prescribed fire treatments would be planned on an annual basis for hazardous fuel reduction and exotic vegetation management. Exotic vegetation prescribed fire treatments would be conducted under categorical exclusion 3.4 E(2) in accordance with the NPS DO-12 Handbook. Hazardous fuel reduction prescribed fire treatments would be conducted only in non-designated Wilderness areas within Everglades National Park under categorical exclusion 3.4 G(1). (Categorical exclusion expires April 24, 2015.) It is anticipated that 8,000 – 45,000 acres would be treated annually.	Prescribed fire program would be implemented via a multi-year fuels treatment plan, with annual updates. Prescribed fires would take place in wilderness and non-wilderness per the provisions of the multi-year fuels treatment plan. Compliance would be programmatic, and updated as needed. Approximately 237,000 to 258,000 acres would be proposed for prescribed fires annually. The actual number of acres treated would likely be less than the number proposed.
Staffing	Staffing would be per the 1995 fire management plan, but would include positions added since the 1995 plan was written. These include a prescribed fire specialist, fire ecologist, and support positions.	Same as Alternative A.
Minimum Requirements in Wilderness	A minimum requirements analysis would occur on an annual project- specific basis.	A programmatic minimum requirements analysis would be included in the fire management plan.
Monitoring and Evaluation	The fire program would implement four levels of monitoring, including environmental monitoring, fire behavior monitoring, and short- and long-term fire effects monitoring. Alternative A would continue the use of an expanded monitoring program in conformance with Reference Manual # 18 and the *Fire Monitoring Handbook*.	Same as Alternative A.
Plan Reviews and Updates	The 1995 plan would remain in place, as modified by existing Federal Wildland Fire and National Park Service policies. Prescribed fire treatments would be planned on an annual basis and documented and approved with the use of categorical exclusions.	Fire management plan would be reviewed and revised annually in response to factors such as changing federal regulations and guidelines, research results, lessons learned in the field, budgets, staffing needs, and administrative changes within and outside the National Park Service. In addition, annual updating would occur for plan elements such as, but not limited to the pre-attack plan, step-up plan, multi-year fuels plan, Cape Sable seaside sparrow strategy, fire effects monitoring plan, and cooperative operating plan.

Effects of the alternatives are summarized below in Table 9, Summary of the Impacts of the Alternatives. A more detailed evaluation of effects is provided in Chapter 3: Affected Environment and Environmental Consequences.

Table 9: Summary of Impacts of the Alternatives

Impact Topic	Alternative A	Alternative B
