

National Park Service
U.S. Department of the Interior



Big Cypress National Preserve
Florida

**Hunting Management Plan/Environmental Assessment
Finding of No Significant Impact**

May 2014

Based on the environmental analysis as documented in the environmental assessment and with the due consideration for the nature of public comments, the National Park Service has determined that the selected alternative is not a major federal action significantly affecting the quality of the human environment. Negative environmental impacts that could occur range from negligible to moderate in intensity. There are no significant impacts on native vegetative communities and habitat, protected plant species, protected wildlife species, game species, wilderness, or soundscapes. No highly uncertain or controversial impacts, unique or unknown risks, significant cumulative effects, or elements of precedence were identified. Implementation of the selected alternative will not violate any federal, state, or local environmental protection law.

Based on the foregoing information, the National Park Service has determined that an environmental impact statement is not required for this project and thus will not be prepared.

Recommended:

Handwritten signature of J.D. Lee in cursive script.

J.D. Lee, Superintendent (Acting)

5/6/14

Date

Approved:

Handwritten signature of Stan Austin in cursive script.

FOR Stan Austin, Regional Director, Southeast Region

5/16/14

Date

INTRODUCTION

The National Park Service (NPS) has prepared a *Hunting Management Plan/Environmental Assessment* (EA) for managing hunting in the 729,000-acre Big Cypress National Preserve (the “Preserve”)/Wildlife Management Area.

The Preserve is located in southern Florida in Collier, Miami-Dade, and Monroe counties, and is situated between the major cities of Miami and Naples. The original Preserve, which consists of 582,000 acres, extends from the northern boundary of Everglades National Park on the south to seven miles north of 1-75 on the north. The Addition is approximately 147,000 acres in size and consists of two separate areas – the Northeast Addition and the Western Addition (see figure 1 in the attached EA). Most of these lands, approximately 128,000 acres in the Northeast Addition, are located northeast of the original Preserve boundary. The Western Addition is an approximately 1-mile strip of land (approximately 19,000 acres) between State Road (SR) 29 and the western boundary of the original Preserve. Unless specified, the “Addition” refers to lands in both areas. The Addition also includes private lands (inholdings), some of which are exempt from NPS acquisition (NPS 2010a).

The Preserve is one of 401 units of the national park system administered by the NPS. The original Preserve was created by Congress on October 11, 1974 [Public Law (PL) 93-440] as one of the first two national preserves in the national park system. The Big Cypress National Preserve Addition Act (PL 100-301) was passed on April 29, 1988, creating the Addition. Most of the acquisition of the Addition was completed in 1996. See appendix A in the attached EA for a copy of the enabling legislation (PL 93-440, as amended by PL 100-301) in its entirety.

In 1991, a General Management Plan (GMP) was completed, which addressed management of the original Preserve. The *Big Cypress National Preserve – Addition Final General Management Plan/Wilderness Study/Off-Road Vehicle Management Plan/Environmental Impact Statement* (Addition GMP) was completed in 2010, which addressed management of the Addition.

The enabling legislation (PL 93-440, as amended by PL 100-301) also dictates that public hunting shall be allowed in the Preserve, including the Addition. Under this legislation, public hunting in the Preserve is mandated by the enabling legislation, unless specific “reasons of public safety, administration, floral and faunal protection and management, or public use and enjoyment” are identified. Pursuant to this legislation, the NPS prepared the attached *Hunting Management Plan/EA*.

36 CFR 7.86 provides specific regulations for hunting, fishing, trapping, and gathering in the Preserve. Subsection (e) (1) states: “Hunting, fishing and trapping are permitted in accordance with the general regulations found in parts 1 and 2 of [36 CFR] and applicable Florida law governing Cooperative Wildlife Management Areas.”

The NPS and the Florida Fish and Wildlife Conservation Commission (FWC) have been partners in fulfilling the legislative mandate that created the Preserve, namely, the preservation of traditional uses along with continual conservation of important natural resources within the Preserve boundaries. Resource management decisions, particularly those related to public hunting and recreational access, have evolved over the more than 30 years since the Preserve was created, and some of those changes have been directed toward improving conditions for the endangered Florida panther (*Puma concolor coryi*) and its primary prey, white-tailed deer (*Odocoileus virginianus*).

Both the GMP completed for the original Preserve in 1991 and the GMP completed for the Addition in 2010 articulated the need to manage hunting within the Preserve. Hunting is currently permitted within the original boundaries of the Preserve and is managed cooperatively by the NPS and FWC through the *NPS/FWC Cooperative Partnership Agreement* (see appendix B of the attached EA).

The Addition has never been open to public hunting since its acquisition by the NPS; however, hunting occurred on private lands in the Addition prior to the acquisition of the lands by the NPS. In accordance with the GMP and the Addition GMP, the goal of the attached *Hunting Management Plan/EA* is to develop a hunting management plan for the entire Preserve, including the Addition, and to analyze the impacts associated with three alternatives for managing hunting in the Preserve.

PROJECT PURPOSE, NEED, AND OBJECTIVES

The purpose of this action is to develop a hunting management plan for the Big Cypress National Preserve/Wildlife Management Area that allows the superintendent of the Preserve to provide for hunting opportunities in the Preserve in a manner that is in the best interest of the Preserve's resources and the public, while meeting the requirements set forth by the NPS, the Preserve's enabling legislation, the *NPS/FWC Cooperative Partnership Agreement*, and all applicable federal, state, and local laws and regulations.

A hunting management plan is needed for the Big Cypress National Preserve/Wildlife Management Area:

- to provide clear and informational guidance for safe and responsible hunting within the Preserve to the public
- to provide for a visitor use experience that complies with the enabling legislation for the Preserve
- to manage the resources present in the Preserve
- to provide a framework for hunting management within the Preserve that meets the requirements set forth by the NPS, the Preserve's enabling legislation, the *NPS/FWC Cooperative Partnership Agreement*, and all applicable federal, state, and local laws and regulations

The objectives in taking action are to:

1. Provide guidelines for hunting within the Big Cypress National Preserve/Wildlife Management Area that satisfy all NPS regulations, the Preserve's enabling legislation, the *NPS/FWC Cooperative Partnership Agreement*, and all applicable federal, state, and local laws and regulations and that maintain or improve the Preserve's ability to contribute to the conservation of rare, threatened, and endangered species.
2. Provide a programmatic framework for facilitating agency communications and goal-setting that provides guidance over a number of years.
3. Utilize science-based resource management (e.g., habitat, wildlife, and protected species) for adaptive decision-making for:
 - the NPS and the FWC to collaborate and cooperate on the rule-making process regarding hunting
 - the NPS to take action independently, with notification to the FWC and U.S. Fish and Wildlife Service (USFWS) as soon as practicable, for resource protection or public safety in certain cases (i.e., high water events, fires, threatened and endangered species issues), which may have an effect on hunting within the Preserve
4. Provide the public with clear and understandable information regarding:
 - hunting management within the Preserve
 - safe and responsible hunting practices
5. Manage opportunities for a positive visitor use experience for hunters and nonhunters.
6. Manage an array of access options to allow for a diversity of hunting opportunities within the framework of existing regulations and funding.

SELECTED ALTERNATIVE

The NPS has selected alternative 3 for implementation, which is identified as the preferred alternative in the attached EA. Under the selected alternative, the NPS and the FWC, in consultation with the USFWS, will cooperate to implement an adaptive management strategy to manage hunting in the Preserve. The adaptive management strategy is designed to address key uncertainties that exist as a result of allowing hunting throughout the entire Preserve. Adaptive management actions will be taken based on effects to the white-tailed deer population (as measured by hunter success rates) and potential conflicts between hunting and nonhunting visitors in the Preserve. Under the selected alternative, adaptive management actions regarding the white-tailed deer population are designed to ensure that there remains enough prey for the Florida panther, and adaptive management actions regarding potential conflicts between hunters and other visitors are designed to ensure satisfactory experiences for all Preserve visitors.

The adaptive management of hunting that will occur under the selected alternative is restricted to actions taken in accordance with the objectives, triggers, and monitoring data relating to hunter success rates for the white-tailed deer population, and potential conflicts between hunting and nonhunting visitors in the Preserve. The NPS is not proposing to take adaptive management actions related to other resources, such as other wildlife (including other game species), vegetation, or wilderness, because the management of these resources does not involve the same level of uncertainties as management of the white-tailed deer population and visitor use conflicts. Impacts to these other resources as a result of hunting activities are disclosed in the attached EA, but these other resources will be managed in accordance with NPS management policies and other existing management plans, not through this adaptive management process. A list of the other plans used to make management decisions in and affecting the Preserve can be found in the “Cumulative Impacts Analysis” section of chapter 4 of the attached EA. The impacts from the actions taken in the Preserve under these other existing plans are discussed in detail throughout chapter 4 of the attached EA, under the respective impact topics.

A detailed description of adaptive management, as defined by the U.S. Department of the Interior, can be found in appendix F of the attached EA.

Adaptive Management Process

Implementation of the adaptive management process will occur in two phases – a set-up phase in which the key components are developed and an iterative phase in which the components are linked together in a sequential decision process (Williams et al. 2009). A detailed description of each step in the process is provided in chapter 2 of the attached EA.

Set-Up Phase. The set-up phase has five structural elements: stakeholder involvement, management objectives, management actions, predictive models, and monitoring plans.

1. Stakeholder Involvement – Allow for open and transparent stakeholder involvement regarding management actions.
2. Management Objectives – Implement clear, measurable, and agreed-upon management objectives to guide decision-making and evaluate management effectiveness over time.
3. Management Actions – Identify a set of management actions for decision-making.
4. Predictive Models – Identify models that characterize different ideas (hypotheses) about how the system works.
5. Monitoring Plans – Design and implement a monitoring plan to track resource status and other key resource attributes.

Iterative Phase. The iterative phase of the adaptive management process uses these elements in an ongoing cycle of learning about system structure and function, and managing based on what is learned (Williams et al. 2009).

6. Decision-making – Select management actions based on management objectives, resource conditions, and understanding.
7. Follow-up Monitoring – Use monitoring to track system responses to management actions.
8. Assessment – Improve understanding of resource dynamics by comparing predicted and observed changes in resource status.
9. Iteration – Cycle back to step 6.

To implement this adaptive management strategy, the NPS and FWC, in consultation with the USFWS, has developed proposed hunting regulations for year 1 of implementation, adaptive management objectives, baseline management actions, adaptive management triggers, and supplemental management actions, as well as a public involvement program to ensure continued public involvement in the adaptive management process. Details of the adaptive management strategy are provided on pages 42 to 51 of the attached EA.

OTHER ALTERNATIVES CONSIDERED

In addition to the selected alternative, one other action alternative and a no action alternative were fully analyzed in the attached EA:

Alternative 1 – No Action – Apply Current Management to the Addition

Under alternative 1 (no action), management of hunting in the entire Preserve would occur in accordance with the *NPS/FWC Cooperative Partnership Agreement* (see appendix B of the attached EA).

U.S. Department of the Interior regulations define a no action alternative as that which would result in “no change from current management direction.” The original Preserve GMP (completed in 1991) and the Addition GMP (completed in 2010) form the basis for management actions taken by the NPS in the original Preserve and in the Addition, respectively. These two GMP documents dictate that hunting would be permitted throughout the entire Preserve. Therefore, the no action alternative for the attached EA was defined as continuation of the current management direction provided by the two GMP documents – hunting would be permitted throughout the Preserve and managed cooperatively by the NPS and FWC using the guidelines outlined in the *NPS/FWC Cooperative Partnership Agreement* (see appendix B of the attached EA).

It is important to note that public hunting does not currently take place in the Addition. The Addition GMP, which guides management actions in the Addition, was completed in October 2010. The ROD for this document was signed in February 2011. The NPS staff at the Preserve have been in the process of coordinating access options to allow hunting in the Addition since the time that the ROD for the Addition was signed in February 2011; however, this process is still ongoing. Under the no action alternative, hunting would be permitted as soon as feasible options are established that allow the public to safely access the Addition for hunting purposes.

Alternative 2 – No Hunting in the Addition

Under alternative 2, current hunting management would continue within the original Preserve boundaries, using the guidance outlined in the *NPS/FWC Cooperative Partnership Agreement* (see appendix B of the attached EA). In the Addition, public hunting would be prohibited.

U.S. Department of the Interior regulations define a no action alternative as that which would result in “no change from current management direction.” For the attached EA, the no action alternative (continuation of current management direction) would allow hunting throughout the Preserve (including the Addition) and therefore could potentially cause adverse environmental impacts. Because hunting does not currently take place in the Addition, the no action alternative for the attached EA does not reflect the true environmental baseline conditions in the Preserve, absent from hunting impacts (refer to the description of alternative 1 for additional details). Therefore, an environmental baseline alternative was added to the range of alternatives that evaluates the environmental consequences of continuing to allow hunting in the original Preserve and prohibiting hunting in the Addition. This allows for a comparison of impacts between prohibition of hunting in the Addition and allowance of hunting in the Addition, in accordance with the conditions outlined in alternatives 1 or 3.

ALTERNATIVES CONSIDERED AND DISMISSED

In addition to the alternatives that were analyzed, the NPS considered other options during early planning phases for the project. The following alternative was dismissed from full consideration because it did not meet the project objectives.

No Hunting in the Preserve

Under this alternative, no hunting would be allowed in any part of the Preserve (i.e., within the original boundaries or the Addition). 36 CFR 7.86 provides specific regulations for hunting, fishing, trapping, and gathering in Big Cypress National Preserve. Subsection (e) (1) states: “Hunting, fishing and trapping are permitted in accordance with the general regulations found in parts 1 and 2 of [36 CFR] and applicable Florida law governing Cooperative Wildlife Management Areas.”

The enabling legislation (PL 93-440, as amended by PL 100-301) also mandates that public hunting shall be allowed in the Preserve (i.e., not a discretionary activity unless specific “reasons of public safety, administration, floral and faunal protection and management, or public use and enjoyment” are identified); therefore, this alternative conflicts with these regulations and the enabling legislation. Additionally, this alternative does not meet the purpose and need for the *Hunting Management Plan*, specifically, “To develop a hunting management plan for the Big Cypress National Preserve/Wildlife Management Area that allows the superintendent of the Preserve to provide for hunting opportunities in the Preserve ...” Therefore, this alternative was dismissed from further consideration.

RATIONALE FOR THE SELECTED ALTERNATIVE

The director of the NPS Southeast Region has identified alternative 3 as the selected alternative. Therefore, upon approval of this Finding of No Significant Impact, alternative 3 will be implemented as the NPS’ selected alternative. The selected alternative fulfills the project purpose and needs and meets all of the project objectives to a greater degree than the other alternatives considered. This alternative fully complies with all NPS regulations; the Preserve’s enabling legislation; the *NPS/FWC Cooperative Partnership Agreement*; and all applicable federal, state, and local laws and regulations.

This alternative creates a long-term framework: for facilitating agency communications and goal-setting that will be valid for a number of years; that utilizes science-based resource management for adaptive decision-making for both the NPS and FWC, in consultation with the USFWS; that allows NPS to collaborate and cooperate on the rule-making process and to take action independently; and that clearly outlines a science-based process for determining hunting management rules. This alternative allows access for hunting opportunities within the entire Preserve and allows the NPS to manage opportunities for a positive visitor use experience for both hunters and nonhunters.

ENVIRONMENTALLY PREFERABLE ALTERNATIVE

In accordance with U.S. Department of the Interior regulations, the NPS is required to identify the “environmentally preferable alternative” in all environmental documents, including an EA. According to U.S. Department of the Interior regulations implementing the National Environmental Policy Act (NEPA) (43 CFR 46.30), the environmentally preferable alternative is the alternative “that 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 [NPS] of long-term environmental impacts against short-term impacts in evaluating what is the best protection of these resources.” Based on the analysis of potential impacts included in the attached *Hunting Management Plan/EA*, the environmentally preferable alternative for the *Hunting Management Plan* is alternative 3 (the selected alternative).

The Preserve is a unit of the national park system, and as the administrator of the Preserve the NPS will continue to fulfill its obligation to protect the area for future generations under any of the alternatives. All of the alternatives would preserve historic and cultural resources in the Preserve, and none of the alternatives would have any adverse impacts on historic or cultural resources in the Preserve. Additionally, none of the alternatives involve the use of any depletable resources, and all of the alternatives would have some impacts on natural renewable resources (e.g., wildlife) in the Preserve.

The white-tailed deer is the most important game species in the Preserve. In addition to being a popular large game animal, white-tailed deer are the endangered Florida panthers’ most consistent prey item (Land 1993, USFWS 2008). Under the selected alternative, the adaptive management strategy will allow the NPS and FWC, in consultation with the USFWS, to use monitoring data for the white-tailed deer, Florida panther, and environmental conditions (e.g., water level data) to make science-based decisions about hunting management to best balance the needs of the endangered Florida panther with the desire for recreational hunters to harvest deer in the Preserve.

This adaptive management framework makes the selected alternative the best long-term alternative to managing hunting in the Preserve over the next 15 to 20 years. For further information on how the environmentally preferable alternative was determined, please reference table 2-3 (Environmental Consequences Summary) in the attached EA, which presents a summary comparison of the effects of the alternatives, based on the evaluations of the impact topics in “Chapter 4: Environmental Consequences” of the attached EA.

WHY THE SELECTED ALTERNATIVE WILL NOT HAVE A SIGNIFICANT IMPACT ON THE HUMAN ENVIRONMENT

As defined in 40 CFR Section 1508.27, significance is determined by examining the following criteria:

1. *Impacts that may have both beneficial and adverse aspects and which on balance may be beneficial, but that may still have significant adverse impacts which require analysis in an Environmental Impact Statement.*

Whether taken individually or as a whole, impacts of the selected alternative as described in the attached EA do not reach the level of significance that would require analysis in an environmental impact statement.

- Impacts on native vegetation communities and protected plant species and from nonnative invasive plant species from the selected alternative will be long-term, negligible, and adverse throughout the Preserve.
- No impacts will occur to the West Indian manatee, and long-term, minor, adverse impacts to eight federally listed wildlife species (Florida bonneted bat, Cape Sable seaside sparrow, Everglade snail kite, red-cockaded woodpecker, wood stork, American crocodile, eastern indigo snake, and American alligator) will result throughout the Preserve from the selection of the selected alternative. Impacts on the Florida panther from the selected alternative will be long-term, negligible to minor, and adverse throughout the Preserve.
- Impacts to game species and their habitat, except the white-tailed deer, from the selected alternative will be long-term, minor, and adverse within the original Preserve and long-term, minor to moderate, and adverse in the Addition. Impacts to the white-tailed deer and their habitat from the selected alternative will be long-term, moderate, and beneficial throughout the Preserve.
- Impacts to native wildlife populations from nonnative invasive wildlife species from the selected alternative will be long-term, negligible, and adverse throughout the Preserve.
- Impacts on wilderness character from the selected alternative will be long-term, negligible to minor, and adverse within the 47,067 acres of proposed wilderness and those lands eligible for wilderness designation [as determined by the Addition GMP (NPS 2010a)].
- Impacts on Preserve management and operations from the selected alternative will be long-term, minor to moderate, and adverse.
- Impacts on visitor use and experience and recreational opportunities throughout the Preserve from the selected alternative will be long-term, moderate, seasonal, and beneficial for hunters and long-term, minor, seasonal, and adverse for nonhunters.
- Impacts to the Preserve soundscape from the selected alternative will be long-term, minor, and adverse.
- Impacts on public health and safety from the selected alternative will be long-term, negligible, and adverse.
- Impacts on the socioeconomic environment of the Preserve, Collier County, and the south Florida region from the selected alternative will be long-term, negligible to minor, and beneficial.

2. *The degree to which public health and safety are affected.*

Based on the information shown in figure 3-9 of the attached EA, participating in hunting is less likely to result in injury (two recorded injuries per 100,000 participants annually) than other recreational activities in which visitors would normally participate in the Preserve, such as fishing (180 recorded injuries per 100,000 participants annually) and bicycle riding (1,349 recorded injuries per 100,000 participants annually). These statistics show that continuing to allow hunting in the original Preserve and opening hunting in the Addition will only cause a negligible but long-term adverse impact to public health and safety for both hunters and nonhunting visitors.

This negligible risk could be further minimized for both hunters and nonhunting visitors to the Preserve. Risk of Class A injury (hunting related shooting injuries or fatalities) to those visitors not participating in hunting activities could be eliminated by visiting the Preserve during times of the year out of hunting season. Risk of a Class A injury to those participating in hunting could be further minimized by hunter education and proper adherence to the hunter orange requirement. A study conducted by the Centers for Disease Control and published in the *Morbidity and Mortality Weekly Report* (1996) analyzed 343 two-party hunting firearm (Class A) injuries in reference to whether the parties involved were wearing hunter orange. The study reported that in 76% of the incidents the injured hunter was not wearing hunter orange, clearly showing an increased safety risk when hunter orange is not worn. Risk of a Class B injury (nonshooting hunting related injuries or fatalities) to hunters could be substantially reduced by use of a fall arrest system or full body harness, as currently recommended by the FWC.

Therefore, a negligible, but long-term, adverse impact to public health and safety will result throughout the Preserve from the selected alternative. Generally, based on the data presented in chapter 3 of the attached EA and discussed above, public health and safety will be unaffected by implementation of the selected alternative.

3. *Any unique characteristics of the area (proximity to historic or cultural resources, wild and scenic rivers, ecologically critical areas, wetlands or floodplains, and so forth).*

No historic, cultural, or ethnographic resources will be impacted by the selected alternative. Regarding traditional uses in the Preserve by traditionally associated peoples, the enabling legislation (PL 93-440, as amended by PL 100-301) states:

... members of the Miccosukee Tribe of Indians of Florida and members of the Seminole Tribe of Florida shall be permitted, subject to reasonable regulations established by the Secretary, to continue their usual and customary use and occupancy of Federal or federally acquired lands and waters within the Preserve and the Addition, including hunting, fishing, and trapping on a subsistence basis and traditional tribal ceremonies.

The scope of the *Hunting Management Plan* is limited to recreational hunting activities, and traditional uses in the Preserve by traditionally associated peoples are not addressed as part of the plan. The *Hunting Management Plan* will not have any impacts on such customary use and occupancy, and hunting, fishing, and trapping on a subsistence basis by traditionally associated peoples will continue to be permitted, subject to existing laws and regulations.

No direct or indirect, short- or long-term adverse impacts to wilderness character will result within the original Preserve from the selected alternative. Long-term, negligible, adverse impacts to the 47,067 acres of proposed wilderness and those lands eligible for wilderness designation [as determined by the Addition GMP (NPS 2010a)] in the Addition will result from the selected alternative.

The impacts from hunter take of game species will be minimized by through the adaptive management process described in chapter 2 of the attached EA. Through the reduction of impacts from hunter take of game species (refer to the section “Wildlife – Major Game Species” in chapter 4 of the attached EA for a discussion of impacts), the wilderness character of the area will be better preserved under the selected alternative than the other alternatives considered. No other unique characteristics were identified in the Preserve that will be affected by the selected alternative.

4. *The degree to which impacts are likely to be highly controversial.*

43 CFR 46.30, Implementation of the National Environmental Policy Act of 1969, defines controversy as:

... circumstances where a substantial dispute exists as to the environmental consequences of the proposed action and does not refer to the existence of opposition to a proposed action, the effect of which is relatively undisputed.

During the public involvement process for the proposed action, some individuals and organizations commenting on the *Hunting Management Plan/EA* expressed opposition to the preferred alternative identified in the attached EA¹ and provided comments with various reasons for the expressed opposition.

However, as demonstrated in the NPS’s responses to each of the concerns (presented in table 1 at the end of this document), the conclusions about the environmental consequences of the proposed action are well-reasoned and fully supported by the analysis provided in the attached EA. These conclusions were drawn through a combination of scientific data and professional judgment from NPS staff, as also documented in the attached EA. These conclusions are also supported by the USFWS and the FWC. Accordingly, the NPS has determined that none of the comments provided during the public involvement process document a “substantial dispute ... as to the environmental consequences of the proposed action...”

5. *The degree to which the potential impacts are highly uncertain or involve unique or unknown risks.*

The NPS recognizes the inherent uncertainty in making ecosystem management decisions. The distinguishing features of adaptive management are its emphasis on sequential decision-making in the face of uncertainty and the opportunity for improved management as learning about system processes accumulates over time. As stated in the *U.S. Department of the Interior Adaptive Management Technical Guide* (Williams et al. 2009):

Making a sequence of good management decisions is more difficult in the presence of uncertainty, an inherent and pervasive feature of managing ecological systems. Uncertainties arise with incomplete control of management actions, errors in measurement and sampling variation, environmental variability, and an incomplete understanding of system dynamics. These uncertainties potentially degrade management performance and contribute to acrimony in the decision making process. Perhaps not surprisingly, managers have sometimes been reluctant to acknowledge uncertainty in environmental assessments and management strategies. Often there is a perception that asserting certainty as to

¹ The preferred alternative identified in the attached EA (alternative 3) is referred to as the selected alternative in this FONSI, since the NPS has chosen to select this alternative for implementation, upon approval of this FONSI by the NPS Regional Director.

management impacts is more convincing, and acknowledging uncertainty increases the likelihood that recommended actions will be ignored. Acknowledgement of uncertain management outcomes is sometimes seen as an invitation for confrontation among different interest groups, resulting in an inability to reach timely agreement on a proposed action. Adaptive management forces stakeholders to confront unresolved uncertainties that can significantly influence management performance. An adaptive approach provides a framework for making good decisions in the face of critical uncertainties, and a formal process for reducing uncertainties so that management performance can be improved over time.

The adaptive management strategy under the selected alternative is designed to address key uncertainties that exist as a result of allowing hunting throughout the entire Preserve. Adaptive management actions will be taken based on effects to the white-tailed deer population (as measured by hunter success rates) and potential conflicts between hunting and nonhunting visitors in the Preserve. Under the selected alternative, adaptive management actions regarding the white-tailed deer population are designed to ensure that there remains enough prey for the Florida panther, and adaptive management actions regarding potential conflicts between hunters and other visitors are designed to ensure satisfactory experiences for all Preserve visitors.

The adaptive management of hunting that will occur under the selected alternative is restricted to actions taken in accordance with the objectives, triggers, and monitoring data relating to hunter success rates for the white-tailed deer population, and potential conflicts between hunting and nonhunting visitors in the Preserve.

The NPS is not proposing to take adaptive management actions related to other resources, such as other wildlife (including other game species), vegetation, or wilderness, because the management of these resources does not involve the same level of uncertainties as management of the white-tailed deer population and visitor use conflicts. Impacts to these other resources as a result of hunting activities are disclosed in the attached EA, but these other resources will be managed in accordance with NPS management policies and other existing management plans, not through this adaptive management process.

6. *Whether the action may establish a precedent for future actions with significant effects or represents a decision in principle about a future consideration.*

Implementation of the proposed action (the selected alternative) will neither establish an NPS precedent for future actions with significant effects, nor will it represent a decision in principle about a future consideration. Under the selected alternative, the NPS and the FWC, in consultation with the USFWS, will cooperate to implement an adaptive management strategy to manage hunting in the Preserve. This alternative is focused on adaptively managing the white-tailed deer population (as measured by hunter success rates) and potential conflicts between hunting and nonhunting visitors in the Preserve.

The use of adaptive management is an established practice in NPS units, as outlined in the U.S. Department of the Interior Adaptive Management Technical Guide (Williams et al. 2009). The proposed action of implementation of an adaptive management strategy does not establish a precedent for use of such a strategy in NPS units that does not already exist. The proposed hunting regulations for year 1 of implementation, adaptive management objectives, baseline management actions, adaptive management triggers, and supplemental management actions developed as part of the proposed action resulted from adaptive management development process due to the purpose, needs, and objectives of this project, which are unique to the Preserve. It is highly unlikely that the same unique needs and on-ground conditions exist in other NPS units or non-NPS properties in the region; therefore, it is highly unlikely that the same proposed actions would result even if the adaptive management process were applied to other

NPS units or non-NPS properties in the region. Therefore, implementation of the proposed action will neither establish an NPS precedent for future actions with significant effects, nor will it represent a decision in principle about a future consideration.

7. *Whether the action is related to other actions that may have individual insignificant impacts but cumulatively significant effects. Significance cannot be avoided by terming an action temporary or breaking it down into small component parts.*

Cumulative impacts were fully analyzed in the attached EA. A full list of the projects and actions considered in the cumulative impact analysis can be found in table 4-3 of the attached EA and potential impacts are discussed under each of the respective impact topics throughout chapter 4 of the attached EA. Based on this analysis, when the likely effects of implementing the selected alternative are added to the effects of other past, present, and reasonably foreseeable future actions, the cumulative impacts range from negligible to moderate and do not rise to the level of significant for any of the impact topics.

8. *The degree to which the action may adversely affect properties in or eligible for listing in the National Register of Historic Places, or other significant scientific, archeological, or cultural resources.*

No historic, cultural, or ethnographic resources will be impacted by the selected alternative. Regarding traditional uses in the Preserve by traditionally associated peoples, the enabling legislation (PL 93-440, as amended by PL 100-301) states:

... members of the Miccosukee Tribe of Indians of Florida and members of the Seminole Tribe of Florida shall be permitted, subject to reasonable regulations established by the Secretary, to continue their usual and customary use and occupancy of Federal or federally acquired lands and waters within the Preserve and the Addition, including hunting, fishing, and trapping on a subsistence basis and traditional tribal ceremonials.

The scope of the *Hunting Management Plan* is limited to recreational hunting activities, and traditional uses in the Preserve by traditionally associated peoples are not addressed as part of the plan. The *Hunting Management Plan* will not have any impacts on such customary use and occupancy, and hunting, fishing, and trapping on a subsistence basis by traditionally associated peoples will continue to be permitted, subject to existing laws and regulations.

The State Historic Preservation Office (SHPO) reviewed the *Draft Hunting Management Plan/EA* for possible impacts to historic properties listed, or eligible for listing, in the National Register of Historic Places, or otherwise of historical, architectural or archaeological value. The review was conducted in accordance with Section 106 of the National Historic Preservation Act of 1966, as amended and 36 CFR Part 800: Protection of Historic Properties. The letter stated:

It is the opinion of this office that the proposed undertaking will have no effect on historic properties if the following conditions are met:

- *All known historic resources should be avoided by potential ground disturbing activities. In addition, any areas that will experience ground disturbance that have not been previously subjected to a cultural resources assessment survey should have such an assessment performed. These activities should be coordinated with the Forest Service archaeologists. The final reports of any such investigations should be forwarded to this office in order to complete the project review process.*

The SHPO also reviewed the *Revised Draft Hunting Management Plan/EA* for possible impacts to historic properties listed, or eligible for listing, in the National Register of Historic Places. The letter stated: “Based on the information provided, it is the opinion of this office that the proposed Alternatives 1-3 described in the Hunting Management Plan will have no effect on historic properties.”

9. *The degree to which the action may adversely affect an endangered or threatened species or its habitat.*

As defined in Table 4-1 of the attached EA, the NPS defines a negligible adverse impact as that which would cause no observable or measurable impacts on a species, their habitats (including designated critical habitat), or the natural processes that sustain them. This impact intensity would equate to a determination of “no effect” under Section 7 of the Endangered Species Act. As defined in Table 4-1 of the attached EA, the NPS defines a minor adverse impact as that which the effects of the action would be discountable (i.e., extremely unlikely to occur and not able to be meaningfully measured detected, or evaluated). Individuals may temporarily avoid areas. Impacts would not affect critical periods (i.e., breeding, nesting, denning, feeding, resting) or habitat. In addition, essential features of critical habitat would not be impacted. This impact intensity would equate to a determination of “may affect, not likely to adversely affect” under Section 7 of the Endangered Species Act.

Based on these definitions, no impacts will occur to the West Indian manatee from the selected alternative, and a determination of “*no effect*” has been made by the NPS. Long-term, minor, adverse impacts to eight federally listed wildlife species (Florida bonneted bat, Cape Sable seaside sparrow, Everglade snail kite, red-cockaded woodpecker, wood stork, American crocodile, eastern indigo snake, and American alligator) will result throughout the Preserve from the selected alternative, and a determination of “*may affect, not likely to adversely affect*” has been made by the NPS. Impacts on the Florida panther from the selected alternative will be long-term, negligible to minor, and adverse throughout the Preserve, and a determination of “*may affect, not likely to adversely affect*” has been made by the NPS.

The NPS initiated consultation with the USFWS under Section 7 of the Endangered Species Act in a memorandum dated March 7, 2012 (see appendix I of the attached EA for the March 7, 2012, memorandum from the NPS to the USFWS). Subsequent to the final rule listing the Florida bonneted bat as endangered, the NPS contacted the USFWS on January 15, 2014, to initiate consultation for this species.

The USFWS issued a memorandum to the NPS for the Hunting Management Plan under Section 7 of the Endangered Species Act on February 10, 2014. The USFWS subsequently issued a revised memorandum to the NPS for the Hunting Management Plan under Section 7 of the Endangered Species Act on April 23, 2014, which stated: “This memorandum supersedes the [USFWS] February 10, 2014, memorandum ...” Therefore, the subsequent discussion refers to the April 23, 2014, USFWS memorandum.

In the April 23, 2014, memorandum the USFWS stated the following, in part (see appendix I of the attached EA for the April 23, 2014, memorandum from the USFWS to the NPS):

... the NPS has determined the implementation of the [Preferred Alternative]² is not likely to adversely affect the [West Indian manatee, wood stork, Everglade snail kite, Cape Sable

² The preferred alternative identified in the USFWS letter (alternative 3) is referred to as the selected alternative in this FONSI, since the NPS has chosen to select this alternative for implementation, upon approval of this FONSI by the NPS Regional Director.

seaside sparrow, red-cockaded woodpecker, American crocodile, and eastern indigo snake]. The [USFWS] concurs and will not consider these species further in this document.

The April 23, 2014, memorandum (see appendix I of the attached EA) further states the following regarding the Florida bonneted bat, in part:

... the NPS has determined the implementation of the Hunting Management Plan is not likely to adversely affect the Florida bonneted bat. The [USFWS] concurs.

The April 23, 2014, memorandum (see appendix I of the attached EA) further states the following regarding the Florida panther, in part:

The goal of the adaptive management framework is to ensure hunting activities do not alter the existing predator/prey relationship in [the Preserve] and, therefore, do not have a measurable effect on the Florida panther. Based on this information, the NPS has determined effects to the Florida panther population would be expected to be minimized with the [Preferred Alternative] and result in long-term, negligible to minor, adverse, regional effects to the Florida panther ... As stated in the Hunting Management Plan, this level of effects equates to a determination that implementation of the [Preferred Alternative] "may affect, but is not likely to adversely affect" the Florida panther. Based on this information, the [USFWS] concurs.

The goal of the adaptive management framework is to ensure hunting activities do not alter the existing predator/prey relationship in [the Preserve] and, therefore, do not have a measurable effect on the Florida panther. As actions that result in harm or harassment of panthers would be measurable, and the analysis indicates these types of effects are not likely to occur, we anticipate harm or harassment of panthers would not occur with implementation of the [Preferred Alternative]. As stated earlier, the potential harassment effects of ORV use have been addressed in prior, formal consultations and, as such, are not included in this consultation. Based on this information, the NPS has determined effects to the Florida panther population would be expected to be minimized with the [Preferred Alternative] and result in long-term, negligible to minor, adverse, regional effects to the Florida panther ... As the NPS stated in the Hunting Management Plan, this level of effects equates to a determination that implementation of the [Preferred Alternative] "may affect, but is not likely to adversely affect" the Florida panther. Based on this information, the [USFWS] concurs.

Additionally, it is important to note that the USFWS did not evaluate the American alligator as part of its Section 7 consultation with the NPS under the Endangered Species Act since this species is only listed due to similarity of appearance with the American crocodile, for which the USFWS concurred with the NPS' finding.

Concluding, the April 23, 2014, memorandum (see appendix I of the attached EA) states the following, in part:

The [USFWS] supports selection of Alternative 3, of the [Preferred Alternative], due to its inclusion of an adaptive management strategy in making decisions regarding hunting activities within [The Preserve]. We believe the [Preferred Alternative] offers the best use of science in decision-making and creates a cooperative atmosphere between NPS, the FWC, and the [USFWS]. Adaptive management focuses on learning and adapting, through partnerships of managers, scientists, and other stakeholders who learn together how to create and maintain sustainable resource systems (Williams et al., 2009). The adaptive management strategy and decision-making framework will ensure the best science is used to formulate decisions regarding hunting in [The Preserve] and the needs of threatened or

endangered species like the Florida panther are adequately considered in those decisions. This letter fulfills the requirements of section 7 of the Act and further action is not required

...

10. *Whether the action threatens a violation of federal, state, or local law or requirements imposed for the protection of the environment.*

The selected alternative will not violate any federal, state, or local environmental protection laws.

Summary

On consideration of the criteria above, the NPS has determined that there are no major adverse or beneficial impacts that will require further analysis in an environmental impact statement.

IMPAIRMENT OF PARK RESOURCES OR VALUES

In addition to reviewing the list of significant criteria, the director of the NPS Southeast Region has determined that implementation of the selected alternative will not constitute an impairment to the Preserve's resources and values. This conclusion is based on a thorough analysis of the environmental impacts described in the project's EA and the professional judgment of the decision-maker guided by the direction in NPS management policies. See the attached Non-Impairment Determination for additional information on the non-impairment determination for this project.

PUBLIC INVOLVEMENT AND AGENCY CONSULTATION

The NPS conducted a total of four public comment periods for this project, including five public meetings. A total of 1,087 pieces of correspondence were received during these public comments periods and a total of 125 members of the public attended the meetings.

Additionally, during each public comment period, the NPS sent letters to the following agencies, providing information about the hunting management plan and the opportunity to comment on the project.

- Florida State Clearinghouse
- USFWS
- Florida SHPO
- Miccosukee Tribe of Indians of Florida
- Seminole Tribe of Florida
- Seminole Nation of Oklahoma

The USFWS and the FWC also participated as partners in developing the *Hunting Management Plan/EA*, participating in several internal meetings, conference calls, and development and internal draft reviews of the document.

The public and agencies were invited to comment on the project in the following ways:

- Participation in the public meetings. Comments could be provided via the following methods at the public meetings:
 - Spoken comments recorded by NPS and contractor staff during the formal comment session
 - Written comments provided at the public meetings
- Submission of comments at any time during the comment period. Comments could be provided via the following methods:
 - The NPS PEPC website
 - E-mail to the Preserve Superintendent or staff
 - Hard copy letter to the Preserve Superintendent or staff

A detailed summary of the public involvement and agency coordination conducted for this project is provided in chapter 5 of the attached EA, including a summary of all of the comments received during each of the public comment periods conducted for this project.

RESPONSES TO SELECTED COMMENTS RECEIVED DURING THE PUBLIC REVIEW OF THE ENVIRONMENTAL ASSESSMENT

All correspondence received during the public involvement process was reviewed, and specific comments within each correspondence were identified. During the review of the comments received, comments were classified as substantive or non-substantive. A substantive comment is defined as one that does one or more of the following (NPS Director's Order 12 Handbook, Section 4.6A):

- Question, with a reasonable basis, the accuracy of information in the EA;
- Question, with a reasonable basis, the adequacy of the environmental analysis;
- Present reasonable alternatives other than those presented in the EA; and/or
- Cause changes or revisions in the proposal.

If a comment met one or more of the above criteria, it was categorized as substantive. As further stated in Director's Order 12, substantive comments "raise, debate, or question a point of fact or policy." Comments in favor of or against the proposed action or alternatives, or comments that only agree or disagree with NPS policy, are not considered substantive.

During the analysis of public comments, all substantive comments were grouped by similar themes, and those groups were assigned a concern statement. Each concern statement could capture one or more comments. All substantive concerns and selected non-substantive concerns (i.e., concerns that were not considered substantive by definition, but recurred throughout multiple correspondences) have been summarized below along with NPS responses (see table 1). The concerns are presented as a paraphrased summary of the original comment(s) received from the public.

**Table 1 – Selected Concerns and NPS Responses on the
Second Revised Draft Hunting Management Plan/EA**

#	Concern	NPS Response
1	The NPS’s methods for collecting deer data and estimating deer populations in the Preserve are inadequate and inaccurate. Therefore, this information cannot be used as a trigger for the adaptive management process.	<p>The current white-tailed deer monitoring conducted by the NPS and the FWC are detailed on pages 37 to 38 of the attached EA. These various forms of monitoring and data collection have been in use at the Preserve since the early 1980s. This provides more than three decades of deer monitoring data upon which the triggers in the adaptive management process are based.</p> <p>As part of the hunting management plan, the NPS also analyzed the current deer monitoring program in the Preserve to determine the best approach to future monitoring in the Preserve. The full results of this analysis are provided in appendix E of the attached EA. Additionally, the NPS and the FWC, in consultation with the USFWS, are committed to continuing to evaluate new technologies and monitoring techniques as part of the deer monitoring program in the Preserve.</p>
2	Panther data should be used as a trigger in the adaptive management process.	As stated on page 48 of the attached EA, "...using panther numbers or distribution to assess the effects of deer hunting activities is not likely to further inform management decisions." Therefore, hunter days and deer harvest were used as the main triggers for deer management in the adaptive management process. See the response to Concern #44 for additional information.
3	The USFWS should not be included in the adaptive management process for alternative 3.	As stated on page 42 of the attached EA, "The cooperative partnership that forms the framework for this alternative was developed based on policies outlined in Section 4.4.2 of the <i>NPS Management Policies</i> ..." The involvement of all three agencies in the adaptive management process will allow the NPS to utilize all of the available monitoring data and scientific expertise of all three agencies to make better decisions regarding hunting management in the Preserve.
4	The NPS/FWC Cooperative Partnership Agreement should be included in alternative 3.	Under alternative 3 (the preferred alternative), the NPS and the FWC, in consultation with the USFWS, will cooperate to implement an adaptive management strategy for hunting management in the Preserve. This new adaptive management strategy consists of a cooperative partnership between the NPS and the FWC, in consultation with the USFWS. The 2010 <i>NPS/FWC Cooperative Partnership Agreement</i> covers many management issues, including hunting, and therefore does not specifically apply to alternative 3 (the selected alternative). However the NPS acknowledges that the agreement remains valid and relevant and the NPS and FWC will continue to collaborate, consult, and cooperate with each other to support and defend mutually agreed upon rules, regulations, and policies relating to the Preserve and the Addition.
5	The statement that "The Addition has never been open to public hunting either before or after its acquisition" is not accurate.	This statement has been revised in the Final EA to state: "The Addition has never been open to public hunting since its acquisition by the NPS; however, hunting occurred on private lands in the Addition prior to the acquisition of the lands by the NPS."
6	Hunting regulations in the Preserve should be managed by FWC.	The Preserve is a unit of the national park system; therefore, the NPS is responsible for all management decisions in the Preserve. The selected alternative allows the NPS to cooperate with the FWC, in consultation with the USFWS, to implement an adaptive management strategy in the Preserve. Available monitoring data and scientific expertise from all three agencies will be used to make decisions regarding hunting management in the Preserve. For additional information, also refer to the response to Concern #40.
7	Additional/different hunting regulations should be included in alternative 3.	All of the proposed hunting regulations for year 1 of implementation of the selected alternative are included in the attached EA. Under the selected alternative, the NPS and the FWC, in consultation with the USFWS, will cooperate to implement an adaptive management strategy for hunting management in the Preserve. Decisions regarding future changes to hunting regulations will be made through the adaptive management process, based on monitoring data and triggers, as discussed in the Final EA.

Table 1 – Selected Concerns and NPS Responses on the Second Revised Draft Hunting Management Plan/EA

#	Concern	NPS Response
8	A doe harvest should be instituted in the Preserve.	As stated on page 45 of the attached EA, "Deer in the Preserve typically occur at lower densities than other parts of Florida, and they are the primary food source for the Florida panther. As such, much consideration has been given to harvest management options for deer within the Preserve. Wildlife managers and published research agree that a conservative, well-regulated hunting strategy should not significantly reduce deer abundance in the Preserve (Downing et al. 1986). Specifically, a buck-only harvest regime has a low risk of negatively affecting the reproductive potential of a deer population (Downing et al. 1986). Deer are polygamous, and a single buck can breed many does. The polygamous nature of deer allows the species to lose a large proportion of the male component, without significant impact to its biotic potential (Mech 1984). Further, the hunting season occurs after the area's breeding season, meaning that most does are bred prior to the onset of the hunting season. Deer population models developed for the Preserve by Labisky et al. (1995) indicated that a high or low harvest of the buck population had little impact on the ability of the deer population to sustain itself. For that reason, buck-only harvest has been in place for many years on the Preserve and is the harvest regime being recommended under [the selected alternative]."
9	Hunting of invasive species such as pythons should be permitted in the Preserve.	In 2009, FWC EO 09-08 was approved, which created the Partner with Hunters program to assist in the control of reptiles of concern, particularly the Burmese python, within the Preserve/Wildlife Management Area. The Partner with Hunters Program allows hunters to take reptiles of concern within the Preserve, in accordance with regulations outlined in the EO. Currently undergoing improvement and enhancement, this program allows licensed hunters to take pythons using methods authorized for game that may be taken during the respective season(s).
10	Small game species are an important part of the Florida panther's diet and should be considered in the hunting management plan and as triggers in the adaptive management process.	As stated on page 48 of the attached EA, "It is important to note why hunter days and deer harvest would be used as triggers for supplemental management actions and why panther population numbers and population numbers for other small game species would not typically be used as triggers. ... other small game species were determined not to be appropriate for use as adaptive management triggers because they are not shown to be primary prey items for the Florida panther (Maehr et al. 1990, Dalrymple and Bass 1996) and the hunter pressure on these species has been shown to be very low in recent years in the Preserve (Bartareau 2012). For example, the total harvest of all small game species combined in the Preserve averaged 198 per year over the past five annual hunting seasons, while the total turkey harvest (checked and estimated) of the Preserve averaged 35 animals per year over the past five annual hunting seasons (Bartareau 2012)."
11	The studies cited in the EA do not include any nighttime research/data, which skews the data set since panthers are typically nocturnal.	As stated on page 48 of the attached EA, "...using panther numbers or distribution to assess the effects of deer hunting activities is not likely to further inform management decisions." Therefore, hunter days and deer harvest were used as the main triggers for deer management in the adaptive management process. See the response to Concern #44 for additional information. Additionally, pages 38 to 39 of the attached EA detail the Florida panther monitoring efforts in the Preserve. This monitoring effort includes radio-collar tracking of panthers in the Preserve, which could be obtained during any time of the day.
12	Impacts and access related to off-road vehicle use should be addressed as part of the hunting management plan. The impact analysis should be based on scientific data.	As stated on page 141 of the attached EA, "This <i>Hunting Management Plan</i> does not provide guidance for managing ORV use in the Preserve for hunting. Rather, management of ORVs in the original Preserve is guided by the <i>General Management Plan/Environmental Impact Statement</i> (NPS 1991a) and <i>Final Recreational Off-Road Vehicle Management Plan Supplemental Environmental Impact Statement</i> (NPS 2000d). Management of ORVs in the Addition is guided by the <i>Addition GMP</i> (NPS 2010a). These planning/compliance efforts considered the impacts from ORV use, including use associated with hunting, for Preserve resources and values, including, but not limited to: water flows, water quality, soils, vegetation, wetlands, wildlife and wildlife habitat (including game species), species of special concern (including endangered and threatened species), cultural resources, visitor use and experience (including hunting), wilderness, and socioeconomics. These plans and accompanying NEPA documents, discussed in further detail in the "Cumulative Impacts Analysis" section, should be referenced for a detailed analysis of these effects. Cumulative impacts from ORV use in the Preserve have been addressed in chapter 4 of the attached EA under each of the respective impact topics.
13	There should be no wilderness designation in the Preserve.	No designation of wilderness is proposed as part of the hunting management plan. Pages 98 to 99 of the attached EA outline the existing and proposed designated wilderness areas in the Preserve. Potential impacts to these resources from the selected alternative are detailed on pages 170 to 171 of the attached EA.