Air quality	Alternative A would result in short-term, minor adverse impacts, and long-term beneficial impacts on air quality. The cumulative effects would be short and long-term, negligible to moderate, and adverse as well as long-term and beneficial. Alternative A would contribute a noticeable amount to the overall adverse cumulative impacts.	Alternative B would result in long-term benefits and short- to long-term, negligible to minor, and adverse impacts on air quality. Prescribed fire could be implemented on substantially more acres annually under Alt B than under Alt A. The cumulative effects would be short-and long-term, negligible to moderate, and adverse as well as long- term and beneficial. Alternative B would contribute a noticeable amount to the overall adverse cumulative impacts.
Soils	Alternative A would have short-term, negligible to moderate adverse effects on soils. The cumulative effects would be short- and long-term, negligible to moderately adverse, and short- and long-term beneficial. Alternative A would contribute an imperceptible amount to the overall adverse and beneficial cumulative impacts.	Alternative B would have short-term, negligible to minor adverse impacts, and long-term beneficial effects on soils. Prescribed fire could be implemented on substantially more acres annually under Alt B than under Alt A. The cumulative effects would be short- and long-term, negligible to moderately adverse, while providing short- and long-term benefits. Alternative B would contribute an imperceptible amount to the overall cumulative impacts.
Hydrology and water quality	Alternative A would have short-term, minor, and adverse impacts as well as short-term beneficial effects on water quality and hydrology. The cumulative effects would be short- and long-term and beneficial. Alternative A would contribute an imperceptible amount to the overall cumulative impacts.	Alternative B would have short-term, minor adverse impacts and short-term benefits on water quality and hydrology. Prescribed fire could be implemented on substantially more acres annually under Alt B than under Alt A. The cumulative effects would be short- and long-term and beneficial. Alternative B would contribute an imperceptible amount to the overall beneficial cumulative impacts on hydrology and water quality.
Vegetation	The effects of prescribed fire under Alternative A would be long-term and beneficial for vegetation communities in sawgrass marsh, marl prairie, coastal prairie, pine rocklands and cypress forests. Prescribed fire would not be used in vegetation communities of hardwood hammocks/tree islands, mangrove/buttonwood forests, and sloughs. The absence of wildfire and prescribed fire, due to random forces, could have long-term, minor to moderate adverse impacts on some communities as a result of unwanted succession. The effects of wildfire management actions would be short- and long-term, negligible to minor, and adverse for native vegetation communities. The cumulative effect would be short- and long-term and beneficial. Alternative A would contribute an imperceptible amount to the overall long-term beneficial cumulative impacts.	Alternative B would have a long-term beneficial impact on vegetation. . Prescribed fire could be implemented on substantially more acres annually under Alt B than under Alt A. The adverse impacts of wildfire management actions on vegetation under Alternative B would be short-term and minor, with some long-term beneficial effects. The cumulative effect would be short- and long-term, and beneficial. The effects of Alternative B would contribute an appreciable amount to the overall long-term beneficial cumulative impacts.

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Table 9: Summary of Impacts of the Alternatives (continued)

Impact Topic	Alternative A	Alternative B
Wildlife and their habitats	The effects of Alternative A would be short-term negligible to minor, and adverse but would result in long-term beneficial effects through maintenance of wildlife habitats. Wildfire management actions would have short-term, minor adverse impacts, but long-term benefits would accrue if habitats such as hardwood hammocks are protected. Cumulative effects would be short- and long-term and beneficial. Alternative A would contribute a noticeable amount to the long-term beneficial cumulative impacts.	Alternative B would result in long-term beneficial impacts to wildlife through maintenance of their habitats while minimizing adverse effects. Prescribed fire could be implemented on substantially more acres annually under Alt B than under Alt A. Wildfire management actions would have short-term, negligible to minor adverse impacts if wildlife habitats are disrupted or species temporarily displaced, but long-term beneficial if habitats such as hardwood hammocks were protected. Fuel reduction activities would have short-term, minor impacts on wildlife species, with future reduced fire intensities representing a long-term benefit. Cumulative effects would be long-term and beneficial. Alternative B would contribute a noticeable amount to the long-term beneficial cumulative impacts.

Table 9: Summary of Impacts of the Alternatives (continued)

Impact Topic	Alternative A	Alternative B
Special status species and their habitats	Alternative A "may affect, but is not likely to adversely affect" the Stock Island tree snail (effects are discountable), American crocodile (negligible to minor, short-term adverse effects), Florida manatee (discountable effects), and wood stork (minor, short-term adverse effects, and short-term beneficial effects). Alternative A "may affect and is likely to adversely affect" Blodgett's silverbush (negligible, short-term effects and moderate, long-term adverse effects), pineland sandmat (negligible short-term effects and moderate, long-term adverse effects), Garber's spurge (negligible short-term effects and moderate, long-term adverse effects), Florida pineland crabgrass (negligible, short-term effects and moderate, long-term adverse effects), Everglades bully (moderate, long-term and adverse effects in wilderness; short-term, negligible to minor adverse impacts and long-term, beneficial effects in non-wilderness), Florida leafwing (no short-term effects, moderate, long-term, and adverse effects), Bartram's hairstreak (no short-term effects, moderate, long-term, and adverse effects), Eastern indigo snake (short-term, minor to moderate adverse effects and long-term beneficial effects), Florida panther (short-term, minor to moderate adverse effects and long-term beneficial effects), Florida bonneted bat (minor, short-term adverse impacts and long-term beneficial effects), Cape Sable seaside sparrow (moderate, short and long-term, adverse effects, with long-term beneficial effects), and Everglade snail kite (short-term, minor to moderate adverse impacts and short- and long-term beneficial effects). Some short-term disturbance to park habitats would occur, but over the long term, habitat conditions for affected species should be maintained or improved. The park would continue to coordinate with the U.S. Fish and Wildlife Service and state resource agencies, and would continue to minimize adverse impacts to individuals of special status species caused by fire management activities. However, some adverse impacts would be unavoidable. Cumulative impacts to special status species would be generally beneficial in areas where fires occur. The contribution of Alternative A to these impacts would be noticeable.	Alternative B, "may affect, but is not likely to adversely affect" the Stock Island tree snail (short-term, minor adverse effects, long term beneficial effects), American crocodile (negligible to minor, short-term adverse effects), Florida manatee (discountable effects), and wood stork (short-term, minor adverse effects, and short-term beneficial effects). Alternative B "may affect and is likely to adversely affect" Blodgett's silverbush (negligible to minor, short-term adverse effects and long-term beneficial effects), pineland sandmat (negligible to minor short-term adverse effects and long-term beneficial effects), Garber's spurge (negligible to minor, short-term adverse effects and long-term beneficial effects), Florida pineland crabgrass (negligible to minor, short-term adverse effects and long-term beneficial effects), Everglades bully (negligible to minor, short-term adverse effects and long-term beneficial effects), Florida leafwing (minor to moderate, short-term adverse effects and long-term beneficial effects), Bartram's hairstreak (minor to moderate, short-term adverse effects and long-term beneficial effects), Eastern indigo snake (minor to moderate, short-term adverse effects and short- and long-term beneficial effects), Florida panther (minor to moderate, short-term adverse effects and short- and long-term beneficial effects), Florida bonneted bat (negligible to minor, short-term adverse effects and long-term beneficial effects), Cape Sable seaside sparrow (moderate, short and long-term, adverse effects, and long-term beneficial effects), and Everglade snail kite (minor to moderate, short-term adverse effects and long-term beneficial effects). Some short-term disturbance of park habitats would occur, but over the long term, habitat conditions for affected species should be maintained or improved. The park would continue to coordinate with the U.S. Fish and Wildlife Service and state resource agencies, and would continue to minimize as much as possible impacts to individuals of special status species caused by fire management activities. However, some adverse impacts would be unavoidable. Cumulative impacts to special status species would be generally beneficial. The contribution of Alternative B to these impacts would be noticeable.
Cultural resources – archaeological resources	Impacts would be long-term, beneficial and permanent, minor to moderate, adverse on archeological resources. These impacts would be a noticeable component of the resulting overall permanent, minor to moderate, adverse cumulative impacts.	Impacts would be long-term, beneficial and permanent, minor, adverse. These impacts would have an imperceptible offset on the resulting overall permanent, minor, adverse cumulative impacts.

Table 9: Summary of Impacts of the Alternatives (continued)