Table 1 – Selected Concerns and NPS Responses on the Second Revised Draft Hunting Management Plan/EA

#	Concern	NPS Response
14	Public lands surrounding the Preserve that are managed as wilderness, but not designated as such, should be included in the wilderness discussion and analysis in the EA.	All federally designated existing and proposed wilderness areas in the region of the Preserve are included in the attached EA, as discussed on pages 98 to 99.
15	Management of the Addition should be combined with the original Preserve.	All of the alternatives considered in the EA (including the selected alternative) apply to all areas of the Preserve, including the Addition. Under the selected alternative, the NPS and the FWC, in consultation with the USFWS, will cooperate to implement an adaptive management strategy to manage hunting in the entire Preserve, including the Addition.
16	The NPS, the FWC, and the USFWS should all have a meaningful role in the process of hunting management in the Preserve. However, the NPS is ultimately responsible for hunting management decisions in the Preserve.	The NPS fully recognizes its role in administering the Big Cypress National Preserve. As stated on page 57 of the attached EA, "Big Cypress National Preserve is a unit of the national park system, and as the administrator of the Preserve the NPS would continue to fulfill its obligation to protect the area for future generations under any of the alternatives." However, the NPS recognizes that by partnering with the USFWS and the FWC, it is able to improve the decision-making process regarding hunting management in the Preserve, in turn leading to better management decisions and improved resource protection. Such cooperative management relationships are discussed and encouraged throughout the NPS Management Policies, as stated on pages 42 to 43 of the attached EA. While the NPS fully accepts its role as the primary decision-maker for the actions that take place in the Preserve, the NPS believes that this partnership in the adaptive management process is entirely appropriate, in compliance with the applicable laws and regulations, and beneficial to the resources it is charged with protecting.
17	If hunting is to be initiated in the Addition, it should begin under a very conservative plan due to the lack of information about the deer population and panther population in the area.	As stated on page 45 of the attached EA, "Deer in the Preserve typically occur at lower densities than other parts of Florida, and they are the primary food source for the Florida panther. As such, much consideration has been given to harvest management options for deer within the Preserve. Wildlife managers and published research agree that a conservative, well-regulated hunting strategy should not significantly reduce deer abundance in the Preserve (Downing et al. 1986)." As discussed in detail on page 47 of the attached EA, "The proposed hunting format is conservative and appropriate for deer populations at low densities and consistent with panther population objectives."
18	Maintaining a suitable prey base for the panther and preventing disturbance of the population is a top priority.	All potential impacts to the Florida panther and its prey base have been considered and are detailed in the impact analysis provided in chapter 4 of the attached EA. As discussed in detail on page 47 of the attached EA, "The proposed hunting format is conservative and appropriate for deer populations at low densities and consistent with panther population objectives."
19	In both alternatives 1 and 3, hunting is predicted to have long term, negligible to minor impacts on listed species and habitat. In an effort to reduce these impacts, all use of lead based ammunition should be prohibited in the Preserve.	As stated on pages 147 and 158 of the attached EA, "Under current hunting regulations, lead-based ammunition is prohibited for duck, geese, and coot hunting. In March 2009, the NPS began to research ways to reduce its own use of lead-based ammunition in units of the national park system. In addition, the NPS is currently cooperating with the Association of Fish and Wildlife Agencies in efforts to bring hunters, anglers, and various interests together to determine the need for and nature of any needed management approaches to use of lead ammunition and lead fishing tackle. The Preserve would comply with any future changes in NPS policy regarding the use of lead-based ammunition for hunting in the Preserve, further reducing the potential for impacts."
20	Dinner Island Wildlife Management Area should be shown on the location map	The Dinner Island Wildlife Management Area is located outside of the Preserve. Therefore, it was not included on the location map.

Table 1 – Selected Concerns and NPS Responses on the Second Revised Draft Hunting Management Plan/EA

#	Concern	NPS Response
21	The statement that “Direct impacts to the Florida Panther could occur from misidentification of target by hunters” is not accurate. An ethical, knowledgeable hunter would not “misidentify” a Florida Panther.	Page 147 of the attached EA states that this potential impact is “very rare.” However, the potential still exists for such an occurrence; therefore, this was included in consideration of the impacts analysis in the EA.
22	Additional fire management and prescribed burning should be conducted in the Preserve.	Conducting prescribed burning activities, unless they specifically pertain to hunting management, are beyond the scope of the hunting management plan. These actions would be guided by the <i>Big Cypress National Preserve Fire Management Plan</i> (NPS 2010d).
23	The NPS should continue to closely monitor the deer population in the Preserve for the potential spread of Chronic Wasting Disease into the area.	Per recent data from the FWC, Chronic Wasting Disease is not currently known to be present in any deer populations in the state of Florida. The NPS would continue to review all available data from the NPS, the FWC, and the USFWS regarding the deer population in the Preserve through the adaptive management process, including any information on the spread of diseases in the deer population in the Preserve.
24	The EA mischaracterizes the Preserve’s enabling legislation (as the Preserve’s enabling legislation does not mandate hunting in the Addition lands) and misapplies NPS regulations to avoid the need to make required findings before permitting hunting.	As stated on page 11 of the attached EA, 36 C.F.R. § 2.2(b) states: “(b) Hunting and trapping. (1) Hunting shall be allowed in park areas where such activity is specifically mandated by Federal statutory law. (2) Hunting may be allowed in park areas where such activity is specifically authorized as a discretionary activity under Federal statutory law if the superintendent determines that such activity is consistent with public safety and enjoyment, and sound resource management principles. Such hunting shall be allowed pursuant to special regulations.” The NPS prepared the attached EA in compliance with 36 C.F.R. § 2.2(b)(1). The enabling legislation is the authority for public hunting in the Preserve. As stated on page 8 of the attached EA, the enabling legislation dictates that “The Secretary shall permit hunting, fishing, and trapping on lands and water under his jurisdiction within the Preserve and the Addition in accordance with the applicable laws of the United States and the State of Florida...” As further stated on page 8 of the attached EA, the enabling legislation does permit the Secretary to “designate zones where and periods when no hunting, fishing, trapping, or entry may be permitted for reasons of public safety, administration, floral and faunal protection and management, or public use and enjoyment.” Such an action was taken when the Stairsteps unit was closed to deer hunting due to the decline of the deer population presumably due to hydrologic conditions, as discussed on pages 94 to 95 of the attached EA. However, such actions are undertaken for specific reasons of “public safety, administration, floral and faunal protection and management, or public use and enjoyment.” In the case of the Addition, the NPS has not identified any unique characteristics of the area that would warrant closure due to any of the specific reasons in the enabling legislation. The affirmative language found in the enabling legislation dictates that hunting is mandatory and not discretionary. Thus, the attached EA is in full compliance with the requirements of 36 C.F.R. § 2.2(b) for park units in which hunting is mandatory. The NPS has taken the affirmative steps necessary to permit hunting in the Addition, as dictated in the enabling legislation, by preparing the attached EA. The NPS will take additional affirmative steps by submitting recommendations for hunting in the original Preserve and the Addition in a request to the FWC to promulgate hunting regulations for the Preserve.

Table 1 – Selected Concerns and NPS Responses on the Second Revised Draft Hunting Management Plan/EA

#	Concern	NPS Response
25	Alternative 3 (the selected alternative) relies on an adaptive management plan that focuses on only one aspect of proposed impacts.	<p>The adaptive management strategy under the selected alternative is designed to address key uncertainties that exist as a result of allowing hunting throughout the entire Preserve. Adaptive management actions will be taken based on effects to the white-tailed deer population (as measured by hunter success rates) and potential conflicts between hunting and nonhunting visitors in the Preserve. Under the selected alternative, adaptive management actions regarding the white-tailed deer population are designed to ensure that there remains enough prey for the Florida panther, and adaptive management actions regarding potential conflicts between hunters and other visitors are designed to ensure satisfactory experiences for all Preserve visitors.</p> <p>The adaptive management of hunting that will occur under the selected alternative is restricted to actions taken in accordance with the objectives, triggers, and monitoring data relating to hunter success rates for the white-tailed deer population, and potential conflicts between hunting and nonhunting visitors in the Preserve.</p> <p>The NPS is not proposing to take adaptive management actions related to other resources, such as other wildlife (including other game species), vegetation, or wilderness, because the management of these resources does not involve the same level of uncertainties as management of the white-tailed deer population and visitor use conflicts. Impacts to these other resources as a result of hunting activities are disclosed in the attached EA, but these other resources will be managed in accordance with NPS management policies and other existing management plans, not through this adaptive management process.</p>
26	Alternative 3 (the selected alternative) uses as a trigger for further action the ratio of deer killed per hunter per day. There is a lack of explanation of and/or support for how this trigger would achieve the objective of sustaining the prey base for the Florida panther.	As stated on page 45 of the attached EA, "Deer in the Preserve typically occur at lower densities than other parts of Florida, and they are the primary food source for the Florida panther. As such, much consideration has been given to harvest management options for deer within the Preserve. Wildlife managers and published research agree that a conservative, well-regulated hunting strategy should not significantly reduce deer abundance in the Preserve (Downing et al. 1986)." As discussed in the response to Concern #2, hunter days and deer harvest trends were determined to be appropriate triggers for measuring the effect of hunting on the panther population and specifically, the main prey base for the Florida panther. As discussed in detail on page 47 of the attached EA, "The proposed hunting format is conservative and appropriate for deer populations at low densities and consistent with panther population objectives."
27	Alternative 3 (the selected alternative) does not provide specific criteria necessary to fully analyze impacts. It only provides a "plan to make a plan."	Pages 42 to 51 of the attached EA have been revised to provide specific details about the proposed adaptive management strategy. Details of the proposed public involvement process, objectives, baseline management actions, monitoring, triggers, supplemental management actions, and proposed hunting regulations are provided. For example, regarding hunting regulations, specific proposed quotas are detailed on page 44 of the attached EA. This specific information was used to analyze potential impacts, as provided in the analysis in chapter 4 of the attached EA.
28	A mitigation plan is needed for the EA.	According to the guidance in the Council on Environmental Quality memorandum titled "Appropriate Use of Mitigation and Monitoring and Clarifying the Appropriate Use of Mitigated Findings of No Significant Impact" (dated January 14, 2011), "When preparing an EA, many agencies develop and consider committing to mitigation measures to avoid, minimize, rectify, reduce, or compensate for potentially significant adverse environmental impacts that would otherwise require full review in an Environmental Impact Statement. Council on Environmental Quality recognizes the appropriateness, value, and efficacy of providing for mitigation to reduce the significance of environmental impacts. Consequently, when such mitigation measures are available and an agency commits to perform or ensure the performance of them, then these mitigation commitments can be used to support a Finding of No Significant Impact, allowing the agency to conclude the NEP A process and proceed with its action without preparing an Environmental Impact Statement." As stated on page 133 of the attached EA, "... no significant environmental impacts were identified from the alternatives analyzed in this plan that would require mitigation measures to be taken ..." The Finding of No Significant Impact for this project is based on the unmitigated level of impacts determined in the analysis conducted for the EA, which were not determined to rise to the level of significant and which do not warrant preparation of a formal mitigation plan.

Table 1 – Selected Concerns and NPS Responses on the Second Revised Draft Hunting Management Plan/EA

#	Concern	NPS Response
29	Alternative 3 (the selected alternative) relies heavily on future monitoring and enforcement, but the NPS lacks the staff and funding to do so.	As stated on page 38 of the attached EA, "As part of this hunting management plan, the NPS analyzed the current deer monitoring program in the Preserve to determine the best approach to future monitoring in the Preserve... The full results of this analysis are provided in appendix E. Additionally, the NPS and the FWC, in consultation with the USFWS, are committed to continuing to evaluate new technologies and monitoring techniques as part of the deer monitoring program in the Preserve, regardless of which alternative is selected for implementation." Additionally, as stated on page 53 of the attached EA, "Existing funding and staffing resources from the NPS and other agencies (FWC and USFWS) would be used with all of the alternatives to accomplish the required enforcement and research and monitoring activities."
30	An Environmental Impact Statement should be prepared for the hunting management plan.	No significant environmental impacts were identified in the EA that would require preparation of an Environmental Impact Statement.
31	A Biological Opinion should be prepared by the USFWS for the hunting management plan.	The USFWS had the option of preparing a Biological Opinion for this action being undertaken by the NPS. The concurrence letter issued by the USFWS under Section 7 of the Endangered Species Act is included in appendix I of the attached EA.
32	The purpose of the Preserve is misstated in the EA.	The purpose statement for Big Cypress National Preserve can be found on page 9 of the attached EA under the heading "Purpose Statements." As correctly stated on page 9 of the attached EA: "The purpose of Big Cypress National Preserve, as stated in the enabling legislation, ... is to assure the preservation, conservation, and protection of the natural, scenic, hydrologic, floral and faunal, and recreational values of the Big Cypress Watershed in the State of Florida and to provide for the enhancement and public enjoyment thereof."
33	Section 1.4.3 of the Management Policies, providing NPS's official interpretation of the Organic Act, should be included in the EA in its entirety. The Second Revised EA paraphrases part of Section 1.4.3 but omits the interpretation of the Organic Act that states that whenever there is a conflict between providing recreational uses and conservation of natural resources, conservation is to be predominant.	The full text of Section 1.4.3 of the NPS Management Policies has been added to the Final EA. However, the NPS has not identified a conflict between providing recreational uses and conservation of natural resources. The EA fully analyzes the impacts of allowing hunting in the Preserve under alternative 3 (the selected alternative) and comes to the conclusion that no significant impacts would occur to resources in the Preserve. Therefore, allowance of hunting in the Preserve can occur as an approved recreational activity without conflict to conservation of the natural resources in the Preserve.
34	Any adaptive management plan must consider all impacts of the hunting management plan on the Preserve's resources and values, including impacts from ORV use.	All impacts of the hunting management plan have been evaluated in the attached EA for all of the proposed alternatives. The impact topics assessed in the EA include: vegetation and habitat (native vegetative communities and habitat, protected plant species, and nonnative invasive plant species); wildlife (protected wildlife species, major game species, and nonnative/invasive wildlife species); wilderness; Preserve management and operations; visitor use and experience/recreational opportunities; noise/soundscapes; public health and safety; and socioeconomics. See the response to Concern #12 for additional information regarding impacts from ORV use in the Preserve.
35	The proposed adaptive management plan fails to comply with NEPA and lacks the specificity required to withstand judicial scrutiny.	The EA was developed in full consideration of and fully complies with the National Environmental Policy Act and all Council on Environmental Quality implementing regulations.

Table 1 – Selected Concerns and NPS Responses on the Second Revised Draft Hunting Management Plan/EA

#	Concern	NPS Response
36	The “Baseline Management Actions” are indefinite and must be developed further.	The details of the adaptive management process were fully developed as part of the <i>Hunting Management Plan</i> . The adaptive management strategy to be implemented under the selected alternative outlines a specific iterative adaptive management cycle of objectives, baseline management actions, monitoring, triggers, supplemental management actions, and additional monitoring (refer to the description of alternative 3 in chapter 2 of the attached EA for specific details of the adaptive management process).
37	Supplemental management actions to be taken when the adaptive management trigger thresholds are met are not specific enough.	The list of supplemental management actions on pages 48 to 49 of the attached EA provides specific actions that would be taken for each of the adaptive management triggers outlined in the attached EA. If any of the adaptive management triggers are documented by the monitoring data, then appropriate and necessary supplemental management actions would be implemented as part of the adaptive framework. Recommendations for action would be proposed by professional staff from the NPS and the FWC, in consultation with the USFWS.
38	<p>The EA does not comply with the commitments that the NPS made in the Addition GMP, including the following commitments:</p> <ul style="list-style-type: none"> - The NPS would consult with USFWS to determine appropriate game harvest levels “by evaluating species population status and trends, hunter densities, and the impacts on the Florida panther.” - The NPS would “include an assessment of the effects of hunting activities on special status species such as the Florida panther. This would include both the effects of human presence (i.e., hunters dispersed throughout the Addition) and the effects of white-tailed deer management on the panther’s primary food source.” 	The NPS has fully complied with the commitments regarding development of a hunting management plan, as made in the Addition GMP. The NPS has consulted with the USFWS since the beginning of the planning process for development of the hunting management plan, and the USFWS has been an active partner in the development of the plan. Further, all potential impacts to the Florida panther and its prey base have been considered in the EA. As discussed in detail on page 47 of the attached EA, “The proposed hunting format is conservative and appropriate for deer populations at low densities and consistent with panther population objectives.”

Table 1 – Selected Concerns and NPS Responses on the Second Revised Draft Hunting Management Plan/EA

#	Concern	NPS Response
39	The EA does not meet the requirement that NPS make an impairment determination before hunting is allowed in any part of the Preserve, and a later determination would deprive the public of the opportunity to comment.	<p>Section 1.4.7 of <i>NPS Management Policies</i> (2006) states: "In making a determination of whether there would be an impairment, an NPS decision-maker must use his or her professional judgment. This means that the decision-maker must consider any environmental assessments or environmental impact statements required by the National Environmental Policy Act of 1969 (NEPA); consultations required under Section 106 of the National Historic Preservation Act; relevant scientific and scholarly studies; advice or insights offered by subject matter experts and others who have relevant knowledge or experience; and the results of civic engagement and public involvement activities relating to the decision." <i>NPS Management Policies</i> (2006) further defines "professional judgment" as "a decision or opinion that is shaped by study and analysis and full consideration of all the relevant facts, and that takes into account the decision-maker's education, training, and experience; advice or insights offered by subject matter experts and others who have relevant knowledge and experience; good science and scholarship; and, whenever appropriate, the results of civic engagement and public involvement activities relative to the decision."</p> <p>The attached Non-Impairment Determination provides information on the non-impairment determination for this project. This Finding of No Significant Impact and attached Non-Impairment Determination will be signed by the director of the NPS Southeast Region, approving the selected alternative, prior to implementation of the selected alternative and allowance of hunting in the Addition.</p>
40	NPS cannot legally abandon or delegate its primary role in making final decisions about hunting in the Preserve.	<p>The NPS fully recognizes its role in administering the Big Cypress National Preserve. As stated on page 57 of the attached EA, "Big Cypress National Preserve is a unit of the national park system, and as the administrator of the Preserve the NPS would continue to fulfill its obligation to protect the area for future generations under any of the alternatives." However, the NPS recognizes that by partnering with the USFWS and the FWC, it is able to improve the decision-making process regarding hunting management in the Preserve, in turn leading to better management decisions and improved resource protection. Such cooperative management relationships are discussed and encouraged throughout the <i>NPS Management Policies</i>, as stated on pages 42 to 43 of the attached EA. While the NPS fully accepts its role as the primary decision-maker for the actions that take place in the Preserve, the NPS believes that this partnership in the adaptive management process is entirely appropriate, in compliance with the applicable laws and regulations, and beneficial to the resources it is charged with protecting.</p>
41	NPS's hunting quota for deer in the Addition is not based on any available data indicating that this quota will allow for sustainable management of deer, consistent with panther management.	<p>As stated on page 45 of the attached EA, "Deer in the Preserve typically occur at lower densities than other parts of Florida, and they are the primary food source for the Florida panther. As such, much consideration has been given to harvest management options for deer within the Preserve. Wildlife managers and published research agree that a conservative, well-regulated hunting strategy should not significantly reduce deer abundance in the Preserve (Downing et al. 1986)." As discussed in detail on page 47 of the attached EA, "The proposed hunting format is conservative and appropriate for deer populations at low densities and consistent with panther population objectives."</p> <p>As stated in the footnote on page 46 of the attached EA, the "maximum quota limit was calculated based on the current quota limit in the Bear Island Unit of one quota permit per 194 acres. For the Northeast Addition and the Western Addition, the potential maximum quota permit density (hunter density) was determined by extrapolating the available NPS and FWC data for areas in the Preserve that are most similar in habitat types to areas in the Addition, based on the habitat map presented in chapter 3 ("Existing Conditions") and the habitat comparison analysis in appendix G."</p> <p>It is important to note that these proposed quota limits cannot be equated to hunter success rates, as the hunter success rates are only a small percentage of the quota limits. For the years between 2008 and 2012, the five-year average hunter success rate was 1.7%, with a range between 0.9% and 2.0%. For the previous five years, between 2003 and 2007, the hunter success rate was similar at 1.1%. Therefore, the actual hunter take could be estimated to be between 7 and 15 deer per season for the Addition (using the recent five-year range of 0.9% to 2.0% hunter success rates).</p>

Table 1 – Selected Concerns and NPS Responses on the Second Revised Draft Hunting Management Plan/EA

#	Concern	NPS Response
42	The Revised Plan/EA violates NEPA by skewing the no action alternative, and thus the environmental baseline upon which all other alternatives are compared.	As stated on page 39 of the attached EA, "U.S. Department of the Interior regulations define a no action alternative as that which would result in 'no change from current management direction.' The original Preserve GMP (completed in 1991) and the Addition GMP (completed in 2010) form the basis for management actions taken by the NPS in the original Preserve and in the Addition, respectively. These two GMP documents dictate that hunting would be permitted throughout the entire Preserve. Therefore, the no action alternative for this EA was defined as continuation of the current management direction provided by the two GMP documents – hunting would be permitted throughout the Preserve and managed cooperatively by the NPS and FWC using the guidelines outlined in the <i>NPS/FWC Cooperative Partnership Agreement</i> ." Additionally, as stated on page 41 of the attached EA, "For this EA, the no action alternative (continuation of current management direction) would allow hunting throughout the Preserve (including the Addition) and therefore, could potentially cause adverse environmental impacts. Because hunting does not currently take place in the Addition, the no action alternative for this EA does not reflect the true environmental baseline conditions in the Preserve, absent from hunting impacts (refer to the description of alternative 1 for additional details). Therefore, an environmental baseline alternative was added to the range of alternatives that evaluates the environmental consequences of continuing to allow hunting in the original Preserve and prohibiting hunting in the Addition. This allows for a comparison of impacts between prohibition of hunting in the Addition and allowance of hunting in the Addition, in accordance with the conditions outlined in alternatives 1 or 3."
43	An additional public comment period should be provided on the EA once the USFWS issues a Biological Opinion on the action.	The purpose of consultation under Section 7 of the Endangered Species Act is for the USFWS to consider the effects on listed species of the preferred alternative, which was chosen by the NPS after a lengthy NEPA process that included multiple opportunities for public comment. This consultation process does not require a public comment period. Therefore, no additional public comment on the EA is necessary.
44	Regarding impacts to the Florida panther, the relationship between hunting and prey needs to be carefully examined.	This relationship has been carefully examined and conclusions in the attached EA are based on recent scientific studies. As stated on page 48 of the attached EA, "It is important to note why hunter days and deer harvest would be used as triggers for supplemental management actions and why panther population numbers and population numbers for other small game species would not typically be used as triggers. Although the Preserve is in the core of the extant range of the Florida panther, their distribution in this landscape is not static, nor is it contained within any specific management unit or within the Preserve boundaries. As a result, additional variables and stressors may cause changes in panther distribution, use, and occupancy of an area that may be unrelated to any potential effects of hunting activities. Aside from the behavioral change noted by Janis and Clark (2002), there have been no studies that demonstrate a measurable effect of deer hunting on panthers. This is not due to a lack of information on hunting and panthers; rather, it is due to the multitude of stressors that simply cannot be isolated to determine which stressor is the cause of a noted effect. Both Janis and Clark (2002) and Fletcher and McCarthy (2011) surmised that hydrology may play a role in panther movements throughout the hunting season resulting in the noted movement away from trails. Therefore, using panther numbers or distribution to assess the effects of deer hunting activities is not likely to further inform management decisions. Because the panther is the predator in the predator/prey relationship, any measurable response would be delayed as the population responds to changes in the prey population. There is also the potential to have other stressors, such as epizootic events, affect the panther population while leaving the deer population untouched. The panther's preferred prey items are white-tailed deer and feral hogs (Maehr et al. 1990, Dalrymple and Bass 1996). Since recent data has shown that feral hogs are nearly extirpated from the Preserve, factors relating to the deer population were determined to be the best indicator for decision-making regarding supplemental management actions for protection of the Florida panther population. Additionally, other small game species were determined not to be appropriate for use as adaptive management triggers because they are not shown to be primary prey items for the Florida panther (Maehr et al. 1990, Dalrymple and Bass 1996) and the hunter pressure on these species has been shown to be very low in recent years in the Preserve (Bartareau 2012). For example, the total harvest of all small game species combined in the Preserve averaged 198 per year over the past five annual hunting seasons, while the total turkey harvest (checked and estimated) from the Preserve averaged 35 animals per year over the past five annual hunting seasons (Bartareau 2012)."

Table 1 – Selected Concerns and NPS Responses on the Second Revised Draft Hunting Management Plan/EA

#	Concern	NPS Response
45	There is an insufficient number of deer in the Preserve to allow for the introduction of public hunting in the Addition.	As stated on page 45 of the attached EA, "Deer in the Preserve typically occur at lower densities than other parts of Florida, and they are the primary food source for the Florida panther. As such, much consideration has been given to harvest management options for deer within the Preserve. Wildlife managers and published research agree that a conservative, well-regulated hunting strategy should not significantly reduce deer abundance in the Preserve (Downing et al. 1986)."
46	The FWC estimates that feral hogs comprise the largest part of the panther's diet. However, the NPS has not studied the impact of hunting on the feral hog population as a prey item for the panther. Recent field observations of feral hogs in the Preserve include hog tracks, tufts of hair, and hog rooting, which shows evidence of their presence in the Preserve. Therefore, this should be addressed in the EA.	As stated on page 95 of the attached EA, "Feral hogs have historically been second to deer in importance as game animals in the Preserve; however, recent data has shown that feral hogs are likely nearly extirpated from the Preserve." This statement is supported by monitoring data from the NPS and the FWC.
47	Previous hunting management decisions in the Preserve have not been based on scientific data.	In previous years, data used for decision-making has involved check station game health surveys, game harvest numbers, hunter pressure, hunter success rates, endangered species monitoring, deer population dynamics (abundance and health), and characterization of habitat and hydrology. This information has been used to identify management units, establish season length, set quotas, hunting methods, and area closures. Under the selected alternative, the NPS and the FWC, in consultation with the USFWS, are committed to continuing to evaluate new technologies and monitoring techniques as part of the monitoring programs in the Preserve, and cooperating to implement the adaptive management strategy for managing hunting in the Preserve. This strategy allows the NPS to utilize monitoring data and scientific expertise from all three agencies to make hunting management decisions in the Preserve.
48	Data in the supporting documentation used by the NPS for the EA is not properly analyzed.	The data provided by the FWC for deer, small game species, and turkey in the Preserve are fully analyzed in the reports included in appendices D, E, and H of the attached EA. Repetition of this analysis in the attached EA does not yield any additional useful information.

Table 1 – Selected Concerns and NPS Responses on the Second Revised Draft Hunting Management Plan/EA

#	Concern	NPS Response
49	<p>The EA does not adequately address the impact of hunting on nonhunters, who are currently the primary users of the Preserve.</p>	<p>The impacts of the proposed alternatives (including the selected alternative) on visitor use and experience (including nonhunting visitors) are detailed on pages 175 to 180 of the attached EA.</p> <p>One of the objectives of the adaptive management strategy, as discussed in chapter 2 of the attached EA, is “minimization of conflicts between hunting and nonhunting visitors in the Preserve.” With the implementation of the selected alternative, this objective would be achieved through an iterative adaptive management cycle of baseline management actions, monitoring, triggers, supplemental management actions, and additional monitoring (refer to the description of the selected alternative in chapter 2 of the attached for specific details of the adaptive management process).</p> <p>Under the selected alternative, the NPS would undertake the following baseline management actions in relation to visitor use to achieve the adaptive management objectives:</p> <ul style="list-style-type: none"> • Monitor potential conflicts between hunting and nonhunting visitors in the Preserve. <p>The occurrence of the following condition related to visitor use would trigger implementation of additional management actions (in addition to the baseline action listed above):</p> <ul style="list-style-type: none"> • Five documented substantive visitor use complaints or conflicts between hunting and nonhunting visitors to the Preserve per month per management unit, trail system, or visitor facility. <p>If this adaptive management trigger is documented, then appropriate and necessary supplemental management actions would be implemented as part of the adaptive framework.</p> <p>The supplemental management actions that could be taken if this trigger occurs include, but are not limited to:</p> <ul style="list-style-type: none"> • implementing a scientific study to better inform decisions • Providing additional educational materials to hunting and nonhunting visitors • Directing nonhunting visitors to areas of the Preserve lesser-used by hunters or off-peak times for hunting • Reducing the amount of hunting and/or nonhunting use in certain areas of the Preserve • Altering levels or types of trail use by hunting and/or nonhunting visitors <p>Implementing these supplemental management actions in a more restrictive/limiting approach (e.g., directing nonhunting visitors to areas of the Preserve lesser-used by hunters or off-peak times for hunting, reducing the amount of hunting and/or nonhunting use in certain areas of the Preserve, or altering levels or types of trail use by hunting and/or nonhunting visitors) will result in both beneficial and adverse impacts to both hunting and nonhunting visitors, dependent upon which group the restrictions were applied. Whereas, implementation of a scientific study or providing additional education materials to hunting and nonhunting visitors will likely not have any adverse effect. Additionally, implementing emergency restrictions or closures will likely result in an adverse effect on both hunting and nonhunting visitors if an area were no longer open for use.</p> <p>Any combination of these supplemental management actions will continue to be implemented in an increasingly restrictive adaptive management approach until follow-up monitoring data (as discussed in step 7 of the adaptive management process in chapter 2 of the attached EA) shows that the adaptive management objectives outlined in step 2 of the adaptive management process in chapter 2 of the attached EA are being met.</p> <p>As noted in chapter 2 of the attached EA, if additional actions are required, which have not been analyzed as part of the impact analysis in the attached EA, additional impacts analyses, and if applicable, NEPA compliance documentation, will be required to implement the proposed actions.</p> <p>The iterative cycle of these actions will ensure that the conflicts between hunting and nonhunting visitors are minimized under the selected alternative.</p>

ATTACHMENT 1 NON-IMPAIRMENT DETERMINATION

THE PROHIBITION ON IMPAIRMENT OF PRESERVE RESOURCES AND VALUES

The National Park Service's (NPS) Organic Act, 16 U.S.C. 1 et seq., states that the purpose of the units of the national park system is to "conserve the scenery and the natural and historic objects and the wild life therein and to provide for the enjoyment of the same in such manner and by such means as will leave them unimpaired for the enjoyment of future generations." 16 U.S.C. 1.

NPS *Management Policies* (2006), Section 1.4.4, explains the prohibition on impairment of park resources and values:

While Congress has given the [USFWS] the management discretion to allow impacts within parks, that discretion is limited by the statutory requirement (generally enforceable by the federal courts) that the Park Service must leave park resources and values unimpaired unless a particular law directly and specifically provides otherwise. This, the cornerstone of the Organic Act, establishes the primary responsibility of the National Park Service. It ensures that park resources and values will continue to exist in a condition that will allow the American people to have present and future opportunities for enjoyment of them.

WHAT IS IMPAIRMENT?

NPS *Management Policies* (2006), Section 1.4.5, *What Constitutes Impairment of Park Resources and Values*, and Section 1.4.6, *What Constitutes Park Resources and Values*, provide an explanation of impairment.

Impairment is an impact that, in the professional judgment of the responsible NPS manager, would harm the integrity of park resources or values, including the opportunities that otherwise would be present for the enjoyment of those resources or values.

Section 1.4.5 of NPS *Management Policies* (2006) states:

An impact to any park resource or value may, but does not necessarily, constitute impairment. An impact would be more likely to constitute impairment to the extent that it affects a resource or value whose conservation is:

- *Necessary to fulfill specific purposes identified in the establishing legislation or proclamation of the park*
- *Key to the natural or cultural integrity of the park or to opportunities for enjoyment of the park, or*
- *Identified as a goal in the park's general management plan or other relevant NPS planning documents as being of significance.*

An impact would be less likely to constitute an impairment if it is an unavoidable result of an action necessary to preserve or restore the integrity of park resources or values and it cannot be further mitigated.

Per Section 1.4.6 of *Management Policies 2006*, park resources and values that may be impaired include:

- *the park's scenery, natural and historic objects, and wildlife, and the processes and condition that sustain them, including, to the extent present in the park: the ecological, biological, and physical processes that created the park and continue to act upon it; scenic features; natural visibility, both in daytime and at night; natural landscapes; natural soundscapes and smells; water and air resources; soils; geological resources; paleontological resources; archeological resources; cultural landscapes; ethnographic resources; historic and prehistoric sites, structure, and objects; museum collections; and native plants and animals;*
- *appropriate opportunities to experience enjoyment of the above resources, to the extent that can be done without impairing them;*
- *the park's role in contributing to the national dignity, the high public value and integrity, and the superlative environmental quality of the national park system, and the benefit and inspiration provided to the American people by the national park system; and*
- *any additional attributes encompassed by the specific values and purposes for which the park was established.*

Impairment may result from NPS activities in managing the park, visitor activities, or activities undertaken by concessionaires, contractors, and others operating in the park. Impairment may also result from sources or activities outside the park, but this would not be a violation of the Organic Act unless the NPS was in some way responsible for the action.

HOW IS AN IMPAIRMENT DETERMINATION MADE?

Section 1.4.7 of *NPS Management Policies* (2006) states:

In making a determination of whether there would be an impairment, an NPS decision-maker must use his or her professional judgment. This means that the decision-maker must consider any environmental assessments or environmental impact statements required by the National Environmental Policy Act of 1969 (NEPA); consultations required under Section 106 of the National Historic Preservation Act; relevant scientific and scholarly studies; advice or insights offered by subject matter experts and others who have relevant knowledge or experience; and the results of civic engagement and public involvement activities relating to the decision.

NPS Management Policies (2006) further defines “professional judgment” as:

A decision or opinion that is shaped by study and analysis and full consideration of all the relevant facts, and that takes into account the decision-maker's education, training, and experience; advice or insights offered by subject matter experts and others who have relevant knowledge and experience; good science and scholarship; and, whenever appropriate, the results of civic engagement and public involvement activities relative to the decision.

NON-IMPAIRMENT DETERMINATION FOR THE SELECTED ALTERNATIVE

This determination on impairment has been prepared for the selected alternative described in the Finding of No Significant Impact and chapter 2 of the attached *Hunting Management Plan/EA*. An impairment determination is made for all resource impact topics analyzed for the selected alternative. An impairment determination is not made for Preserve management and operations, visitor use and experience/recreational opportunities, public health and safety, and socioeconomics because impairment findings relate back to park resources and values, and these impact areas are not generally considered to be park resources or values according to the Organic Act, and cannot be impaired in the same way that an action can impair park resources and values.

Findings on Impairment for Vegetation and Habitat

Under the selected alternative, impacts to vegetation and habitat and protected plant species will be negligible in the original Preserve and potentially slightly greater (although still negligible) in the Addition since hunting is not currently allowed in this area. These impacts will be long-term (repeated short-term direct impacts while hunters are in the area) and consist of trampling of native vegetation, protected plant species, etc. Such trampling of native vegetation and protected plant species will be expected to occur to only individual specimens in sporadic areas of the Preserve where hunters walk off existing trails. These impacts will not be expected to be measurable and vegetation will be expected to fully recover each year during nonhunting seasons.

Under the selected alternative, impacts from nonnative invasive plants will be limited to unintentional seed dispersal of nonnative invasive plants by hunters, and therefore negligible in the original Preserve and potentially slightly greater (although still negligible) in the Addition since hunting is not currently allowed in this area. These impacts will be long-term (repeated short-term impacts). Such seed dispersal will be expected to result in the establishment of only very few specimens of nonnative plants; this establishment will likely be detected through the Preserve's systematic nonnative plant reconnaissance and treatment, resulting in no detriment to native plant populations in the greater landscape of the Preserve.

Therefore, the selected alternative will not impair vegetation and habitat because impacts will be negligible.

Findings on Impairment for Protected Wildlife Species

The federally listed species present in the Preserve are the Florida panther, West Indian manatee, Florida bonneted bat, Cape Sable seaside sparrow, Everglade snail kite, red-cockaded woodpecker, wood stork, American crocodile, eastern indigo snake, and American alligator.

One of the objectives of the adaptive management strategy to be carried out under the selected alternative is “a sustainable deer population in the Preserve, which ensures that the effects of hunting in the Preserve are beneficial, discountable, or insignificant to the Florida panther population.” With the implementation of the selected alternative, this objective will be achieved through an iterative adaptive management cycle of baseline management actions, monitoring, triggers, supplemental management actions, and additional monitoring. This adaptive management approach will ensure a continued sustainable prey base (white-tailed deer) for the Florida panther. Therefore, impacts on the Florida panther from the selected alternative will be long-term, negligible to minor, and adverse throughout the Preserve.

Since the *Hunting Management Plan* only addresses terrestrial hunting activities, no impacts will occur to the West Indian manatee.

The federally listed avian species (Cape Sable seaside sparrow, Everglade snail kite, red-cockaded woodpecker, and wood stork) could be impacted by indirect adverse effects resulting from human use such as flushing and short-term displacement, etc. These impacts would be long-term (repeated short-term impacts while hunters are in the area each season), but since hunting is a seasonal activity and hunters would be dispersed over a large number of acres in the Preserve, the impacts would be negligible. Such flushing and short-term displacement would be expected to occur only to individual species in localized areas for short periods of time while hunters are in the area. This effect would not be expected to be observable or measurable for any extended period of time once hunters have left the area. The eastern indigo snake could also be impacted by similar flushing and short-term displacement; however, since no construction or other permanent ground disturbing activities

are associated with this project, impacts to the eastern indigo snake would be negligible as well. Similar flushing and short-term displacement impacts could occur to the American crocodile and American alligator. Since hunting of alligators is not permitted in the Preserve, no other impacts would be anticipated to occur to these species. Similarly, the Florida bonneted bat could be impacted by flushing and short-term displacement; however, their daytime roosting locations in tree cavities and nocturnal feeding behavior would limit their exposure to hunters; however, since no construction or other permanent ground disturbing activities are associated with this project, impacts to the Florida bonneted bat would be negligible.

The federally listed avian species (Cape Sable seaside sparrow, Everglade snail kite, red-cockaded woodpecker, and wood stork) could also be impacted by indirect adverse effects resulting from direct lead-based ammunition ingestion or ingestion of water/soil contaminated by dissolved lead from lead-based ammunition. The effects will be minor since not all hunters in the Preserve use lead-based ammunition and hunters are dispersed over a large acreage. Therefore, the effects to these species resulting from the use of lead-based ammunition for hunting under this alternative will be expected to occur only on rare occasions to individual specimens and therefore be discountable (i.e., not able to be meaningfully measured, detected, or evaluated) in terms of species populations and the greater area of the Preserve. Moreover, under current hunting regulations, lead-based ammunition is prohibited for duck, geese, and coot hunting. No impacts or very negligible impacts will occur for other listed species such as the eastern indigo snake, American crocodile, and American alligator since current literature does not demonstrate any substantial effect on reptiles from lead-based ammunition ingestion.

The selected alternative will not impair protected wildlife species because no impacts will occur to the West Indian manatee and impacts to the other federally listed wildlife species in the Preserve (Florida panther, Florida bonneted bat, Cape Sable seaside sparrow, Everglade snail kite, red-cockaded woodpecker, wood stork, American crocodile, eastern indigo snake, and American alligator) will be negligible to minor.

The NPS has made a determination of “no effect” for the West Indian manatee and a determination of “may affect, not likely to adversely affect” for eight federally listed wildlife species (Florida bonneted bat, Cape Sable seaside sparrow, Everglade snail kite, red-cockaded woodpecker, wood stork, American crocodile, eastern indigo snake, and American alligator) and the Florida panther.

The NPS initiated consultation with the USFWS under Section 7 of the Endangered Species Act in a memorandum dated March 7, 2012 (see appendix I of the attached EA for the March 7, 2012, memorandum from the NPS to the USFWS). Subsequent to the final rule listing the Florida bonneted bat as endangered, the NPS contacted the USFWS on January 15, 2014, to initiate consultation for this species.

The USFWS issued a memorandum to the NPS for the Hunting Management Plan under Section 7 of the Endangered Species Act on February 10, 2014. The USFWS subsequently issued a revised memorandum to the NPS for the Hunting Management Plan under Section 7 of the Endangered Species Act on April 23, 2014, which stated: “This memorandum supersedes the [USFWS] February 10, 2014, memorandum ...” Therefore, the subsequent discussion refers to the April 23, 2014, USFWS memorandum.

In the April 23, 2014, memorandum the USFWS stated the following, in part (see appendix I of the attached EA for the April 23, 2014, memorandum from the USFWS to the NPS):

... the NPS has determined the implementation of the [Preferred Alternative] is not likely to adversely affect the [West Indian manatee, wood stork, Everglade snail kite, Cape Sable

seaside sparrow, red-cockaded woodpecker, American crocodile, and eastern indigo snake]. The [USFWS] concurs and will not consider these species further in this document.

The April 23, 2014, memorandum (see appendix I of the attached EA) further states the following regarding the Florida bonneted bat, in part:

... the NPS has determined the implementation of the Hunting Management Plan is not likely to adversely affect the Florida bonneted bat. The [USFWS] concurs.

The April 23, 2014, memorandum (see appendix I of the attached EA) further states the following regarding the Florida panther, in part:

The goal of the adaptive management framework is to ensure hunting activities do not alter the existing predator/prey relationship in [the Preserve] and, therefore, do not have a measurable effect on the Florida panther. Based on this information, the NPS has determined effects to the Florida panther population would be expected to be minimized with the [Preferred Alternative] and result in long-term, negligible to minor, adverse, regional effects to the Florida panther ... As stated in the Hunting Management Plan, this level of effects equates to a determination that implementation of the [Preferred Alternative] "may affect, but is not likely to adversely affect" the Florida panther. Based on this information, the [USFWS] concurs.

The goal of the adaptive management framework is to ensure hunting activities do not alter the existing predator/prey relationship in [the Preserve] and, therefore, do not have a measurable effect on the Florida panther. As actions that result in harm or harassment of panthers would be measurable, and the analysis indicates these types of effects are not likely to occur, we anticipate harm or harassment of panthers would not occur with implementation of the [Preferred Alternative]. As stated earlier, the potential harassment effects of ORV use have been addressed in prior, formal consultations and, as such, are not included in this consultation. Based on this information, the NPS has determined effects to the Florida panther population would be expected to be minimized with the [Preferred Alternative] and result in long-term, negligible to minor, adverse, regional effects to the Florida panther ... As the NPS stated in the Hunting Management Plan, this level of effects equates to a determination that implementation of the [Preferred Alternative] "may affect, but is not likely to adversely affect" the Florida panther. Based on this information, the [USFWS] concurs.

Additionally, it is important to note that the USFWS did not evaluate the American alligator as part of its Section 7 consultation with the NPS under the Endangered Species Act since this species is only listed due to similarity of appearance with the American crocodile, for which the USFWS concurred with the NPS' finding.

Concluding, the April 23, 2014, memorandum (see appendix I of the attached EA) states the following, in part:

The [USFWS] supports selection of Alternative 3, of the [Preferred Alternative], due to its inclusion of an adaptive management strategy in making decisions regarding hunting activities within [The Preserve]. We believe the [Preferred Alternative] offers the best use of science in decision-making and creates a cooperative atmosphere between NPS, the FWC, and the [USFWS]. Adaptive management focuses on learning and adapting, through partnerships of managers, scientists, and other stakeholders who learn together how to create and maintain sustainable resource systems (Williams et al., 2009). The adaptive management strategy and decision-making framework will ensure the best science is used to formulate decisions regarding hunting in [The Preserve] and the needs of threatened or endangered species like the Florida panther are adequately considered in those decisions. This letter fulfills the requirements of section 7 of the Act and further action is not required ...

Findings on Impairment for Major Game Species

One of the objectives of the adaptive management strategy to be carried out under the selected alternative is “a sustainable deer population in the Preserve, which ensures that the effects of hunting in the Preserve are beneficial, discountable, or insignificant to the Florida panther population.” With the implementation of the selected alternative, this objective will be achieved through an iterative adaptive management cycle of baseline management actions, monitoring, triggers, supplemental management actions, and additional monitoring.

Long-term, moderate, beneficial effects will result from harvesting and management of game populations, such as disease mitigation and improvements in the diversity of population genetics. The partnership between the NPS, FWC, and USFWS established through the adaptive management process will contribute to the monitoring and improved understanding of these game populations. These actions could be expected to result in clearly detectable positive changes in game populations in the Preserve, observed in the long-term through monitoring data.

Allowing hunting in the entire Preserve under this science-based adaptive management framework will be expected to have long-term, moderate, beneficial effects on the white-tailed deer population. The iterative cycle of these actions could be expected to result in clearly detectable positive changes in the deer population in the Preserve, observed in the long-term through monitoring data, while ensuring that the effects of deer hunting in the Preserve are beneficial, discountable, or insignificant to the Florida panther population.

Long-term, minor, adverse impacts to major game species, except the white-tailed deer population, within the original Preserve and long-term, minor to moderate, adverse impacts in the Addition will accrue from hunter take, flushing and short-term displacement, and lead-based ammunition exposure from the selected alternative.

While long-term, minor to moderate, adverse impacts to major game species in the Preserve will occur from the selected alternative, these impacts will not impair major game species in the Preserve. Additionally, allowing hunting in the entire Preserve under the selected alternative will be expected to have long-term, moderate, beneficial effects on the white-tailed deer population.

Findings on Impairment for Nonnative/Invasive Wildlife Species

Under the selected alternative, the impacts from nonnative species will consist of potential spread of invertebrate species throughout areas of the Preserve where hunters trek. These impacts will be long-term (repeated short-term direct impacts while hunters are in the area), negligible, and adverse. Such dispersal will be expected to be limited to individual species in limited areas over a large landscape and will not be expected to result in the establishment of any new populations in the Preserve; this change will likely not be measurable and will not be likely to have any effect on the viability of local native wildlife populations. Additionally, no impacts will be expected in regards to nonnative, invasive vertebrate or fish species.

Additionally, the NPS and FWC, in consultation with the USFWS, will have the option of making changes to hunting management protocol if a need arises to control nonnative invasive wildlife species, such as the Burmese python, as documented by monitoring data and the adaptive management triggers outlined in chapter 2 of the attached EA. The ability to institute a hunting season (or other hunting regulations) for nonnative invasive wildlife species that pose a threat to native wildlife populations will have a long-term, minor to moderate, beneficial impact on native wildlife populations in the entire Preserve. However, additional NEPA analysis and documentation may have to be conducted to implement such measures.

The selected alternative will not cause impairment from nonnative/invasive wildlife species because adverse impacts will be negligible and potential beneficial effects could also result from implementation of the adaptive management strategy.

Findings on Impairment for Wilderness Character

Under the selected alternative, walk-in hunting will be permitted in the 47,067 acres of proposed wilderness and those lands eligible for wilderness designation [as determined by the Addition GMP (NPS 2010a)] located in the Addition. Within these lands, since hunting will only be permitted via walk-in access, the impacts to the “untrammeled” quality of wilderness character will be negligible to minor. These impacts will be long-term and consist of direct impacts while hunters are in the wilderness area such as trampling vegetation and hunter take of wildlife. Effects such as trampling of native vegetation will be expected to occur to only individual specimens in sporadic areas of the Preserve where hunters walk off existing trails. These impacts will not be expected to be measurable and vegetation will be expected to fully recover each year during nonhunting seasons. The impacts from hunter take of game species will be minimized by the adaptive management process to be implemented under the selected alternative, thus minimizing the impact on the “untrammeled” and “natural” qualities of wilderness character. No impacts are expected to the “undeveloped” quality of wilderness character, as the selected alternative does not call for the placement of structures or installations in wilderness.

Both beneficial and adverse effects to the wilderness experience will occur for recreational visitors that chose to visit the proposed and eligible wilderness areas of the Addition. For those recreational visitors that choose to participate in hunting activities, the wilderness experience will be enhanced in the long-term by a minor and beneficial amount because of the ability to hunt in the proposed and eligible wilderness areas. For those recreational visitors that enter the wilderness to experience “opportunities for solitude and primitive and unconfined recreation,” this element of wilderness character will be adversely impacted by the potential presence of hunters in the area and the sporadic sound of firearm shots. These impacts will be minor, seasonal, and long-term.

The selected alternative will not impair wilderness character because adverse impacts will be negligible to minor and beneficial effects will also occur for those recreational visitors that chose to participate in hunting in the wilderness areas of the Preserve.

Findings on Impairment for Noise/Soundscapes

The main long-term adverse effects to the soundscape associated with the selected alternative are directly attributable to hunting-related firearm noise. However, with the selected alternative, the NPS will have more flexibility to manage hunting in order to minimize any future hunting-related noise impacts to white-tailed deer, panthers, and visitor use in accordance with baseline management actions, adaptive management triggers, and supplemental management actions outlined in chapter 2 of the attached EA. As discussed in the impact analysis for alternative 3 under the “Wildlife – Major Game Species” (for impacts to white-tailed deer), “Wildlife – Protected Wildlife Species” (for impacts to panthers), and “Visitor Use and Experience/Recreational Opportunities” (for impacts to visitor use) sections of the attached EA, the iterative cycle of the baseline management actions, adaptive management triggers, and supplemental management actions (as outlined in chapter 2 of the attached EA) implemented as part of the adaptive management process will help to minimize future hunting-related noise impacts to white-tailed deer, panthers, and visitor use. Given these factors, new disturbances from firearm noise due to the selected alternative are expected to be adverse, intermittent, and long-term, and are expected to result in minor disturbance to white-tailed deer, panthers, and visitors located in proximity to the Preserve. Natural sounds will continue to

predominate within the Preserve except during the discrete occurrences of gunfire; human-generated sounds (i.e., gunfire) from appropriate recreational activities (i.e., hunting) could be heard occasionally.

Other long-term adverse impacts could include sporadic aircraft noise from additional monitoring flights required for deer and panther monitoring efforts. However, since similar aircraft noise currently occurs from ongoing monitoring efforts at the Preserve, the impact will be minor. Natural sounds will continue to predominate within the Preserve except during the sporadic flights caused by aircraft noise during monitoring activities.

The selected alternative will not impair soundscapes because impacts will be minor and natural sounds will continue to predominate within the Preserve.

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Final Hunting Management Plan / Environmental Assessment



May 2014

EXECUTIVE SUMMARY

INTRODUCTION

This *Hunting Management Plan/Environmental Assessment* (EA) has been prepared for the Big Cypress National Preserve (the “Preserve”)/Wildlife Management Area (WMA) by Big Cypress National Preserve under the jurisdiction of the National Park Service (NPS), U.S. Department of the Interior. This EA has been prepared in accordance with the National Environmental Policy Act (NEPA) [42 U.S. Code (USC) § 4321] and implementing regulations [40 Code of Federal Regulations (CFR) 1500-1508], and U.S. Department of the Interior regulations.

Big Cypress National Preserve is one of 401 units of the national park system administered by the NPS. Big Cypress National Preserve was created by Congress on October 11, 1974 [Public Law 93-440] as one of the first two national preserves in the national park system, with 582,000 acres. The Big Cypress National Preserve Addition Act (Public Law 100-301) was passed on April 29, 1988, authorizing the addition of 147,000 acres to the Preserve. Most of the acquisition of this additional 147,000 acres, referred to as “the Addition,” was completed in 1996.

36 CFR 7.86 provides specific regulations for hunting, fishing, trapping, and gathering in Big Cypress National Preserve. Subsection (e) (1) states: “Hunting, fishing and trapping are permitted in accordance with the general regulations found in parts 1 and 2 of [36 CFR] and applicable Florida law governing Cooperative Wildlife Management Areas.” The enabling legislation (PL 93-440, as amended by PL 100-301) also dictates that public hunting shall be allowed in the Preserve. Since public hunting in the Preserve is mandated by the enabling legislation (not a discretionary activity unless specific “reasons of public safety, administration, floral and faunal protection and management, or public use and enjoyment” are identified), the NPS has prepared this *Hunting Management Plan*.

In 1991, a General Management Plan (GMP) was completed, which addressed management of the original 582,000 acres of the Preserve. The *Big Cypress National Preserve – Addition Final General Management Plan/Wilderness Study/Off-Road Vehicle Management Plan/Environmental Impact Statement* (Addition GMP) was subsequently completed in 2010, which addressed management of the 147,000 acres in the Addition.

Both the general management plan completed for the original Preserve in 1991 and the general management plan completed for the Addition in 2010 articulated the need to manage hunting within the Preserve. Hunting is currently permitted within the original boundaries of the Preserve and is managed cooperatively by the NPS and Florida Fish and Wildlife Conservation Commission (FWC) through the *NPS/FWC Cooperative Partnership Agreement*. The Addition has never been open to public hunting since its acquisition by the NPS; however, hunting occurred on private lands in the Addition prior to the acquisition of the lands by the NPS. In accordance with the GMP and the Addition GMP, the goal of this document is to develop a hunting management plan for the entire Preserve, including the Addition, and to analyze the impacts associated with three alternatives for managing hunting in the Preserve¹.

PURPOSE OF THE PROJECT

Throughout development of this *Hunting Management Plan/Environmental Assessment*, the project team [consisting of staff from the NPS, FWC, and U.S. Fish and Wildlife Service (USFWS)] considered many issues which might play a role in the future of hunting management in the Preserve. Two factors consistently appeared to be fundamental in the consideration of hunting

¹ The “Preserve” refers to the entire Preserve which encompasses the original boundaries and the Addition, unless otherwise noted.

management in the Preserve: the white-tailed deer population and the endangered Florida panther population in the Preserve. The white-tailed deer is the most important game species in the Preserve in addition to being the most common prey item for the Florida panther (NPS 2010a). Therefore, the purpose and need for action and the objectives in taking action (as well as the alternatives detailed in chapter 2) for this plan were developed with these two key issues in mind.

The purpose of this action is:

To develop a hunting management plan for the Big Cypress National Preserve/Wildlife Management Area that allows the superintendent of the Preserve to provide for hunting opportunities in the Preserve in a manner that is in the best interest of the Preserve's resources and the public, while meeting the requirements set forth by the NPS, the Preserve's enabling legislation, the NPS/FWC Cooperative Partnership Agreement, and all applicable federal, state, and local laws and regulations.

NEED FOR ACTION

The need for action is that:

A hunting management plan is needed for the Big Cypress National Preserve/Wildlife Management Area:

- *to provide clear and informational guidance for safe and responsible hunting within the Preserve to the public*
- *to provide for a visitor use experience that complies with the enabling legislation for the Preserve*
- *to manage the resources present in the Preserve*
- *to provide a framework for hunting management within the Preserve that meets the requirements set forth by the NPS, the Preserve's enabling legislation, the NPS/FWC Cooperative Partnership Agreement, and all*

applicable federal, state, and local laws and regulations

OBJECTIVES IN TAKING ACTION

The objectives in taking action are to:

1. *Provide guidelines for hunting within the Big Cypress National Preserve/Wildlife Management Area that satisfy all NPS regulations, the Preserve's enabling legislation, the NPS/FWC Cooperative Partnership Agreement, and all applicable federal, state, and local laws and regulations and that maintain or improve the Preserve's ability to contribute to the conservation of rare, threatened, and endangered species.*
2. *Provide a programmatic framework for facilitating agency communications and goal-setting that provides guidance over a number of years.*
3. *Utilize science-based resource management (e.g., habitat, wildlife, and protected species) for adaptive decision-making for:*
 - *the NPS and the FWC to collaborate and cooperate on the rule-making process regarding hunting*
 - *the NPS to take action independently, with notification to the FWC and USFWS as soon as practicable, for resource protection or public safety in certain cases (i.e., high water events, fires, threatened and endangered species issues), which may have an effect on hunting within the Preserve*
4. *Provide the public with clear and understandable information regarding:*
 - *hunting management within the Preserve*
 - *safe and responsible hunting practices*

5. *Manage opportunities for a positive visitor use experience for hunters and nonhunters.*
6. *Manage an array of access options to allow for a diversity of hunting opportunities within the framework of existing regulations and funding.*

ALTERNATIVES

Alternative 1 – No Action – Apply Current Management to the Addition

Under alternative 1 (no action), management of hunting in the entire Preserve would occur in accordance with the *NPS/FWC Cooperative Partnership Agreement*.

Alternative 2 – No Hunting in the Addition

Under alternative 2, current hunting management would continue within the original Preserve boundaries, using the guidance outlined in the *NPS/FWC Cooperative Partnership Agreement*. In the Addition, public hunting would be prohibited.

Alternative 3 – New Adaptive Management Strategy

Under alternative 3, the NPS and the FWC, in consultation with the USFWS, would cooperate to implement an adaptive management strategy to manage hunting in the Preserve.

NPS PREFERRED ALTERNATIVE

The Director's Order 12 Handbook (NPS 2001) states that a preferred alternative should be identified in an EA if one exists at the time an EA is released. The preferred alternative is defined by the Council on Environmental Quality as the alternative, "which the agency believes would fulfill its statutory mission and responsibilities, giving consideration to economic, environmental, technical and other factors" (46 FR 18026, Q4a).

The NPS has identified alternative 3 as its preferred alternative for submittal to the director of the NPS Southeast Region for possible approval. In identifying the preferred alternative, the NPS considered a number of factors, including the extent to which alternatives meet plan objectives, the environmental consequences of implementing each of the alternatives, anticipated effort associated with implementation, degree of management flexibility, and costs. The cost differences between the alternatives were determined to be negligible.

The NPS also used a process called Choosing By Advantages (CBA) in order to determine the relative advantages of implementing each alternative, compared to implementing the other alternatives. A CBA workshop was conducted on November 1, 2011. Workshop participants included NPS (Preserve, Denver Service Center, and contractor) staff and cooperating state (FWC) and federal (USFWS) agency participants. Through the CBA process, the NPS determined that alternative 3 would provide the greatest advantages to the NPS and the public.

GUIDE TO THIS ENVIRONMENTAL ASSESSMENT

The contents of this document are as follows:

Chapter 1: Purpose and Need for Action – The first chapter includes a discussion of the background of the NPS, the purpose and significance of the Big Cypress National Preserve, the purpose and need for action, project objectives, the relationship to laws and other plans, the impact topics that were selected for detailed analysis, and the impact topics that were dismissed from further analysis.

Chapter 2: Alternatives – This chapter describes the action alternatives and the no action alternative. It also discusses alternatives considered but dismissed.

Chapter 3: Affected Environment – This chapter describes existing environmental conditions in the areas potentially affected by the alternatives. This section addresses the following impact topics: vegetation and habitat (native vegetative communities and habitat, protected plant species, and nonnative invasive plant species); wildlife (protected wildlife species, major game species, and nonnative/invasive wildlife species); wilderness; Preserve management and operations; visitor use and experience/recreational opportunities; noise/soundscapes; public health and safety; and socioeconomics.

Chapter 4: Environmental Consequences – This chapter presents the methods and analysis of the potential impacts for each topic under each of the alternatives (no action and action). This chapter also includes the mitigation measures and cumulative impacts analyses for each of the alternatives.

Chapter 5: Consultation and Coordination – This chapter summarizes the consultations undertaken in the preparation and review of this document, including the scoping process, public involvement, and agency and tribal coordination. It also includes a list of document preparers who have contributed to this EA.

Chapter 6: References – This chapter lists the references cited in this document and defines the acronyms and abbreviations used in this document.

Appendixes:

- Appendix A** *Big Cypress National Preserve Enabling Legislation* (PL 93-440, as amended by PL 100-301)
- Appendix B** *National Park Service/Florida Fish and Wildlife Conservation Commission Cooperative Partnership Agreement*
- Appendix C** *Big Cypress Wildlife Management Area Regulations Summary and Area Map* (July 1, 2013 – June 30, 2014)
- Appendix D** *Deer Status Report, Big Cypress National Preserve – Addition Lands* (April 2012)
- Appendix E** *National Park Service White-Tailed Deer and Panther Monitoring Program Analysis and U.S. Fish and Wildlife Service Concurrence Letter* (November 1, 2013)
- Appendix F** *Adaptive Management*
- Appendix G** *Addition Habitat Comparison Analysis*
- Appendix H** *Big Cypress National Preserve Small Game and Wild Turkey Harvest and Pressure Summary* (2011-12)
- Appendix I** *Endangered Species Act Section 7 Consultation Memorandums between the National Park Service and the U.S. Fish and Wildlife Service* (March 7, 2012, February 10, 2014, and April 23, 2014)

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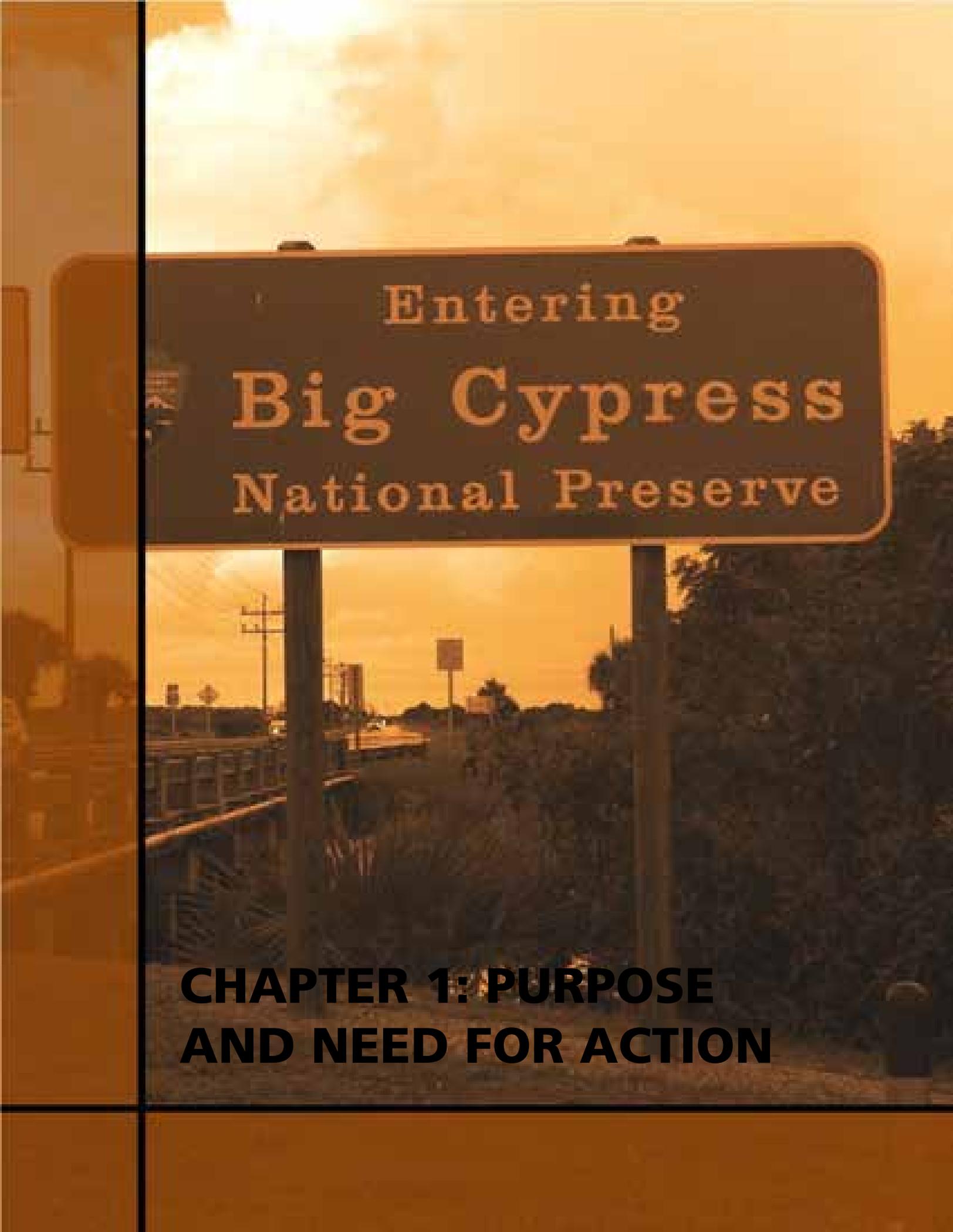
- Appendix A** *Big Cypress National Preserve Enabling Legislation (PL 93-440, as amended by PL 100-301)*
- Appendix B** *National Park Service/Florida Fish and Wildlife Conservation Commission Cooperative Partnership Agreement*
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Entering
Big Cypress
National Preserve

**CHAPTER 1: PURPOSE
AND NEED FOR ACTION**

INTRODUCTION AND BACKGROUND

INTRODUCTION

This *Hunting Management Plan/Environmental Assessment* (EA) has been prepared for the Big Cypress National Preserve (the “Preserve”)/Wildlife Management Area (WMA) by Big Cypress National Preserve under the jurisdiction of the National Park Service (NPS), U.S. Department of the Interior. This EA has been prepared in accordance with the National Environmental Policy Act (42 U.S. Code § 4321) and implementing regulations (40 Code of Federal Regulations 1500-1508), and U.S. Department of the Interior regulations.

BACKGROUND

General Preserve Background

Big Cypress National Preserve is one of 401 units of the national park system administered by the NPS. Big Cypress National Preserve was created by Congress on October 11, 1974 [Public Law (PL) 93-440] as one of the first two national preserves in the national park system, with 582,000 acres. The Big Cypress National Preserve Addition Act (PL 100-301) was passed on April 29, 1988, authorizing the addition of 147,000 acres to the Preserve. Most of the acquisition of this additional 147,000 acres, referred to as “the Addition,” was completed in 1996. See appendix A for a copy of the enabling legislation (PL 93-440, as amended by PL 100-301) in its entirety.

In 1991, a General Management Plan (GMP) was completed, which addressed management of the original 582,000 acres of the Preserve. The *Big Cypress National Preserve – Addition Final General Management Plan/Wilderness Study/Off-Road Vehicle Management Plan/Environmental Impact Statement* (Addition GMP) was subsequently completed in 2010, which addressed management of the 147,000 acres in the Addition.

Preserve History

Originally, the lands now encompassing the Preserve were to be included within the boundaries of Everglades National Park; however, by 1947, when Everglades National Park was officially established, these lands were not included in the legislation. By the late 1960s, areas within the current Preserve were hunted and fished, many areas had been logged, oil had been discovered at Bear Island and drill sites were established, cattle grazing occurred on approximately 440,000 acres, orange groves and vegetables farming occurred on approximately 42,000 acres, and the western edge of lands were being developed to create the community of Golden Gate Estates (EvergladesOnline.com 2012).

In 1968, plans were unveiled for a jetport to be developed in the area of the current Preserve, midway between Miami and Naples along US 41/Tamiami Trail. Potential impacts from the jetport included development of a new community of 150,000 people, generation of five million gallons of sewage and industrial wastes, and production of 25 tons of jet fuel pollutants each day (EvergladesOnline.com 2012).

The development was proceeding smoothly until Robert Padrick, Chairman of the Central Southern Florida Flood Control District, voiced his concern that the road and transportation corridor would pass through Conservation District #3. When Nathaniel Reed, environmental advisor to Florida Governor Claude Kirk Jr., and Art Marshall, ecologist, researcher, and teacher at the University of Miami, looked at the hydrological maps, they didn't like what they saw. The bulldozers and pavers were already in action when Nathaniel Reed wrote a report to Governor Claude Kirk Jr. explaining the situation. The report prompted the Governor to look for a graceful way to back out of building the jetport. Governor Claude Kirk Jr.'s

support was vital. He and Nathaniel Reed testified before both houses of Congress to urge passage of the legislation to save Big Cypress (EvergladesOnline.com 2012).

Environmental groups supported establishment of the Preserve; however, those same groups were uncomfortable with "...the unprecedented concept of letting people who owned existing homes, hunting camps, and businesses within the Preserve boundaries be[ing] allowed to keep them forever..." (EvergladesOnline.com 2012). Environmental groups were also opposed to allowing continued hunting and off-road vehicle (ORV) access after establishment of the Preserve, as well as "...the decision to create perpetual legal rights for the Miccosukee and Seminole people in Big Cypress ..." (EvergladesOnline.com 2012). These provisions hadn't been included in any other NPS unit; however, since both hunters and the tribes were integral in the fight to establish the Preserve, it didn't seem appropriate that they should not be allowed access to the lands once it became an NPS unit (EvergladesOnline.com 2012). Thus, Big Cypress was established as a National Preserve as opposed to a National Park, with the allowance of these special provisions, unlike any previous NPS unit.

What is a National Preserve?

The diversity of national park system units is reflected in the variety of titles given to them. These include designations such as national park, national preserve, national monument, national memorial, national historic site, national seashore, etc. Although some titles are self-explanatory, others require further clarification (NPS 2010a).

Generally, a national park contains a variety of resources and encompasses large land or water areas to help provide adequate protection of the resources (NPS 2010a). National preserves are defined as "areas having characteristics associated with national parks, but in which Congress has permitted continued public hunting, trapping, [and] oil/gas exploration and extraction" (NPS 2000a).

As with all units of the national park system, the enabling legislation that accompanies the authorization of a particular park system unit describes its purpose and provides the direction for its establishment and management. Big Cypress National Preserve was established to protect the watershed values of the Big Cypress Swamp while allowing for the continuation of traditional uses (such as hunting, fishing, ORV use, and mineral extraction) in the area. The national preserve designation of Big Cypress presents unique opportunities to integrate multiple uses with conservation and preservation (NPS 2010a).

What is a Wildlife Management Area?

Florida's WMA system is managed by the Florida Fish and Wildlife Conservation Commission (FWC) to sustain the widest possible range of native wildlife in their natural habitats. This system includes more than 5.8 million acres of land established as WMAs or wildlife and environmental areas in the state. These lands are typically more rugged than parks, with fewer developed amenities. On the majority of these lands (about 4.4 million acres), such as the Big Cypress WMA, the FWC is a cooperating manager working with other governmental or private landowners to conserve wildlife and provide public use opportunities. The Big Cypress WMA consists of 565,848 acres within the 720,566-acre Preserve, which includes most of the original Preserve and currently does not include the Addition lands. The FWC currently cooperatively manages the Big Cypress WMA with the NPS by managing species restoration, conducting habitat management and restoration activities, conducting surveying and monitoring activities, setting regulations and seasons for hunting and fishing, and conducting outreach and education activities, among other activities.

Project Site Location

The Preserve² is located in southern Florida in Collier, Miami-Dade, and Monroe counties, and is situated between the major cities of Miami and Naples. The original Preserve, which consists of 582,000 acres, extends from the northern boundary of Everglades National Park on the south edge to seven miles north of 1-75 on the northern edge. The Addition, a portion of the Preserve, is approximately 147,000 acres in size and consists of two separate areas – the Northeast Addition and the Western Addition (see figure 1-1). Most of these lands, approximately 128,000 acres in the Northeast Addition, are located northeast of the original Preserve boundary. The Western Addition is an approximately 1-mile strip of land (approximately 19,000 acres) between State Road (SR) 29 and the western boundary of the original Preserve. When unspecified, the “Addition” refers to lands in both areas. The Addition also includes private lands (inholdings), some of which are exempt from NPS acquisition (NPS 2010a).

See figure 1-1 for a map depicting the limits of the original Preserve boundaries and the Addition.

Hunting Management Background

The NPS and the FWC have been partners in fulfilling the legislative mandate that created the Preserve, namely, the preservation of traditional uses along with continual conservation of important natural resources within the Preserve boundaries. Resource management decisions, particularly those related to public hunting and recreational access, have evolved over the more than 30 years since the Preserve was created, and some of those changes have been directed toward improving conditions for the endangered Florida panther (*Puma concolor coryi*) and its primary prey, white-tailed deer (*Odocoileus virginianus*). Some of these changes include a

² From this point forward in the document, the “Preserve” refers to the entire Preserve which encompasses the original boundaries and the Addition, unless otherwise noted.

reduction in general gun hunting from 58 to 49 days; buck-only harvest with at least a 5-inch antler; elimination of dogs for deer and hog hunting; and mandatory hunter check-in/check-out system coupled with quota permits. In addition, elimination of quotas that were not being filled and allowance for take of Conditional Reptiles were considered expansion of hunting opportunities.

Scope of the Analysis

36 CFR 7.86 provides specific regulations for hunting, fishing, trapping, and gathering in Big Cypress National Preserve. Subsection (e) (1) states: “Hunting, fishing and trapping are permitted in accordance with the general regulations found in parts 1 and 2 of [36 CFR] and applicable Florida law governing Cooperative Wildlife Management Areas.” The enabling legislation (PL 93-440, as amended by PL 100-301) also dictates that public hunting shall be allowed in the Preserve. Since public hunting in the Preserve is mandated by the enabling legislation (not a discretionary activity unless specific “reasons of public safety, administration, floral and faunal protection and management, or public use and enjoyment” are identified), the NPS has prepared this *Hunting Management Plan*.

Both the GMP completed for the original Preserve in 1991 and the Addition GMP completed in 2010 articulated the need to manage hunting within the Preserve. Hunting is currently permitted within the original boundaries of the Preserve and is managed cooperatively by the NPS and FWC through the *NPS/FWC Cooperative Partnership Agreement* (see appendix B). The Addition has never been open to public hunting since its acquisition by the NPS; however, hunting occurred on private lands in the Addition prior to the acquisition of the lands by the NPS. In accordance with the GMP and the Addition GMP, the goal of this document is to develop a hunting management plan for the entire Preserve, including the Addition, and to analyze the impacts associated with three alternatives for managing hunting in the Preserve.

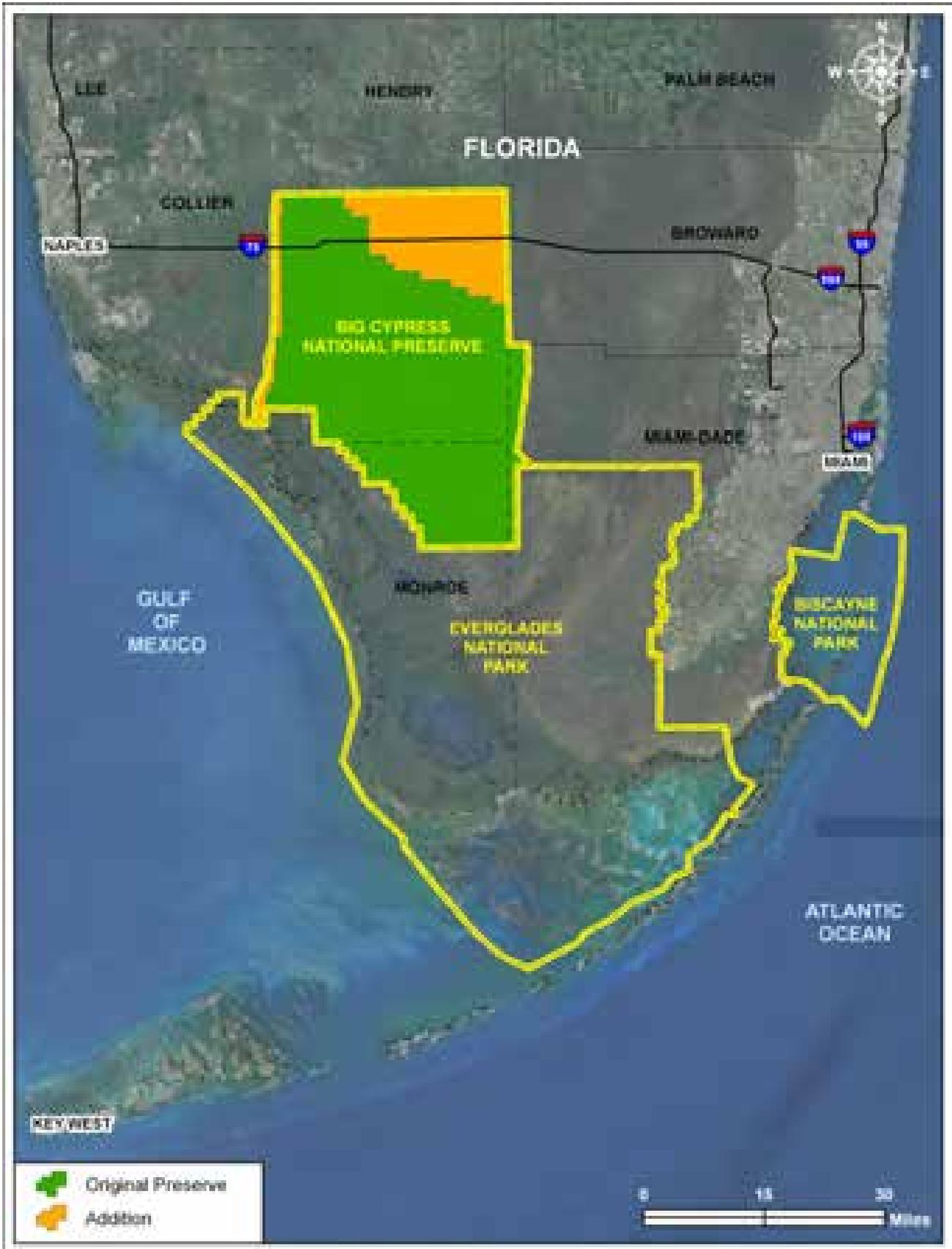


Figure 1-1 – Big Cypress National Preserve Location Map

PURPOSE AND NEED FOR ACTION

Throughout development of this *Hunting Management Plan/Environmental Assessment*, the project team [consisting of staff from the NPS, FWC, and U.S. Fish and Wildlife Service (USFWS)] considered many issues which might play a role in the future of hunting management in the Preserve. Two factors consistently appeared to be fundamental in the consideration of hunting management in the Preserve: the white-tailed deer population and the endangered Florida panther population in the Preserve. The white-tailed deer is the most important game species in the Preserve in addition to being the most common prey item for the Florida panther (NPS 2010a). Therefore, the purpose and need for action and the objectives in taking action (as well as the alternatives detailed in chapter 2) for this plan were developed with these two key issues in mind.

PURPOSE OF THE PROJECT

“Purpose” is an overarching statement of what the project must do to be considered a success (NPS 2011a). The project purpose was developed during the internal and public scoping portions of the project and is as follows:

To develop a hunting management plan for the Big Cypress National Preserve/Wildlife Management Area that allows the superintendent of the Preserve to provide for hunting opportunities in the Preserve in a manner that is in the best interest of the Preserve’s resources and the public, while meeting the requirements set forth by the NPS, the Preserve’s enabling legislation, the NPS/FWC Cooperative Partnership Agreement, and all applicable federal, state, and local laws and regulations.

NEED FOR ACTION

“Need for Action” describes why action is required (NPS 2011a). It summarizes the most important points of the planning issues and provides the reasons the project is needed at this time. The project need for action was developed during the internal and public scoping portions of the project.

A hunting management plan is needed for the Big Cypress National Preserve/Wildlife Management Area:

- *to provide clear and informational guidance for safe and responsible hunting within the Preserve to the public*
- *to provide for a visitor use experience that complies with the enabling legislation for the Preserve*
- *to manage the resources present in the Preserve*
- *to provide a framework for hunting management within the Preserve that meets the requirements set forth by the NPS, the Preserve’s enabling legislation, the NPS/FWC Cooperative Partnership Agreement, and all applicable federal, state, and local laws and regulations*

OBJECTIVES IN TAKING ACTION

“Objectives” are specific purpose statements that describe what must be accomplished to a large degree for the action to be considered a success (NPS 2011a). Based on a consideration of the purpose and need for action for the project, the following project objectives were developed during the internal and public scoping portions of the project:

1. *Provide guidelines for hunting within the Big Cypress National Preserve/Wildlife Management Area that satisfy all NPS regulations, the Preserve’s enabling legislation, the NPS/FWC Cooperative Partnership Agreement, and all applicable federal, state, and local laws and regulations and that maintain or improve the Preserve’s ability to contribute to the conservation of rare, threatened, and endangered species.*
2. *Provide a programmatic framework for facilitating agency communications and goal-setting that provides guidance over a number of years.*
3. *Utilize science-based resource management (e.g., habitat, wildlife, and protected species) for adaptive decision-making for:*
 - *the NPS and the FWC to collaborate and cooperate on the rule-making process regarding hunting*
 - *the NPS to take action independently, with notification to the FWC and USFWS as soon as practicable, for resource protection or public safety in certain cases (i.e., high water events, fires, threatened and endangered species issues), which may have an effect on hunting within the Preserve*
4. *Provide the public with clear and understandable information regarding:*
 - *hunting management within the Preserve*
 - *safe and responsible hunting practices*
5. *Manage opportunities for a positive visitor use experience for hunters and nonhunters.*
6. *Manage an array of access options to allow for a diversity of hunting opportunities within the framework of existing regulations and funding.*

PURPOSE OF AND SIGNIFICANCE OF BIG CYPRESS NATIONAL PRESERVE

ENABLING LEGISLATION

Big Cypress National Preserve was created by Congress on October 11, 1974 (PL 93-440) as one of the first two national preserves in the national park system, with 582,000 acres (see appendix A). The Big Cypress National Preserve Addition Act (PL 100-301) was passed on April 29, 1988, authorizing the addition of 147,000 acres to the Preserve. The enabling legislation (PL 93-440, as amended by PL 100-301) dictates that public hunting shall be allowed in the Preserve. See appendix A for a copy of the enabling legislation (PL 93-440, as amended by PL 100-301) in its entirety.

The enabling legislation (PL 93-440, as amended by PL 100-301) states:

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled, That (a) in order to assure the preservation, conservation, and protection of the natural, scenic, hydrologic, floral and faunal, and recreational values of the Big Cypress Watershed in the State of Florida and to provide for the enhancement and public enjoyment thereof, the Big Cypress National Preserve is hereby established.

Section 4 (b) of the enabling legislation (PL 93-440, as amended by PL 100-301) states:

In administering the Preserve, the Secretary shall develop and publish in the Federal Register such rules and regulations as he deems necessary and appropriate to limit or control the use of Federal lands and waters with respect to:

- (1) motorized vehicles,
- (2) exploration for and extraction of oil, gas, and other minerals,
- (3) grazing,
- (4) draining or constructing of works or structures which alter the natural water courses,

- (5) agriculture,
- (6) hunting, fishing, and trapping,
- (7) new construction of any kind, and
- (8) such other uses as the Secretary determines must be limited or controlled in order to carry out the purposes of this Act: Provided, That the Secretary shall consult and cooperate with the Secretary of Transportation to assure that necessary transportation facilities shall be located within existing or reasonably expanded rights-of-way and constructed within the reserve in a manner consistent with the purposes of this Act.

Section 5 of the enabling legislation (PL 93-440, as amended by PL 100-301) states:

The Secretary shall permit hunting, fishing, and trapping on lands and water under his jurisdiction within the Preserve and the Addition in accordance with the applicable laws of the United States and the State of Florida, except that he may designate zones where and periods when no hunting, fishing, trapping, or entry may be permitted for reasons of public safety, administration, floral and faunal protection and management, or public use and enjoyment. Except in emergencies, any regulations prescribing such restrictions relating to hunting, fishing, or trapping shall be put into effect only after consultation with the appropriate State agency having jurisdiction over hunting, fishing, and trapping activities. Notwithstanding this section or any other provision of this Act, members of the Miccosukee Tribe of Indians of Florida and members of the Seminole Tribe of Florida shall be permitted, subject to reasonable regulations established by the Secretary, to continue their usual and customary use and occupancy of Federal or federally acquired lands and waters within the Preserve and the Addition, including hunting, fishing, and trapping

on a subsistence basis and traditional tribal ceremonies.

Section 10 of the enabling legislation (PL 93-440, as amended by PL 100-301) states:

The Secretary and other involved Federal agencies shall cooperate with the State of Florida to establish recreational access points and roads, rest and recreation areas, wildlife protection, hunting, fishing, frogging and other traditional opportunities in conjunction with the creation of the Addition and in the construction of Interstate Highway 74. Three of such access points shall be located within the Preserve (including the Addition).

Since public hunting in the Preserve is mandated by the enabling legislation (not a discretionary activity unless specific “reasons of public safety, administration, floral and faunal protection and management, or public use and enjoyment” are identified), the NPS has prepared this *Hunting Management Plan*.

PURPOSE STATEMENTS

Purpose statements are based on the Preserve’s legislation, legislative history, and NPS policies. The statements reaffirm the reasons for which the Preserve was set aside as a unit of the national park system and provide the foundation for Preserve management and use (NPS 2010a).

The purpose of Big Cypress National Preserve, as stated in the enabling legislation,

... is to assure the preservation, conservation, and protection of the natural, scenic, hydrologic, floral and faunal, and recreational values of the Big Cypress Watershed in the State of Florida and to provide for the enhancement and public enjoyment thereof.

SIGNIFICANCE STATEMENTS

Significance statements capture the essence of the Preserve’s importance to our country’s natural and cultural heritage. Significance statements do not inventory Preserve resources; rather, they describe the Preserve’s distinctiveness and help to place the Preserve within its regional, national, and international contexts. Significance statements answer questions such as: “Why are the Preserve’s resources distinctive?” and “What do they contribute to our natural/cultural heritage?” Defining the Preserve’s significance helps managers make decisions that preserve the resources and values necessary to accomplish the purpose of the Preserve (NPS 2010a).

The significance of Big Cypress National Preserve, as stated in the Addition GMP (NPS 2010a) is as follows:

Big Cypress National Preserve, including the Addition, contains vestiges of primitive southwest Florida. It is significant as a unit of the national park system because it:

- *is a large wetland mosaic that supports a vast remnant of vegetation types found only in this mix of upland and wetland environments*
- *contains the largest strands of dwarf cypress in North America*
- *is habitat for the Florida panther and other animal and plant species that receive special protection or are recognized by the state of Florida, the U.S. government, or the Convention on International Trade in Endangered Species*
- *provides opportunities for the public to pursue recreational activities in a subtropical environment*
- *is home to the Miccosukee Tribe of Indians of Florida and Seminole Tribe of Florida and sustains resources that are important to their cultures*
- *is a watershed that is an important component to the survival of the greater Everglades ecosystem (NPS 2010a).*

LAWS, REGULATIONS, AND POLICIES

Numerous laws, regulations, and policies at the federal, state, and local levels guide the decisions and actions regarding this EA. Some of the primary examples of these legal and regulatory constraints and bounds follow.

NATIONAL PARK SERVICE

National Park Service Organic Act (1916)

The National Park Service Organic Act (1916) (16 USC § 1-4) created the NPS with the direction to:

...conserve the scenery and the natural and historic objects and the wild life therein and to provide for the enjoyment of the same in such manner and by such means as will leave them unimpaired for the enjoyment of future generations.

General Authorities Act (1970)

The purpose of the General Authorities Act (1970) (16 USC § 2, 3, and 4) was to include all areas administered by the NPS in one national park system and to clarify the authorities applicable to the system. Areas of the national park system, the act states:

... though distinct in character, are united through their inter-related purposes and resources into one national park system as cumulative expressions of a single national heritage; that, individually and collectively, these areas derive increased national dignity and recognition of their superb environmental quality through their inclusion jointly with each other in one national park system preserved and managed for the benefit and inspiration of all people of the United States...

Redwood National Park Act (1978)

The Redwood National Park Act (16 USC § 79a) reasserted the system-wide standard of protection prescribed by Congress in the original Organic Act. It states:

Congress further reaffirms, declares, and directs the promotion and regulation of the various areas of the National Park System...shall be consistent with and founded in the purpose established by the first section of the Act of August 25, 1916, to the common benefit of all the people of the United States. The authorization of activities shall be construed and the protection, management, and administration of these areas shall be conducted in light of the high public value and integrity of the National Park System and shall not be exercised in derogation of the values and purposes for which these various areas have been established, except as may have been or shall be directly and specifically provided by Congress.

National Parks Omnibus Management Act (1998)

The National Parks Omnibus Management Act (16 USC § 5901, et seq.) provides direction for articulating and connecting resource management decisions to the analysis of impacts, using appropriate technical and scientific information. The purpose of this act is:

- (1) *to more effectively achieve the mission of the NPS*
- (2) *to enhance management and protection of national park resources by providing clear authority and direction for the conduct of scientific study in the national park system and to use the information gathered for management purposes*

- (3) *to ensure appropriate documentation of resource conditions in the national park system*
- (4) *to encourage others to use the national park system for study to the benefit of park management as well as broader scientific value, where such study is consistent with the [NPS Organic Act]*
- (5) *to encourage the publication and dissemination of information derived from studies in the national park system*

Nonconflicting State laws are adopted as a part of these regulations.

(c) Except in emergencies or in areas under the exclusive jurisdiction of the United States, the superintendent shall consult with appropriate State agencies before invoking the authority of §1.5 for the purpose of restricting hunting and trapping or closing park areas to the taking of wildlife where such activities are mandated or authorized by Federal statutory law.

(d) The superintendent may establish conditions and procedures for transporting lawfully taken wildlife through the park area. Violation of these conditions and procedures is prohibited.

(e) The Superintendent may designate all or portions of a park area as closed to the viewing of wildlife with an artificial light. Use of an artificial light for purposes of viewing wildlife in closed areas is prohibited.

(f) Authorized persons may check hunting and trapping licenses and permits; inspect weapons, traps and hunting and trapping gear for compliance with equipment restrictions; and inspect wildlife that has been taken for compliance with species, size and other taking restrictions.

(g) The regulations contained in this section apply, regardless of land ownership, on all lands and waters within a park area that are under the legislative jurisdiction of the United States.

**Code of Federal Regulations, Title 36:
Parks, Forests, and Public Property**

36 CFR 2.2 provides regulations governing wildlife protection in NPS units. 36 CFR 2.2 (a) prohibits “the taking of wildlife, except by authorized hunting and trapping activities conducted in accordance with paragraph (b) of [36 CFR 2.2].” 36 CFR 2.2 (b-g) state:

(b) Hunting and trapping.

(1) Hunting shall be allowed in park areas where such activity is specifically mandated by Federal statutory law.

(2) Hunting may be allowed in park areas where such activity is specifically authorized as a discretionary activity under Federal statutory law if the superintendent determines that such activity is consistent with public safety and enjoyment, and sound resource management principles. Such hunting shall be allowed pursuant to special regulations.

(3) Trapping shall be allowed in park areas where such activity is specifically mandated by Federal statutory law.

(4) Where hunting or trapping or both are authorized, such activities shall be conducted in accordance with Federal law and the laws of the State within whose exterior boundaries a park area or a portion thereof is located.

Further, 36 CFR 7.86 provides specific regulations for hunting, fishing, trapping, and gathering in Big Cypress National Preserve. Subsection (e) (1) states: “Hunting, fishing and trapping are permitted in accordance with the general regulations found in parts 1 and 2 of [36 CFR] and applicable Florida law governing Cooperative Wildlife Management Areas.”

Management Policies

The NPS *Management Policies* (2006a) establishes servicewide policies for the preservation, management, and use of park resources and facilities. These policies provide guidelines and direction for management of resources within the Preserve. The alternatives considered in this EA incorporate and comply with the provisions of these mandates and policies.