Impact Topic	Alternative A	Alternative B
Cultural resources – historic structures	Impacts would be long-term, beneficial and short- to long-term, negligible to minor, adverse. These impacts would be a noticeable component of the resulting overall long-term or permanent, minor to moderate, adverse cumulative impacts.	Impacts would be long-term, beneficial and short- to long-term, negligible to minor, adverse. These impacts would have an imperceptible offset on the resulting overall long-term or permanent, minor to moderate, adverse cumulative impacts.
Cultural resources – cultural landscapes	Impacts would be long-term, beneficial and long-term, negligible to minor, adverse. These impacts would be a noticeable component of the resulting overall long-term, minor to moderate, adverse cumulative impacts.	Impacts would be short- and long-term, beneficial and long-term, negligible to minor, adverse. These impacts would have an imperceptible offset on the resulting overall long-term, minor, adverse cumulative impacts.
Cultural resources – ethnographic resources	Impacts would be long-term, beneficial and long-term or permanent, negligible to minor, adverse. These impacts would have an imperceptible offset on the overall long-term or permanent, minor to moderate, cumulative adverse impacts.	Impacts would be long-term, beneficial and long-term or permanent, negligible to minor, adverse. These impacts would have an imperceptible offset on the resulting overall long-term or permanent, minor, adverse cumulative impacts.
Wilderness character	Impacts on the untrammeled quality of wilderness would be short-term, minor to moderate and adverse due to the relatively limited use of prescribed fire under this alternative. Impacts on the undeveloped quality would be short-term moderate and adverse. Impacts on the natural quality could be long-term, adverse, and moderate to major, depending on the amount of prescribed fire and wildfire that occurred in the park. Adverse impacts would primarily be the result of the limited use of prescribed fire under this alternative. Impacts in the localized areas where burns did take place would typically be long-term and beneficial Impacts on the quality related to solitude or primitive and unconfined recreation would be short-term, negligible to moderate, and adverse. Cumulative impacts on wilderness would be short-term, minor, and adverse and long-term beneficial. This alternative's contribution to these effects would be noticeable.	Prescribed fire could be implemented on substantially more acres annually under Alt B than under Alt A. Impacts on the untrammeled quality of wilderness would be moderate and adverse, and both short and long term. These adverse impacts would be offset in the long-term by enhancement of the natural quality of wilderness. Impacts on the undeveloped quality would be short- and long-term, minor to moderate, and adverse. Some impacts would be long-term and beneficial as compared to Alternative A. Impacts on the natural quality of wilderness would be long term and beneficial through improvement of degraded habitat and maintenance of non-degraded natural habitats. Some activities would result in impacts that were short-term, negligible to moderate, and adverse. Impacts on the quality related to solitude or primitive and unconfined recreation would be short-term, negligible to moderate, and adverse. Impacts would be greater than under Alternative A due to a higher degree of active management. Cumulative impacts on wilderness would be short-term, minor, and adverse as well as long-term and beneficial. This alternative's contribution to these effects would be noticeable.

Table 9: Summary of Impacts of the Alternatives (continued)

Impact Topic	Alternative A	Alternative B
Visitor use and experience	Alternative A would have short-term, negligible to minor adverse, and long- and short-term beneficial effects on visitor use and experience. The cumulative effects would be short-term, negligible to moderate, and adverse as well as long-term and beneficial. Alternative A would contribute an imperceptible amount to the overall beneficial and adverse cumulative impacts.	Alternative B would have short-term, negligible to minor adverse impacts, and short- and long-term beneficial effects on visitor use and experience. The cumulative effects would be short-term, negligible to moderate, and adverse as well as short- and long-term and beneficial. Alternative B would contribute an imperceptible amount to the overall cumulative impacts.
Land use	Alternative A would have short-term, negligible to minor adverse impacts and long-term beneficial effects on land use and transportation. The cumulative effects would be short-term, negligible to minor and adverse, as well as long-term and beneficial. Alternative A would contribute an imperceptible amount to the overall beneficial and adverse cumulative impacts.	Alternative B would have short-term, negligible to minor adverse impacts and long- and short-term beneficial effects on land use and transportation. Prescribed fire could be implemented on substantially more acres annually under Alt B than under Alt A. The cumulative effects would be short-term, negligible to minor, and adverse, as well as long-term and beneficial. Alternative B would contribute an imperceptible amount to the overall adverse and beneficial cumulative impacts.
Park operations	Alternative A would have short-term, negligible to moderate adverse effects on park operations. The cumulative effects would be considered short- and long-term, minor to moderate, and adverse as well as long-term and beneficial. Alternative A would contribute an appreciable amount to the overall beneficial and adverse cumulative impacts on park operations.	Alternative B would have short-term, negligible to moderate adverse impacts, as well as short- and long-term beneficial effects on park operations. Prescribed fire could be implemented on substantially more acres annually under Alt B than under Alt A. The cumulative effects would be long-term and beneficial. The beneficial effects of Alternative B would contribute an appreciable amount to the overall beneficial cumulative impacts.