Chapter 1 (section 1.4) of NPS *Management Policies* (2006a) requires analysis of potential effects to determine whether or not proposed actions would impair park resources and values. Section 1.4.3 of NPS *Management Policies* (2006a) states:

The fundamental purpose of the national park system, established by the Organic Act and reaffirmed by the General Authorities Act, as amended, begins with a mandate to conserve park resources and values. This mandate is independent of the separate prohibition on impairment and applies all the time with respect to all park resources and values, even when there is no risk that any park resources or values may be impaired. NPS managers must always seek ways to avoid, or to minimize to the greatest extent practicable, adverse impacts on park resources and values. However, the laws do give the [NPS] the management discretion to allow impacts to park resources and values when necessary and appropriate to fulfill the purposes of a park, so long as the impact does not constitute impairment of the affected resources and values.

The fundamental purpose of all parks also includes providing for the enjoyment of park resources and values by the people of the United States. The enjoyment that is contemplated by the statute is broad; it is the enjoyment of all the people of the United States and includes enjoyment both by people who visit parks and by those who appreciate them from afar. It also includes deriving benefit (including scientific knowledge) and inspiration

from parks, as well as other forms of enjoyment and inspiration. Congress, recognizing that the enjoyment by future generations of the national parks can be ensured only if the superb quality of park resources and values is left unimpaired, has provided that when there is a conflict between conserving resources and values and providing for enjoyment of them, conservation is to be predominant. This is how courts have consistently interpreted the Organic Act.

The discretion of the NPS discussed above is limited by the statutory requirement that the NPS must leave resources and values unimpaired unless a particular law directly and specifically provides otherwise. The prohibited impairment is an impact that would, in the professional judgment of the responsible NPS manager, harm the integrity of a park unit's resources or values, and violate the 1916 NPS Organic Act's mandate (NPS *Management Policies*, 2006a, section 1.4.5). An impact on a park unit's resource or value may, but does not necessarily, constitute an impairment. An impact is more likely to constitute impairment to the extent that it affects a resource or value whose conservation is:

- necessary to fulfill specific purposes identified in the establishing legislation or proclamation of the park, or
- key to the natural or cultural integrity of the park or to opportunities for enjoyment of the park, or
- identified in the park's general management plan or other relevant NPS planning documents as being of significance.

An impact would be less likely to constitute impairment if it is an unavoidable result of an action necessary to preserve or restore the integrity of park resources or values and it cannot be further mitigated. Impairment may result from visitor activities; NPS administrative activities; or activities undertaken by concessioners, contractors, and others operating in the park unit. Impairment may also result from sources or activities

outside the park unit. A determination on impairment is made for each impact topic related to the park unit's cultural and natural resources. A determination of impairment is not required for impact topics such as visitor experience, regional socioeconomics, and NPS operations. The determination of nonimpairment for the selected alternative will be attached to the decision document at the completion of the planning process.

Chapter 2 of *NPS Management Policies* (2006a) states:

Park planning helps define the set of resource conditions, visitor experiences, and management actions that, taken as a whole, will best achieve the mandate to preserve resources unimpaired for the enjoyment of present and future generations. NPS planning processes will flow from broad-scale general management planning through progressively more specific strategic planning, implementation planning, and annual performance planning and reporting, all of which will be grounded in foundation statements (NPS 2006a).

This planning process occurs through general principles laid out by the NPS for decision-making; scientific, technical, and scholarly analysis; public participation; and goal orientation. Chapter 2 of the *NPS Management Policies* states:

The National Park Service will use planning to bring logic, analysis, public involvement, and accountability into the decision-making process. Park planning and decision-making will be conducted as a continuous, dynamic cycle, from broad visions shared with the public to individual, annual work assignments and evaluations ... Decision-makers and planners will use the best available scientific and technical information and scholarly analysis to identify appropriate management actions for protection and use of park resources. Analysis will be interdisciplinary and tiered ... The [NPS] will actively seek out and consult with existing and potential visitors, neighbors,

American Indians, other people with traditional cultural ties to park lands, scientists and scholars, concessioners, cooperating associations, gateway communities, other partners, and government agencies... Managers will be held accountable for identifying and accomplishing measurable long-term goals and annual goals that are incremental steps to carrying out the park mission. Such planning is a critical and essential part of the NPS performance management system that is designed to improve the Park Service's performance and results (NPS 2006a).

Section 4.4.1 of *NPS Management Policies* (2006a) outlines how the NPS maintains native plants and animals in park units and states:

The [NPS] will successfully maintain native plants and animals by:

- *preserving and restoring the natural abundances, diversities, dynamics, distributions, habitats, and behaviors of native plant and animal populations and the communities and ecosystems in which they occur;*
- *restoring native plant and animal populations in parks when they have been extirpated by past human-caused actions; and*
- *minimizing human impacts on native plants, animals, populations, communities, and ecosystems, and the processes that sustain them.*

Section 4.4.3 of *NPS Management Policies* provides guidance on harvest of plants and animals by the public and states, in part:

Public harvesting of designated species of plants and animals, or their components, may be allowed in park units when

- *hunting, trapping, subsistence use, or other harvesting is specifically authorized by statute or regulation and not subsequently prohibited by regulation ...*

Where harvesting is allowed and subject to NPS control, the [NPS] will allow harvesting only when (1) the monitoring requirement contained in section 4.4.2 and the criteria in section 4.4.2.1 ... have been met, and (2) the [NPS] has determined that the harvesting will not unacceptably impact park resources or natural processes, including the natural distributions, densities, age-class distributions, and behavior of

- harvested species
- native species that the harvested species use for any purpose, or
- native species that use the harvested species for any purpose

In consultation and cooperation, as appropriate, with individual state or tribal governments, the [NPS] will manage harvesting programs and any associated habitat management programs intended to restore and maintain habitats supporting harvested plant or animal populations to conform with applicable federal and state regulations.

Habitat manipulation for harvested species may include the restoration of a disturbed area to its natural condition so it can become self-perpetuating, but this will not include the artificial manipulation of habitat to increase the numbers of a harvested species above its natural range in population levels.

The [NPS] may encourage the intensive harvesting of exotic species in certain situations when needed to meet park management objectives.

The [NPS] does not engage in activities to reduce the numbers of native species for the purpose of increasing the numbers of harvested species (i.e., predator control), nor does the [NPS] permit others to do so on lands managed by the [NPS].

The [NPS] manages harvest to allow for self-sustaining populations of harvested

species and does not engage in the stocking of plants or animals to increase harvest. In some special situations, the [NPS] may stock native or exotic animals for recreational harvesting purposes, but only when such stocking will not unacceptably impact park natural resources or processes and [in accordance with designated exceptions]... (NPS 2006a)

Section 8.2.2.6 of NPS Management Policies provides guidance on hunting and trapping:

Hunting, trapping, or any other methods of harvesting wildlife by the public will be allowed where it is specifically mandated by federal law. Where hunting activity is not mandated but is authorized on a discretionary basis under federal law, it may take place only after the [NPS] has determined that the activity is an appropriate use and can be managed consistent with sound resource management principles.

Hunting and trapping, whether taking place as a mandated or a discretionary activity, will be conducted in accordance with federal law and applicable laws of the state or states in which a park is located ... Before the [NPS] issues regulations or other restrictions, representatives of appropriate tribes and state and federal agencies will be consulted to ensure that all available scientific data are considered in the decision-making process. Any such regulations or other restrictions will be developed with public involvement.

The [NPS's] cooperative consultation concerning fish and wildlife management will be consistent with departmental policy at 43 CFR Part 24. This policy recognizes the broad authorities and responsibilities of federal and state agencies with regard to the management of the nation's fish and wildlife resources, and promotes cooperative management relationships among these agencies. In particular, the policy calls on the [NPS] to consult with state agencies on certain fish

and wildlife management actions, and encourages the execution of memoranda of understanding as appropriate to ensure the conduct of programs that meet mutual objectives as long as they do not conflict with federal law or regulation.
(NPS 2006a)

National Park Service Director's Orders

Director's orders, handbooks, and reference manuals issued by the NPS supplement and enhance the enabling legislation and *Management Policies*. The following director's orders were applicable to the development of this EA.

- Director's Order 6: *Interpretation and Education* (NPS 2005a)
- Director's Order 9: *Law Enforcement Program* (NPS 2009)
- Director's Order 11B: *Ensuring Quality of Information* (NPS 2005b)
- Director's Order 12: *Conservation Planning, Environmental Impact Analysis, and Decision-Making* (NPS 2011a)
- Director's Order 17: *Tourism* (NPS 1999)
- Director's Order 28: *Cultural Resource Management*
- Director's Order 41: *Wilderness Stewardship* (NPS 2011b)
- Director's Order 42: *Accessibility for Park Visitors with Disabilities in NPS Programs and Services* (NPS 2000b)
- Director's Order 47: *Sound Preservation and Noise Management* (NPS 2000c)
- Director's Order 54: *Management Accountability*(NPS 2003a)
- Director's Order 75A: *Civic Engagement and Public Involvement* (NPS 2007)
- Director's Order 82: *Public Use Data Collecting and Reporting* (NPS 2004)

National Park Service Director's Order

12. Director's Order 12: *Conservation Planning, Environmental Impact Analysis, and Decision-Making* and the associated handbook lay the groundwork for how the NPS complies with the National Environmental

Policy Act (NEPA). Director's Order 12 and the handbook set forth a planning process for incorporating scientific and technical information and establishing a solid administrative record for NPS projects (NPS 2011a).

Director's Order 12 requires that impacts to the Preserve's resources be analyzed in terms of their context, duration, and intensity. It is crucial for the public and decision-makers to understand implications of those impacts in the short and long-term, cumulatively, and in context, based on an understanding and interpretation by resource professionals and specialists (NPS 2011a).

OTHER FEDERAL LAWS AND EXECUTIVE ORDERS

The following laws, Executive Orders (EO), regulations, and policies were also considered in developing this EA.

National Environmental Policy Act (1969)

Section 102(2) (c) of the National Environmental Policy Act (42 USC § 4321) requires that an environmental analysis be prepared for proposed federal actions that may significantly affect the quality of the human environment or are major or controversial federal actions. The National Environmental Policy Act is implemented through regulations of the Council on Environmental Quality (CEQ) (40 CFR 1500-1508), U.S. Department of the Interior (43 CFR Part 46), and Department Manual 516. The U.S. Department of the Interior and the NPS have, in turn, adopted procedures to comply with the act and the CEQ regulations. Section 102(2) (c) of this act requires that a detailed environmental analysis be prepared for proposed major federal actions that may significantly affect the quality of the human environment. Hunting management within the Preserve is considered a major federal action; therefore, a NEPA analysis and documentation is required.

Endangered Species Act (1973)

The Endangered Species Act (16 USC § 1531-1543) requires all federal agencies to consult with the Secretary of the Interior on all projects and proposals with the potential to impact federally endangered or threatened plants and animals. It also requires federal agencies to use their authorities in furtherance of the purposes of the Endangered Species Act by carrying out programs for the conservation of endangered and threatened species and to ensure that any agency action authorized, funded, or carried out by the agency is not likely to jeopardize the continued existence of any endangered species or threatened species or result in the destruction or adverse modification of designated critical habitat. This act was reviewed in the development of this EA for impacts to federally endangered and threatened species, including the Florida panther.

Migratory Bird Treaty Act (1918)

The Migratory Bird Treaty Act (16 USC § 703–712), as amended, implements various treaties and conventions between the U.S. and Canada, Japan, Mexico, and the former Soviet Union for the protection of migratory birds. Under the act, taking, killing, or possessing migratory birds is unlawful, except as permitted by regulation. Migratory birds, part, eggs, and nests are all included in the protection afforded by this act. This act was reviewed in the development of this EA for impacts to migratory birds found in the Preserve.

Firearms in National Park System Units (Credit Card Accountability Responsibility and Disclosure Act) (2009)

This federal law (16 USC § 512) instated in 2010 permits persons who can legally possess firearms under applicable federal, state, and local laws to legally possess firearms in national park system units, including the Preserve. Under this law, U.S. residents who possess a state-issued concealed weapons

permit in Florida or who possess a state-issued concealed weapons permit from another state which shares concealed weapons permit reciprocity with Florida may possess concealed firearms within the Preserve. Possession of these firearms is regulated by Florida statutes. Additionally, federal law still prohibits firearms in certain facilities in the Preserve; those places are marked with signs at all public entrances.

Lacey Act (1900)

The Lacey Act (16 USC § 3371-3378), as amended, makes it illegal to “import, export, transport, sell, receive, acquire, or purchase any fish or wildlife or plant taken, possessed, transported, or sold in violation of any law, treaty, or regulation of the United States or in violation of any Indian tribal law.” This law would apply to some of the nonnative species that occur in the Preserve, such as the Burmese python (*Python molurus bivittatus*). This act was reviewed in the development of this EA since some of the alternatives considered could potentially allow the option of future hunting of species listed in this act.

National Historic Preservation Act (1966)

The National Historic Preservation Act (16 USC § 470) was enacted to preserve historical and archaeological sites in the U.S. This act created the National Register of Historic Places, the list of National Historic Landmarks, and the State Historic Preservation Offices. The National Historic Preservation Act requires federal agencies to consider the effects of their undertakings on properties listed or potentially eligible for listing on the National Register of Historic Places. In accordance with this act, coordination was conducted with the State Historic Preservation Officer (SHPO) for this EA.

Rehabilitation Act (1973)

The Rehabilitation Act (29 USC § 791 and 794) states:

No otherwise qualified individual with a disability in the United States shall, solely by reason of disability, be excluded from the participation in, be denied the benefits of, or be subject to discrimination under any program or activity conducted by Federal Financial Assistance or by any Executive Agency.

As stated in Director's Order 42 (NPS 2000b):

This means the NPS not only has to be concerned with enabling people with disabilities to have access to parks and facilities but, once there, the NPS also needs to do everything feasible to enable them to receive as close to the same benefits as those received by other visitors. This also means our obligation extends to individuals with visual impairments, hearing impairments, and cognitive impairments, as well as those with mobility impairments.

This act was reviewed in the development of this EA to ensure compliance with both the act and Director's Order 42.

Wilderness Act (1964)

The Wilderness Act (16 USC § 1131-1136) established a National Wilderness Preservation System, "administered for the use and enjoyment of the American people in such manner as would leave them unimpaired for future use and enjoyment as wilderness, and so as to provide for the protection of these areas, the preservation of their wilderness character, and for the gathering and dissemination of information regarding their use and enjoyment as wilderness." Lands identified as being suitable for wilderness designation, wilderness study areas, proposed wilderness, and recommended wilderness (including potential wilderness) must also be managed to preserve their wilderness

character and values in the same manner as "designated wilderness" until Congress has acted on the recommendations (NPS 2011a). Since proposed designated wilderness and eligible wilderness exists in the Addition, this act was reviewed in the development of this EA.

Executive Order 13112 – Invasive Species

This EO requires federal agencies to prevent the introduction of invasive species, provide for their control, and to minimize the economic, ecological, and human health impacts that invasive species may cause. Since hunting management activities could potentially have an impact on invasive species in the Preserve, this EO was reviewed in the development of this EA.

Executive Order 13423 – Strengthening Environmental, Energy, and Transportation Management

Executive Order 13423 consolidates and strengthens the sustainable practices of EOs 13101, 13123, 13134, 13148, and 13149. Executive Order 13423 requires federal agencies to lead by example in advancing the nation's energy security and environmental performance. It requires federal agencies to "conduct their environmental, transportation, and energy-related activities under the law in support of their respective missions in an environmentally, economically and fiscally sound, integrated, continuously improving, efficient, and sustainable manner." It includes requirements for the reduction of greenhouse gases and other energy and water conservation measures. The order requires agencies to reduce greenhouse gas emissions by 3% annually through the end of fiscal year 2015, or 30% by the end of fiscal year 2015, relative to the baseline of the agency's energy use in fiscal year 2003. This EO was reviewed in the development of this EA to ensure that the NPS is compliant.

Executive Order 13443 – Facilitation of Hunting Heritage and Wildlife Conservation

This EO directs the U.S. Department of the Interior and its component agencies, bureaus, and offices “to facilitate the expansion and enhancement of hunting opportunities and the management of game species and their habitat.” Since this EO directly relates to providing hunting opportunities and the management of game species and their habitat, it was reviewed during the development of this EA.

Executive Order 13514 – Federal Leadership in Environmental, Energy, and Economic Performance

Executive Order 13514 enhances EO 13423, which requires federal agencies to improve energy efficiency, reduce water consumption, and achieve other sustainability goals. All the provisions of EO 13423 remain in effect. Executive Order 13514 introduces new greenhouse gas emissions management requirements, expands water reduction requirements for federal agencies, and addresses waste diversion, local planning, sustainable buildings, environmental management, and electronics stewardship. This EO was reviewed in the development of this EA to ensure that the NPS is compliant.

STATE LAWS AND EXECUTIVE ORDERS

Florida Fish and Wildlife Conservation Commission, Big Cypress Wildlife Management Area Regulations Summary and Area Map (July 1, 2013 – June 30, 2014)

Current hunting regulations in the Preserve are set forth in FAC 68A and outlined for the public in the *FWC Big Cypress WMA Regulations Summary and Area Map (July 1, 2013 – June 30, 2014)* brochure (see appendix C), which states:

Persons using wildlife management areas are required to have appropriate licenses, permits and stamps. The following persons are exempt from all license and permit requirements (except for quota permits when listed as “no exemptions,” recreational use permits, antlerless deer permits and the Migratory Bird Hunting and Conservation Stamp [federal duck stamp]): Florida residents who are 65 years of age or older; residents who possess a Florida Resident Disabled Person Hunting and Fishing Certificate; residents in the U.S. Armed Forces, not stationed in Florida, while home on leave for 30 days or less, upon submission of orders; and children under 16 years of age. Children under 16 years of age are exempt from the federal duck stamp. Anyone born on or after June 1, 1975 and 16 years of age or older must have passed a Commission-approved hunter-safety course prior to being issued a hunting license, except the Hunter Safety Mentoring exemption allows anyone to purchase a hunting license and hunt under the supervision of a licensed hunter, 21 years of age or older, for one year.

The brochure provides detailed information on quota permit information, ORV permit requirements, general area regulations, public access and vehicles, check stations, dogs, camping, bag and possession limits, archery season, muzzleloading gun season, general gun season, small game season, trapping (which is prohibited), spring turkey season, migratory bird seasons, fishing and frogging (not covered as part of this plan), and general NPS rules and information (FWC 2013a).

Florida Endangered and Threatened Species Act

The state of Florida regulates the protection of threatened and endangered species through the Florida Endangered and Threatened Species Act (FS § 379.2291-379.231). This act is the primary regulation in the state, and sets the policy to conserve and wisely manage these resources, as well as provide for research and

management to conserve and protect these species as a natural resource. This act also emphasizes coordination with state agencies and outlines annual reporting requirements. This act was reviewed in the development of this EA for impacts to state-listed endangered and threatened species (including species of special concern).

Endangered Species Protection Act

The Endangered Species Protection Act (FS § 372.0725) prohibits the intentional wounding or killing of any fish or wildlife species designated by the FWC as endangered, threatened, or of special concern. This prohibition also extends to the intentional destruction of the nests or eggs of any such species. This act was reviewed in the development of this EA for impacts to state-listed endangered and threatened species (including species of special concern).

Preservation of Native Flora of Florida Act

The protection of endangered, threatened, or commercially exploited plants is addressed in the Preservation of Native Flora of Florida Act (FS § 581.185). Commercially exploited plants are defined as species native to the state which are subject to being removed in substantial numbers from native habitats in the state and sold or transported for sale. This act sets the policy for the state of Florida relating to these species and includes several prohibitions covering the “willful destroying or harvesting” of such plants. It also contains an exemption for agricultural and silviculture uses. Since hunting management could have an impact on native flora in the Preserve, this act was reviewed in the development of this EA.

Florida Coastal Management Act (1978)

The Florida Coastal Management Act authorized the development of the Florida Coastal Management Program. This program, approved in 1981, is charged with overseeing

the state’s coastal management program and administers the Coastal Zone Management Act within the state of Florida. This act applies to a small portion of the Preserve located along the coast of southwestern Florida.

Florida Fish and Wildlife Conservation Commission Executive Order 09-08

In 2009, FWC EO 09-08 was approved, which created the Partner with Hunters program to assist in the control of reptiles of concern, particularly the Burmese python, within the Preserve/WMA. The Partner with Hunters Program allows hunters to take reptiles of concern within the Preserve, in accordance with regulations outlined in the EO.

Florida Fish and Wildlife Conservation Commission Executive Order 10-37

Florida Fish and Wildlife Conservation Commission EO 10-37 places restrictions on deer hunting in the Stairsteps Unit, which are currently in place. Currently, in Zone 3 of the Stairsteps Unit, the bag limit for deer is one annually; hunting deer in Zone 4 of the Stairsteps Unit is prohibited.

RELATIONSHIP TO OTHER PLANS, POLICIES, AND ACTIONS

National Park Service Plans, Policies, and Actions

National Park Service plans, policies, and actions beyond those listed previously that may influence the *Hunting Management Plan* are provided below.

General Management Plan/Environmental Impact Statement (1991).

The GMP completed in 1991 for the original Preserve was mandated by the National Parks and Recreation Act (1978). This document guides visitor use, natural and cultural resource management, and general development for a period of 10 to 15 years. It

provides a clearly defined direction for resource management and preservation as well as appropriate visitor use and interpretation of the resources within the original Preserve boundaries. This document also articulated the need to manage hunting within the Preserve.

Addition Final General Management Plan/Wilderness Study/Off-Road Vehicle Management Plan/Environmental Impact Statement (2010).

The purpose of the Addition GMP, completed in 2010, is “to provide a comprehensive direction for resource preservation and visitor use and a basic foundation for decision-making for the Addition for the next 15 to 20 years” (NPS 2010a). The Addition GMP outlines diverse frontcountry and backcountry recreational opportunities, enhanced day use and interpretive opportunities along road corridors, and enhanced recreational opportunities with new facilities and services. A substantial amount of ORV access and riding opportunities and a moderate amount of proposed wilderness are also proposed in this document. This document also articulated the need for an independent plan to manage hunting within the Preserve.

Superintendent’s Compendium. This document outlines specific regulatory provisions established for the proper management and protection of resources and the public use of the Preserve. Regulations outlined in the *Superintendent’s Compendium* include those pertaining to closures and public use limits; permits; preservation of natural, cultural, and archeological resources; wildlife protection; and recreational uses and limitations.

Cooperative Partnership Agreement Between the National Park Service and the Florida Fish and Wildlife Conservation Commission (2010).

This agreement was established between the NPS and the FWC in regards to managing the Preserve in order to:

... focus the resources, expertise, skills, and abilities of the FWC and the NPS toward achieving the proper management of the lands and waters involved, the proper management of fish and wildlife resources, and the maximum public benefit from these endeavors.

This agreement states:

NPS and FWC will offer reasonable access as provided for in Public Law 93-440 and Public Law 100-301, allowing the public to engage in authorized traditional uses in the Preserve and the Addition such as hunting, fishing, camping and other wildlife-oriented recreational activities, which can be compatible with fish and wildlife conservation and are integral to fulfilling the mandate and intent of said public laws, without compromising the integrity of Preserve natural and cultural resources.

See appendix B for the full text of the *Cooperative Partnership Agreement Between the NPS and the FWC*.

Final Environmental Impact Statement and South Florida and Caribbean Parks Exotic Plant Management Plan (2010).

This plan outlines the management of nonnative plants in nine south Florida and Caribbean parks, including the Preserve. The plan promotes restoration of native plant communities and habitat conditions in ecosystems that have been invaded by nonnative plants and protects resources, values, visitors, staff, and area residents from adverse effects resulting from nonnative plant presence and control activities. The plan takes a collaborative approach to managing nonnative plants across the nine parks, improving effectiveness and efficiency and providing a consistent management framework for responding to this threat. The plan also seeks to establish plant and treatment location priorities, reduce new nonnative plant introductions, and reduce the number of individually targeted plants to protect natural resources (NPS 2010b).

Interstate 75 Recreational Access Plan/Environmental Assessment (1991).

The Addition Act directed the NPS to cooperate with the state to develop three recreation access points along Interstate 75 (I-75) within the Preserve, including the Addition. Many of the requirements and recommendations included in this access plan are incorporated in the 1991 GMP. The development of recreational access points along I-75 was also included as a component of the Addition GMP.

Land Protection Plan (1988). This plan was written in response to the May 1982 policy statement in the Federal Register regarding use of the federal portion of the Land and Water Conservation Fund. The monies were to be used to identify land and/or interests in land to be in federal ownership to achieve management purposes that include resource protection and public access in a cooperative, cost-effective manner. The plan identifies methods for protecting the Preserve's resources while taking into consideration public access and visitor experiences. Such resources include natural, historic, scenic, cultural, and recreational resources among others. Due to severance of subsurface oil and gas rights from the surface estate, oil and gas activities are not identified within the plan. The plan delineates the Preserve into zones and subzones for management purposes and outlines the acceptable activities on "improved property."

Long-Range Interpretive Plan (2002).

This plan provides the vision for visitor experiences in the Preserve based on the purpose, significance, and mission put forth in the "Preserve's Strategic Plan." The *Interpretive Plan* proposes both development and management activities to satisfy current visitor demands and identifies a media and activity action plan to meet future visitor needs. The interpretive plan was meant to guide the Preserve's interpretation direction for 10 years (NPS 2002a).

Recreational Off-road Vehicle Management Plan/Environmental Impact Statement (2000).

This plan is called for and directed by the 1991 GMP. It was also prepared to comply with the 1995 settlement agreement negotiated between the Florida Biodiversity Project and several agencies and bureaus. ORV use is allowed in the original Preserve by the enabling legislation in a manner that is compatible with resource preservation. The ORV plan outlines the management of recreational ORV use in the original 582,000 acres of the Preserve. It specifies that ORV travel is facilitated by a system of designated access points and trails; that sensitive areas be closed; that temporal and seasonal closures be instituted; and that permits and education be required to operate off-road vehicles in the original Preserve.

Resource Management Plan (n.d.). The original Preserve was established "to assure the preservation, conservation and protection of the natural, scenic, hydrologic, floral and faunal, and recreational values of the Big Cypress Watershed." The boundary of the Preserve was expanded in 1988 to include approximately 147,000 acres of adjacent tracts. This plan includes initial planning and resource inventorying for the Addition. Resource conditions in the Preserve vary from nearly pristine to areas where natural function no longer exists. The plan outlines issues within the Preserve, including natural resources, cultural resources, nonnative plants and wildlife, and the hydrologic environment. The plan emphasizes that conservation, restoration, and preservation must take place on an ecosystem scale.

Other Federal Plans, Policies, and Actions

Comprehensive Everglades Restoration Plan (CERP) (2000). This plan is a framework and guide to restore, protect, and preserve the water resources of central and southern Florida, including the Preserve. The plan was approved in the Water Resources Development Act (2000), and it is a component of the world's largest ecosystem

restoration effort, encompassing 16 counties and an 18,000-square-mile area. The comprehensive plan includes more than 60 elements designed to capture, store, and redistribute fresh water. Implementation of the comprehensive plan is expected take more than 30 years to complete and would improve the quality, quantity, timing, and distribution of water flows through the Preserve.

CERP Master Recreation Plan (2004). The *CERP Master Recreation Plan* takes “a system-wide approach to identify, evaluate, and address the impacts of CERP implementation on existing recreational use within the south Florida ecosystem and identify and evaluate potential new recreation, public use and public educational opportunities. A particular focus will be on the identification of additional public use and recreational opportunities to compensate for public use facilities that may be lost” [U.S. Army Corps of Engineers (USACE) and South Florida Water Management District (SFWMD) et al. 2004].

Florida Panther National Wildlife Refuge Comprehensive Conservation Plan (1998). The National Wildlife Refuge System Improvement Act of 1997 requires the USFWS to develop comprehensive conservation plans for all lands and waters of the National Wildlife Refuge System. The *Florida Panther National Wildlife Refuge Comprehensive Conservation Plan* meets the requirements of the act. The refuge was established to conserve fish, wildlife, and plants listed as endangered and/or threatened species under the Endangered Species Act of 1973, specifically the Florida panther. The Refuge abuts the northwest boundary of the Preserve and functions as a vital habitat linkage for panthers.

Interagency Florida Panther Response Plan (2008). The USFWS, in partnership with the NPS and the FWC, prepared a final response plan in October 2008 that includes guidelines for the agencies responding to human-panther interactions and depredations. The plan also provides guidelines for developing an outreach and education

program to help people understand panther behavior and actions humans should take when living or recreating in panther habitat.

Florida Panther Recovery Plan (2008). This recovery plan includes specific recovery objectives and criteria to be met in order to reclassify (downlist) and eventually delist the Florida panther under the Endangered Species Act. The plan also includes provisions that contemplate reintroduction of panthers in locations across the Southeast. Last updated in 2008, this is the third update of the plan since 1981 when the first plan was crafted. The revised plan supersedes the panther chapter in the USFWS’s Multi-Species Recovery Plan as well as its range-wide species recovery plan for the panther.

South Florida Multi-Species Recovery Plan (1999). This plan was written to recover multiple species by restoring ecological communities throughout the south Florida ecosystem (26,002 square miles). There are more than 600 species considered either rare or imperiled in south Florida, 68 of which are federally listed as threatened or endangered. A number of limiting factors for habitat-limited species are outlined, including habitat loss, fragmentation, and degradation as a result of urbanization, agriculture or other land-use conversions, wetland drainage and alteration of hydrological patterns, invasion of nonnative species, fire suppression, soil subsidence, degradation of water quality, and increased levels of contaminants. Recovery objectives are identified at the species level, while recovery criteria are identified at the species and community level. Recovery actions have been developed to provide consistency between each of the 68 species, and habitat level recovery actions have been developed to facilitate the integration of individual species needs at the community level. The plan does not replace existing approved species recovery plans, but rather outlines south Florida’s contribution to range-wide recovery. A number of threatened and endangered species reside within the Preserve, and the Preserve is a critical habitat link in the ecosystem.

Other State and Local Plans, Policies, and Actions

recreational opportunities and facilities, including hiking, bicycling, horseback riding, camping, fishing, and ORV use.

Conceptual Management Plan for the Everglades Complex of Wildlife Management Areas (2002).

The Everglades Complex is part of the Kissimmee-Okeechobee-Everglades basin and lies within three counties — southwestern Palm Beach, western Broward, and northwestern Miami-Dade. It includes three management areas — Holey Land, Rotenberger, and Everglades-Francis S. Taylor. Through a cooperative management agreement with the South Florida Water Management District, the FWC has management authority over Everglades Complex WMA lands (mainly lands in Water Conservation Areas 2 and 3) for game and fresh water fish preservation, protection, propagation, and recreational use. The plan lists 28 federal and state listed and endangered or threatened species and their habitat. The majority of the complex is east and northeast of the Preserve; however, the southwest corner of Everglades-Francis S. Taylor WMA abuts the eastern boundary of the Preserve from the Tamiami Ranger Station north to the Broward County line.

Growth Management Plan. This plan was required under the 1985 Florida Growth Management Act and is to be consistent with state and regional plans. The elements of this plan provide the framework to effectively guide future development, while providing for the protection of open space; natural resources; and public health, safety, and welfare. Development in Collier County directly impacts natural resources in the Preserve. Therefore, managed growth policies outlined in this plan are necessary to reduce negative impacts of development and ensure that the Preserve is protected for future generations.

State Comprehensive Outdoor Recreation Plan – Outdoor Recreation in Florida (2000). This plan assesses recreational supply, demand, and needs for 11 regions in the state. Region 9 (Southwest Florida) includes the Preserve and the surrounding area. The plan identifies goals for

ISSUES AND IMPACT TOPICS

ISSUES

The NPS Director's Order 12 Handbook defines an "issue" as a concern or obstacle to achieving a park goal (NPS 2001). In NEPA, an issue is any possible barrier to achieving the main goal of NEPA, to minimize effects of proposals on the human environment. Project issues may be any problem that could arise due to implementation of the no action alternative or an action alternative. The following issues were identified for this project and will be addressed as part of this EA:

- Hunting in the Addition could cause adverse environmental impacts on an area that contains unique natural resources that are protected by the NPS.
- Some members of the public believe that the Addition should be opened to hunting to allow opportunities for passing on hunting to younger generations, while others believe that hunting should not be allowed in the Addition in order to preserve the area for future generations.
- The deer population in the Preserve could be adversely impacted by allowing hunting in the Addition or changing the current hunting protocol within the original Preserve, which could adversely impact the Florida panther population in the Preserve since the deer are a main food source for the Florida panther.
- Allowing hunting in the Addition could create a perceived safety conflict for those visitors that wish to experience the Preserve's resources in the absence of hunting activities.
- Hunting in the Addition could adversely impact the visitor experience of nonhunting visitors in the Addition.
- Nonhunting activities in the Addition along with hunting could adversely impact the visitor experience of hunting visitors in the Addition.

ISSUES NOT ADDRESSED AS PART OF THIS PLAN

The scope of the alternatives considered in this EA is limited to recreational terrestrial hunting activities in the Preserve and the impacts associated with those activities. Direct impacts of the following issues are not addressed as part of this plan:

- fishing
- trapping
- frogging
- off-road vehicles

However, the cumulative impacts of these issues may be discussed in "Chapter 4: Environmental Consequences."

Additionally, it is important to note that the scope of this plan is limited to recreational hunting activities, and traditional uses in the Preserve by traditionally associated peoples are not addressed as part of this plan. The enabling legislation (PL 93-440, as amended by PL 100-301) states:

... members of the Miccosukee Tribe of Indians of Florida and members of the Seminole Tribe of Florida shall be permitted, subject to reasonable regulations established by the Secretary, to continue their usual and customary use and occupancy of Federal or federally acquired lands and waters within the Preserve and the Addition, including hunting, fishing, and trapping on a subsistence basis and traditional tribal ceremonies.

This *Hunting Management Plan* would not have any impacts on such customary use and occupancy, and hunting, fishing, and trapping on a subsistence basis by traditionally associated peoples would continue to be permitted, subject to existing laws and regulations.

IMPACT TOPICS SELECTED FOR ANALYSIS

The following impact topics are resources of concern that would be beneficially or adversely affected by the actions proposed under each alternative and are analyzed in this EA to ensure that the alternatives are evaluated and compared based on the most relevant topics. A brief rationale for the selection of each impact topic is given.

Natural Resources

Vegetation and Habitat. The NPS Organic Act and the NPS *Management Policies* (2006) direct national park system units to provide for the protection of Preserve resources. The NPS *Management Policies* (2006) states that “the [NPS] would not attempt to solely preserve individual species (except threatened or endangered species) or individual natural processes; rather, it would try to maintain all the components and processes of naturally evolving park ecosystems, including the natural abundance, diversity, and genetic and ecological integrity of the plant and animal species native to those ecosystems. Just as all components of a natural system would be recognized as important, natural change would also be recognized as an integral part of the functioning of natural systems” (NPS 2006a).

As stated in the Addition GMP (2010), and consistent with the 1991 GMP for the original Preserve boundaries, five major vegetation communities can be found in the Preserve: (1) cypress strands and domes, mixed-hardwood swamps, and sloughs, (2) prairies and marshes, (3) mangrove forests, (4) pinelands, and (5) hardwood hammocks. Disturbed areas can also be found throughout the Preserve and are intermixed within all of these vegetation communities. Numerous protected plant species can be found within these vegetative communities, as well as serving as habitat for the protected animal species found in the Preserve.

Actions associated with hunting activities and the proposed alternatives could have impacts

on the vegetation and habitat present in the Preserve. Therefore, this impact topic is analyzed in detail in this EA.

Rare, Threatened, and Endangered Species.

Rare, threatened, and endangered species in the Preserve are governed by several laws and policies, primarily the NPS Organic Act and the Endangered Species Act. The purpose of the Endangered Species Act is to conserve “the ecosystem upon which endangered and threatened species depend” and to conserve and recover listed species. This act mandates that all federal agencies protect listed species and preserve their habitats. NPS *Management Policies* (2006) also provides specific guidance for management of threatened or endangered plants and animals. These policies dictate that the NPS would survey for, protect, and strive to recover all species native to national park system units that are listed under the Endangered Species Act. Additionally, in the state of Florida, laws protecting rare, threatened, and endangered species include the Florida Endangered and Threatened Species Act, the Endangered Species Protection Act, and the Preservation of Native Flora of Florida Act.

A total of 29 animal species that could occur in the Preserve receive some level of special protection or are recognized as rare species by the state of Florida or the federal government. Ten of these 29 species are listed as either federally endangered or threatened and reside in the Preserve. The federally listed species present in the Preserve are the Florida panther (*Puma concolor coryi*) (endangered), West Indian manatee (*Trichechus manatus*) (endangered), Florida bonneted bat (*Eumops floridanus*) (endangered), Cape Sable seaside sparrow (*Ammodramus maritimus mirabilis*) (endangered), Everglade snail kite (*Rostrhamus sociabilis plumbeus*) (endangered), red-cockaded woodpecker (*Picoides borealis*) (endangered), wood stork (*Mycteria americana*) (endangered), American crocodile (*Crocodylus acutus*) (threatened), eastern indigo snake (*Drymarchon corais couperi*) (threatened), and American alligator (*Alligator*

mississippiensis) (threatened due to similarity of appearance). Additionally, critical habitat has been designated for the West Indian manatee in the Preserve.

Actions associated with hunting activities and the proposed alternatives could have impacts on the terrestrial and avian listed-species present in the Preserve. Therefore, this impact topic is analyzed in detail in this EA.

Wildlife. As stated in the Addition GMP, the Preserve contains 13 major game species. Of these, the white-tailed deer (*Odocoileus virginianus*), wild turkey (*Meleagris gallopavo osceola*), and feral hog (*Sus scrofa*) require special management considerations because of their importance to recreational hunters. White-tailed deer and feral hogs are also main prey species for the endangered Florida panther, while turkeys are taken by panthers opportunistically.

Actions associated with hunting activities and the proposed alternatives could have impacts on unprotected game species present in the Preserve. Therefore, this impact topic is analyzed in detail in this EA.

Nonnative/Invasive Species. The native plant communities that exist in the Preserve are considered an important resource. Nonnative/invasive plant species impact native species by outcompeting them – they aggressively take over disturbed habitats, expand their distribution and displace native species, use more water, and impact wildlife that depend on native plant communities and functional ecosystems. Nonnative/invasive plants can be distributed by recreational use and other activities, including hunting.

Hunting activities associated with the proposed alternatives could impact the native plant communities by potentially allowing the spread of nonnative/invasive species. Elements of the proposed alternatives could also have beneficial effects on the spread of nonnative/invasive species by helping to control the spread of certain nonnative/invasive plant and animal species.

Therefore, this impact topic is analyzed in detail in this EA.

Wilderness Resources

Wilderness. Wilderness in national park system units is governed by the Wilderness Act and NPS *Management Policies* (2006). NPS *Management Policies* (2006) requires that wilderness considerations be integrated into all planning documents to guide the preservation, management, and use of the Preserve’s wilderness area and ensure that wilderness is unimpaired for future use and enjoyment as such.

Summarizing the Wilderness Act (1964), wilderness character is generally present if an area is untrammeled, undeveloped, natural, and has outstanding opportunities for solitude or primitive and unconfined types of recreation. There is currently no designated wilderness in the Preserve. However, per the Addition GMP (2010), about 47,067 acres of land would be proposed for wilderness designation in the Addition. Lands identified as being suitable for wilderness designation, wilderness study areas, proposed wilderness, and recommended wilderness (including potential wilderness) must also be managed to preserve their wilderness character and values in the same manner as “designated wilderness” until Congress has acted on the recommendations (NPS 2011a).

Actions associated with hunting activities and the proposed alternatives could have impacts on the areas proposed for wilderness in the Addition. Therefore, this impact topic is analyzed in detail in this EA.

Visitor Use

Recreational Opportunities/Visitor Use and Experience. NPS *Management Policies* (2006) addresses “enjoyment of park resources and values by the people of the United States” as “part of the fundamental purpose of all parks.” The NPS is committed to “providing appropriate, high-quality

opportunities for visitors to enjoy the parks,” by maintaining “an atmosphere that is open, inviting, and accessible” (NPS 2006a). The primary recreational activities within the original Preserve boundaries include frontcountry driving, sightseeing, and visitor centers; walking and hiking; bird-watching and wildlife viewing; paddling; motorboating; camping; bicycling; ORV riding; hunting, fishing, and frogging; and opportunities to experience peace and quiet in a natural environment (NPS 2010a). Within the Addition, current recreational opportunities are limited to walking and hiking, bird-watching and wildlife viewing, paddling, limited bicycling and motorboating, camping, and opportunities to experience peace and quiet in a natural environment; however, per the preferred alternative in the Addition GMP, all of the above activities that are currently permitted within the original Preserve boundaries have been proposed for the Addition (NPS 2010a).

Both hunting and nonhunting recreational activities in the Preserve could be impacted by the proposed alternatives. Additionally, the visitor experience of both hunting and nonhunting visitors could be impacted by hunting activities associated with the proposed alternatives. Therefore, this impact topic is analyzed in detail in this EA. Opportunities to experience peace and quiet in a natural environment will also be analyzed as part of the Noise/Soundscapes impact topic.

Noise/Soundscapes. In accordance with NPS *Management Policies* (2006) and Director’s Order 47: *Sound Preservation and Noise Management* (NPS 2000c), an important part of the NPS mission is preservation of natural soundscapes associated with national park units. Natural soundscapes exist in the absence of human-caused sound. The natural ambient soundscape is the aggregate of all the natural sounds that occur in the Preserve, together with the physical capacity for transmitting natural sounds. As stated in Director’s Order 47, natural sounds are intrinsic elements of the environment. They are inherent components of the “scenery and the natural and historic objects and the wildlife” protected by the NPS

Organic Act. Natural sounds occur within and beyond the range of sounds that humans can perceive and can be transmitted through air, water, or solid materials.

Intrusive sounds are of concern to the NPS because they can impede the NPS’s ability to accomplish its mission. By definition, noise is human-caused sound that is considered unpleasant and unwanted. Whether a sound is considered unpleasant depends on the individual who hears the sound and the setting and circumstance under which the sound is heard. However, natural sounds throughout the Preserve – including flowing water, animals, and rustling leaves – are not considered noise.

Actions associated with hunting activities and the proposed alternatives, including the sound of firearm shots, could have impacts on the soundscape within the Preserve in the form of impacts to wildlife and nonhunting visitor use. Therefore, this impact topic is analyzed in detail in this EA.

Public Health and Safety. NPS *Management Policies* (2006) states that the NPS “will not intervene in natural biological or physical processes, except: when directed by Congress; in emergencies in which human life and property are at stake; to restore natural ecosystem functioning that has been disrupted by past or ongoing human activities; or when a park plan has identified the intervention as necessary to protect other park resources, human health and safety, or facilities.”

Hunting, similar to many other recreational activities, involves some potential safety risks. While the associated risks are primarily limited to those engaging in the activity and standard safety clothing and procedures are required to mitigate risks, there is also a potential for safety risks to nonhunting visitors at the Preserve.

Actions associated with hunting activities and the proposed alternatives could have impacts on the health and safety of both hunting and nonhunting visitors to the Preserve. Therefore, this impact topic is analyzed in detail in this EA.

NPS Management and Operations

Preserve Management and Operations.

Direction for management and operations at the Preserve is set forth in the Preserve's enabling legislation, *NPS Management Policies* (2006), the *Superintendent's Compendium*, and the two GMPs completed for the Preserve (the 1991 GMP for the original Preserve and the 2010 GMP for the Addition). Preserve management and operations refers to the current staff available to adequately protect and preserve resources and provide for an effective visitor experience, including education and interpretation, maintenance, and enforcement activities. This topic also includes the operating budget necessary to conduct Preserve operations.

All of the proposed alternatives could cause impacts to Preserve management and operations, especially in regards to enforcement activities. Therefore, this impact topic is analyzed in detail in this EA.

Socioeconomic Environment

Socioeconomics. Actions at the Preserve have the potential to affect local businesses and the local economy. As stated in the Addition GMP, Collier County is the primary geographic unit for analysis of the socioeconomic impacts in regards to the Preserve. However, actions at the Preserve also have the potential to cause socioeconomic impacts in Broward, Lee, Palm Beach, Hendry, Miami-Dade, and Monroe counties. Additionally, when data permit, socioeconomic impacts can also be analyzed for Everglades City, the Big Cypress Seminole Indian Reservation, and the Miccosukee Indian Reservation (NPS 2010a).

Since actions at the Preserve have the potential to affect the local economy, actions associated with allowance or prohibition of hunting activities in the Preserve as well as actions associated with regulating hunting activities in the Preserve could have socioeconomic impacts on surrounding areas, specifically

Collier County. Therefore, this impact topic is analyzed in detail in this EA.

IMPACT TOPICS DISMISSED FROM FURTHER ANALYSIS

Several potential impact topics were dismissed because they would not be affected, or the potential for impacts under all of the alternatives would be negligible. These topics are listed below, with an explanation of why they were dismissed from further analysis.

Natural Resources

Air Quality. The legal authority for federal programs regarding air pollution control is based on the 1990 Clean Air Act Amendments. These are the latest in a series of amendments made to the Clean Air Act. This legislation modified and extended federal legal authority provided by the earlier Clean Air Acts of 1963 and 1970. The Air Pollution Control Act of 1955 was the first federal legislation involving air pollution. This act provided funds for federal research in air pollution. The Clean Air Act of 1963 was the first federal legislation regarding air pollution control. In 1967, the Air Quality Act was enacted in order to expand federal government activities. The Air Quality Act of 1967 also authorized expanded studies of air pollutant emission inventories, ambient monitoring techniques, and control techniques (U.S. Environmental Protection Agency 2008). The Preserve has been designated a Class II area under the Clean Air Act. The Preserve is currently within a designated attainment area (i.e., concentrations are below standards) for criteria pollutants.

Upon review of these laws and the proposed alternatives associated with this EA, the contribution of pollutants resulting from implementation any of the alternatives would be negligible compared to current levels. Exhaust emissions could be produced by an increase in visitor use and subsequent vehicle use in the Preserve; however, these activities would not be expected to cause national ambient air quality standards to be exceeded

because visitation increases would be relatively minor. Any amount of pollutants added because of the actions proposed in the alternatives would be negligible compared to existing levels. Therefore, this impact topic is not analyzed in detail as a separate topic in this EA.

Geologic Resources. The geological resources (soils) in the Preserve are important to maintaining the ecological integrity of the Preserve. However, none of the alternatives being considered would alter the geologic features or processes within the Preserve. Therefore, this impact topic is not analyzed in detail as a separate topic in this EA.

Estuarine and Fisheries Resources. The Magnuson-Stevens Fishery Conservation and Management Act, as amended, is the primary law governing fisheries management in the Preserve. The Preserve contains important estuarine and fisheries resources. Recreational fishing in the Preserve is currently regulated by the FWC; no commercial fishing is allowed in the Preserve. This plan only addresses hunting management in regards to terrestrial areas of the Preserve (including terrestrial wildlife) and does not address estuarine or fisheries resources. Therefore, this impact topic is not analyzed in detail as a separate topic in this EA.

Water Quality or Quantity. National Park Service policies require protection of water resources in a manner consistent with the Clean Water Act. Both water quantity and water quality are important issues at Big Cypress National Preserve. None of the alternatives being considered would alter the Preserve's water quality or quantity. Therefore, this impact topic is not analyzed in detail as a separate topic in this EA.

Wetlands. The Preserve's wetlands are protected under the NPS Organic Act, NPS *Management Policies* (2006), EO 11990 ("Protection of Wetlands"), and Director's Order 77-1: *Wetland Protection* (NPS 2002b).

Upon review of these laws and policies and the proposed alternatives associated with this EA,

none of the alternatives would alter the Preserve's wetlands. Although terrestrial wildlife considered in this plan utilize wetland habitats in the Preserve, specific impacts to wetlands from hunting activities are not expected. In all of the alternatives, the NPS would continue to protect and conserve the Preserve's wetlands as required under the NPS Organic Act, NPS *Management Policies*, EO 11990, and Director's Order 77-1 (NPS 2002b). General impacts to vegetation and wildlife habitat that would occur across all habitat types will be analyzed in detail as part of the Vegetation and Habitat impact topic. Therefore, this impact topic is not analyzed in detail as a separate topic in this EA.

Floodplains. The Preserve's floodplains are protected under the NPS Organic Act, NPS *Management Policies* (2006), EO 11988 ("Floodplain Management"), and Director's Order 77-2: *Floodplain Management* (NPS 2003b).

Upon review of these laws and policies and the proposed alternatives associated with this EA, none of the alternatives would alter the Preserve's floodplains and impacts to floodplains from hunting activities are not expected. In all of the alternatives, the NPS would continue to protect and conserve the Preserve's floodplains as required under the NPS Organic Act, NPS *Management Policies*, EO Order 11988, and Director's Order 77-2 (NPS 2003b). Therefore, this impact topic is not analyzed in detail as a separate topic in this EA.

Night Sky/Lightscaapes. Since lighting is not a component of any of the proposed alternatives, no impacts to night sky would occur. Therefore, this impact topic is not analyzed in detail as a separate topic in this EA.

Prime or Unique Farmlands. The Farmland Protection Policy Act (7 USC 4201 et seq.) and the U.S. Department of the Interior Environmental Statement Memorandum ESM94-7 – Prime and Unique Agricultural Lands require an evaluation of impacts on prime or unique agricultural lands. Prime

farmland is soil that produces general crops such as common foods, forage, fiber, and oil seed; unique farmland produces specialty crops such as fruits, vegetables, and nuts.

No prime or unique farmlands exist in the Preserve according to the U.S. Department of Agriculture Natural Resources Conservation Service. Therefore, this impact topic is not analyzed in detail as a separate topic in this EA.

Cultural/Archeological Resources

Cultural Resources (Archeological Resources, Prehistoric/Historic Structures, and Cultural Landscapes).

Several laws govern cultural resources in the Preserve. Section 106 of the National Historic Preservation Act (1966) requires federal agencies to consider the effects of their undertakings on properties listed or potentially eligible for listing on the National Register of Historic Places. The Antiquities Act (1906) protects all historic and prehistoric sites on federal lands and prohibits excavation or destruction of such antiquities unless a permit is obtained. The Archeological Resources Protection Act (1979) protects prehistoric, historic, or archeological data. The Native American Graves Protection and Repatriation Act (1990) assigns ownership and control of Native American cultural items, human remains, and associated funerary objects to Native Americans; it also establishes requirements for the treatment of Native American human remains and sacred or cultural objects found on federal land. The American Indian Religious Freedom Act (1978) affirms the right of Native Americans to have access to their sacred places. The Secretary of the Interior's Standards for the Treatment of Historic Properties (1995) provides additional standards for preservation of historic properties.

Upon review of the above laws, since no ground disturbing activities are proposed as part of this *Hunting Management Plan*, no impacts are expected to occur to archeological

resources, historic structures, or cultural landscapes within the Preserve.

On August 5, 2011, a letter was sent to the SHPO, which provided information about the development of a hunting management plan for the Preserve and the opportunity to comment on the project. The State Historic Preservation Officer responded by letter on September 14, 2011, and stated that the scoping notice for the project was reviewed for possible impact to historic properties listed, or eligible for listing, in the National Register of Historic Places. The review was conducted in accordance with Section 106 of the National Historic Preservation Act of 1966, as amended and 36 CFR Part 800: Protection of Historic Properties. The SHPO letter concluded the following regarding the *Hunting Management Plan*:

Based on the information provided, it is the opinion of this office that the above-referenced undertaking will have no effect on historic properties.

Therefore, this impact topic is not analyzed in detail as a separate topic in this EA.

Ethnographic Resources. As defined by the NPS *Management Policies* (2006), ethnographic resources are the cultural and natural features of the Preserve that are of traditional significance to traditionally associated peoples. These peoples are the contemporary Preserve neighbors and ethnic or occupational communities that have been associated with the Preserve for two or more generations (40 years), and whose interests in the Preserve's resources began before the Preserve's establishment.

Regarding traditional uses in the Preserve by traditionally associated peoples, the enabling legislation (PL 93-440, as amended by PL 100-301) states:

... members of the Miccosukee Tribe of Indians of Florida and members of the Seminole Tribe of Florida shall be permitted, subject to reasonable regulations established by the Secretary, to continue their usual and customary use

and occupancy of Federal or federally acquired lands and waters within the Preserve and the Addition, including hunting, fishing, and trapping on a subsistence basis and traditional tribal ceremonials.

The scope of this plan is limited to recreational hunting activities, and traditional uses in the Preserve by traditionally associated peoples are not addressed as part of this plan. This *Hunting Management Plan* would not have any impacts on such customary use and occupancy, and hunting, fishing, and trapping on a subsistence basis by traditionally associated peoples would continue to be permitted, subject to existing laws and regulations.

On August 5, 2011, letters were sent to representatives of the Miccosukee Tribe of Indians of Florida, the Seminole Tribe of Florida, and the Seminole Nation of Oklahoma, which provided information about the development of a hunting management plan for the Preserve and the opportunity to comment on the project. A member of the Seminole Tribe of Florida commented on the proposed *Hunting Management Plan*, but no official correspondence was received. No correspondence was received from the Miccosukee Tribe of Indians of Florida or the Seminole Nation of Oklahoma. Copies of the *Draft Hunting Management Plan/EA*, *Revised Draft Hunting Management Plan/EA*, and *Second Draft Hunting Management Plan/EA* were provided to each of the tribes for review and comment. Comments received have been considered to resolve tribal issues or concerns before completing this Final EA. Appropriate consultation will continue through implementation of the plan.

Upon review of the NPS *Management Policies* (2006), the enabling legislation for the Preserve, and the above information, it has been determined that none of the alternatives are expected to affect ethnographic resources within the Preserve. Therefore, this impact topic is not analyzed in detail as a separate topic in this EA.

Museum Collections. Museum collections are prehistoric and historic objects, artifacts, works of art, archival material, and natural history specimens. Implementation of any of the alternatives would have no effect on how the Preserve's museum collections are acquired, accessioned and cataloged, preserved, protected, and made available for access and use. Therefore, this impact topic is not analyzed in detail as a separate topic in this EA.

Socioeconomic Environment

Environmental Justice. Any proposed federal project must comply with the provisions of Title VI of the Civil Rights Act (1964), as amended by Title VIII of the Civil Rights Act (1968). Title VI of the 1964 Civil Rights Act provides that no person will, on the grounds of race, color, religion, sex, national origin, marital status, disability, or family composition be excluded from participation in, be denied the benefits of, or be otherwise subject to discrimination under any program of the federal, state, or local government. Title VIII of the 1968 Civil Rights Act guarantees each person equal opportunity in housing. Additionally, EO 12898, "Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations," requires federal agencies to identify and address disproportionately high and adverse human health or environmental effects on minority and low-income populations.

Upon review of these laws and the proposed alternatives associated with this EA, no person will be excluded from or discriminated against in any of the proposed alternatives considered in this EA. Additionally, minority or low-income populations would be treated the same way under all of the alternatives considered in this plan; none of the alternatives being considered would have a disproportionately high and adverse effect on any minority or low-income population or community. Therefore, this impact topic is not analyzed in detail as a separate topic in this EA.

Climate Change

Climate Change. Executive Order 13514, “Federal Leadership in Environmental, Energy, and Economic Performance” and U.S. Department of the Interior Secretarial Order 3285 both provide guidance on how federal agencies should address greenhouse gas emissions and climate change. The NPS has also issued draft interim guidance for considering climate change in NPS NEPA analyses.

NPS *Management Policies 2006* states that “Parks containing significant natural resources will gather and maintain baseline climatological data for reference.” *Management Policies* also state that “The [NPS] will use all available authorities to protect park resources and values from potentially harmful activities...NPS managers must always seek ways to avoid, or minimize to the greatest degree possible, adverse impacts on park resources and values” (NPS 2006a).

The 2001 report of the United Nations sponsored Intergovernmental Panel on Climate Change projected a sea level rise over the coming century of one to three feet (median sea level rise of two feet) (Miami-Dade 2008). The 2007 Intergovernmental Panel on Climate Change report projected a somewhat lower sea level rise than the 2001 Intergovernmental Panel on Climate Change report, but it did not incorporate the substantially accelerated melting being observed in the Greenland Ice Sheet (Miami-Dade 2008). The *Second Report and Initial Recommendations* published by the Miami-Dade Climate Change Advisory Task Force states that global warming would result in many changes to the natural environment, “including changing atmospheric circulation and temperature patterns, changes in rainfall and severe weather, changes in biologic community distribution, increased extinction rates, changes in disease and pest distribution, and changes in sea level” (Miami-Dade 2008). While all these environmental impacts would affect south Florida within the next century, the key concern would be rising sea level,

“with a very high likelihood” that the sea level would rise an additional 1.5 feet in the next 50 years and a cumulative total of three to five feet within a century (Miami-Dade 2008).

Upon review of these laws and regulations and the information available regarding climate change and sea level rise estimates for south Florida, none of the actions associated with the proposed alternatives are anticipated to have an effect on climate change or sea level rise. Therefore, this impact topic is not analyzed in detail as a separate topic in this EA.

Land Use

Land Use. No land use plans (outside the Preserve boundaries) would be affected by actions proposed under any of the alternatives. In addition, hunting activities as described under any of the alternatives would not induce any changes in land use or increase pressure for development within or adjacent to the Preserve. Therefore, this impact topic is not analyzed in detail as a separate topic in this EA.

Other Agency or Tribal Land Use Plans or Policies. The actions included in this EA and considered under each of the proposed alternatives are compatible and not in conflict with local land use plans. Therefore, this impact topic is not analyzed in detail as a separate topic in this EA.

Energy Resources

Energy Resources. None of the alternatives being considered would result in the extraction of energy resources from the Preserve and none of the alternatives would result in a measurable change in energy consumption compared to current conditions. Additionally, none of the alternatives would affect ongoing oil and gas operations in the Preserve. Therefore, this impact topic is not analyzed in detail as a separate topic in this EA.



**CHAPTER 2:
ALTERNATIVES**

PROJECT ALTERNATIVES

National Environmental Policy Act implementing regulations provide guidance on the consideration of alternatives in an EA. These regulations require the decision-maker (the NPS) to consider the environmental effects of the proposed action and a range of alternatives, including “no action” (40 CFR § 1502.14). The range of alternatives includes reasonable alternatives that must be rigorously and objectively explored, as well as other alternatives that are eliminated from detailed study. To be “reasonable,” an alternative must meet the stated purpose of and need for the project. Project alternatives may originate from the proponent agency, coordinating or cooperating agencies, other agencies, or members of the public, at public meetings, or during the early stages of project development. The alternatives analyzed in this document, in accordance with NEPA, are the result of internal scoping and public scoping for the project (see Chapter 5 – Consultation and Coordination for details of the internal and public scoping conducted for this project).

ELEMENTS COMMON TO ALL ALTERNATIVES

Two primary elements would be applied to all of the alternatives, regardless of which alternative is selected for implementation:

- The NPS is the lead agency for hunting management within the Big Cypress National Preserve. Consultation and coordination with other agencies would occur as outlined under each of the proposed alternatives.
- This *Hunting Management Plan* and the selected alternative would become effective upon signing of the decision document associated with the EA. The *Hunting Management Plan* and selected alternative would remain in effect for a period that mirrors the approved Addition GMP, which is 15 to 20 years.

Scope of the Analysis

As discussed in the “Introduction and Background, Scope of the Analysis” section of chapter 1, 36 CFR 7.86 provides specific regulations for hunting, fishing, trapping, and gathering in Big Cypress National Preserve. Subsection (e) (1) states: “Hunting, fishing and trapping are permitted in accordance with the general regulations found in parts 1 and 2 of [36 CFR] and applicable Florida law governing Cooperative Wildlife Management Areas.” The enabling legislation (PL 93-440, as amended by PL 100-301) also dictates that public hunting shall be allowed in the Preserve. Since public hunting in the Preserve is mandated by the enabling legislation (not a discretionary activity unless specific “reasons of public safety, administration, floral and faunal protection and management, or public use and enjoyment” are identified), the NPS has prepared this *Hunting Management Plan*.

Both the GMP completed for the original Preserve in 1991 and the Addition GMP completed in 2010 articulated the need to manage hunting within the Preserve. Hunting is currently permitted within the original boundaries of the Preserve and is managed cooperatively by the NPS and FWC through the *NPS/FWC Cooperative Partnership Agreement* (see appendix B). The Addition has never been open to public hunting since its acquisition by the NPS; however, hunting occurred on private lands in the Addition prior to the acquisition of the lands by the NPS. Therefore, the NPS has prepared this *Hunting Management Plan* to analyze the impacts associated with alternatives for managing hunting in the Preserve.

NEPA Review

For all alternatives, once it is determined that a potential future hunting management action is necessary, an initial environmental screening process will be conducted to determine what, if any, additional environmental compliance may be required. Through this screening process, the NPS will

document whether such hunting management actions, both individually and cumulatively, are (1) within the range of management actions described for the selected alternative in this plan, and (2) fully analyzed in the environmental consequences chapter of this NEPA analysis or those incorporated by reference. The following questions will be used to evaluate if this *Hunting Management Plan* and documents incorporated by reference have adequately analyzed impacts for proposed changes to hunting management:

- Is the range of alternatives analyzed in the existing NEPA analysis appropriate with respect to the hunting management action, given current environmental concerns, interests, and resource values?
- Is the existing analysis valid in light of any new information or circumstances? Can it be concluded that new information or new circumstances would not be significant as they relate to environmental concerns?
- Are the direct, indirect, and cumulative effects that would result from implementation of the hunting management action similar (both quantitatively and qualitatively) to those analyzed in the existing NEPA analysis?
- Does the hunting management action alter the conclusions of the NEPA analysis?

Some hunting management actions could be implemented quickly, as they would be within the scope of the selected alternative and their impacts will have been adequately assessed. However, other actions may require additional environmental review and/or rulemaking prior to implementation.

In addition to the public/agency/stakeholder involvement proposed under each of the alternatives, the appropriate level of public/agency/stakeholder involvement and notification of any proposed hunting management actions would occur based on the level of environmental analysis required.

NPS/FWC Hunting Management Partnership

The NPS has enjoyed a nearly four-decade history of partnering with the FWC (and its predecessor agency, the Florida Game and Fresh Water Fish Commission) to co-manage public access and recreation in the Preserve, including hunting, fishing, trapping, and other forms of recreational access while also providing for threatened and endangered species, including the Florida panther. The FWC has a long history (over 60 years) of managing for hunting of sustainable white-tailed deer populations on landscapes similar to the Preserve. By design, FWC management of deer hunting in the Preserve is very conservative, as evidenced by restricting hunting to only buck deer, compared to adjacent landscapes. Management focuses on adjustments to season length, bag limit, and methods of take designed to maintain a sustainable deer population and provide for public recreation, both of which are also goals of the Preserve. Adjustments to the deer hunt by FWC deliberately take into account information from deer population monitoring via ground and aerial surveys, along with information gathered through a mandatory hunter check-in and check-out system that is coupled with quota permits. Additionally, major environmental disturbances, such as flooding (that can have a greater impact on deer population dynamics than hunter harvest), are also taken into account by FWC in formal adjustments in deer harvest levels. Since 1985, deer harvest in the Preserve has been restricted to harvest of bucks with at least one five-inch antler, and best available science (Warren et al. 1986) and practice throughout the southeast United States indicates that bucks-only hunting is highly unlikely to detrimentally affect the deer herd, as buck hunting rarely removes more than 10 percent of the population (Warren et al. 1986). Since the 1990-91 season, deer harvest rates have been relatively stable (Smith et al. 2009), suggesting a relatively stable population under the bucks-only regulation. Each year FWC reviews the recent deer population and hunter harvest information, compares these to long-term trends, and as warranted, generates

proposed adjustments to the deer hunt. The FWC abides by Ch. 120, FS, when making rules, and in doing so, notifies the public of rulemaking activity through the Florida Administrative Weekly. Adjustments to hunting regulations by FWC include public notice and direct contact with those who may be affected, including gathering input from stakeholders and interested parties. As such, the NPS is provided the opportunity to review proposed adjustments to deer hunting in the Preserve prior to implementation. Final decisions on rules usually happen at FWC Commission meetings, held five times per year in locations throughout the state.

This partnership and process would continue and apply throughout the entire Preserve with the implementation of alternative 1. With alternative 2, this partnership and process would continue and apply only to the original Preserve boundaries, since hunting would be prohibited in the Addition. With the implementation of alternative 3, this partnership between the NPS and the FWC would continue (in consultation with the USFWS) and apply throughout the entire Preserve; however, any proposed changes to hunting management would occur in accordance with the steps outlined in the adaptive management process, including stakeholder involvement and consultation with the USFWS.

Hunting Rules and Regulations

Current hunting regulations in the Preserve are set forth in FAC 68A and outlined for the public in the *FWC Big Cypress WMA Regulations Summary and Area Map (July 1, 2013 – June 30, 2014)* brochure (see appendix C). For all of the alternatives, all current general rules and regulations for hunting in the Preserve would apply to the areas where hunting is permitted. For alternatives 1 and 3, hunting rules and regulations would apply Preserve-wide, including the Addition. For alternative 2, hunting rules and regulations would apply within the original Preserve boundaries and hunting would be prohibited in the Addition.

Additionally, current bag and possession limits would continue to apply for the areas where hunting is permitted under each alternative (Preserve-wide for alternatives 1 and 3, and in the original Preserve for alternative 2):

- Host hunter and guest must share all bag and possession limits
- Deer – Daily limit of one, annual limit of two (all seasons combined)
- Feral hog – Daily limit of one, annual limit of two (all seasons combined)
- Turkey – Daily limit of one, season limit of two, possession limit of two
- Gray squirrel, quail and rabbit – Daily limit of 12, possession limit of 24 for each
- Raccoon, opossum, armadillo, beaver, coyote, skunk, and nutria – No bag limits
- Bobcat and otter – Prohibited
- Migratory birds – Consistent with current migratory bird hunting regulations

Emergency Situations

For all alternatives, adjustments to hunting opportunities would be called for under emergency situations or extreme and sustained increases or declines in multiple indicators of deer abundance. In emergency situations such as a tropical storm, hurricane, catastrophic wild fire, or other unknown or undocumented acute situation that involves major resource impacts or threats to public safety, management actions would be taken up to and including closure of hunting seasons or units for the protection of resources or public health and safety in the Preserve, as determined by NPS staff. Additionally, if a conflict arises in the Preserve between hunting management and public health and safety, management actions would be taken up to and including closure of hunting seasons or units for the protection of public health and safety in the Preserve, as determined by NPS staff.

White-Tailed Deer Monitoring

Various forms of white-tailed deer monitoring by both the NPS and FWC have taken place in the Preserve. Deer population monitoring in the Preserve has included deer surveys conducted by the NPS and the FWC and manned/unmanned hunter check stations monitored by the FWC.

Aerial Monitoring. Aerial monitoring has been used to estimate deer population density in some management units (Garrison et al. 2009) and land cruise surveys have been conducted in the northern Addition (Garrison et al. 2009), but the methods are challenging to execute.

Deer surveys have typically been conducted annually by the NPS in approximately one-third of the Preserve: Stairsteps Unit (Zones 3 and 4), Loop Unit, Turner River Unit (2 areas), Deep Lake Unit, Bear Island Unit, and the Addition (south of I-75). Some areas of the Preserve have been surveyed since 1995. In 2008, no deer surveys were conducted anywhere in the Preserve due to budget constraints. The following areas in the Preserve have also typically been surveyed by the FWC: Bear Island Unit, the Addition (north of I-75 and south of I-75), and Stairsteps Unit (Zones 2 and 4). Surveys are conducted in the spring (usually May) and again in the summer (usually August). Spring surveys are intended to measure fawn to doe ratios and the summer counts are intended to measure adult buck to doe ratios, yielding deer density estimates per hunt unit.

All NPS surveys have been conducted from a helicopter flying at 200 feet at 50 miles per hour. Surveys begin at approximately 7:00 a.m. and end at or before 9:30 a.m. In some areas, surveys may take two to three days to complete. In all but one survey area the flight lines are east – west with a distance of one kilometer between flight lines. In the Stairsteps Unit survey area, flight lines are east – west and one mile apart.

The NPS surveys differ from typical line transect surveys. During the surveys, the

helicopter follows the flight line as usual. When deer are spotted, the time, location, sex, and age (adult/fawn) are recorded. However, unlike typical surveys, if the deer are too far to identify these characteristics the helicopter leaves the flight line and approaches as close as necessary to identify the deer. If other deer are observed while the helicopter is away from the flight line, the helicopter and crew will continue directly to those deer for identification purposes before returning to the flight line. After the deer have been counted and sexed, the helicopter returns to the flight line at the point of its departure. For this reason, typical statistics cannot be used to obtain a population density estimate. However, this procedure provides better fawn to doe and doe to buck ratios than might be obtained through typical line transect methods. Additionally, the flights have proven useful in tracking deer population trends.

The FWC has also established aerial surveys over some areas in the Preserve. Spotlight counts and morning survey routes to estimate deer numbers along four routes were initially used by the FWC in the Addition in 2006. However, due to the size of the area, visibility problems, and lack of access to some areas, ground surveys were found to be unfeasible. Aerial surveying using line transects was initiated in 2007. These FWC surveys are not as extensive as those conducted by the NPS, nor have they been conducted for as long. Both fixed-wing and rotary-wing aircraft of different types have been used during these surveys. The FWC surveys follow the typical line transect method of staying on the flight line and only recording those deer falling within a pre-determined distance from the observation point. Well researched statistical tests can be used to estimate deer density. However, data collected from these surveys are not used to estimate either sex ratios or fawn to doe ratios. Deer density estimates using distance sampling techniques from aircraft in the Results have been difficult to interpret due to changes from ground surveys to aerial surveys, and changes in types of aircraft, observers, and pilots resulting in lack of consistent estimates of transect widths for aerial surveys (FWC 2012). For additional information, please refer to appendix D for a copy of the *Deer Status*

Report, Big Cypress National Preserve – Addition Lands (FWC 2012).

As part of this hunting management plan, the NPS analyzed the current deer monitoring program in the Preserve to determine the best approach to future monitoring in the Preserve. The results of the analysis concluded that the NPS buck/doe, doe/fawn deer survey program should continue into the future at approximately 23% of former years' capacity. The objectives of the deer monitoring program will remain the same, but will concentrate on fewer areas annually as compared to the past. The full results of this analysis are provided in appendix E. Additionally, the NPS and the FWC, in consultation with the USFWS, are committed to continuing to evaluate new technologies and monitoring techniques as part of the deer monitoring program in the Preserve, regardless of which alternative is selected for implementation.

Check Stations. Deer check stations have been used in the Preserve since at least 1982. All hunters are required to check-in and checkout through one of the FWC check stations. Hunter check stations in the Preserve currently include four manned and two unmanned check stations monitored by the FWC: 40-Mile Bend, Monroe Station, Dona Drive, Bear Island, and I-75/Alligator Alley (northbound and southbound) (unmanned). The four manned check stations are staffed for at least five days per week during deer season as well as during the weekends of deer season when hunter pressure is at its greatest³. The two check stations located on I-75 (one each on the north and south side of the highway) and are never manned.

General data collected from the check-in/check-out forms includes number of hunters, type of transportation used, area hunted, and time spent hunting. Harvest information gathered includes number and species of all game animals, the count of deer harvested, hunting pressure (or number of hunter-days that the area is hunted) in each management

³ Note that all of the six check stations are typically self-service during small game season, due to the low hunter pressure for these species.

unit, the success rate (number of deer harvested per hunter-day of effort) in each management unit, an acreage based success rate (number of deer harvested per acre of a management unit), and the number of deer harvested in each of six possible age classes. Physical data collected from harvested deer (only bucks may be harvested in the Preserve) include the gutted weight of each deer, the mean antler main beam circumference, the number of points present on the rack, and the spread distance between antlers. If permitted by the hunter, check station operators will also collect a jaw to be used to age the animal. All check station information is specific to those deer that are brought in by hunters to the check station. These data were first collected for the Preserve in 1980 and have been continuously collected since then. These data allow the FWC to estimate buck population age structure for the Preserve as a whole as well as for each hunt unit. Physical characteristics are used to compare age classes within and between hunt units. Trends in herd age structure, physical size, harvest, hunter pressure, and transportation are all available for analysis.

Florida Panther Monitoring

The NPS has an ongoing project monitoring the status of the panther population within the Preserve, which would continue regardless of which alternative is selected for implementation. The overall purpose is to provide information to management so that their decisions will support and enhance panther recovery, and to determine the panthers' behavioral and/or demographic responses to natural events, management actions, and human impacts in south Florida.

In the past, each panther with a functioning radio-collar has been located three times a week (usually between 9:00 a.m. and 12:00 p.m.) from a fixed-wing aircraft. Wildlife personnel record the date, time, coordinates, habitat type, and unique situations (i.e. two panthers in the same location or panther sightings) for each panther. These data are entered into a database, which is shared with the FWC on an annual basis, or as requested.

Panthers fitted with Global Positioning System (GPS) equipped collars provide nighttime location and movement data. Annually, location data are used to determine home range for each individual. More immediate uses of location data include identification of mortality sites, possible breeding events (male and female located together), kill locations, and den sites. In the long term, such data can provide locations of high use highway crossing sites in an effort to prioritize fenced wildlife crossing areas, seasonality of denning, age at first denning, and changes in home range size.

Dead panthers are collected and given to the FWC for necropsy. Information obtained can include panther age at death, general health and, in many cases, cause of death.

Once located, panther dens are visited while females are absent. Kittens are captured and handled to collect data including sex ratios, litter size, and general health conditions. Blood is collected and used to determine the success of the genetic restoration effort and the existence of any diseases. Kittens are examined for external parasites and given deworming medication. Kittens are also marked with sub-dermal Passive Integrated Transponder (PIT) tags for future identification.

Annual capture efforts provide data regarding the general health of adult panthers. Data collected include sex, age, weight, external parasite loading, and injuries. Previously collared panthers allow a comparison of individual health between two known dates. Uncollared panthers are checked for PIT tags. Presence of such a tag allows for exact aging of the individual. Blood is collected for genetic testing and testing for disease. If the animal has not previously been inoculated against Feline Leukemia, it is done at this time. Capture efforts themselves can provide an index of panther density and sex ratio within the area.

As part of this hunting management plan, the NPS analyzed the current panther monitoring program in the Preserve to determine the best approach to future monitoring in the Preserve. The results of the analysis concluded that a

weekly aerial survey of the radio-collared panthers should continue into the future. This program would be sufficient to adequately monitor the panther population in the Preserve while also meeting the objectives of this hunting management plan. The full results of this analysis are provided in appendix E. Additionally, the NPS and the FWC, in consultation with the USFWS, are committed to continuing to evaluate new technologies and monitoring techniques as part of the panther monitoring program in the Preserve, regardless of which alternative is selected for implementation.

ALTERNATIVE 1 – NO ACTION – APPLY CURRENT MANAGEMENT TO THE ADDITION

U.S. Department of the Interior regulations define a no action alternative as that which would result in “no change from current management direction.” The original Preserve GMP (completed in 1991) and the Addition GMP (completed in 2010) form the basis for management actions taken by the NPS in the original Preserve and in the Addition, respectively. These two GMP documents dictate that hunting would be permitted throughout the entire Preserve. Therefore, the no action alternative for this EA was defined as continuation of the current management direction provided by the two GMP documents – hunting would be permitted throughout the Preserve and managed cooperatively by the NPS and FWC using the guidelines outlined in the *NPS/FWC Cooperative Partnership Agreement* (see appendix B).

It is important to note that public hunting does not currently take place in the Addition. The Addition GMP, which guides management actions in the Addition, was completed in October 2010. The ROD for this document was signed in February 2011. The NPS staff at the Preserve have been in the process of coordinating access options to allow hunting in the Addition since the time that the ROD for the Addition was signed in February 2011; however, this process is still ongoing. Under the no action alternative, hunting would be

permitted as soon as feasible options are established that allow the public to safely access the Addition for hunting purposes.

Under alternative 1 (no action), management of hunting in the entire Preserve would occur in accordance with the *NPS/FWC Cooperative Partnership Agreement* (see appendix B). The most recent *NPS/FWC Cooperative Partnership Agreement* was signed on December 1, 2010, by the NPS (represented by the Superintendent of the Preserve) and the FWC (represented by the Executive Director of the FWC). While all 25 conditions of the agreement would apply to the entire Preserve under this alternative, the following key conditions would serve as the framework for hunting management in the Preserve:

Time Frame

Condition 23: *The Superintendent and the Executive Director or their designees will meet at least annually to insure that the provisions of the cooperative partnership established under this Agreement are being fully implemented and to identify any measures necessary to improve this cooperative partnership.*

Modifications

Condition 24: *Modifications to this Agreement may be made through mutual consent of the NPS and FWC as approved by the Superintendent and the Executive Director.*

Hunting Regulations

Condition 15: *FWC shall consult with and secure the concurrence of NPS before establishing any regulation of fishing, hunting, and other activities associated with the taking or possession of game fish and wildlife on the Preserve and the Addition.*

Law Enforcement

Condition 16: *FWC shall provide law enforcement support for sufficient enforcement of FWC regulations effective in the Preserve and the Addition. Furthermore the FWC and NPS will develop and adopt a specific Memorandum of Understanding that sets forth the procedures for mutual aid and law enforcement in the Preserve and the Addition.*

Threatened and Endangered Species

Condition 5: *FWC and NPS shall collaborate, consult and cooperate with one another regarding management of imperiled species of fish and wildlife on the Preserve and/or the Addition.*

Nonnative/Invasive Species

Condition 6: *FWC and NPS shall collaborate, consult and cooperate with one another on courses of action to control or eradicate exotic or nonnative fish and wildlife or plants in the Preserve and the Addition. Nothing herein shall restrict or constrain the ability of NPS to implement management measures necessary to control or eradicate exotic fish, wildlife or plants.*

Research and Monitoring

Condition 7: *When practicable, the NPS and FWC shall collaborate, consult, and cooperate on ecological research and resource monitoring to address questions of mutual interest to NPS and FWC. Authorship rights to publications resulting from such collaboration, consultation, and cooperation shall follow the guidelines in Dickson, J. G., R. C. Conner, and K. T. Adair. 1978. Guidelines for Authorship of Scientific Articles. Wildlife Society Bulletin 6:260-261.*

Condition 8: *NPS and FWC shall have the opportunity to review and comment upon each other's research and monitoring*

proposals when related to fish and wildlife in the Preserve and the Addition prior to commencement of the research and monitoring.

Public Access

Condition 2: NPS and FWC will offer reasonable public access as provided for in Public Law 93-440 and Public Law 100-301, allowing the public to engage in authorized traditional uses in the Preserve and the Addition such as hunting, fishing, camping and other wildlife oriented recreational activities, which can be compatible with fish and wildlife conservation and are integral to fulfilling the mandate and intent of said public laws, without compromising the integrity of Preserve natural and cultural resources.

Emergencies

Condition 13: This Agreement recognizes the authority of the Preserve Superintendent to promulgate regulations and implement management limits and controls as they relate to public access, including but not limited to actions in response to changing resource conditions during emergencies as described in paragraph 19 below, but in any case where such actions relate to fish and wildlife management or the taking of fish and wildlife or associated activities, these actions shall be promulgated in collaboration, consultation, and cooperation with FWC.

Condition 19: When necessary to address emergencies, NPS may issue regulations or orders to restrict or prohibit public use and access in the Preserve and the Addition or portions thereof. With the concurrence of NPS, FWC may issue regulations or orders to restrict or prohibit hunting or fishing or other activities associated with the taking of fish and wildlife in the Preserve and the Addition or portions thereof. When practicable, regulations and orders of the nature referenced in this provision should be jointly or cooperatively issued.

Condition 20: FWC and NPS shall enter into a separate agreement to render mutual assistance as practicable in times of emergency or natural disaster affecting the Preserve or its employees.

ALTERNATIVE 2 – NO HUNTING IN THE ADDITION

U.S. Department of the Interior regulations define a no action alternative as that which would result in “no change from current management direction.” For this EA, the no action alternative (continuation of current management direction) would allow hunting throughout the Preserve (including the Addition) and therefore, could potentially cause adverse environmental impacts. Because hunting does not currently take place in the Addition, the no action alternative for this EA does not reflect the true environmental baseline conditions in the Preserve, absent from hunting impacts (refer to the description of alternative 1 for additional details). Therefore, an environmental baseline alternative was added to the range of alternatives that evaluates the environmental consequences of continuing to allow hunting in the original Preserve and prohibiting hunting in the Addition. This allows for a comparison of impacts between prohibition of hunting in the Addition and allowance of hunting in the Addition, in accordance with the conditions outlined in alternatives 1 or 3.

Under this alternative, current hunting management would continue within the original Preserve boundaries, using the guidance outlined in the *NPS/FWC Cooperative Partnership Agreement* (see appendix B). All 25 conditions of the agreement would apply to the original Preserve boundaries under this alternative, including the key conditions outlined under alternative 1 above. In the Addition, public hunting would be prohibited.

ALTERNATIVE 3 – NEW ADAPTIVE MANAGEMENT STRATEGY

Under alternative 3, the NPS and the FWC, in consultation with the USFWS, would cooperate to implement an adaptive management strategy to manage hunting in the Preserve. The adaptive management strategy is designed to address key uncertainties that exist as a result of allowing hunting throughout the entire Preserve. Adaptive management actions would be taken based on effects to the white-tailed deer population (as measured by hunter success rates) and potential conflicts between hunting and nonhunting visitors in the Preserve. Under this alternative, adaptive management actions regarding the white-tailed deer population are designed to ensure that there remains enough prey for the Florida panther, and adaptive management actions regarding potential conflicts between hunters and other visitors are designed to ensure satisfactory experiences for all Preserve visitors.

The adaptive management of hunting that would occur under this alternative is restricted to actions taken in accordance with the objectives, triggers, and monitoring data relating to hunter success rates for the white-tailed deer population, and potential conflicts between hunting and nonhunting visitors in the Preserve.

The NPS is not proposing to take adaptive management actions related to other resources, such as other wildlife (including other game species), vegetation, or wilderness, because the management of these resources does not involve the same level of uncertainties as management of the white-tailed deer population and visitor use conflicts. Impacts to these other resources as a result of hunting activities are disclosed in this EA, but these other resources would be managed in accordance with NPS management policies and other existing management plans, not through an adaptive management process. A list of the other plans used to make management decisions in and affecting the Preserve can be found in the “Cumulative Impacts Analysis” section of chapter 4 of this

document. The impacts from the actions taken in the Preserve under these other existing plans are discussed in detail throughout chapter 4, under the respective impact topics. A detailed description of adaptive management, as defined by the U.S. Department of the Interior, can be found in appendix F.

Adaptive Management Process

Implementation of the adaptive management process would occur in two phases – a set-up phase in which the key components are developed and an iterative phase in which the components are linked together in a sequential decision process (Williams et al. 2009).

Set-Up Phase. The set-up phase has five structural elements: stakeholder involvement, management objectives, management actions, predictive models, and monitoring plans.

1. Stakeholder Involvement – Allow for open and transparent stakeholder involvement regarding management actions.

The cooperative partnership that forms the framework for this alternative was developed based on policies outlined in Section 4.4.2 of the NPS *Management Policies* (2006a), which states:

The [NPS’s] cooperative conservation efforts concerning fish and wildlife management will be consistent with departmental policy articulated at 43 CFR Part 24. This departmental policy recognizes the broad authorities and responsibilities of federal and state agencies with regard to the management of the nation’s fish and wildlife resources; this policy also promotes cooperative management relationships among these agencies. In particular, the policy calls on the [NPS] to consult with state agencies on certain fish and wildlife management actions and encourages the execution of memoranda of understanding as appropriate to ensure the conduct of programs that meet mutual objectives as

long as they do not conflict with federal law or regulation.

The NPS and the FWC, in consultation with the USFWS, would continue to involve other stakeholders including other government agencies, nongovernment organizations, and interested individuals. The FWC has an established process for interested stakeholders to comment on the rule-making process regarding hunting management throughout the state, including an established Deer Management Stakeholder Group. The Deer Management Stakeholder Group has been in existence since December 2006 and is comprised of an email distribution list that goes to approximately 80 individuals and groups interested in deer management. The group is governed by a steering committee, currently 17 individuals representing 19 different interest groups. The steering committee is the main representative discussion forum and is constituted as a “Technical Assistance Group” to provide facts and information on deer management issues. The Technical Assistance Group exists in parallel with the FWC deer management team which is a group of FWC staff charged with developing the deer management plan. The steering committee meets roughly every two months and meetings are open to any member and members of the public. The Deer Management Stakeholder Group's site is made available to stakeholders by the FWC as a service to support effective stakeholder action. Since the FWC is an agency partner in the proposed framework of alternative 3, the NPS proposes utilizing the existing stakeholder participation process established by the FWC. This would avoid duplication of effort by stakeholders and the agencies involved in the process, while allowing each of the agency partners to play an active role in the stakeholder participation process. The NPS feels that this cooperative process will ultimately lead to better decision-making for the Preserve. To ensure that a specific part of the FWC stakeholder involvement process is dedicated to the adaptive management process in the Preserve, the NPS proposes to have an annual agenda item in the FWC stakeholder involvement process. The NPS would notify the public of this annual discussion and would

review all comments received during the process before taking any action as part of the adaptive management process. This would guarantee that the public and other stakeholders have a role in the adaptive management process on an annual basis.

2. Management Objectives – Implement clear, measurable, and agreed-upon management objectives to guide decision-making and evaluate management effectiveness over time.

Adaptive Management Objectives – The following adaptive management objectives would be implemented under alternative 3:

- A sustainable deer population in the Preserve, which ensures that the effects of hunting in the Preserve are beneficial, discountable, or insignificant to the Florida panther population⁴
 - Minimization of conflicts between hunting and nonhunting visitors in the Preserve
3. Management Actions – Identify a set of management actions for decision-making.

Baseline Management Actions – While ORV use has been authorized in the Addition per the Addition GMP, such use has not yet been implemented, and access points and parking are limited and are not anticipated to be fully established for another two to three years. Therefore, proposed hunting for year 1 will be required to occur on a walk-in only basis. Currently, nonhunting walk-in access to the Addition is permitted from at least two access points on I-75, at mile marker (MM) 51 and MM 63. The Addition can also be accessed by walking in from any of the surrounding

⁴ Deer are the Florida panthers' most consistent prey item (Land 1993, USFWS 2008). Janis and Clark (2002) determined a predation success rate of one kill per 5.24 days for female panthers and one kill per 7.7 days for male panthers, with an average of one kill per animal per 6.45 days for the general panther population. Other literature (Anderson and Lindzey 2003; Cooley et al. 2008; Murphy, Nadeau, and Ruth 2011) shows similar predation success rates of one deer-sized prey per panther approximately every 6.7 to 7.6 days or on average one deer-sized prey per week (Ruth and Murphy 2010).

adjacent areas and may be able to be accessed in the future along the L-28 levee road (managed by the SFWMD). To avoid overcrowding at the MM 51 and MM 63 access points and parking areas and ensure a satisfactory hunting experience, restricting hunter access through a lower number of quota permits than the maximum of one quota permit per 194 acres is warranted for year 1. Parking is also currently limited at the access points and some hunters will be unable to disperse long distances from the designated entrances. Taking these access limitations into consideration, the following quota permits would be available during year 1 of hunting in the Addition:

Table 2-1 – Recommended Seasons, Season Lengths, and Associated Quotas for the Addition (Year 1)

Season	Season Length (Days)	Quota
Archery	30	30
Muzzleloading Gun	16	30
General Gun	49-52*	30
Small Game	27-30*	None**
Spring Turkey	37	30

* Depending on which day of the week January 1 falls.

** A quota permit is not required for hunting during small game season.

Under alternative 3, the NPS would allow hunting within the original Preserve boundaries in accordance with the rules and regulations described in the “Elements Common to All Alternatives, Hunting Rules and Regulations” section above and in the Addition in accordance with the recommended seasons, season lengths, and associated quotas shown in table 2-1 above.

Additionally, the NPS would undertake the following baseline management actions to achieve the adaptive management objectives:

- Monitor hunter success rates for the white-tailed deer population in the Preserve (as described in the “Elements Common to All Alternatives, White-Tailed Deer Monitoring” section above and further detailed in step 5 of the adaptive management process below).

- Monitor potential conflicts between hunting and nonhunting visitors in the Preserve.
4. Predictive Models – Identify models that characterize different ideas (hypotheses) about how the system works.

Models play an important role in virtually all applications of structured decision-making, whether adaptive or otherwise. In order to make smart decisions, it always is important to compare and contrast management alternatives in terms of their costs, benefits, and resource consequences. Models typically express benefits and costs as outputs of management through time. More importantly, they allow one to forecast the impacts of management.

The term “model” is used here to mean a plausible representation of a dynamic natural resource system. Models can be as informal as a verbal description of system dynamics, or as formal as a detailed mathematical expression of change. The models used in an adaptive management framework are not restricted to a particular kind.

A proposed conceptual ecological model has been developed for the Preserve (see appendix F). There are a large range of options for the type and complexity of models to be developed in the future. The use of predictive models is intended to focus/compare different sources of uncertainty (particularly structural uncertainty, environmental variability, and partial observability) associated with a management decision. The types of models necessary are closely associated with the amount of disagreement between agencies or stakeholders who participate in the adaptive management process.

No modeling has been conducted for potential hunting and nonhunting visitor use conflicts in the Preserve. A combination of the changing dynamics of visitor use in the Preserve (e.g., varying levels and areas of use impacted by factors such as time of day, day of the week, season, weather, etc.) and the extremely low levels of use per acre of the Preserve would make it very difficult to develop a visitor use

model, even on a conceptual scale. If such a model could be developed, it would likely produce unreliable results due to the factors mentioned above.

Future development of predictive models for hunting management would be done in cooperation with the NPS and the FWC, in consultation with the USFWS, as needed and as resources are available.

5. Monitoring Plans – Design and implement a monitoring plan to track resource status and other key resource attributes.

Deer and panther population monitoring conducted by the NPS and the FWC (as described in the “Elements Common to All Alternatives, White-Tailed Deer Monitoring” and “Elements Common to All Alternatives, Florida Panther Monitoring” sections above) would continue (see appendix E for additional details of the NPS’ proposed future deer and panther population monitoring program in the Preserve). Additionally, all current check stations would continue operating; future plans include two additional manned check stations, one at each new designated access point in the Preserve (MM 51 and MM 63). Additionally, the NPS and the FWC, in consultation with the USFWS, are committed to continuing to evaluate new technologies and monitoring techniques as part of the deer and panther monitoring programs in the Preserve.

As part of the adaptive management process, hunter success data was determined to be the best indicator of changes in the deer population in the Preserve, as discussed in the “Adaptive Management Triggers” section below. Therefore, this data would initially be used as the triggers for adaptive management actions relating to the deer and panther populations. However, all data collected by the NPS and FWC regarding the deer and panther populations in the Preserve would continue to be reviewed through the adaptive management process. This data would be looked at as an ancillary support to the hunter success data to determine if any of the data could serve in the future as a better indicator of the status of the deer and panther populations in the Preserve in regards to hunting management.

Information regarding documented visitor use related complaints and conflicts between hunting and nonhunting visitors would be collected and tracked, consistent with the user capacity indicators and standards contained in the Addition GMP.

If any new survey methods arise during the effective life of this plan (15 to 20 years) that are deemed to be more accurate or reliable in providing the data needed for the adaptive management process, such new or additional monitoring efforts would be done in cooperation with the NPS and the FWC, in consultation with the USFWS, as needed and as resources are available.

Iterative Phase. The iterative phase of the adaptive management process uses these elements in an ongoing cycle of learning about system structure and function, and managing based on what is learned (Williams et al. 2009).

6. Decision-making – Select management actions based on management objectives, resource conditions, and understanding.

The FWC hunting regulation development process is open and transparent to the public and allows for coordination between agencies and other stakeholders. Under alternative 3, on the first day of implementation of this *Hunting Management Plan*, management of hunting in the original Preserve would be guided by the current rules and regulations set forth in FAC 68A and outlined for the public in the *FWC Big Cypress WMA Regulations Summary and Area Map (July 1, 2013 – June 30, 2014)* brochure (see appendix C). For the Addition, rules, regulations, and maximum quotas would be determined by extrapolating the available NPS and FWC data for areas in the Preserve that are most similar in habitat types to areas in the Addition, based on the habitat map presented in chapter 3 (“Existing Conditions”). For additional details of the habitat comparison analysis, see appendix E.

Deer in the Preserve typically occur at lower densities than other parts of Florida, and they are the primary food source for the Florida panther. As such, much consideration has

been given to harvest management options for deer within the Preserve. Wildlife managers and published research agree that a conservative, well-regulated hunting strategy should not significantly reduce deer abundance in the Preserve (Downing et al. 1986). Specifically, a buck-only harvest regime has a low risk of negatively affecting the reproductive potential of a deer population (Downing et al. 1986). Deer are polygamous, and a single buck can breed many does. The polygamous nature of deer allows the species to lose a large proportion of the male component, without significant impact to its biotic potential (Mech 1984). Further, the hunting season occurs after the area's breeding season, meaning that most does are bred prior to the onset of the hunting season. Deer population models developed for the Preserve by Labisky et al. (1995) indicated that a high or low harvest of the buck population had little impact on the ability of the deer population to sustain itself. For that reason, buck-only harvest has been in place for many years on the Preserve and is the harvest regime being recommended under alternative 3.

For the purposes of analysis in this EA, the following assumptions were made for alternative 3, based on the currently best available scientific data from the NPS and the FWC on current populations and past harvests in the Preserve:

- All current general rules and regulations for hunting in the Preserve would apply Preserve-wide, including the Addition (as described in the “Elements Common to All Alternatives, Hunting Rules and Regulations” section above)
- Season lengths, dates, and hours would be the same as currently allowed in the Bear Island Unit (see appendix C)
- Current bag and possession limits would continue to apply Preserve-wide, including the Addition
- Deer hunting in the Addition would be limited to bucks-only harvest with at least one five-inch antler
- Deer hunting in the Northeast Addition and Western Addition would be limited to

a maximum of one quota permit per 194 acres⁵

Proposed Hunting Regulations (Year 1) – Proposed hunting regulations for year 1 would be implemented along with the baseline management actions, as described in the “Baseline Management Actions” section in step 3 of the adaptive management process. These quota limits would remain in place until additional access options and/or ORV access are established in the Addition. As access options and parking for the Addition are expanded, the number of quota permits will be increased accordingly. However, these access and parking limitations are anticipated to be the limiting factor in the number of quota permits for at least the first two to three years of hunting in the Addition, unless one of the conditions in the adaptive management triggers shows a need to decrease quota permits below the level limited by access and parking. When additional access options are established in the Addition, hunters would be better distributed throughout the landscape than by walk-in access only. It is expected that over time, the full number of ORV permits envisioned in the Addition GMP would be issued. Adjustments (limitations) to the number of quota permits available in the Addition would occur through the adaptive management process and would be limited by the maximum potential quotas used as assumptions for the impact analysis conducted in this document⁶.

⁵ This maximum quota limit was calculated based on the current quota limit in the Bear Island Unit of one quota permit per 194 acres. For the Northeast Addition and the Western Addition, the potential maximum quota permit density (hunter density) was determined by extrapolating the available NPS and FWC data for areas in the Preserve that are most similar in habitat types to areas in the Addition, based on the habitat map presented in chapter 3 (“Existing Conditions”) and the habitat comparison analysis in appendix G.

⁶ This maximum quota limit was calculated based on the current quota limit in the Bear Island Unit of one quota permit per 194 acres. For the Northeast Addition and the Western Addition, the potential maximum quota permit density (hunter density) was determined by extrapolating the available NPS and FWC data for areas in the Preserve that are most similar in habitat types to areas in the Addition, based

For the beginning of the second iteration of the adaptive management process, hunter success data would be monitored and analyzed by NPS and FWC staff, in consultation with USFWS staff, on an annual basis. Hunter success data was determined to be the best indicator of changes in the deer population in the Preserve, as discussed in the “Adaptive Management Triggers” section below. Therefore, this data would initially be used as the triggers for adaptive management actions relating to the deer and panther populations. However, all data collected by the NPS and FWC regarding the deer and panther populations in the Preserve would continue to be reviewed through the adaptive management process. This data would be looked at as an ancillary support to the hunter success data to determine if any of the data could serve in the future as a better indicator of the status of the deer and panther populations in the Preserve in regards to hunting management. Information regarding documented substantive visitor use related complaints or conflicts between hunting and nonhunting visitors would also be monitored and analyzed by NPS. However, as noted above, access and parking are anticipated to be the limiting factors for at least the first two to three years of hunting in the Addition.

The proposed hunting format is conservative and appropriate for deer populations at low densities and consistent with panther population objectives. Under these conservative regulations, the primary determining factors of deer population status are hydrology, habitat conditions, and natural mortality. Previous studies indicate that deer populations do recover when habitat conditions improve (Land et al. 1993, Labisky et al. 1995).

NPS and FWC staff, in consultation with USFWS staff, would look for any substantial long-term changes in the monitored indicators of deer populations and habitat status. The following adaptive management triggers would be assessed at annual meetings of professional

staff from both the NPS and the FWC, in consultation with the USFWS, through interpretation of the monitoring data and also would be informed by additional data from hunter observations and other sources that may be available.

Adaptive Management Triggers – The occurrence of one or more of the following conditions would trigger implementation of additional management actions (in addition to those baseline actions listed above):

1. A doubling (100% increase) or halving (50% decrease) trend in hunter days per deer harvested across the most recent five-year period⁷ for each management unit. To determine significant trend, a regression analysis will be performed on the harvest data⁸.
2. A doubling (100% increase) or halving (50% decrease) trend in total deer harvest across the entire Preserve (total number of deer harvested from the Preserve), provided that changes in harvest regulations over time are considered. To determine significant trend, a regression analysis will be performed on all available harvest data.
3. An emergency situation, such as a hurricane, high water event, or other unknown or undocumented acute situation that involves major resource impacts, as outlined in NPS policy.
4. Five documented substantive visitor use complaints or conflicts between hunting and nonhunting visitors to the Preserve

⁷ Refer to the discussion of follow-up monitoring in step 7 for the reasoning of why five years of data is expected to be necessary to provide an accurate trend of data for triggers and implementation of supplemental management actions.

⁸ For example, if the regression analysis shows a doubling (100% increase) in hunter days per deer harvested across the most recent five-year period in the Addition (or any other management unit), supplemental management actions would be taken (as discussed in the “Supplemental Management Actions” section, such as decreasing the number of quota permits issued by 50% (or more/less, as appropriate) and/or decreasing season lengths and bag limits and/or placing further restrictions on the legal methods of take.

on the habitat map presented in chapter 3 (“Existing Conditions”) and the habitat comparison analysis in appendix G.

per month per management unit, trail system, or visitor facility⁹.

It is important to note why hunter days and deer harvest would be used as triggers for supplemental management actions and why panther population numbers and population numbers for other small game species would not typically be used as triggers. Although the Preserve is in the core of the extant range of the Florida panther, their distribution in this landscape is not static, nor is it contained within any specific management unit or within the Preserve boundaries. As a result, additional variables and stressors may cause changes in panther distribution, use, and occupancy of an area that may be unrelated to any potential effects of hunting activities. Aside from the behavioral change noted by Janis and Clark (2002), there have been no studies that demonstrate a measurable effect of deer hunting on panthers. This is not due to a lack of information on hunting and panthers; rather, it is due to the multitude of stressors that simply cannot be isolated to determine which stressor is the cause of a noted effect. Both Janis and Clark (2002) and Fletcher and McCarthy (2011) surmised that hydrology may play a role in panther movements throughout the hunting season resulting in the noted movement away from trails. Therefore, using panther numbers or distribution to assess the effects of deer hunting activities is not likely to further inform management decisions. Because the panther is the predator in the predator/prey relationship, any measurable response would be delayed as the population responds to changes in the prey population. There is also the potential to have other stressors, such as epizootic events, affect the panther population while leaving the deer population untouched. The panther's preferred prey items are white-tailed deer and feral hogs (Maehr et al. 1990, Dalrymple and Bass 1996). Since recent data has shown that feral hogs are nearly extirpated from the Preserve, factors relating to the deer population were determined to be the best

⁹ The general metric of five documented visitor use complaints or conflicts for taking management actions in the Preserve was developed as part of the Addition GMP (NPS 2010a).

indicator for decision-making regarding supplemental management actions for protection of the Florida panther population.

Additionally, other small game species were determined not to be appropriate for use as adaptive management triggers because they are not shown to be primary prey items for the Florida panther (Maehr et al. 1990, Dalrymple and Bass 1996) and the hunter pressure on these species has been shown to be very low in recent years in the Preserve (Bartareau 2012). For example, the total harvest of all small game species combined in the Preserve averaged 198 per year over the past five annual hunting seasons, while the total turkey harvest (checked and estimated) from the Preserve averaged 35 animals per year over the past five annual hunting seasons (Bartareau 2012).

Supplemental Management Actions – If any of the adaptive management triggers are documented by the monitoring data, then appropriate and necessary supplemental management actions would be implemented as part of the adaptive framework. Recommendations for action would be proposed by professional staff from the NPS and the FWC, in consultation with the USFWS.

The supplemental management action that could be taken if any of the four triggers occur includes, but is not limited to:

- implementing a scientific study to better inform decisions

The supplemental management actions that could be taken if triggers 1, 2, or 3 occur include, but are not limited to:

- increasing or decreasing bag limits (number of animals allowed to be harvested)
- increasing or decreasing season lengths
- increasing or decreasing the number of quota permits issued
- increasing or decreasing antler restrictions (age of allowable harvest of deer)
- modifying legal methods of take (type of firearms or archery equipment allowed)

- implementing season or unit closures to harvest¹⁰

The supplemental management action that could be taken if trigger 3 occurs includes, but is not limited to:

- implementing emergency restrictions or closures to harvest due to high water events, hurricanes, or other emergency situations¹¹

And the supplemental management actions that could be taken if trigger 4 occurs include, but are not limited to:

- providing additional educational materials to hunting and nonhunting visitors
- directing nonhunting visitors to areas of the Preserve lesser-used by hunters or off-peak times for hunting
- reducing the amount of hunting and/or nonhunting use in certain areas of the Preserve
- altering levels or types of trail use by hunting and/or nonhunting visitors

Any combination of these supplemental management actions would continue to be implemented in an increasingly restrictive adaptive management approach until follow-up monitoring data (as discussed in step 7) shows that the adaptive management objectives outlined in step 2 are being met.

¹⁰ For units that have been closed to hunting through the adaptive management process, harvest data from adjacent units would be used in combination with all available monitoring data from that unit to conduct a surrogate analysis to make management decisions on these units (i.e., whether to continue closures or reopen units that have been closed to hunting), since no harvest data would be available during the years that the units are closed to hunting.

¹¹ For units that have been closed to hunting through the adaptive management process, harvest data from adjacent units would be used in combination with all available monitoring data from that unit to conduct a surrogate analysis to make management decisions on these units (i.e., whether to continue closures or reopen units that have been closed to hunting), since no harvest data would be available during the years that the units are closed to hunting.

If additional actions are required, which have not been analyzed as part of the impact analysis in this document, additional impacts analyses, and if applicable, NEPA compliance documentation, would be required to implement those actions.

7. Follow-up Monitoring – Use monitoring to track system responses to management actions.

Deer population monitoring in the Preserve includes aerial deer surveys conducted by the NPS and the FWC and manned/unmanned hunter check stations monitored by the FWC (as described in the “Elements Common to All Alternatives” section and step 5 of the adaptive management process). The NPS also has an ongoing project monitoring the status of the panther population within the Preserve (as described in the “Elements Common to All Alternatives” section and step 5 of the adaptive management process). The overall purpose is to provide information to management so that their decisions will support and enhance panther recovery, and to determine the panthers’ behavioral and/or demographic responses to natural events, management actions, and human impacts in south Florida.

(as described in the “Elements Common to All Alternatives” section and step 5 of the adaptive management process)

Annual deer population estimates are derived from the check station information and aerial surveys (as described in the “Elements Common to All Alternatives” section and step 5 of the adaptive management process). Both of these methods are challenged by partial observability in the sense that neither are complete censuses of the deer population. The development of the aerial deer population survey is currently focused on explicitly accounting for the degree of observability of deer with this method. There is no existing plan for explicitly estimating the observability of harvested deer in the check stations (i.e. what fraction of harvested deer is measured in the check stations?).

On average, the number of deer observed per year in the un hunted deer population in the Preserve (in the Addition) has fluctuated 40%, with some year-to-year fluctuations reaching over 160% (E. Garrison, unpublished data). This high variability is partly the result of the naturally low deer density and thick habitats, which make it difficult to detect deer in portions of the Addition. This annual variation in observations of an un hunted deer population (in the Addition) shows the difficulty in interpreting deer survey data within the Preserve from year-to-year. Therefore, it is important that several years (three to five years) of survey data are considered in order to evaluate trends and to determine if the deer population is increasing, decreasing, or remaining stable. Deer surveys, coupled with harvest data collected at check stations, supplemented by biological data, anecdotal observations by hunters, and information on habitat conditions collectively would allow biologists to interpret population trends and provide for appropriate management decisions to be made in a timely manner. Consistency in the trends across these data sets adds reliability to conclusions drawn from indicated trends.

Some exceptions to this multi-year trend analysis could occur and would include:

- actions to be taken within the first five years of implementation of the adaptive management framework
- emergency situations (as discussed in the “Elements Common to All Alternatives, Hunting Rules and Regulations” section above)
- actions related to hunting management necessary for the protection of public health and safety in the Preserve

During the first five years of implementation of the adaptive management framework, the adaptive management team (NPS and FWC staff, in consultation with USFWS staff) would meet at least annually to review the previous year’s data and use best professional judgment to make decisions about supplemental management actions. It is important to note that during this time, until a full five-year

regression analysis will be available to the adaptive management team, that quota limits in the Addition are limited to a conservative number due to access options [as discussed in the “Proposed Hunting Regulations (Year 1)” section above]. It is unlikely that the data would result in any of the criteria outlined in the adaptive management triggers even on a year-to-year basis. Therefore, yearly trends will be looked at by the adaptive management team for the first five years, until a full five-year regression analysis can be performed on the monitoring data, and best professional judgment will be used to determine which supplemental management actions would be taken.

In emergency situations for the protection of resources of public safety or in non-emergency situations solely for the protection of public safety (as discussed in the “Elements Common to All Alternatives, Hunting Rules and Regulations” section above), management actions would be taken without a documented five-year trend.

Information regarding documented visitor use related complaints and conflicts between hunters and other visitors would be collected and tracked, consistent with the user capacity indicators and standards contained in the Addition GMP for the addition lands.

For units that are closed to hunting through the adaptive management process, harvest data from adjacent units would be used in combination with all available monitoring data from that unit to conduct a surrogate analysis to make management decisions on these units (i.e., whether to continue closures or reopen units that have been closed to hunting), since no harvest data would be available during the years that the units are closed to hunting.

8. Assessment – Improve understanding of resource dynamics by comparing predicted and observed changes in resource status.

Assessment would only be possible once simulations are developed and an explicit estimate of observability of the deer population is constructed. A predictive model would be developed by the NPS and FWC, in

consultation with the USFWS, to model the deer populations in the Preserve. This model would be used with the established monitoring data to improve future understanding of the system dynamics which affect the deer populations in the Preserve. No modeling has been conducted for potential hunting and nonhunting visitor use conflicts in the Preserve and none is anticipated in the future. Any future predictive models would be modified by the NPS and FWC, in consultation with the USFWS, as needed and as resources are available.

9. Iteration – Cycle back to step 6.

The knowledge and understanding gained in step 7 (follow-up monitoring) and step 8 (assessment) would be used to better inform the selection of hunting management actions at the next decision point. As knowledge and understanding of the hunting management process and resource dynamics evolves, the hunting management decision-making process would be improved. Consequently, the iterative cycle of decision making, monitoring, and assessment would gradually lead to improved understanding of resource dynamics, and improved hunting management as a consequence of improved understanding.

ALTERNATIVES CONSIDERED AND DISMISSED

NO HUNTING IN THE PRESERVE

Under this alternative, no hunting would be allowed in any part of the Preserve (i.e., within the original boundaries or the Addition). 36 CFR 7.86 provides specific regulations for hunting, fishing, trapping, and gathering in Big Cypress National Preserve. Subsection (e) (1) states: "Hunting, fishing and trapping are permitted in accordance with the general regulations found in parts 1 and 2 of [36 CFR] and applicable Florida law governing Cooperative Wildlife Management Areas."

The enabling legislation (PL 93-440, as amended by PL 100-301) also mandates that public hunting shall be allowed in the Preserve (i.e., not a discretionary activity unless specific "reasons of public safety, administration, floral and faunal protection and management, or public use and enjoyment" are identified); therefore, this alternative conflicts with these regulations and the enabling legislation.

Additionally, this alternative does not meet the purpose and need for this *Hunting Management Plan*, specifically, "To develop a hunting management plan for the Big Cypress National Preserve/Wildlife Management Area that allows the superintendent of the Preserve to provide for hunting opportunities in the Preserve ..." Therefore, this alternative was dismissed from further consideration.

COST ANALYSIS OF THE ALTERNATIVES

This *Hunting Management Plan* would not require any facilities as part of its implementation. Therefore, costs associated with implementation of the alternatives would be limited mainly to staffing and research and monitoring activities. Costs associated with implementation of the alternatives could include the following:

- research and monitoring
- enforcement
- staffing (other than enforcement)
- hunter education costs (brochures, signs, etc.)

Existing funding and staffing resources from the NPS and other agencies (FWC and USFWS) would be used with all of the alternatives to accomplish the required enforcement and research and monitoring activities. Therefore, it was determined that the difference in costs between the alternatives would be negligible, and costs were not considered in the determination of the preferred alternative.

HOW THE ALTERNATIVES MEET PROJECT OBJECTIVES

All action alternatives selected for analysis must address the stated purpose of the plan and resolve the need for action. The action alternatives selected for analysis must meet all objectives to a large degree to be considered reasonable. Therefore, alternatives were

assessed as to how well they would meet the plan objectives. Table 2-2 summarizes the results of this assessment. Alternative 3 best meets the project objectives by meeting objectives 1, 2, 3, 4, and 6 to a high degree and meeting objective 5 to a moderate degree.

Table 2-2 – Analysis of How the Alternatives Meet Project Objectives

Project Objective	Alternative 1 No Action Apply Current Management to the Addition	Alternative 2 No Hunting in the Addition	Alternative 3 New Adaptive Management Strategy
1. Provide guidelines for hunting within the Big Cypress National Preserve/Wildlife Management Area that satisfy all NPS regulations, the Preserve’s enabling legislation, the NPS/FWC Cooperative Partnership Agreement, and all applicable federal, state, and local laws and regulations and that maintain or improve the Preserve’s ability to contribute to the conservation of rare, threatened, and endangered species.	<p>This alternative meets the project objective. This alternative fully complies with all NPS regulations, the Preserve’s enabling legislation, the <i>NPS/FWC Cooperative Partnership Agreement</i>, and all applicable federal, state, and local laws and regulations.</p> <p><i>Rank: High</i></p>	<p>This alternative meets the project objective. This alternative fully complies with all NPS regulations, the <i>NPS/FWC Cooperative Partnership Agreement</i>, and all applicable federal, state, and local laws and regulations. However, this alternative only partially complies with the Preserve’s enabling legislation since hunting would only be permitted within the original Preserve.</p> <p><i>Rank: Low</i></p>	<p>This alternative meets the project objective. This alternative fully complies with all NPS regulations, the Preserve’s enabling legislation, the <i>NPS/FWC Cooperative Partnership Agreement</i>, and all applicable federal, state, and local laws and regulations.</p> <p><i>Rank: High</i></p>
2. Provide a programmatic framework for facilitating agency communications and goal-setting that provides guidance over a number of years.	<p>This alternative meets the project objective. This alternative creates a framework for facilitating agency communications and goal-setting (e.g., <i>the NPS/FWC Cooperative Partnership Agreement</i>); however, the framework takes a year-to-year approach to coordination between agencies.</p> <p><i>Rank: Moderate</i></p>	<p>This alternative meets the project objective. This alternative creates a framework for facilitating agency communications and goal-setting (e.g., <i>the NPS/FWC Cooperative Partnership Agreement</i>); however, the framework takes a year-to-year approach to coordination between agencies. Additionally, this alternative does not provide any long-term guidance for coordination regarding hunting management in the Addition.</p> <p><i>Rank: Low</i></p>	<p>This alternative meets the project objective. This alternative creates a long-term framework for facilitating agency communications and goal-setting that would be valid for a number of years.</p> <p><i>Rank: High</i></p>

Table 2-2 – Analysis of How the Alternatives Meet Project Objectives

Project Objective	Alternative 1 No Action Apply Current Management to the Addition	Alternative 2 No Hunting in the Addition	Alternative 3 New Adaptive Management Strategy
<p>3. Utilize science-based resource management (e.g., habitat, wildlife, and protected species) for adaptive decision-making for:</p> <ul style="list-style-type: none"> • The NPS and the FWC to collaborate and cooperate on the rule-making process regarding hunting. • The NPS to take action independently, with notification to the FWC and USFWS as soon as practicable, for resource protection or public safety in certain cases (i.e., high water events, fires, threatened and endangered species issues), which may have an effect on hunting within the Preserve. 	<p>This alternative does not meet the project objective. This alternative does allow for NPS and FWC to collaborate and cooperate on the rule-making process as well as allowing the NPS to take action independently through the <i>NPS/FWC Cooperative Partnership Agreement</i>; however, it does not utilize adaptive decision-making in this process.</p> <p><i>Rank: Nil</i></p>	<p>This alternative does not meet the project objective. This alternative does allow for NPS and FWC to collaborate and cooperate on the rule-making process as well as allowing the NPS to take action independently through the <i>NPS/FWC Cooperative Partnership Agreement</i>; however, it does not utilize adaptive decision-making in this process. Additionally, it does not allow for any actions regarding hunting management in the Addition.</p> <p><i>Rank: Nil</i></p>	<p>This alternative meets the project objective. This alternative utilizes a framework of science-based resource management for adaptive decision-making for both the NPS and FWC, in consultation with the USFWS, to collaborate and cooperate on the rule-making process and the NPS to take action independently.</p> <p><i>Rank: High</i></p>
<p>4. Provide the public with clear and understandable information regarding:</p> <ul style="list-style-type: none"> • Hunting management within the Preserve • Safe and responsible hunting practices 	<p>This alternative meets the project objective. This alternative provides the public with information regarding hunting within the Preserve and safe and responsible hunting practices.</p> <p><i>Rank: High</i></p>	<p>This alternative meets the project objective. This alternative provides the public with information regarding hunting within the Preserve and safe and responsible hunting practices.</p> <p><i>Rank: High</i></p>	<p>This alternative meets the project objective. This alternative provides a framework that clearly outlines a science-based process for determining hunting management rules.</p> <p><i>Rank: High</i></p>

Table 2-2 – Analysis of How the Alternatives Meet Project Objectives

Project Objective	Alternative 1 No Action Apply Current Management to the Addition	Alternative 2 No Hunting in the Addition	Alternative 3 New Adaptive Management Strategy
5. Manage opportunities for a positive visitor use experience for hunters and nonhunters.	<p>This alternative meets the project objective. This alternative allows the NPS to manage opportunities for a positive visitor use experience for both hunters and nonhunters. While nonhunting recreational activities would be available year-round (as permitted by regulations), visitors would only be able to experience these activities in the absence of hunting during certain times of the year (i.e., out of hunting season).</p> <p><i>Rank: Moderate</i></p>	<p>This alternative meets the project objective. This alternative allows the NPS to manage opportunities for a positive visitor use experience for both hunters and nonhunters by providing separate areas of the Preserve (e.g., the original Preserve and the Addition) for hunting and nonhunting recreational activities.</p> <p><i>Rank: High</i></p>	<p>This alternative meets the project objective. This alternative allows the NPS to manage opportunities for a positive visitor use experience for both hunters and nonhunters. While nonhunting recreational activities would be available year-round (as permitted by regulations), visitors would only be able to experience these activities in the absence of hunting during certain times of the year (i.e., out of hunting season). Additionally, potential conflicts between hunting and nonhunting visitors would be minimized through the adaptive management process.</p> <p><i>Rank: High</i></p>
6. Manage an array of access options to allow for a diversity of hunting opportunities within the framework of existing regulations and funding.	<p>This alternative meets the project objective. This alternative allows access for hunting opportunities within the entire Preserve.</p> <p><i>Rank: High</i></p>	<p>This alternative meets the project objective. This alternative allows access for hunting opportunities within the original Preserve; however, it does not allow hunting opportunities within the Addition.</p> <p><i>Rank: Moderate</i></p>	<p>This alternative meets the project objective. This alternative allows access for hunting opportunities within the entire Preserve.</p> <p><i>Rank: High</i></p>

Legend
<i>Nil</i> – Does not meet the project objective to any degree
<i>Low</i> – Meets the project objective to a low degree
<i>Moderate</i> – Meets the project objective to a moderate degree
<i>High</i> – Meets the project objective to a high degree

ENVIRONMENTALLY PREFERABLE ALTERNATIVE

In accordance with U.S. Department of the Interior regulations, the NPS is required to identify the “environmentally preferable alternative” in all environmental documents, including an EA. According to U.S. Department of the Interior regulations implementing NEPA (43 CFR 46.30), the environmentally preferable alternative is the alternative “that 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 [NPS] of long-term environmental impacts against short-term impacts in evaluating what is the best protection of these resources.” Based on the analysis of potential impacts included in this EA, the environmentally preferable alternative for this *Hunting Management Plan* is alternative 3.

Big Cypress National Preserve is a unit of the national park system, and as the administrator of the Preserve the NPS would continue to fulfill its obligation to protect the area for future generations under any of the alternatives. All of the alternatives would preserve historic and cultural resources in the Preserve, and none of the alternatives would have any adverse impacts on historic or cultural resources in the Preserve. Additionally, none of the alternatives involve the use of any depletable resources, and all of the alternatives would have some impacts on natural renewable resources (e.g., wildlife) in the Preserve.

The white-tailed deer is the most important game species in the Preserve. In addition to being a popular large game animal, white-tailed deer are the endangered Florida panthers’ most consistent prey item (Land 1993, USFWS 2008). Under alternative 3, the adaptive management strategy would allow the NPS and FWC, in consultation with the USFWS, to use monitoring data for the white-tailed deer, Florida panther, and environmental conditions (e.g., water level data) to make science-based decisions about

hunting management to best balance the needs of the endangered Florida panther with the desire for recreational hunters to harvest deer in the Preserve.

This adaptive management framework makes alternative 3 the best long-term alternative to managing hunting in the Preserve over the next 15 to 20 years. For further information on how the environmentally preferable alternative was determined, please reference table 2-3 (Environmental Consequences Summary) in the next section of this document, which presents a summary comparison of the effects of the alternatives, based on the evaluations of the impact topics in “Chapter 4: Environmental Consequences.”

SUMMARY OF ENVIRONMENTAL CONSEQUENCES

Table 2-3 below summarizes the environmental consequences associated with the implementation of each project alternative including the no action alternative (alternative 1) and both action alternatives. These impacts were analyzed relative to the environmental

baseline alternative (alternative 2). Additional information on impacts associated with project alternatives can be found in “Chapter 3: Affected Environment” and “Chapter 4: Environmental Consequences.”

Table 2-3 – Summary of Environmental Consequences by Alternative

Impact Topic	Alternative 1 No Action Apply Current Management to the Addition	Alternative 2 No Hunting in the Addition	Alternative 3 New Adaptive Management Strategy
Natural Resources			
Vegetation and Habitat			
Native Vegetative Communities and Habitat, Protected Plant Species, and Nonnative Invasive Plant Species	Impacts on native vegetation communities and protected plant species and impacts from nonnative invasive plants from alternative 1 would be long-term, negligible, and adverse throughout the Preserve.	Impacts on native vegetation communities and protected plant species and from nonnative invasive plant species from alternative 2 would be long-term, negligible, and adverse within the original Preserve; no direct or indirect short- or long-term adverse impacts to native vegetation communities or protected plant species or from nonnative invasive plant species would occur within the Addition.	Impacts on native vegetation communities and protected plant species and from nonnative invasive plant species from alternative 3 would be long-term, negligible, and adverse throughout the Preserve.
Wildlife			
Protected Wildlife Species	No impacts would occur to the West Indian manatee, and long-term, minor, adverse impacts to eight federally listed wildlife species (Florida bonneted bat, Cape Sable seaside sparrow, Everglade snail kite, red-cockaded woodpecker, wood stork, American crocodile, eastern indigo snake, and American alligator) would result throughout the Preserve from the selection of alternative 1. Impacts on the Florida panther from alternative 1 would be long-term, moderate, and adverse throughout the Preserve.	Within the original Preserve, no impacts would occur to the West Indian manatee, and long-term, minor, adverse impacts to eight federally listed wildlife species (Florida bonneted bat, Cape Sable seaside sparrow, Everglade snail kite, red-cockaded woodpecker, wood stork, American crocodile, eastern indigo snake, and American alligator) would result from the selection of alternative 2; in the Addition, no direct or indirect short- or long-term adverse impacts to federally listed wildlife species or their habitat (except the Florida panther) would occur with implementation of this alternative. Impacts on the Florida panther from alternative 2 would be long-term, moderate, and adverse throughout the Preserve.	No impacts would occur to the West Indian manatee, and long-term, minor, adverse impacts to eight federally listed wildlife species (Florida bonneted bat, Cape Sable seaside sparrow, Everglade snail kite, red-cockaded woodpecker, wood stork, American crocodile, eastern indigo snake, and American alligator) would result throughout the Preserve from the selection of alternative 3. Impacts on the Florida panther from alternative 3 would be long-term, negligible to minor, and adverse throughout the Preserve.

Table 2-3 – Summary of Environmental Consequences by Alternative

Impact Topic	Alternative 1 No Action Apply Current Management to the Addition	Alternative 2 No Hunting in the Addition	Alternative 3 New Adaptive Management Strategy
Major Game Species	Impacts to game species and their habitat from alternative 1 would be long-term, minor, and adverse within the original Preserve and long-term, minor to moderate, and adverse in the Addition.	Impacts to game species and their habitat from alternative 2 would be long-term, minor, and adverse within the original Preserve; in the Addition, no direct or indirect short- or long-term adverse impacts to game species or their habitat would occur with implementation of this alternative.	Impacts to game species and their habitat, except the white-tailed deer, from alternative 3 would be long-term, minor, and adverse within the original Preserve and long-term, minor to moderate, and adverse in the Addition. Impacts to the white-tailed deer and their habitat from alternative 3 would be long-term, moderate, and beneficial throughout the Preserve.
Nonnative/Invasive Wildlife Species	Impacts to native wildlife populations from nonnative invasive wildlife species from alternative 1 would be long-term, negligible, and adverse throughout the Preserve.	Impacts to native wildlife species from nonnative invasive wildlife species from alternative 2 would be long-term, negligible, and adverse within the original Preserve; in the Addition, no direct or indirect short- or long-term adverse impacts to native wildlife species from nonnative invasive wildlife species would occur with implementation of this alternative.	Impacts to native wildlife populations from nonnative invasive wildlife species from alternative 3 would be long-term, negligible, and adverse throughout the Preserve.
Wilderness Character			
Wilderness	Impacts on wilderness character from alternative 1 would be long-term, negligible to minor, and adverse within the 47,067 acres of proposed wilderness and those lands eligible for wilderness designation [as determined by the Addition GMP (NPS 2010a)].	No direct or indirect short- or long-term adverse impacts on wilderness character would result from alternative 2.	Impacts on wilderness character from alternative 3 would be long-term, negligible to minor, and adverse within the 47,067 acres of proposed wilderness and those lands eligible for wilderness designation [as determined by the Addition GMP (NPS 2010a)].
NPS Management and Operations			
Preserve Management and Operations	Impacts on Preserve management and operations from alternative 1 would be long-term, minor, and adverse.	Impacts on Preserve management and operations from alternative 2 would be long-term, minor, and adverse.	Impacts on Preserve management and operations from alternative 3 would be long-term, minor to moderate, and adverse.

Table 2-3 – Summary of Environmental Consequences by Alternative

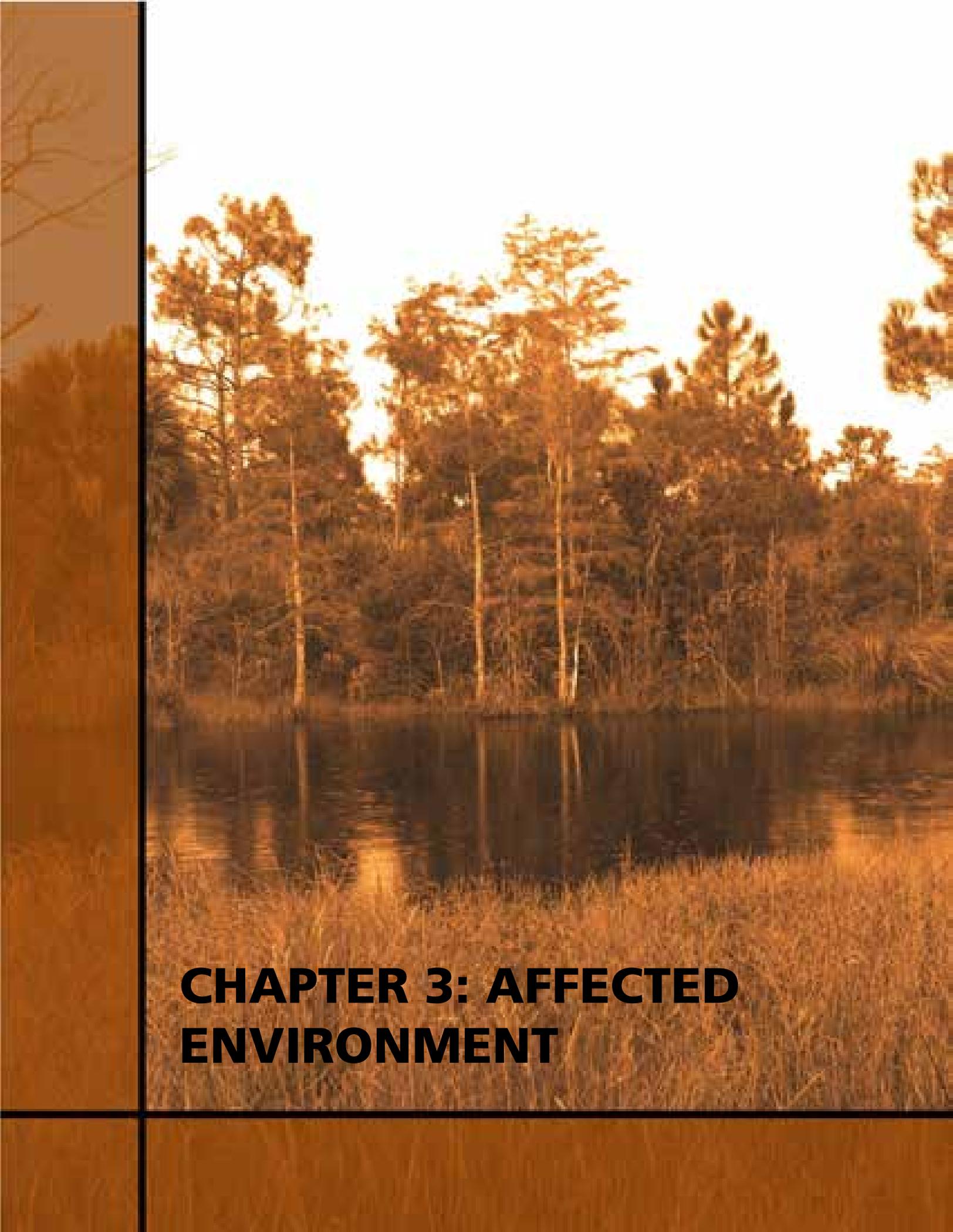
Impact Topic	Alternative 1 No Action Apply Current Management to the Addition	Alternative 2 No Hunting in the Addition	Alternative 3 New Adaptive Management Strategy
Visitor Use			
Visitor Use and Experience/Recreational Opportunities	Impacts on visitor use and experience and recreational opportunities throughout the Preserve from alternative 1 would be long-term, moderate, seasonal, and beneficial for hunters and long-term, minor, seasonal, and adverse for nonhunters.	Impacts on visitor use and experience and recreational opportunities in the original Preserve from alternative 2 would be long-term, moderate, seasonal, and beneficial for hunters and long-term, minor, seasonal, and adverse for nonhunters. In the Addition, impacts on visitor use and experience and recreational opportunities would be long-term, minor, seasonal, and adverse for hunters and long-term, moderate, year-round, and beneficial for nonhunters with the implementation of this alternative.	Impacts on visitor use and experience and recreational opportunities throughout the Preserve from alternative 3 would be long-term, moderate, seasonal, and beneficial for hunters and long-term, minor, seasonal, and adverse for nonhunters.
Noise/Soundscapes	Impacts to the Preserve soundscape from alternative 1 would be long-term, minor, and adverse.	Impacts to the Preserve soundscape from alternative 2 would be long-term, negligible to minor, and adverse.	Impacts to the Preserve soundscape from alternative 3 would be long-term, minor, and adverse.
Public Health and Safety	Impacts on public health and safety from alternative 1 would be long-term, negligible, and adverse throughout the Preserve.	Impacts on public health and safety from alternative 2 would be long-term, negligible, and adverse in the original Preserve; in the Addition, no direct or indirect short- or long-term adverse impacts to public health and safety would result from the selection of this alternative.	Impacts on public health and safety from alternative 3 would be long-term, negligible, and adverse.
Socioeconomic Environment			
Socioeconomics	Impacts on the socioeconomic environment of the Preserve, Collier County, and the south Florida region from alternative 1 would be long-term, negligible to minor, and beneficial.	Impacts on the socioeconomic environment of the Preserve, Collier County, and the south Florida region from alternative 2 would be long-term, negligible to minor, and beneficial.	Impacts on the socioeconomic environment of the Preserve, Collier County, and the south Florida region from alternative 3 would be long-term, negligible to minor, and beneficial.

PREFERRED ALTERNATIVE

The Director's Order 12 Handbook (NPS 2001) states that a preferred alternative should be identified in an EA if one exists at the time an EA is released. The preferred alternative is defined by the CEQ as the alternative, "which the agency believes would fulfill its statutory mission and responsibilities, giving consideration to economic, environmental, technical and other factors" (46 FR 18026, Q4a).

The NPS has identified alternative 3 as its preferred alternative for submittal to the director of the NPS Southeast Region for possible approval. In identifying the preferred alternative, the NPS considered a number of factors, including the extent to which alternatives meet plan objectives, the environmental consequences of implementing each of the alternatives, anticipated effort associated with implementation, degree of management flexibility, and costs. The cost differences between the alternatives were determined to be negligible.

The NPS also used a process called Choosing By Advantages (CBA) in order to determine the relative advantages of implementing each alternative, compared to implementing the other alternatives. A CBA workshop was conducted on November 1, 2011. Workshop participants included NPS (Preserve, Denver Service Center, and contractor) staff and cooperating state (FWC) and federal (USFWS) agency participants. Through the CBA process, the NPS determined that alternative 3 would provide the greatest advantages to the NPS and the public.



**CHAPTER 3: AFFECTED
ENVIRONMENT**

INTRODUCTION

This chapter describes the existing environmental conditions (“Affected Environment”) in the areas potentially affected by the alternatives. The impact topics discussed in this chapter are those that were selected for analysis in this *Hunting Management Plan*, as described in Chapter 1. Information for this chapter was gathered from several sources, including but not limited to, the following documents:

- *General Management Plan* for the original Preserve (NPS 1991a)
- Addition GMP (NPS 2010a)
- *The Big Cypress National Preserve Resource Inventory and Analysis* (Duever et al. 1986)
- NPS Public Use Statistics Office website (NPS 2011d)
- *Big Cypress Wildlife Management Area Regulations Summary and Area Map (July 1, 2013 – June 30, 2014)* (FWC 2013a)

The following sections detail the natural resources (vegetation/habitat and wildlife) and wilderness resources that are present in the Preserve that may be potentially affected by the proposed alternatives. Then, the relevant NPS management and operations and visitor use at the Preserve are discussed in reference to management, operations, and uses that may be potentially affected by the proposed alternatives. Finally, the socioeconomic environment characteristics in the areas surrounding the Preserve that may be potentially affected by the proposed alternatives are discussed.

NATURAL RESOURCES

VEGETATION AND HABITAT

Native Vegetative Communities and Habitat

Five major vegetation communities can be found in the Preserve: Cypress – cypress strands and domes, mixed-hardwood swamps, and sloughs; Prairie – prairies and marshes; Mangrove; Pinelands; and Hammocks (see figure 3-1). Disturbed areas are intermixed throughout the Preserve and can be found within all the vegetation communities. The vegetation classes used in this plan are the same as those used in the Addition GMP (NPS 2010a).

Temperate plants are abundant in the Preserve but the majority of the species are tropical. Pinelands, cypress strands and domes, prairies, and marshes are the most prevalent vegetation types and are dominated by temperate species. Tropical species occur primarily in hardwood hammocks but are also found in pinelands, mixed-hardwood swamps, and cypress strands. Endemic species, native only to the Preserve area, comprise 10 percent of the Preserve vegetation (Long 1974).

Cypress (Cypress Strands and Domes, Mixed-Hardwood Swamps, and Sloughs). The dominant trees in the Preserve are two species of cypress, bald cypress (*Taxodium distichum*) and pond cypress (*T. ascendens*). Both species are deciduous conifers that are tolerant of inundation and saturated soils for extended periods. Pond cypress occurs naturally in shallow ponds and along the edges of swamps and low-flow streams in low-nutrient soils. Bald cypress prefers sites with moderate water flow and higher nutrient concentrations. While pond cypress tolerates frequent water draw-downs, bald cypress prefers a more stable water level with seasonal fluctuations (Myers and Ewel 1990).

Cypress strands — Cypress strands are linear swamps dominated by bald cypress occurring throughout the Preserve in deep mineral soil depressions. They form along major drainageways and generally retain a north-south orientation. Strands are similar to cypress domes but are generally larger and more biologically diverse. Hardwood trees that are adapted for hydric conditions, such as red maple (*Acer rubrum*), pond-apple (*Annona glabra*), and pop ash (*Fraxinus caroliniana*), are often common. Although the shrub stratum is generally sparse, scattered individuals of commonly occurring species such as dahoon (*Ilex cassine*), myrsine (*Myrsine cubana*), or swamp dogwood (*Cornus foemina*) are often present. Ground cover is often very sparse because hydroperiods are long or may be ephemeral and appear during the dry season. Swamp fern (*Blechnum serrulatum*) is a common ground cover that is dominant in strands. The substrates of this vegetation community type are generally inundated or saturated nearly throughout the year with hydroperiods often extending over 240 days.

Cypress domes — Cypress domes are generally small, relatively discrete wetlands dominated by cypress. Domes are nearly circular swamps often surrounded by fire-maintained herbaceous wetland communities with few trees. The dome shape results from taller bald cypress trees growing in the deeper waters of the interior with progressively smaller trees extending to the shallower waters of the periphery. Soils are often composed of a layer of peat that is thicker toward the dome's interior and becomes thinner approaching the periphery (Florida Natural Areas Inventory 2010).

The cypress dome community transitions to the surrounding herbaceous communities (e.g., prairie) at the periphery. Limestone usually occurs near the substrate surface in the peripheral areas, inhibiting the establishment of root systems. The cypress trees that survive near the periphery are usually smaller than

those near the center, where soils are deeper with a more hydric peat layer. In the peripheral areas, the ground cover is similar to that found in the adjacent communities because the smaller trees become more scattered, allowing more sunlight to reach the substrate.

Mixed-hardwood swamps — Cypress swamps that contain significant populations of hardwood trees that co-dominate the canopy with cypress are often referenced as mixed hardwood and cypress swamps. Red maple, pond-apple, swamp bay (*Persea palustris*), cabbage palm (*Sabal palmetto*), or laurel oak (*Quercus laurifolia*) are often co-dominants in this vegetation community. Vines such as poison-ivy (*Toxicodendron radicans*), grapes (*Vitis* spp.), laurel greenbrier (*Smilax laurifolia*), and rattan vine (*Berchemia scandens*) are common. Understory species include ferns, epiphytes, aquatic species, and saplings of overstory vegetation. Several bromeliads such as airplants (*Tillandsia* spp.) and the state listed endangered Fuch's bromeliad (*Guzmania monostachia*), and orchids such as epidendrums (*Epidendrum* spp.) and ghost orchid (*Polyradicion lindenii*) occur on the branches and trunks of trees in this community. Epiphytic ferns such as shoestring fern (*Vittaria lineata*) and golden polypody (*Phlebodium aureum*) are common on the trunks of cabbage palms.

Knolls within this vegetation type comprise a principal habitat for the state listed endangered Florida royal palm (*Roystonea regia*). Mixed-hardwood swamps serve as habitat for numerous birds, mammals, reptiles, and amphibians. This swamp community is usually diverse and may represent a later stage of community succession than the bald cypress-dominated community.

Sloughs — Sloughs are sinuous, elongated natural drainage channels that are inundated most of the time and are usually the deepest drainageways within swamp and marsh systems. They are broad channels inundated with slow-moving water, except during extreme droughts. The vegetation structure is variable with some sloughs dominated by

floating aquatics, others by large emergent herbs, and still others by a low or sparse canopy. Canopied sloughs are characterized by various swamp species, particularly pop ash and coastalplain willow (*Salix caroliniana*), with or without a mixture of large emergent herbs and floating aquatic plants. Pond-apple is a frequent canopy component and can withstand somewhat deeper water than pop ash (Florida Natural Areas Inventory 2010). Other common woody species include cypress (*Taxodium* spp.) and common buttonbush (*Cephalanthus occidentalis*). Sloughs are generally a few feet to a few inches below adjacent marshes. Soils are mostly peat or muck, with submerged surface sediments rising and falling with fluctuating water levels. During severe droughts, surface sediments dry out and ground fires may develop, but generally sloughs are wet most of the year and have historically served as fire breaks for communities bordering the sloughs. When fires do occur, depressions are formed in the organic soils, and they fill with water to become ponds. Ponds and sloughs provide important habitat for alligators.

Prairie (Prairies and Marshes).

Prairies — Prairies are treeless areas dominated by grasses and grasslike plants (graminoids). Herbaceous wet and dry prairies and cypress prairies can be found in the Preserve. Wet prairies are typically seasonally inundated short-grass communities characterized by hydroperiods of 70 days with inundation to eight inches. Graminoids such as hairawn muhly (*Muhlenbergia capillaris*), blue maidencane (*Amphicarpum muhlenbergianum*), rhizomatous bluestem (*Schizachyrium rhizomatum*), or short sawgrass (*Cladium jamaicense*) often dominate these prairies. Wet prairie communities may occur on many soils, but these communities are often found on frequently flooded calcium carbonate marls or fine sands. Dry prairies are typically seasonally inundated graminoid communities characterized by hydroperiods of 50 days with inundation to two inches. Common components of dry prairies include broomsedge bluestems (*Andropogon* spp.),

sand cordgrass (*Spartina bakeri*), starrush whitetop (*Rhynchospora colorata*), and saw palmetto (*Serenoa repens*). Herbaceous broad-leaved plants (forbs) are common components of the wet and dry prairie communities, but these plants do not usually dominate them. Limestone is commonly near the soil surface in prairie areas, which inhibits the growth of trees; thus vegetation is limited to ground cover. Additionally, prairies will burn during periods of drought and when sufficient fuel is present. Fire maintains prairies by eliminating invading trees and shrubs.

Cypress prairies are communities that transition between prairies and cypress-dominated swamp communities and typically contain elements of both. Cypress prairies are usually dominated by graminoid ground cover made up of species common in prairies such as hairawn muhly or sawgrass. Cypress trees are common in these prairies but seldom attain a large size. This is partly because the limestone that is a common component of substrates in the region is close to the soil surface and inhibits the establishment and growth of cypress trees unless there are fractures in the limestone where the cypress trees can establish limited growth. These trees are called dwarf or hatrack cypress. These areas are inundated (usually less than 1 foot of water depth) through much of the wet season.

Marshes — Both freshwater and saltwater marshes can be found in the Preserve with freshwater marshes more prevalent. Marshes are wetland communities that are dominated by herbaceous plants and occasional shrubs. These communities are typically inundated nearly year-round and have substrates with a thick organic mantle on the surface. Marshes are usually dominated by herbaceous species, but a marsh that is dominated by grasses or sedges may be considered a graminoid marsh. Grasses usually occur in areas without standing water during some part of the year, but related graminoids may be common in areas with prolonged hydroperiods. The graminoid that is probably most common in such areas is sawgrass. Sawgrass is actually a sedge (Cyperaceae) that is commonly found in wetlands with various depths to limestone,

often with a significant organic peat layer covering the limestone. This organic layer is usually derived from the sawgrass. Freshwater marshes are commonly dominated by broad-leaved plants, typically including pickerelweed (*Pontederia cordata*), cattails (*Typha* spp.), and bulltongue arrowhead (*Sagittaria lancifolia*) along with sawgrass and maidencane (*Panicum hemitomon*). These wetlands have comparatively deep water during the wet season and persist as aquatic communities year-round or well into the dry season. These deeper areas provide refuge for fish during dry seasons, when few places are under water, and also tend to concentrate populations of fish and other aquatic animals as water levels decrease with dry weather. Many wading birds such as wood storks depend on these concentrated prey populations to find sufficient food for nesting and brood rearing.

Saltwater marshes occur in coastal areas and are often affected by marine systems. These communities are influenced by tidal fluctuations and have higher soil salinity than inland freshwater systems. Saltwater marshes that are far inland may be affected by marine waters only during extreme storm tides such as those associated with hurricanes. This produces a change in salinity very infrequently, but the effects of this change may remain with the marsh community for several years. These inland saltwater marsh communities are usually populated with plants that are typical of freshwater marshes but that are able to tolerate small increases in salinity. Plants commonly occurring in these communities include southern cattail (*Typha domingensis*), pond-apple, and sand cordgrass. These areas and other communities inland from coastal systems may be dominated by fresh water almost all of the time but may still be frequently influenced by tidal changes in water level. During the dry season, decreased flow of fresh water may allow salt water to flow farther inland than during the wet season.

Tidal systems are more likely to dominate in proximity to the coast so that mixing of fresh water and salt water becomes more common, which can produce a gradient of fresh,

brackish, and salt-tolerant species assemblages. Communities that are dominated most of the year by brackish water are likely to be dominated by saltwater marsh with occasional mangrove trees. These saltwater marsh communities typically are comprised of commonly occurring species such as needle rush (*Juncus roemerianus*) cordgrasses (*Spartina* spp.), saltgrass (*Distichlis spicata*), and seashore dropseed.

Mangrove. Mangrove forests (mangrove swamps) are intertidal wetlands dominated by hardwood trees that are tolerant of coastal, saline conditions. Mangrove communities are the least diverse terrestrial vegetation type in south Florida (Long 1974). Three mangrove species, red mangrove (*Rhizophora mangle*), black mangrove (*Avicennia germinans*), and white mangrove (*Laguncularia racemosa*), along with buttonwood (*Conocarpus erectus*), a mangrove associate, comprise the dominant tree species within these communities. These trees often form dense forests on much of the coast in southern Florida and form scattered tree islands farther inland where surface waters become brackish. The distribution of mangrove communities in the Preserve depends on water depth and salinity.

Depending on the distance from the coast and seasonal runoff from inland freshwater systems, mangrove forest soils can vary in salinity. These changes in ground water and salt content create adverse conditions for most organisms, so that species richness in mangrove forests is usually low. Catastrophic events such as fires, frosts, hurricanes, and oil spills also limit mangrove productivity. Frosts severely prune mangroves and hurricanes can destroy them.

Pinelands. Pinelands occur in areas that are higher than most wetlands, so their substrates are inundated less frequently. In the Preserve, south Florida slash pine (*Pinus elliottii* var. *densa*) dominates these communities. Slash pine forests are woodland communities with pine trees that are spaced several yards apart resulting in an open (incomplete) tree canopy. Depending on substrate, some of these woodlands form a pine and palmetto

community, where widely spaced pine trees form an open canopy with a dense shrub layer comprised primarily of saw palmetto. The saw palmetto shrub layer is often so dense that groundcover does not become well established.

Slash pine forested communities that occur on limestone outcrops are called pine rockland communities. These areas also develop a saw palmetto shrub layer, but the saw palmettos are usually not as dense as in the pine and palmetto communities. This allows the establishment of other shrubs and ground cover resulting in more diversity than pine and palmetto communities occurring on sandy substrates. Pine rockland communities often contain plants that are associated with the Atlantic coastal ridge communities.

The pine and palmetto and pine rockland communities are typically mesic communities, but frequently include extensive ecotonal (transitional) areas that are adjacent to wetlands. These ecotonal communities have brief or infrequent hydroperiods and contain elements of the adjacent wetlands. Saw palmettos may not adapt well to hydric conditions and are not common in areas that are saturated or inundated often. Slash pines, however, tolerate more hydric conditions so that in areas with short hydroperiods, slash pines commonly live without the saw palmetto understory. In these areas, the open pine canopy allows sunlight to penetrate, and graminoids commonly found in prairies are supported.

Several ecotonal communities can be found in pinelands. These ecotonal communities occur in areas with subtle topographic differences, so that differences in the communities may occur because of differences in soil type, hydrology, small elevation differences, or fire history.

Pine needles, grasses, and other combustible materials accumulate relatively quickly in pinelands, and pinelands burn at frequent intervals. Pinelands are fire-dependent, and prescribed fires by NPS staff maintain the habitat viability by preventing hardwood succession. If fires are suppressed, pinelands eventually succeed to hardwood-dominated stands.

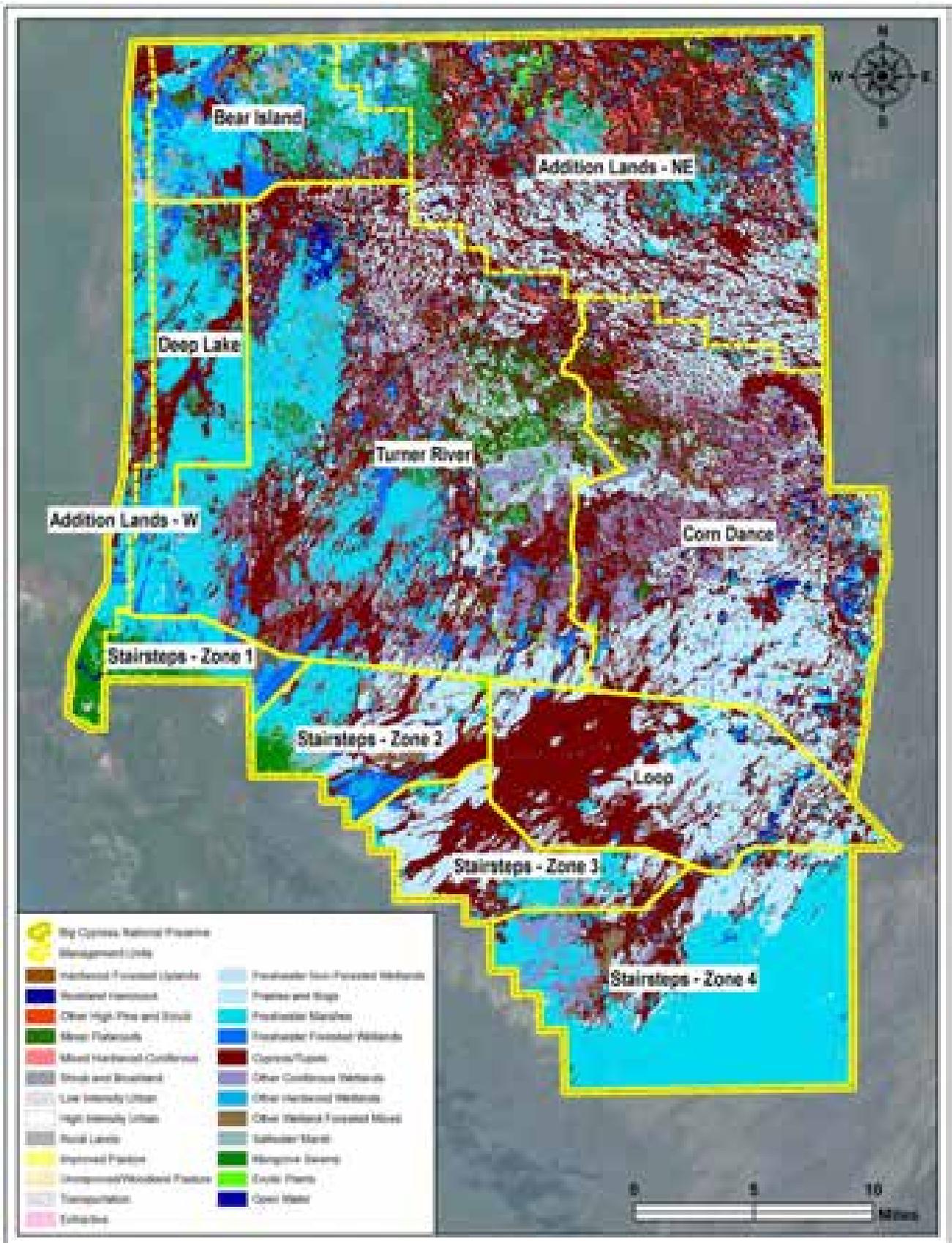
Suitable pinelands provide habitat for the federally listed red-cockaded woodpecker. Red-cockaded woodpeckers form clusters of trees with cavities within pinelands.

Hammocks. Hardwood hammock communities are dense and diverse forests of hardwood trees and shrubs, ferns, and epiphytes occurring on slightly elevated areas with soils slightly drier than the surrounding swamps and herbaceous wetlands. Mesic and hydric hardwood hammocks are scattered throughout the Preserve and because of their slightly elevated position, they often appear as islands of trees. Hammocks are usually small areas (2.5 acres or less) that are surrounded by other communities; in the Big Cypress region, the surrounding community is typically a wetland swamp or prairie. These slightly elevated areas function as refuges for wildlife during periods of high water. Because soils remain moist most of the year, hardwood hammocks rarely burn, but they are susceptible to fire during extended droughts. Following a fire, the species composition of recolonized hammocks often changes significantly (Duever et al. 1986).

Hammocks are usually dominated by hardwood trees with cabbage palms. Dominant canopy species are usually oaks such as live oak (*Quercus virginiana*), laurel oak, and water oak (*Quercus nigra*). Wild-tamarind (*Lysiloma latisiliquum*) is often a prevalent canopy species of hammocks in the less frost-susceptible southern portions of the Preserve. Understory composition commonly includes saw palmetto, coco-plum (*Chrysobalanus icaco*), common snowberry (*Chiococca alba*), and American beautyberry (*Callicarpa americana*). Epiphytes are common, especially on the branches of oak trees, where resurrection fern (*Pleopeltis polypodioides* var. *michauxiana*), numerous bromeliads, and several uncommon orchids grow. Many epiphytes such as shoestring fern and golden polypody also occur on the trunks and boots (persistent leaf bases) of cabbage palms. Vines that attain the tree canopy such as poison ivy, grapes, and peppervine (*Ampelopsis arborea*) are common canopy components. Elevated areas with sandy soils and limestone near the substrate surface often

support cabbage palm hammocks. These hammocks are usually not especially diverse, and have few trees other than cabbage palms forming the tree canopy. Shrubs are uncommon, and ground cover is sparse. Vines and epiphytes may occur on the palm trunks, but these are also usually sparse.

Disturbed Areas. Disturbed areas, found throughout the Preserve and intermixed within all of the above vegetation communities, are areas that have been affected by nature (fire, freeze, storms, extreme tides, etc.) or by man's activities such as logging, canal and road construction, farming and grazing, oil extraction, ORV use, fire, deliberate introduction of nonnative species, earth moving, altering drainage, altering the chemistry of water or soils, or facility construction. Community succession has been altered in disturbed areas. Soils in disturbed areas differ with locations and original substrates. The result is a change in the ecosystem that usually allows colonization and recruitment of invasive nonnative and opportunistic native species. These invasive nonnative and opportunistic native species outcompete desirable native species and quickly dominate the disturbed area.



Protected Plant Species

As shown in table 3-1, three species of plants that occur in the Preserve are listed as candidate species for federal listing as endangered or threatened. The state of Florida lists 99 species (including those three listed as federal candidate species) that occur in the Preserve as threatened or endangered, along

with three more that are listed as commercially exploited. Collectively, these species warrant attention because they have had long-term population declines and are vulnerable to exploitation or environmental changes. Table 3-1 displays the status of all 102 special status plant species that occur in the Addition.

Table 3-1 – Listed Plant Species for Big Cypress National Preserve¹

Common Name	Scientific Name	Designated Status ²	
		Federal	State
Paurotis palm, Everglades palm	<i>Acoelorrhaphe wrightii</i>		T
Golden leather fern	<i>Acrostichum aureum</i>		T
Brittle maidenhair	<i>Adiantum tenerum</i>		E
Sensitive joint-vetch, meadow joint-vetch	<i>Aeschynomene pratensis</i>		E
White colic-root, bracted colic-root	<i>Aletris bracteata</i>		E
Pineland-allamanda, pineland golden trumpet	<i>Angadenia berteroi</i>		T
Eared spleenwort	<i>Asplenium erosum</i>		E
Bird's-nest fern, wild birdnest fern	<i>Asplenium serratum</i>		E
Pinepink	<i>Bletia purpurea</i>		T
Fakahatchee bluethread	<i>Burmannia flava</i>		E
Manyflowered grasspink	<i>Calopogon multiflorus</i>		E
Spicewood, pale lidflower	<i>Calyptranthes pallens</i>		T
Leafless bentspur orchid	<i>Campylocentrum pachyrrhizum</i>		E
Narrow strap fern, narrow-leaved strap fern	<i>Campyloneurum angustifolium</i>		E
Tailed strap fern	<i>Campyloneurum costatum</i>		E
Powdery strap airplant	<i>Catopsis berteroniana</i>		E
Florida strap airplant	<i>Catopsis floribunda</i>		E
Southern Florida sandmat, rockland sandmat	<i>Chamaesyce pergamena</i>		T
Porter's sandmat	<i>Chamaesyce porteriana</i>		E
Satinleaf	<i>Chrysophyllum oliviforme</i>		T
Coffee colubrina, greenheart	<i>Colubrina arborescens</i>		E
Butterflybush, Curacao bush	<i>Cordia globosa</i>		E
Quailberry, Christmasberry	<i>Crossopetalum ilicifolium</i>		T
Pepperbush	<i>Croton humilis</i>		E
Florida tree fern, red-hair comb fern	<i>Ctenitis sloanei</i>		E
Blodgett's swallowwort	<i>Cynanchum blodgettii</i>		T
Cowhorn orchid, cigar orchid	<i>Cyrtopodium punctatum</i>		E
Florida prairieclover	<i>Dalea carthagenensis</i> var. <i>floridana</i>	C	E
Ghost orchid, palmlolly	<i>Polyradicion lindenii</i>		E
Caribbean crabgrass	<i>Digitaria filiformis</i> var. <i>dolichophylla</i>		T
Florida pineland crabgrass, Everglades crabgrass, twospike crabgrass	<i>Digitaria pauciflora</i>	C	E
Guiana-plum	<i>Drypetes lateriflora</i>		T
Clamshell orchid, cockleshell orchid	<i>Encyclia cochleata</i>		E
Florida butterfly orchid	<i>Encyclia tampensis</i>		CE
Dingy-flowered star orchid	<i>Epidendrum anceps</i>		E
Acuna's star orchid	<i>Epidendrum blancheanum</i>		E
Umbrella star orchid	<i>Epidendrum floridense</i>		E
Night-blooming epidendrum, night-scented orchid	<i>Epidendrum nocturnum</i>		E

Table 3-1 – Listed Plant Species for Big Cypress National Preserve¹

Common Name	Scientific Name	Designated Status ²	
		Federal	State
Stiff-flower star orchid	<i>Epidendrum rigidum</i>		E
Sanibel Island love grass	<i>Eragrostis tracyi</i>		E
Beach verbena, coastal mock vervain	<i>Glandularia maritima</i>		E
Wild cotton, upland cotton	<i>Gossypium hirsutum</i>		E
Fuchs' bromeliad, West Indian tufted airplant	<i>Guzmania monostachia</i>		E
Snowy orchid	<i>Habenaria nivea</i>		T
Needleroot airplant orchid	<i>Harrisella porrecta</i>		T
Poeppig's rosemallow	<i>Hibiscus poeppigii</i>		E
Hanging club-moss	<i>Huperzia dichotoma</i>		E
Delicate violet orchid	<i>Ionopsis utricularioides</i>		E
Rockland morningglory	<i>Ipomoea tenuissima</i>		E
Pineland clustervine	<i>Jacquemontia curtisii</i>		T
Skyblue clustervine	<i>Jacquemontia pentanthos</i>		E
West coast lantana, Sanibel shrubverbena	<i>Lantana depressa</i> var. <i>sanibelensis</i>		E
Catesby's lily, pine lily	<i>Lilium catesbaei</i>		T
Small's flax	<i>Linum carteri</i> var. <i>smallii</i>		E
Pantropical widelip orchid	<i>Liparis nervosa</i>		E
Nodding club-moss	<i>Lycopodiella cernua</i>		CE
Hidden orchid	<i>Maxillaria crassifolia</i>		E
Pineland blackanthers	<i>Melanthera parvifolia</i>		T
Climbing vine fern	<i>Microgramma heterophylla</i>		E
Twinberry, Simpson's stopper	<i>Myrcianthes fragrans</i>		T
Giant sword fern	<i>Nephrolepis biserrata</i>		T
Wild basil, wild sweet basil	<i>Ocimum campechianum</i>		E
Florida dancinglady orchid	<i>Oncidium ensatum</i>		E
Hand fern	<i>Ophioglossum palmatum</i>		E
Erect pricklypear	<i>Opuntia stricta</i>		T
Royal fern	<i>Osmunda regalis</i> var. <i>spectabilis</i>		CE
Pineland passionflower	<i>Passiflora pallens</i>		E
Comb polypody	<i>Pecluma ptilodon</i> var. <i>caespitosa</i>		E
Cypress peperomia	<i>Peperomia glabella</i>		E
Florida peperomia, baby rubberplant	<i>Peperomia obtusifolia</i>		E
Yerba linda	<i>Peperomia rotundifolia</i>		E
Southern fogfruit	<i>Phyla stoechadifolia</i>		E
Greater yellowspike orchid	<i>Polystachya concreta</i>		E
Bahama ladder brake	<i>Pteris bahamensis</i>		T
Swartz's snoutbean	<i>Rhynchosia swartzii</i>		E
Royal palm, Florida royal palm	<i>Roystonea regia</i>		E
Leafless beaked lady's-tresses	<i>Sacoila lanceolata</i> var. <i>paludicola</i>		T
Ray fern	<i>Schizaea pennula</i>		E
Florida Keys nutrush	<i>Scleria lithosperma</i>		E
Everglades bully	<i>Sideroxylon reclinatum</i> subsp. <i>austrofloridense</i>	C	E
Mullein nightshade	<i>Solanum donianum</i>		T
Everglades Keys false buttonweed	<i>Spermacoce terminalis</i>		T
Texas ladiestresses	<i>Spiranthes brevilabris</i>		E
Lacelip lady's-tresses	<i>Spiranthes laciniata</i>		T
Longlip lady's-tresses	<i>Spiranthes longilabris</i>		T
Southern lady's-tresses	<i>Spiranthes torta</i>		E
West Indian mahogany	<i>Swietenia mahagoni</i>		T
Broad halbard fern	<i>Tectaria heracleifolia</i>		T

Table 3-1 – Listed Plant Species for Big Cypress National Preserve¹

Common Name	Scientific Name	Designated Status ²	
		Federal	State
Curtiss' hoarypea	<i>Tephrosia angustissima</i> var. <i>curtissii</i>		E
Lattice-vein fern	<i>Thelypteris reticulata</i>		E
Reflexed wild-pine, northern needleleaf	<i>Tillandsia balbisiana</i>		T
Stiff-leaved wild-pine, cardinal airplant	<i>Tillandsia fasciculata</i> var. <i>densispica</i>		E
Banded wild-pine, twisted airplant	<i>Tillandsia flexuosa</i>		T
Hoary wild-pine, fuzzywuzzy airplant	<i>Tillandsia pruinosa</i>		E
Giant wild-pine, giant airplant	<i>Tillandsia utriculata</i>		E
Soft-leaved wild-pine, leatherleaf airplant	<i>Tillandsia variabilis</i>		T
Chiggery grapes	<i>Tournefortia hirsutissima</i>		E
Entire-winged bristle fern	<i>Trichomanes holopterum</i>		E
Hoopvine	<i>Trichostigma octandrum</i>		E
Florida gamagrass	<i>Tripsacum floridanum</i>		T
Leafy vanilla	<i>Vanilla phaeantha</i>		E
Rain-lily, redmargin zephyrlily	<i>Zephyranthes simpsonii</i>		T

Sources: USFWS 2011a, USDA 2011, and Florida Natural Areas Inventory 2011.

¹ Species in this table include those that have been documented in the Preserve – it does not include listed species for Collier County that are not present in the Preserve.

² E = endangered; T = threatened; C = candidate; CE = commercially exploited

Nonnative Invasive Plant Species

Thousands of nonnative plant species have been introduced to south Florida for ornamental plantings, agriculture, and other human uses. Due to the relative youth of the south Florida landmass and the semi-tropical climate, it is theorized that the region is particularly susceptible to invasion by nonnative invasive plant species (Duever et al. 1986a). The Florida Exotic Pest Plant Council keeps an updated list of the 143 Category I and Category II nonnative plants in Florida, which represents about eleven percent of the more than 1,400 nonnative plant species that have been introduced into Florida and subsequently established outside of cultivation (Florida Exotic Pest Plant Council 2011). Category I nonnative plants are those invasive nonnatives that are altering native plant communities by displacing native species, changing community structures or ecological functions, or hybridizing with natives (Florida Exotic Pest Plant Council 2011). Category II nonnative plants are those invasive nonnatives that have increased in abundance or frequency but have not yet altered Florida plant communities to the extent shown by Category I species; these species may become ranked Category I, if

ecological damage is demonstrated (Florida Exotic Pest Plant Council 2011). Many of these plants are reported in the Preserve, but most are restricted to early successional stages on disturbed sites, and only a few pose a long-term threat to native communities. Of these, five species — melaleuca (*Melaleuca quinquenervia*), Brazilian-pepper (*Schinus terebinthifolius*), water-hyacinth (*Eichhornia crassipes*), hydrilla (*Hydrilla verticillata*), and small-leaf climbing fern (*Lygodium microphyllum*) — are fairly common in the Preserve. Melaleuca and Brazilian-pepper are capable of invading native plant communities, and control efforts have been concentrated on these species. Australian-pine (*Casuarina* spp.) was identified as a nonnative invasive species of concern; however, in the last two decades it has been eradicated. All known Australian-pine plants have been eliminated from the Preserve, except for those on private property. Crested floatingheart (*Nymphoides cristata*), a relatively new nonnative for south Florida, was discovered in the Preserve in August 2006. Infestations are restricted to about 4 miles of canal along Tamiami Trail and two strand swamps south of the trail (NPS 2006b). Evidence suggests that this species was introduced to the Preserve through the

transfer of propagules attached to a net or other fishing gear. Invasion of the adjacent swamps likely occurred from water flowing through culverts in the area. Water-lettuce (*Pistia stratiotes*) and common air-potato (*Dioscorea bulbifera*) are also known to be present.

The nonnative plant control program is carried out by NPS contractors and maintenance and resource management staff. NPS staff are active participants in the Florida Exotic Pest Plant Council, an interagency task force organized to share technical information on the control of nonnatives, monitor the distribution of nonnatives in south Florida, and collaborate on comprehensive control strategies.

Even though nonnatives are spread by natural events (such as hurricanes) and animals (such as raccoons and birds), there are indications that ORVs have resulted in the spread of nonnative and invasive plants within the Preserve, including Brazilian-pepper, melaleuca, and small-leaf climbing fern. Off-road vehicles transport seed in their tire treads and vehicle beds and distribute it in currently unaffected areas of the Preserve as they travel. Evidence of the spread of invasive plants along ORV trails has been documented around the Monroe Station trailhead (Pernas 1999).

Melaleuca. This species, a native of Australia and New Guinea, was introduced to Florida around 1910 for landscaping. Perhaps the first introduction of melaleuca in the Preserve was at Monroe Station around 1940. Since it grows in pure stands at the expense of native vegetation and can occupy large areas, melaleuca is considered to be a major threat to the ecological integrity of the Preserve.

Melaleuca has successfully invaded much of south Florida because of its outstanding ability to propagate. A mature tree may contain tens of thousands of small woody seed capsules along its branches, and each capsule contains about 250 seeds. The capsules remain closed as long as they receive moisture from the tree's vascular system. However, if the vascular system fails due to damage by fire, frost, cutting, herbicidal injury, or simply old age,

the capsules will slowly dry out, open, and release hundreds of thousands of seeds. The seeds fall within a short distance of the parent tree and germinate best on open, moist soils. Germination is limited on very dry or very wet soils and under dense canopy cover. As a result, melaleuca does well in prairies and open, moist pinelands, but is slower to invade wetter communities such as cypress domes and strands.

Melaleuca is extremely fire tolerant. The spongy inner bark insulates the trunk while the papery outer bark and oil-rich leaves readily carry fire. Following a fire, melaleucas will both release seeds and resprout, and fires create excellent conditions for melaleuca seed germination and seedling survival. Hence, fire in a mature melaleuca stand can encourage the nonnative to spread.

Melaleuca is controlled through two primary methods: (1) hand pulling — manually pulling the plants when they are small enough, and (2) stump cutting/girdling — brushing or spraying herbicide on freshly cut stump surfaces. Both techniques are labor-intensive, and trained personnel are required to handle the herbicides. Once mature, seed-bearing trees have been killed, prescribed fire or cutting may be used to control seedlings and sprouts.

The entire Preserve has been inspected for the presence of melaleuca plants. Today, melaleuca is considered to be under control within the Preserve. Future treatments of melaleuca in the Preserve would focus on re-treating previously treated areas.

Brazilian-pepper. A native of South America, Brazilian-pepper was first introduced to south Florida around 1900. It is now widespread in the region, primarily on disturbed, well-drained sites.

Brazilian-pepper reproduces by seed. Seeds are produced in bright red berries that are ingested by birds and other wildlife and then spread to other areas. Ingestion appears to improve seed germination potential.

Fire has variable effects on pepper plants. Seedlings are killed by fairly frequent fires; however, in more mature stands trees may be top-killed by fires but can resprout and reoccupy a burned area. Intense fires on upland sites tend to eliminate competing vegetation and prepare good seedbed conditions.

Like melaleuca, Brazilian-pepper occurs in dense, pure stands. However, unlike melaleuca, dense Brazilian-pepper stands are almost always confined to areas with substrate disturbance (roadsides, canal banks, abandoned homesites, or camps — typically areas in which fill has been placed to create dry land). As some upland areas mature toward hardwood hammock vegetation, Brazilian-pepper will decline in importance. However, in most upland areas the natural fire cycle is likely to maintain Brazilian-pepper as a component of the understory indefinitely. Fire and hydrological cycles seem to prevent Brazilian-pepper from invading undisturbed prairies, marshes, and other more moist types of environments.

Brazilian-pepper occurs in mesic communities nearly throughout the Preserve. It is often found on old farm fields, spoil banks, and canal berms. The overall goal is for stopping the spread of Brazilian pepper in the entire Preserve, which would likely take about 10 years (NPS 2006b).

Water-hyacinth and Hydrilla. Water-hyacinth and hydrilla have invaded the Preserve's canal systems and excavated ponds, where they often form dense mats. Neither species can invade seasonally dry wetlands, and both species appear to be restricted to permanent water in canals and ponds. For this reason no major control program is currently warranted.

Small-leaf Climbing Fern. Small-leaf climbing fern is rapidly becoming a significant problem species throughout southern Florida due to its invasive nature. It apparently originated in the Palm Beach County area on the east coast of the state and has been spreading rapidly westward and southward.

The first recorded treatment of small-leaf climbing fern in the Preserve occurred in 1998. Since then this nonnative invasive species has been found in nearly 100 sites in the Preserve. Infestations have been found throughout the Preserve, with the greatest concentration in the northeast. Most of these infestations are small (<0.5 acre), although some larger patches have been found. To date all known infestations of this species have been treated. However, further establishment of this fern in the Preserve is anticipated, and detailed reconnaissance to locate infestations will occur annually. The overall goal is to prevent incipient infestations of small-leaf climbing fern from becoming major eradication problems.

Another similar nonnative invasive climbing fern, Japanese climbing fern (*Lygodium japonicum*), is causing similar problems with native communities, but this plant is more common to the north. Although Japanese climbing fern has been recorded in the Preserve, it is not common.

WILDLIFE

Protected Wildlife Species

A total of 29 animal species that could occur in the Preserve receive some level of special protection or are recognized as rare species by the state of Florida or the federal government.

Eight of the 29 species mentioned above are listed as either federally endangered or threatened and reside in the Preserve. The state lists 13 species as species of special concern. Collectively, these species warrant attention because they have experienced long-term population declines and are vulnerable to exploitation or environmental changes. Table 3-2 displays the status of all 29 special status wildlife species that are known to occur in the Preserve.

Table 3-2 – Listed Wildlife Species for Big Cypress National Preserve¹

Common Name	Scientific Name	Designated Status ²	
		Federal	State
Mammals			
Florida bonneted bat	<i>Eumops floridanus</i>	E	T ³
Everglades mink	<i>Mustela vison evergladensis</i>		T
Mountain lion	<i>Puma concolor</i>		T(S/A)
Florida panther	<i>Puma concolor coryi</i>	E	FE
Big Cypress fox squirrel	<i>Sciurus niger avicennia</i>		T
West Indian manatee	<i>Trichechus manatus</i>	E	FE
Florida black bear	<i>Ursus americanus floridanus</i>		Delisted ⁴
Birds			
Cape Sable seaside sparrow	<i>Ammodramus maritimus mirabilis</i>	E	FE
Limpkin	<i>Aramus guarana</i>		SSC
Little blue heron	<i>Egretta caerulea</i>		SSC
Reddish egret	<i>Egretta rufescens</i>		SSC
Snowy egret	<i>Egretta thula</i>		SSC
Tricolored heron	<i>Egretta tricolor</i>		SSC
White ibis	<i>Eudocimus albus</i>		SSC
Florida sandhill crane	<i>Grus canadensis pratensis</i>		ST
American oystercatcher	<i>Haematopus palliatus</i>		SSC
Wood stork	<i>Mycteria americana</i>	E	FE
Osprey	<i>Pandion haliaetus</i>		SSC*
White-crowned pigeon	<i>Patagioenas leucocephala</i>		ST
Brown pelican	<i>Pelecanus occidentalis</i>		SSC
Red-cockaded woodpecker	<i>Picoides borealis</i>	E	FE
Roseate spoonbill	<i>Platalea ajaja</i>		SSC
Everglade snail kite	<i>Rostrhamus sociabilis plumbeus</i>	E	FE
Black skimmer	<i>Rynchops niger</i>		SSC
Least tern	<i>Sterna antillarum</i>		ST
Reptiles			
American alligator	<i>Alligator mississippiensis</i>	T(S/A)	FT(S/A)
American crocodile	<i>Crocodylus acutus</i>	T	FT
Eastern indigo snake	<i>Drymarchon corais couperi</i>	T	FT
Mollusks			
Florida tree snail	<i>Liguus fasciatus</i>		SSC

Sources: USFWS 2011a, FWC 2013, and Florida Natural Areas Inventory 2011.

¹ Species in this table include those that have been documented in the Preserve; it does not include listed species for Collier County that are not present in the Preserve.

² E = endangered; T = threatened; (S/A) = similarity of appearance to a threatened or endangered species; FE = federally endangered; FT = federally threatened; ST = state threatened; SSC = species of special concern (no regulatory authority); SSC* = SSC in Monroe County only

³ The Florida bonneted bat was federally listed as endangered under the Endangered Species Act, effective November 2013, at which time the bat was already state-listed as threatened. Based on the current rule-making process in Florida, the FWC is likely to revise the state status for the bat to “federally endangered” during the next revision of Florida’s Endangered and Threatened Species List (FWC 2013b).

⁴ The Florida black bear was removed from the Florida’s Endangered and Threatened Species List on August 23, 2012, after approval by the FWC at the June 2012 meeting (FWC 2013b); since this removal occurred after the initial draft of this document, the Florida black bear has been left on the list.

Florida Panther. The Florida panther is federally listed as endangered by the state of Florida. Lands in the Preserve contain suitable habitat for the Florida panther, and approximately one-third of the panthers' current range falls within the Preserve. Figure 3-2 shows the regional network of state and federal lands in south Florida where Florida panthers are known to occur. Figure 3-3 shows the Preserve, Florida Panther National Wildlife Refuge, and Everglades National Park overlaid with a 95% kernel range estimate based on panther radio-telemetry data (1981-2009).

Panthers once lived throughout most of the southeastern U.S., but intensive persecution of these animals, prey decline, and destruction of wildlands severely reduced the population. Today, the only confirmed breeding population is located in south Florida. The current panther population is centered in and around the Preserve, including Everglades National Park, Fakahatchee Strand Preserve State Park, Florida Panther National Wildlife Refuge, and privately owned lands north of the Preserve in Collier and Hendry counties.

Annual range-wide surveys of the Florida panther population in central and southern Florida began in 1981 (McBride et al. 2008). Approximately 20 to 30 Florida panthers remained in the early 1980s (McBride et al. 2008). Based on documented physical evidence, the population remained relatively stable between 20 to 30 panthers between 1985 and 1995 (McBride et al. 2012). In 1995, eight female Texas cougars were released into the Florida panther population, including four introduced into the Big Cypress, to offset the negative effects of inbreeding documented in panthers. The population began increasing after the genetic restoration efforts in 1995, reached a peak in 2007, and has remained relatively stable between 104 to 110 panthers from 2008 through 2011 (McBride et al. 2012).

Panthers are a landscape species that require large contiguous areas with adequate prey availability and reduced levels of human disturbance. Forest patches comprise an important component of panther habitat in south Florida (Kautz et al. 2006). Panthers

select forested habitat types interspersed with other habitat types that are used in proportion to their availability (Land et al. 2007, Onorato et al. 2010). Panthers prefer to move through vegetated areas, and rarely move through open areas except at night. It is important to maintain vegetated corridors between habitats to allow for panther movement.

Existing data on panther reproduction indicate that breeding may occur throughout the year, with a peak during winter and spring, a gestation period of around 90 to 95 days, litter sizes of one to four kittens, and a breeding cycle of two years for females successfully rearing young to dispersal, which typically occurs at 18 months (USFWS 2008). Most panther births occur between March and July, and the den sites are used for two months after birth. Den sites are usually located in dense, understory vegetation, typically saw palmetto (Maehr 1990a, Shindle et al. 2003).

The panther's preferred prey items are white-tailed deer and feral hogs (Maehr et al. 1990, Dalrymple and Bass 1996). Secondary prey includes raccoons (*Procyon lotor*), nine-banded armadillos (*Dasypus novemcinctus*), marsh rabbits (*Sylvilagus palustris*) (Maehr et al. 1990) and alligators (Dalrymple and Bass 1996). Regarding deer predation, Janis and Clark (2002) determined a predation success rate of one kill per 5.24 days for female panthers and one kill per 7.7 days for male panthers, with an average of one kill per animal per 6.45 days for the general panther population. Other literature (Anderson and Lindzey 2003; Cooley et al. 2008; Murphy, Nadeau, and Ruth 2011) shows similar predation success rates of one deer-sized prey per panther approximately every 6.7 to 7.6 days or on average one deer-sized prey per week (Ruth and Murphy 2010).

Panthers are typically shy, secretive animals that normally avoid human interaction. Interactions with humans can affect panther behavior. A study was conducted between 1994 and 1998 by Janis and Clark (1999) to study the effects of hunting on panthers. It centered on the panther population north of I-75, including the Bear Island Unit in the original Preserve. The USFWS's "Biological

Opinion” for the 2000 *Final Recreational ORV Management Plan* states the following on page 562 of the plan:

Janis and Clark (1999) surmise that the increase in the distance of panther locations from trails is “biologically minor” and probably related to prey behavior; i.e. white-tailed deer moving deeper into the forest to avoid ORV users. The decrease in panther use of the Bear Island Unit is balanced by an increase in use of private lands north of [Big Cypress National Preserve] as “refugia.” The authors assert that this pattern would be of serious concern if panther habitat on private lands were lost.

Fletcher and McCarthy (2011) conducted an updated analysis to assess effects found in Janis and Clark (2002). Their analysis provided limited support for the effects of hunting on panthers. In particular, Fletcher and McCarthy (2011) did not re-affirm private land refugia postulated by Janis and Clark (2002). Rather, they found:

Our updated analysis to assess effects found in Janis and Clark (2002) provided limited support for concluding hunting affects panther distribution and movements. We observed an increasing frequency of use of Bear Island during the hunting season by panthers rather than a decrease as seen in Janis and Clark (2002). Similar to Janis and Clark (2002), we found a significant difference in the distance to trail across hunting time periods. However, we did not observe an increase in the hunting period followed by a decrease in the post period, as in Janis and Clark (2002) but rather a continuous increase from pre-hunting through to post-hunting, perhaps because the small game and turkey seasons appear to be included in the post-hunting period of Janis and Clark (2002). We also note that the change in the average distance of panther locations from trails between the pre-hunting and hunting seasons (81 m) was well within the telemetry error of panther locations (489 m; as estimated by Janis 1999).

Fletcher and McCarthy (2011) found that heightened ORV use has some weak effects on panther distribution, specifically an increase in use of forested wetlands, but that variation in standing ground water was more influential on panther distributions. The authors concluded:

Nonetheless, these results suggest that panthers and hunter ORV use can co-occur at least at the hunter ORV levels observed, and that forested wetlands may be disproportionately used by panthers during times of high hunter ORV use.

Several government agencies are involved in panther management and research in south Florida and the Preserve. Under the Endangered Species Act, the USFWS has oversight responsibility to review the actions of other agencies in relation to federally protected species and to establish species recovery programs. The NPS has the primary responsibility for protecting the panther (as well as other listed species) on lands under its jurisdiction. National Park Service efforts have concentrated on the distribution of panthers on NPS lands in the Preserve south of I-75 and east of SR 29 and in Everglades National Park. The FWC is responsible for panther research and management and has focused on panther home ranges and movement patterns, habitat selection and needs, food habits, demographic parameters, physical condition and health, and other life history and management questions. In addition, the FWC has also been involved in studies of the condition and health of deer in the Preserve as the panthers’ main prey. The NPS and the FWC cooperate for overall wildlife management in the Preserve.

In 2008, the *Florida Panther Recovery Plan* was updated with a third revision and released by the USFWS (USFWS 2008). This 2008 plan includes the following recovery objectives: recovery objectives:

- to maintain, restore, and expand the panther population and its habitat in south Florida and expand the breeding portion of the population in south Florida to areas north of the Caloosahatchee River
- to identify, secure, maintain, and restore panther habitat in potential reintroduction

areas within the historic range, and to establish viable populations of the panther outside south and south-central Florida

- to facilitate panther recovery through public awareness and education

The plan also identifies criteria for recovery and reclassification under the Endangered Species Act. Downlisting on the Florida panther would require two separate, viable populations of at least 240 individual panthers (adults and subadults) that have been established and maintained for a minimum of 12 years. And, sufficient habitat quality, quantity, and spatial configuration to support these populations would need to be secured. To work toward this long-term goal, the 2008 recovery plan identifies an interim goal to achieve and maintain a minimum of 80 panthers in each of two reintroduction areas within the historic range and to maintain, restore, and expand the south/south-central Florida subpopulation. The actions needed to achieve this interim goal are as follows:

1. Maintain, restore, and expand the panther population and its habitat in south Florida.
2. Expand the breeding portion of the population in south Florida to areas north of the Caloosahatchee River.
3. Identify potential reintroduction areas within the historic range of the panther.
4. Reestablish viable panther populations outside of south and south-central Florida within the historic range.
5. Secure, maintain, and restore habitat in reintroduction areas.
6. Facilitate panther conservation and recovery through public awareness and education.

The NPS has an ongoing project monitoring the status of the panther population within the Preserve. The overall purpose is to provide information to management so that their decisions will support and enhance panther recovery, and to determine the panthers' behavioral and/or demographic responses to natural events, management actions, and human impacts in south Florida.

Each panther with a functioning radio-collar is located three times a week (usually between 9:00 a.m. and 12:00 p.m.) from a fixed-wing

aircraft. Wildlife personnel record the date, time, coordinates, habitat type, and unique situations (i.e. two panthers in the same location or panther sightings) for each panther. These data are entered into a database, which is shared with the FWC on an annual basis, or as requested. Panthers fitted with GPS equipped collars provide nighttime location and movement data. Annually, location data are used to determine home range for each individual. More immediate uses of location data include identification of mortality sites, possible breeding events (male and female located together), kill locations, and den sites. In the long term, such data can provide locations of high use highway crossing sites in an effort to prioritize fenced wildlife crossing areas, seasonality of denning, age at first denning, and changes in home range size.

Dead panthers are collected and given to the FWC for necropsy. Information obtained can include panther age at death, general health and, in many cases, cause of death.

Once located, panther dens are visited while females are absent. Kittens are captured and handled to collect data including sex ratios, litter size, and general health conditions. Blood is collected and used to determine the success of the genetic restoration effort and the existence of any diseases. Kittens are examined for external parasites and given deworming medication. Kittens are also marked with sub-dermal PIT tags for future identification.

Annual capture efforts provide data regarding the general health of adult panthers. Data collected include sex, age, weight, external parasite loading, and injuries. Previously collared panthers allow a comparison of individual health between two known dates. Uncollared panthers are checked for PIT tags. Presence of such a tag allows for exact aging of the individual. Blood is collected for genetic testing and testing for disease. If the animal has not previously been inoculated against Feline Leukemia, it is done at this time. Capture efforts themselves can provide an index of panther density and sex ratio within the area.

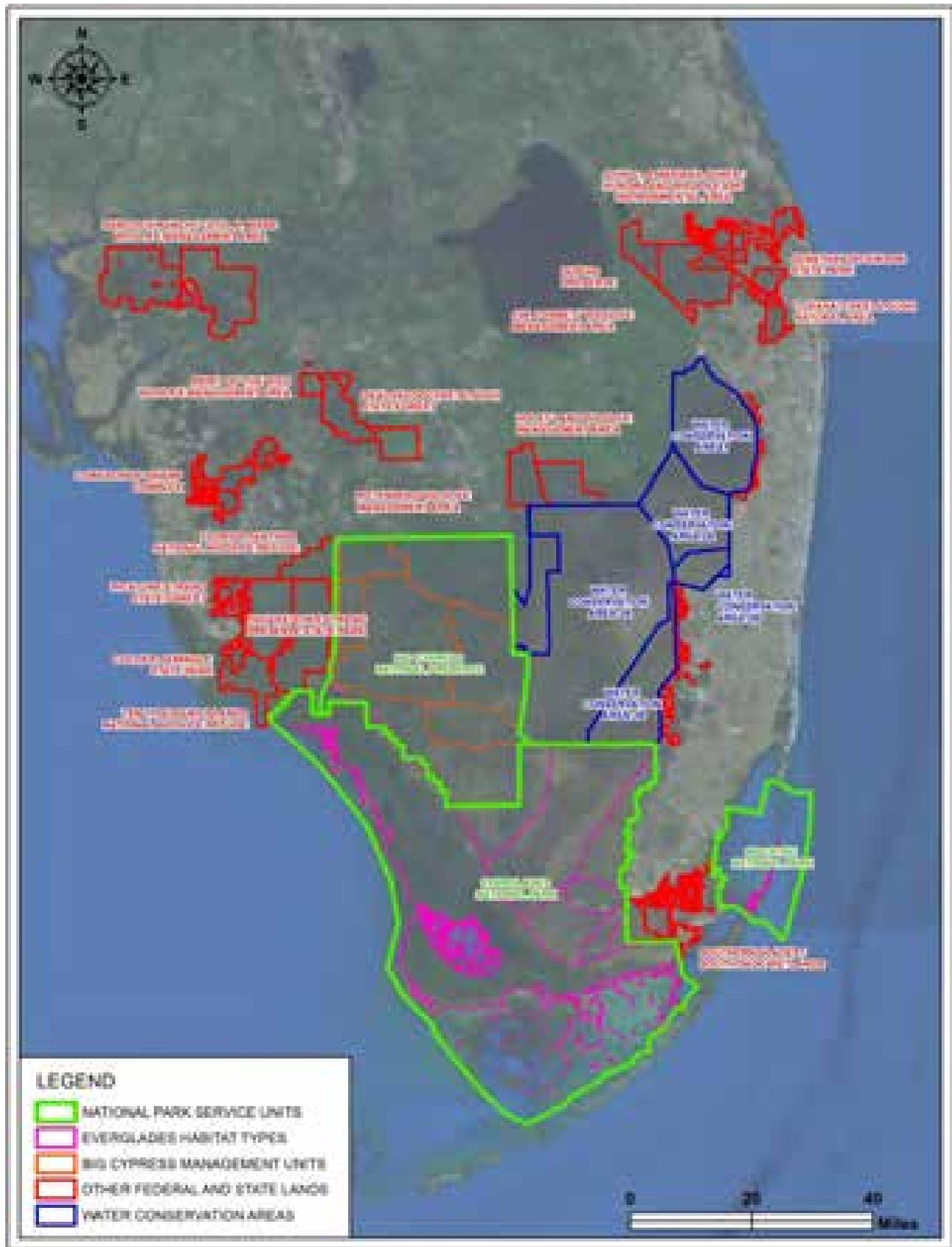


Figure 3-2 – Regional Network of State and Federal Lands in South Florida Where Florida Panthers are Known to Occur

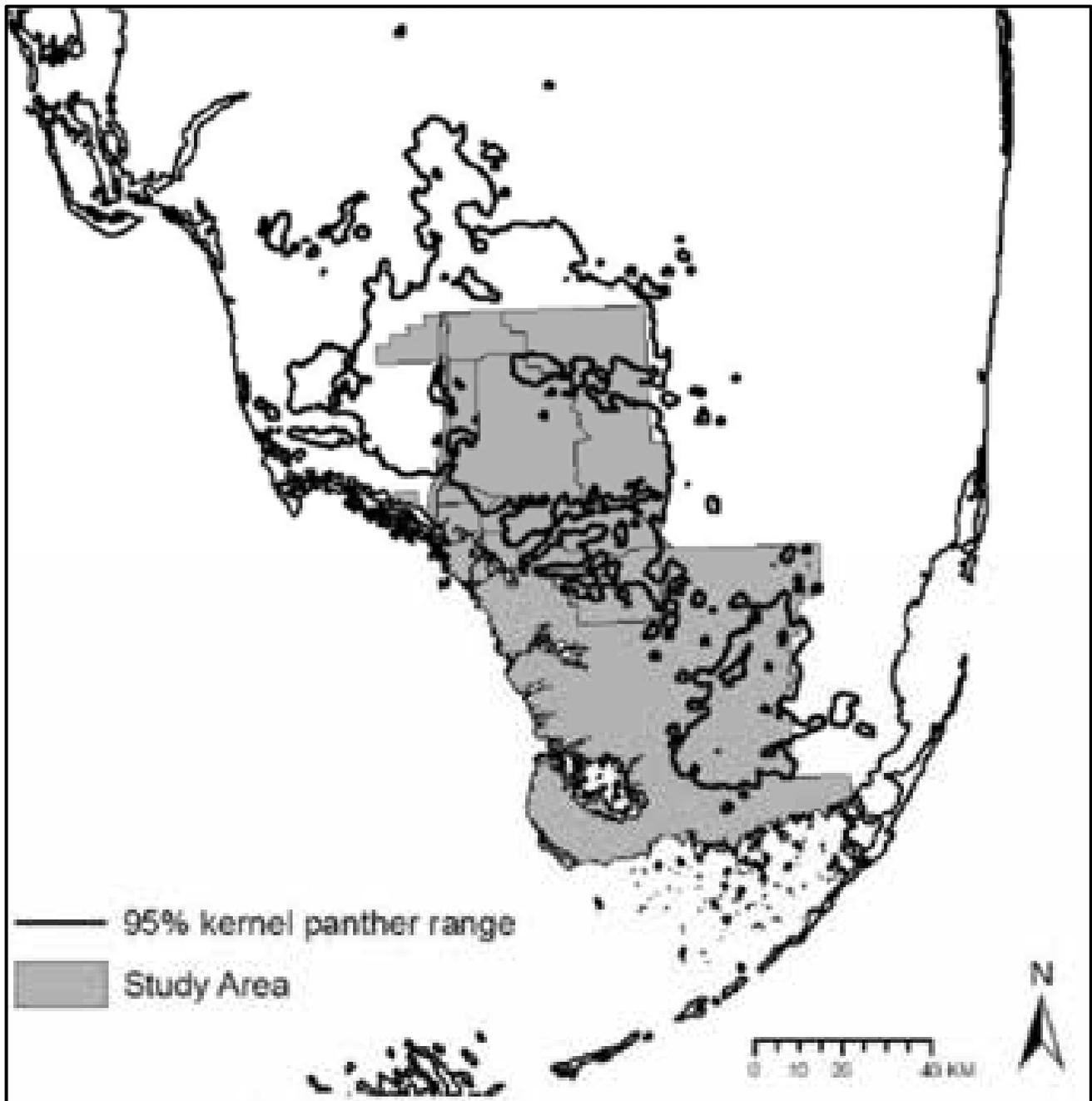


Figure 3-3 – The Preserve, Florida Panther National Wildlife Refuge, and Everglades National Park overlaid with a 95% Kernel Range Estimate Based on Panther Radio-Telemetry Data (1981-2009)

Source: Fletcher and McCarthy 2011

West Indian Manatee. The West Indian manatee was listed as federally endangered under the Endangered Species Act in 1967. Critical habitat for the West Indian manatee was designated by the USFWS in 1976 (41 FR 41914), and corrected and augmented in 1977 (42 FR 47840-47845). As published in the *Federal Register* (50 CFR Part 17.95), critical habitat, as it applies to the Addition, is defined as:

all U.S. territorial waters adjoining the coast and islands and all connected bays, estuaries, and rivers from Gordon's Pass, near Naples, Collier County, southward to and including Whitewater Bay, Monroe County.

No specific primary or secondary constituent elements were included in the designation. Critical habitat for the manatee identifies specific areas occupied by the manatee that have those physical or biological features that are essential to the conservation of the manatee and/or may require special management considerations.

Interpretations of the critical habitat criteria contained in the *Federal Register* have led biologists to conclude that critical habitat in the Preserve is generally limited to open water creeks, canals, and estuarine areas south of U.S. 41. Critical habitat includes near-shore mangrove estuaries and creeks, as well as the canals along U.S. 41 and SR 29. Occupied critical habitat in the SR 29 canal (aka Barron River Canal) extends to the north beyond U.S. 41 as far as the first water control structure.

The West Indian manatee is one of the largest coastal mammals in North America. The West Indian manatee is an aquatic mammal with grey to grey-brown, thick, tough skin that is sparsely covered with small, thick hairs and is sometimes covered with barnacles and algae. The rounded body of the manatee has no hind limbs, but it has paddle-like forelimbs or flippers with three to four nails present on the dorsal surface of each flipper. The body tapers to a flattened tail.

This unusual marine mammal with its massive, seal-like body has been able to adapt

well to its marine environment. Exact estimates of the historic manatee population are uncertain, but overhunting during the 1700s to 1900s is believed to be responsible for reducing the manatee population to only a few relict groups (Hartman 1979). Manatees migrate seasonally to adapt to changing water temperatures. West Indian manatees roam in fresh, brackish, and marine waters throughout Florida, the Greater Antilles, Central America, and South America. Waters colder than 20 degrees Celsius increase the manatees' susceptibility to cold stress and cold-induced mortality. Because of this temperature restriction, manatees seek out warm water refuges to help reduce energetic maintenance costs. The West Indian manatee is one of the most endangered marine mammals in coastal waters of the United States.

The manatee occurs throughout the southeastern United States. The only year-round populations of manatees occur throughout the coastal and inland waterways of peninsular Florida and Georgia (Hartman 1974). During the summer, manatees may range as far north along the East Coast of the U.S. as Rhode Island, west to Texas, and, rarely, east to the Bahamas (USFWS 1996, Lefebvre et al. 1989). There are reports of occasional manatee sightings from Louisiana, southeastern Texas, and the Rio Grande River mouth (Gunter 1941, Lowery 1974).

Manatees frequently migrate throughout the waterways in south Florida. The south Florida ecosystem region is home to the most resident manatee populations and transient migrants in Florida. In south Florida, manatees are most prominent year-round in the following areas: Indian River, Biscayne Bay, Everglades and Ten Thousand Island area, Estero Bay and Caloosahatchee River area, and Charlotte Harbor area. Some of the largest winter aggregations (50 or more manatees) occur in south and central Florida (USFWS 1996).

Manatees occur in both fresh- and saltwater habitats within tropical and subtropical regions. They depend on areas with access to natural springs or manmade warm water refugia and access to areas with vascular plants and freshwater sources (Humphrey

1992). Several factors contribute to the distribution of manatees in Florida. Between October and April, Florida manatees concentrate in areas of warmer water. When water temperatures drop below 21 to 22 degrees Celsius, they migrate to south Florida or form large aggregations in natural springs and industrial outfalls. Severe cold fronts have been known to kill manatees when the animals did not have access to warm water refuges.

During warmer months they appear to choose areas based on food supply, water depth, and proximity to fresh water. Manatees may not need fresh water, but they are frequently observed drinking fresh water from sewage outfalls and culverts.

The manatee occupies a prominent position in marine and estuarine systems as a prodigious grazer of submerged aquatic vegetation. It spends about five hours a day feeding, and in that time, it consumes about 4 – 9 per cent of its body weight (44 to 99 pounds or 20 to 45 kilograms/day) (Bengston 1983). Submerged aquatic vegetation, such as seagrasses, is a major component of the diet of manatees, and although manatees appear to tolerate marine and hyper saline conditions, they are most frequently found in fresh or brackish waters. Manatees inhabit both salt and fresh water of sufficient depth (5 feet to usually less than 20 feet) and may be encountered in canals, rivers, estuarine habitats, saltwater bays, and, on occasion, have been observed as much as 3.7 miles off the Florida gulf coast (USFWS 2005).

Although there are no accurate estimates of manatee population size, the Florida Department of Environmental Protection aerial surveys determined that there were at least 2,639 manatees in Florida's waters in 1996, and a minimum of 1,709 in 1997. The synoptic (general) aerial survey for 2007 reported 2,817 manatees in Florida waters, and 3,807 manatees in 2009 (Fish and Wildlife Research Institute 2009). Although this has been the highest estimate of manatees since the surveys were started, the results of these surveys may vary because of such factors as sampling methodology, manatee behavior, and weather conditions.

Human activities have significantly affected manatees by eliminating or modifying suitable habitat, altering migratory access routes, increasing mortality, and decreasing abundance, all of which can affect manatee reproduction, recruitment, distribution, and behavior. The greatest current threat to manatees is the high rate of manatee mortalities caused by watercraft or propeller collisions. In addition to direct collisions with boats, secondary effects from boating activity include such stresses as disruption of normal breeding behavior, disruption of cow-calf bonding, interference with migration routes and patterns, and the loss of feeding areas. The second most significant threat to manatees is the loss and degradation of habitat, due primarily to direct damage by aquatic recreational and commercial boating activity, coastal construction, and pollution from sewage discharge and stormwater runoff (Marine Mammal Commission 1992, Smith 1993). Other human-related threats include manatee death or injury from flood-control structures and navigational locks, entanglement in fishing line, entrapment in culverts, and poaching. These other threats accounted for 162 known mortalities between 1974 and 1993.

The USFWS's recovery plan for the manatee established four objectives: (1) identify and minimize causes of manatee disturbance, injury, and mortality, (2) protect essential manatee habitat, (3) determine and monitor the status of manatee populations and essential habitat, and (4) coordinate recovery activities, monitor and evaluate progress, and update and/or revise the recovery plan (USFWS 1996).

Florida Bonneted Bat. The Florida bonneted bat was federally listed as endangered under the Endangered Species Act in 2013 and is currently listed by the state of Florida as threatened. The bat is active year-round and does not have periods of hibernation or torpor. Based upon information from G.T. Hubbell, Belwood (1992) indicated that individuals leave roosts to forage on a variety of flying insects after dark, seldom occur below 10 meters (33 feet) in the air, and produce loud, audible calls when flying; calls

are easily recognized by some humans. Emergence from roosts began roughly 26 minutes after sunset and continued for approximately 20 minutes.

The Florida bonneted bat is not migratory, but there might be seasonal shifts in roosting sites. Habitat mainly consists of foraging areas and roosting sites, including artificial structures. At present, no active, natural roost sites are known, and only limited information on historical sites is available. All known active roost sites are artificial structures (i.e., bat houses, buildings). A biological review team for the FWC estimated that there were less than 100 individuals of all ages known in roost counts, inferring a total population to number fewer than 1,000 mature individuals.

In general, open, fresh water and wetlands provide prime foraging areas for bats (Marks and Marks 2008a). Bats will forage over ponds, streams, and wetlands and will drink when flying over open water (Marks and Marks 2008a). During dry seasons, bats become more dependent on remaining ponds, streams, and wetland areas for foraging purposes (Marks and Marks 2008a). The presence of roosting habitat is critical for day roosts, protection from predators, and the rearing of young (Marks and Marks 2008a). For most bats, the availability of suitable roosts is an important, limiting factor (Humphrey 1975). Bats in south Florida roost primarily in trees and manmade structures (Marks and Marks 2008b). Protective tree cover around bat roosts may be important for predator avoidance and allowing earlier emergence from the roost, thereby allowing bats to take advantage of the peak in insect activity at dusk and extend foraging.

The extremely limited available information on roosting sites is particularly problematic, as the availability of suitable roosts is an important limiting factor for most bat species. Existing roost sites need to be identified so that they can be preserved and protected. Belwood (1981) found a small colony of Florida bonneted bats (seven females and one male, all adults) roosting in a longleaf pine (*Pinus palustris*) in a pine flatwoods community near Punta Gorda in 1979. The bats were roosting in

a cavity 4.6 meters (15.1 feet) high, which had been excavated by a red-cockaded woodpecker and later enlarged by a pileated woodpecker (*Dryocopus pileatus*) (Belwood 1981). Belwood (1981) suggested that the bats were permanent residents of the tree due to the considerable accumulation of guano, approximately one meter (3.3 feet) in depth. Eger (1999) noted that in forested areas, old, mature trees are essential roosting sites for this species. The species also uses foliage of palm trees.

The Florida bonneted bat has been found in various habitats within the Preserve. During surveys conducted in a variety of habitats in 2006–2007, the majority consisting of cypress swamps and wetlands, only one Florida bonneted bat call sequence was recorded in the Preserve in 16 nights of effort (stationary and roving surveys) (Marks and Marks 2008b). The call sequence was recorded at Deep Lake along the western edge of the Preserve and the eastern side of the Fakahatchee Strand Preserve State Park; the lake was surrounded by cypress and hardwood hammocks similar to the habitat around Ballard Pond in the Fakahatchee Strand Preserve State Park (R. Arwood, pers. comm. 2008). The species was recorded again in February 2012 at another location (Cal Stone's camp) in an area of pine and palmetto with cypress domes in the surrounding area (R. Arwood, pers. comm. 2012; Marks and Marks 2012). Data derived from recordings taken in 2003 and 2007 by a contractor and provided to the USFWS (S. Snow, pers. comm. 2012) and available land use covers derived from a geographic information system also suggest that the species uses a wide array of habitats within the Preserve. Additional call data obtained in late 2012 and early 2013 also suggest the use of various habitat types, including forested areas, wetlands, and open water in the Preserve (R. Arwood, pers. comm. 2013).

Although species occurrences on conservation lands are inherently more protected than those on private lands, habitat alteration during management practices may impact natural roosting sites because the locations of such sites are unknown. For example, removal of

old or live trees with cavities during activities associated with forest management (e.g., thinning, pruning), prescribed fire, exotic species treatment, or trail maintenance may inadvertently remove roost sites, if such sites are not known. Loss of an active roost or removal during critical life-history stages (e.g., when females are pregnant or rearing young) can have severe ramifications, considering the species' small population size and low fecundity. Furthermore, based upon recent analyses, Marks (2013) recommended that natural habitats conducive to insect diversity be protected and that any pesticides be used with caution.

Red-cockaded Woodpecker. The red-cockaded woodpecker was listed as federally endangered under the Endangered Species Act in 1970. Critical habitat for the red-cockaded woodpecker has not been designated by the USFWS. Lands in the Preserve contain suitable habitat for the red-cockaded woodpecker.

The red-cockaded woodpecker is one of 22 species of woodpeckers native to North America. Adult red-cockaded woodpeckers are approximately 7 to 8 inches in length and have a wingspan that ranges between 1 to 1.2 feet. The red-cockaded woodpecker is easily distinguished by its large, conspicuous white cheek patches, black cap and neck, and black-and-white barred back and wings (Jackson 1994).

The red-cockaded woodpecker's historic range encompassed the southeastern U.S. from eastern Texas and Oklahoma to New Jersey, and the bird was characterized as abundant in 19th-century literature. Throughout the 20th century, however, the species distribution within its historic range has become fragmented, and its total population numbers have decreased drastically due to the destruction of its habitat. The woodpecker is still widely distributed in the southeastern United States, but the few remaining colonies (a particular group of woodpeckers that use a set of cavity trees) are confined to scattered refuges.

The population in the Preserve is the southernmost and perhaps the largest in south Florida (NPS 1981). The red-cockaded woodpecker can only survive in mature pine stands, usually 60 years old or more, that are infected with red-heart disease, a fungus that weakens the interior "heartwood" of a pine. This allows the birds to excavate cavities for roosting and nesting. The red-cockaded woodpecker typically nests between April and August in tree cavities located 20 to 50 feet above the ground. In the Preserve, nesting is usually over by mid-June (Schulze 2007).

The pine trees must be widely spaced and preferably have an open understory. Such stands are uneconomical from a forest products perspective, and most mature pinelands in the Southeast have been converted to plantations of young pines for the pulp and lumber industries, thus removing most woodpecker habitat (Lennartz et al. 1983) and causing population decline.

Beyond direct removal of mature pinelands, the woodpecker may also decline if remaining mature pinelands are not properly managed. The open understory is commonly maintained by periodic fire. However, if fires are too frequent, then the pine reproduction necessary to perpetuate the stand may be suppressed; if fires are not frequent enough, the understory may become too dense to maintain the colony, or the fuel build-up may cause an intense fire that could destroy cavity trees (NPS 1981).

Red-cockaded woodpeckers forage in a wide variety of pine species and especially favor areas that contain large trees, which have a large surface area and loose bark. They feed on adults, larvae, and eggs of arthropods, especially ants and termites that they find by flaking bark from the tree. In prime habitat the forage area for the red-cockaded woodpecker surrounds the colony and consists of pine forests. But in Big Cypress, where pine forests are patchy, the forage area is large and includes prairies, swamps, and other vegetation communities. Recent studies show that forage areas in south Florida average more than 360 acres rather than 200 acres typical for most of the woodpecker's range (Nesbitt et al. 1983).

The red-cockaded woodpecker appears to be fairly tolerant of human activities as long as the colony is maintained. For instance, several active colonies in the Preserve are near ORV trails, oil pads, and backcountry camps. There appears to be a limit, however, on the amount or types of activities that woodpeckers will tolerate; in other parts of the South, nesting failures have been attributed to noise from loud radio music and house construction, continuous chainsaw operation, and heavy interstate traffic (Jackson 1983).

The FWC has been monitoring the red-cockaded woodpecker population in Big Cypress Preserve since 2008. In 2011, there were 86 confirmed active clusters containing 84 potential breeding groups. The FWC intensively monitors a portion of these clusters every year for reproductive success, cavity augmentations, translocation potential, and habitat recommendations. New clusters have been discovered in suitable pine habitat consistently since 2008.

Management of the red-cockaded woodpecker in the Preserve currently consists of prescribed burning, or allowing prescribed natural fire in mature pine stands known to support colonies, and restricting oil and gas activity to avoid disturbing these colonies. NPS staff from the Resource Management and Fire programs meet annually to determine prescribed fire needs. Oil and gas activity is prohibited near a colony to provide an undisturbed forage area around the colony. Management actions for this species within the Preserve include mechanical removal of fuel loads under cavity trees and reduction in midstory vegetation through prescribed fire. Annual work includes determining cluster status, observing nesting activity, making nesting cavities in trees, and banding nestlings.

Habitat fragmentation and/or loss are the primary threats to this species. Other range-wide threats to the red-cockaded woodpecker include cluster abandonment due to encroachment of midstory vegetation. Genetic isolation may be a problem with the woodpecker throughout its range. Even though genetic problems have not been documented within the Preserve, the widely scattered

habitat may preclude adequate genetic mixing. Environmental events such as wildfires, hurricanes, and inundation by water for extended periods have also affected pinelands that host woodpeckers.

Wood Stork. The wood stork was listed as federally endangered under the Endangered Species Act in 1984. Critical habitat for the wood stork has not been designated by the USFWS. Lands within the Preserve and several known rookeries are documented. A large portion of the Preserve contains the habitat parameters required to support nesting.

The wood stork is a large, long-legged wading bird, with a body length (head to tail) of approximately 2.75 to 3.25 feet and a wingspan of 5 to 5.5 feet. Their plumage is white, except for iridescent black primary and secondary feathers and a short black tail. On adult wood storks, the rough scaly skin of the head and neck is unfeathered and blackish in color. Their legs are dark with dull pink toes. The bill color is blackish.

Wood storks are birds of fresh water and brackish wetlands, primarily nesting in cypress or mangrove swamps. In the United States, wood storks historically nested in all coastal states between Texas and South Carolina (Wayne 1910; Bent 1926; Howell 1932; Oberholser 1938; Dusi and Dusi 1968; Cone and Hall 1970; Oberholser and Kincaid 1974). Currently, wood storks breed in Florida, Georgia, and coastal South Carolina. Wood storks usually construct their nests in medium to tall trees that are usually standing in water or in trees that are on dry land if the land is a small island surrounded by water. Their nests are large rigid structures usually found in the forks of large branches or limbs. Storks may add guano to the nest to stabilize the twigs (Rodgers et al. 1988). The nest may be constructed in branches that are only a yard above the water or in the tops of tall trees.

The nesting season of wood storks varies geographically, but in Florida egg laying begins in October, and fledging of young birds occurs in February or March. The U.S. breeding population of the wood stork declined from an estimated 20,000 pairs in

the 1930s to about 10,000 pairs by 1960. Since 1978, fewer than 5,000 pairs have bred each year. The decline is believed to be due primarily to the loss of suitable feeding habitat, especially in south Florida rookeries, where repeated nesting failures have occurred despite protection of the rookeries. According to the *South Florida Multi-Species Recovery Plan*, under pre-drainage conditions wood storks formed colonies between November and January (December in most years regardless of annual rainfall and water level conditions). In response to deteriorating habitat conditions in south Florida, wood storks in the Everglades and Big Cypress basins have delayed the initiation of nesting to February or March in most years since the 1970s. This shift in timing is believed to be responsible for the increased frequency of nest failures and colony abandonment.

Wood storks feed in freshwater marshes, narrow tidal creeks, or flooded tidal pools, primarily on fish between 7.75 and 9.75 inches in length. Particularly attractive feeding sites are depressions in marshes or swamps where fish become concentrated during periods of falling water levels. Feeding areas in south Florida have decreased by about 35 per cent since 1900 because of human alteration of wetlands. Additionally, levees, canals, and floodgates have greatly changed natural water regimes in south Florida.

The wood stork forages annually in Big Cypress when water levels provide concentrations of fish. Documented nesting in the Big Cypress was rare until 1996 when 45 colonies were reported (Jansen and Brooks 1996). The previous two consecutive years of high water and subsequent buildup of the prey base apparently provided ideal conditions in which to raise young. Wood stork nests have been found only sporadically in the Big Cypress since 1996. Observations since that time have not been systematic and have generally been conducted in conjunction with overflights and aerial surveys for the Florida panther.

Preservation and/or restoration of natural hydrologic processes is critical to the survival of the wood stork, as it depends on open water

to support its nesting, roosting, and foraging sites.

Cape Sable Seaside Sparrow. The Cape Sable seaside sparrow was first listed as federally endangered under the Endangered Species Conservation Act (which preceded the Endangered Species Act) in 1967 (32 FR 4001). Cape Sable seaside sparrows are small birds about 13 centimeters or 5 inches long (USACE et al. 2000).

The Cape Sable seaside sparrow inhabits brushless, subtropical marshes (prairies) of interior southern Florida. These habitats remain dry most of the year but are seasonally flooded with entirely fresh to slightly brackish water. These habitats are subject to occasional flooding, which can be a major cause of nest loss (USACE et al. 2000).

According to USACE et al. (2000), the Cape Sable seaside sparrow remains widely distributed over a large area of south Florida and continues to occupy much of its historically known range in Collier, Miami-Dade, and Monroe Counties. Most of the sparrow population occurs in and near Taylor Slough and in Big Cypress Swamp (Kushlan and Bass 1983). Critical habitat for the Cape Sable seaside sparrow is designated in the area of Taylor Slough in Collier, Miami-Dade, and Monroe counties (USACE et al. 2000).

The population estimate in 1992 was 6,450 birds. In 1993, they numbered 3,347 and in 1994 they totaled 2,800 birds. The decrease is likely because of the devastating effects of Hurricane Andrew in August 1992.

The principal reasons for the decline of the Cape Sable seaside sparrow and the greatest threats to its continued survival are vegetation changes, fire, development, and hydrologic alteration. Catastrophic storms, such as the hurricanes in 1935 and 1992, can lead to natural vegetation changes that make the environment unsuitable for Cape Sable sparrows, thus causing local extirpations. Hurricanes may also kill birds directly, as was likely the case in 1992, as mentioned above (USACE et al. 2000).

Regarding management of the Cape Sable seaside sparrow, this species is adapted to life in vegetation that burns periodically (Kushlan et al. 1982). Timing of the fires, however, is critical. Fires that occur late in the dry season or during and immediately after nesting threaten eggs and newly fledged young. If burned too frequently, an area may never support a vigorous population of nesting sparrows. Prescribed fires and natural wet season fires can enhance marsh habitat and retard the invasion of native shrubs and trees into the prairies occupied by sparrows. A natural fire regime resulting in a burn mosaic is compatible with protecting sparrow habitat (Kushlan et al. 1982). Maintenance of water levels is also important to sparrows because periods of inundation are required to perpetuate the marshes on which they depend. The manipulative capabilities of the water management system can cause high water levels at the wrong time of year which can limit sparrow production by reducing the duration of the nesting season (Kushlan et al. 1982).

Everglade Snail Kite. The Everglade snail kite was first listed as federally endangered under the Endangered Species Conservation Act (which preceded the Endangered Species Act) in 1967 (32 FR 4001). With a very low population at that time (only 10 snail kites were counted in Florida in 1965), the species was included in the first group of species to be listed under the act. Subsequent to the initial listing, critical habitat for the Everglade snail kite was designated by the USFWS in 1977 (42 FR 40685) and augmented and corrected later that year (42 FR 47840). The designated critical habitat areas for the kite are east and north of Big Cypress National Preserve (along the western perimeter of Lake Okeechobee and the South Florida Water Management District's Water Conservation Areas 1, 2A, 2B, and 3A).

Potential impacts to snail kite critical habitat should be considered because Water Conservation Area 3A is very close to the Preserve (abutting portions of the Preserve to the east). Also, in the *South Florida Multi-Species Recovery Plan*, the USFWS recommends a reconsideration of the critical habitat boundaries for the Everglade snail kite

as a "species-level recovery action" and identifies Big Cypress National Preserve as a potential area of inclusion in the critical habitat area.

The Everglade snail kite (or snail kite) is medium in size, with a wingspan of 43 to 46 inches and a body length of 14 to 16 inches (Sykes et al. 1995). It is most easily distinguished from other raptors by its narrow, curved bill, which it uses to extract its primary prey, the apple snail. Also, the tail of both sexes is square-tipped with a white base. Adult snail kites have red eyes, while juveniles have brown eyes (Brown and Amadon 1978; Clark and Wheeler 1987). The adult males are a uniform slate gray in color, whereas adult females are brown with cream-colored streaks from the face down to the breast. Immature snail kites tend to resemble adult females, with the facial/breast streaking being slightly more light brown than cream (Sykes et al. 1995).

The current range of the Everglade snail kite includes parts of south Florida, Cuba, and northwestern Honduras. However, the movement of birds between Florida and Cuba has never been confirmed (Sykes 1979; Beissinger et al. 1983). Currently, the range and distribution of the Everglade snail kite in Florida is confined to areas with available habitat in the southern half of the state. This Florida range is much smaller than it was years ago when the snail kite was documented in areas of north Florida. Loss of habitat from urban development, agricultural operations, and hydrologic alterations is the primary cause for this reduction in range. Although the snail kite is not a migratory bird species, it is known to be somewhat nomadic within its range in response to habitat changes (i.e., hydrologic changes, food availability, etc.)

The habitat for the Everglade snail kite primarily consists of lowland freshwater marshes and the shallow littoral zones of lakes where an abundance of apple snails (*Pomacea paludosa*) can be found. The snail kite's diet predominantly consists of apple snails. The kite generally forages for the snail by flying low over the water surface or by perching on woody vegetation over open water. Thus the kite depends on sustaining healthy

populations of apple snails. Sustained wetland flooding conditions and low-density emergent aquatic vegetation are important for snail reproduction.

However, even if apple snails are thriving in an area, the habitat value for the kite may be dramatically reduced if turbid or eutrophic water conditions exist, or if the kite's view of the water is obstructed by dense vegetation. In other words, the snail kite relies heavily on a clear view of the water subsurface. Thus, marshes or lakes with high nutrient levels can also yield diminished habitat value for the snail kites because nutrient-rich water often generates invasive, nonnative plant growth. This impact from eutrophication can be two-fold. First, algal blooms that result from high nutrient levels can diminish water clarity, which in turn limits the kite's ability to locate subsurface apple snails. And, dense, nonnative growths such as cattail stands can quickly displace large areas of open water, which can fully eliminate foraging areas for the kite.

Also, the presence of interspersed shrubs or small trees in the emergent vegetation in the marsh or lake littoral zone is another important habitat feature for the snail kite. The kite uses this woody vegetation for foraging activities, roosting, and nesting. Kite roosting and nesting sites are predominantly located over open water. And, nests in shrubs or small trees are less susceptible to water fluctuations, waves, human disturbances, and predators than nests in emergent herbaceous vegetation. Thus, the nest sites in interspersed shrubs and small trees tend to be more successful than those in herbaceous vegetation.

As noted above, the very low Everglade snail kite population in the 1960s (less than 20) warranted its original listing as an endangered species. Subsequently, the snail kite population has grown to several hundred. However, the population counts vary considerably from year to year. For example, during a 10-year monitoring period from 1985 to 1994, the Everglade snail kite count went from 563 in 1986 to 325 in 1987, and back to 498 in 1988. This count period ended with a 1994 population estimate of 996 kites in

Florida. The year-to-year fluctuations in counts is attributed to bird mortality, decreased nesting success, dispersal into new areas, or a combination of these factors. However, the potential for more accurate population estimates increases each year as the number of marked birds and their resightings increase.

According to the *South Florida Multi-Species Recovery Plan*, the USFWS has an objective to restore the Everglade snail kite to a stable, self-sustaining population that would allow a status reclassification to threatened (USFWS 1999). This status change would occur if the 10-year average total population size is sustained above 650 kites (assuming various sustainability and year-to-year variation criteria are met). The USFWS considers the Everglade snail kite a resilient species in a highly changeable environment. However, given the limited distribution of the species, its specialized ecological niche, and the irreversible loss of its habitat in south Florida, the USFWS believes that the snail kite does not have the potential to be elevated above the threatened status.

American Crocodile. The American crocodile is one of two crocodylian species that are native to the United States. It was first listed as a federal endangered species under the Endangered Species Act in 1975 (40 CFR 44151). At the time of listing, an estimated 100 to 400 nonhatchling crocodiles existed in Florida (Ogden 1978). Given its low numbers at the time, as well as rapidly growing disturbances to its habitat from human activities (e.g., recreation, hydrology alterations, and urban encroachment), critical habitat for the American crocodile was designated in 1979 (44 CFR 75076). The designated critical habitat for the crocodile includes most of Florida Bay and its perimeter lands, running from the Florida keys north and west to the southern portions of the Everglades.

Given the stabilization of crocodile numbers in Florida by the early 21st century, the USFWS reclassified the American crocodile to threatened in the state of Florida in 2007. According to the USFWS, the Florida crocodile

population is between 1,400 and 2,000 individuals (not including hatchlings), with more than 90 documented nest sites in 2005 (USFWS 2007). However, the crocodile population in Florida continues to be susceptible to habitat loss from development and recreation, road mortality, and extreme weather such as hurricanes. And, through the remainder of its range, the crocodile remains listed as an endangered species. In addition to its south Florida range, the American crocodile inhabits the coastal wetlands and rivers of Cuba, Jamaica, the Caribbean coast from Venezuela to the Yucatan peninsula, and the Pacific coast from central Mexico to northern Peru (Moler 1992).

The American crocodile is the larger of the two crocodylian species in Florida. Generally, in Florida, both the American crocodile and the American alligator coexist without conflict. The tolerance for the other species is maintained as long as food and essential and unique habitat attributes are available to both species. Most likely, the coexistence and tolerance of these two species result from species-specific habitat utilization (spatially or temporally), which depends on variations in the species' preferences for water salinity levels (USFWS 1999). In addition to its size, it can typically be distinguished from the adult alligator by its longer, narrower, tapered snout and its exposed fourth tooth of the lower jaw (when mouth is closed). Adult crocodiles in Florida are often more than 12 feet long (Moler 1992).

The habitat for the American crocodile is mainly associated with mangrove swamps and mangrove-lined creeks, rivers, and bays. However, the habitat use varies seasonally. During breeding and nesting season, adult crocodiles tend to occupy exposed shoreline areas along Florida Bay and nearby inland creek banks. Males generally move more inland than females during this time. In south Florida, breeding typically occurs from late February through March, when ambient air and water temperatures are high enough to trigger reproductive hormonal activity in the crocodiles. In nonnesting seasons, crocodiles generally prefer the lower saline waters of inland swamps, ponds, and creeks (Kushlan

and Mazzotti 1989). Given this dependence on inland waterbodies with low salinity and brackish estuaries, the timing and frequency of inland freshwater flow deliveries to south Florida and Florida Bay are very important attributes of American crocodile habitat (USFWS 1999).

Female crocodiles usually locate their nests along the exposed shoreline of open waterbodies (e.g., Florida Bay), or along the banks of inland creeks in extreme south Florida. They typically select nest sites in well-drained, sandy soils at about the normal high water level. However, nests in other substrates, such as peat, marl, and rocky spoil piles, are not uncommon. The nesting success often depends on sustained soil moisture, but success can also be affected by flooding and egg predation. Females must return to the nests to excavate the soil for the hatchlings, thus human presence during nest building, egg laying, and incubation tending can adversely affect nest success. Research indicates that some females may abandon their nest if they are exposed to repeated human disturbances (Kushlan and Mazzotti 1989).

Once the hatchlings leave the nest site, they typically disperse to seek shelter, stable food sources, and brackish to freshwater in nursing areas that are generally more inland than their nest sites. The hatchlings are very susceptible to predation during this dispersal period (Kushlan and Mazzotti 1989). Also, a lack of available freshwater can adversely affect hatchling survival. Periods of low rainfall or long distances to available freshwater can be detrimental to crocodile hatchlings. Once the hatchlings reach the brackish or freshwater nursing areas in estuarine and inland mangrove forests, they typically feed on fish, crabs, snakes, and small invertebrates (USFWS 1999).

Generally, the American crocodile is primarily a nocturnal species, doing most of its active foraging between sunset and sunrise (Lang 1975; Mazzotti 1983). The diet of adult crocodiles generally consists of small mammals, fish, snakes, turtles, and crabs (Ogden 1978; Ross and Magnusson 1989).

The American alligator is also listed as threatened due to similarity of appearance to the crocodile as an additional protection measure for the crocodile. While alligator hunting is permitted in the state of Florida, it is currently prohibited in the Preserve.

Eastern Indigo Snake. The eastern indigo snake was first listed as a federally threatened species under the Endangered Species Act in 1978. The listing was prompted by the snake's significant population decline, which was caused by over collecting for the domestic and international pet trade, as well as mortalities resulting from rattlesnake collectors gassing gopher tortoise burrows. With enforcement of the Endangered Species Act as well as the Lacey Act, exploitation for the pet trade has declined but still remains a concern (Moler 1992). Although the gassing of tortoise burrows is still a threat to the eastern indigo snake, it is not the most serious. Instead, the displacement and fragmentation of habitat from urban development have become the biggest threats to the snake since the listing. However, no critical habitat areas have been designated for the snake to date.

The eastern indigo snake is a long, black, nonvenomous snake found in Florida and Georgia. With a length of up to 104 inches, it is considered one of the longest snakes in the United States (Ashton and Ashton 1981). The eastern indigo has large and smooth scales with a uniform shiny black coloration, except for red or cream tints on the throat, chin, or cheeks.

The eastern indigo snake is an active terrestrial predator that will eat any vertebrate small enough to be overpowered. Layne and Steiner (1996) documented several instances of indigos flushing prey from cover and then chasing it. An adult eastern indigo snake's diet may include frogs, toads, snakes (venomous as well as nonvenomous), lizards, turtles, turtle eggs, fish, juvenile gopher tortoises, small alligators, birds, and small mammals (Keegan 1944; Babis 1949; Kochman 1978; Steiner et al. 1983). Juvenile eastern indigo snakes eat mostly invertebrates (Layne and Steiner 1996).

Currently, the eastern indigo is primarily found in sandhill habitat in northern Florida and southern Georgia. However, the snake is also widely distributed throughout central and south Florida. With their general preference for upland habitats, large numbers of eastern indigos are not common in the wetland complexes of the Everglades region (Duellman and Schwartz 1958; Steiner et al. 1983). Historically, the eastern indigo snake was found throughout Florida and in the coastal plain of Georgia, Alabama, and Mississippi (Haltom 1931; Carr 1940; Cook 1954; Diemer and Speake 1983; Moler 1985a).

Throughout most of its range, the eastern indigo uses a variety of habitat types, particularly because it needs a mosaic of habitats to complete its annual cycle. The habitats include pine flatwoods, scrubby flatwoods, high pine, dry prairie, tropical hardwood hammocks, edges of freshwater marshes, agricultural fields, coastal dunes, and even human-altered habitats. They are especially common in the hydric hammocks throughout this region (Moler 1985a). In central and coastal Florida, eastern indigos are mainly found within many of the state's high, sandy ridges. In extreme south Florida, these snakes are typically found in pine flatwoods, pine rocklands, tropical hardwood hammocks, and mangrove forests (Kuntz 1977). In portions of south Florida, eastern indigos may also occupy agricultural sites and areas along canals and other artificial waterways.

Wherever the eastern indigo snake occurs in xeric habitats, it is closely associated with the gopher tortoise (*Gopherus polyphemus*), the burrows of which provide shelter from winter cold (Bogert and Cowles 1947; Speake et al. 1978; Layne and Steiner 1996). In the milder climates of central and southern Florida, eastern indigo snakes exist in a more stable thermal environment, where availability of thermal refuge may not be as critical to the snake's survival. However, even though thermal stress may not be a limiting factor throughout the year in south Florida, eastern indigo snakes still seek and use underground refuges in the region. On the sandy central ridge of south Florida, eastern indigos use gopher tortoise burrows more (62 percent)

than other underground refuges (Layne and Steiner 1996). Other underground refuges used by this species include burrows of armadillos, cotton rats (*Sigmodon hispidus*), and land crabs; burrows of unknown origin; natural ground holes; hollows at the base of trees or shrubs; ground litter; trash piles; and in the crevices of rock-lined ditch walls (Layne and Steiner 1996; Hyslop 2007).

Eastern indigo snakes range over large areas and into various habitats throughout the year, with most activity occurring in the summer and fall (Smith 1987; Moler 1985b; Speake 1993). In peninsular Florida, data on home ranges for females vary from 4.75 to 375 acres; while male home ranges vary from 4 to 818 acres (Moler 1985b, Layne and Steiner 1996, Bolt 2006, Dodd and Barichivich 2007). Summer home ranges tend to be much larger than winter home ranges. The eastern indigo's relatively large home range also makes it vulnerable to habitat loss, degradation, and fragmentation (Lawler 1977; Moler 1985b). Extensive tracts of wild land are the most important refuge for large numbers of eastern indigo snakes (Diemer and Speake 1981; Moler 1985b). Additional human population growth will increase the risk of direct mortality of the eastern indigo snake from property owners, domestic animals, and highway mortality. Pesticides that are introduced into the food chain may also be a hazard to the snake. Pesticides used on crops or for silviculture would pose a threat to the indigo (Speake 1993). Secondary exposure to rodenticides used to control rats may also occur (Speake 1993).

Declines in gopher tortoise populations are negatively affecting eastern indigo snake populations, especially in the northern areas of the snake's range. Gopher tortoises are declining due to loss of both quantity and quality of their habitat. Loss of tortoise habitat quantity is occurring from human population growth and development and conversion of native habitat to agriculture. The use of off-road vehicles in sandhill habitats of the tortoise can also destroy groundcover and soil stability (Lawler 1977).

In the southern parts of their range, eastern indigo snakes often move among the available habitat types. This is one of the reasons why the species is especially vulnerable to habitat fragmentation (Breininger et al. 2004, Hyslop et al. 2006). Large areas of natural habitats protected from roads and the fragmentation associated with development are needed to maintain viable snake populations (Layne and Steiner 1996, Breininger et al. 2004). During the past decade, the loss of natural areas in Florida has continued to rise dramatically (The Nature Conservancy 2006). The effects of habitat destruction and alteration on the eastern indigo snake are likely most substantial along the Florida coasts, in the Keys, and along the high ridges of south-central Florida. Agricultural interests (principally citrus) continue to destroy large expanses of suitable natural indigo snake habitat throughout much of southern Florida. More roads create habitat fragmentation and increases in mortality when snakes try to cross highways (Andrews and Gibbons 2005, Bolt 2006). At some point, the size of fragmented habitat patches will become too small to support viable populations. It has been suggested that eastern indigo snake populations that occur on managed preservation lands of at least 2,500 acres, with few roads or human-altered habitats that increase habitat fragmentation and mortality, may have the best chance of long-term viability (Moler 1992, Breininger et al. 2004).

The USFWS estimates that the eastern indigo population as a whole is declining in south Florida because of habitat destruction and degradation. Considering the small population of this species, additional threats to its survival or habitat could cause local extirpations. Current and future habitat fragmentation would probably result in a large number of isolated, small groups of indigo snakes. However, even with continued habitat loss, this species would probably persist in most localities where large, unfragmented pieces of natural habitat remain. According to the *South Florida Multi-Species Recovery Plan*, the USFWS has an objective to stabilize and increase the overall eastern indigo population and ensure that multiple healthy populations exist and are protected. If it is determined that

sufficient, suitable habitat exists in south Florida for the eastern indigo snake population to stabilize or increase, delisting criteria would be considered.

Major Game Species

Of the 13 game species in the Preserve, white-tailed deer, wild turkey, and feral hogs require special management consideration because of their importance to recreational hunters. White-tailed deer and feral hogs¹² are also main prey species for the endangered Florida panther, while turkeys are taken by panthers as an opportunistic prey item (Maehr et al. 1990, Dalrymple and Bass 1996). The current status of these three game species and their habitat is described below.

White-tailed Deer. The white-tailed deer is the most important game species in the Preserve. In addition to being a popular large game animal, white-tailed deer are the endangered Florida panthers' most consistent prey item (Land 1993, USFWS 2008). The deer's food preference is the swamp lily (*Crinum americanum*), a monocot that grows in cypress and hardwood swamps (Labisky 2003).

Generally, deer browse in south Florida is poor because of low fertility and low palatability (Florida Game and Fresh Water Fish Commission 1959). In the later stages of plant succession woody plants and graminoids, which tend to be high in lignin and low in nutrition, occupy a site. Consequently, deer browse declines as the vegetation matures. The best deer browse occurs after disturbances that encourage new growth, because young shoots are relatively high in nutritional value and much more palatable. Fires in the Preserve likely improve deer browse and habitat in the near-term.

In the Addition, because the area has been closed to hunting and vehicular access since its acquisition by the NPS, the current deer

population is likely at the level that the current habitat can support. Habitat condition, especially in Florida, is a major limiting factor for deer populations (Giuliano et al. 2009).

Although areas within the Preserve host resident Florida panthers, the full effect of panther predation on deer herds is unknown. McBride (1985) suggests a comparison with western cougar predation on mule deer. Ackerman (1982) found that a cougar in Utah killed a mule deer about each 9.5 days, which equates to 39 mule deer per year per cougar. Janis and Clark (2002) determined a predation success rate of one kill per 5.24 days for female panthers and one kill per 7.7 days for male panthers, with an average of one kill per animal per 6.45 days for the general panther population. Other literature (Anderson and Lindzey 2003; Cooley et al. 2008; Murphy, Nadeau, and Ruth 2011) shows similar predation success rates of one deer-sized prey per panther approximately every 6.7 to 7.6 days or on average one deer-sized prey per week (Ruth and Murphy 2010).

The FWC began collecting data on the deer herd in the Preserve in 1982 to estimate the population size and assess the health and condition of the deer. Since the 1991 *General Management Plan* was completed, the deer population in many areas of the Preserve has increased. Factors influencing this increase include area closures, favorable environmental conditions, and changes in hunting regulations.

Various forms of white-tailed deer monitoring has taken place in the Preserve. Deer population monitoring in the Preserve has included deer surveys conducted by the NPS and the FWC and manned/unmanned hunter check stations monitored by the FWC.

Aerial monitoring has been used to estimate deer population density in some management units (Garrison et al. 2009) and land cruise surveys have been conducted in the northern Addition (Garrison et al. 2009), but the methods are challenging to execute.

Deer surveys have typically been conducted annually by the NPS in approximately one-

¹² Recent data shows that feral hogs are nearly extirpated from the Preserve, lessening their importance as a prey item for the Florida panther.

third of the Preserve, including the Stairsteps Unit (Zones 3 and 4), Loop Unit, Turner River Unit (2 areas), Deep Lake Unit, Bear Island Unit, and the Addition (south of I-75). Some areas of the Preserve have been surveyed since 1995. In 2008, no deer surveys were conducted anywhere in the Preserve due to budget constraints. The following areas in the Preserve have also typically been surveyed by the FWC: Bear Island Unit, the Addition (north of I-75 and south of I-75), and Stairsteps Unit (Zones 2 and 4). Surveys are conducted in the spring (usually May) and again in the summer (usually August). Spring surveys are intended to measure fawn to doe ratios and the summer counts are intended to measure adult buck to doe ratios, yielding deer density estimates per hunt unit.

All NPS surveys have been conducted from a helicopter flying at 200 feet at 50 miles per hour. Surveys begin at approximately 7:00 a.m. and end at or before 9:30 a.m. In some areas, surveys may take two to three days to complete. In all but one survey area the flight lines are east – west with a distance of one kilometer between flight lines. In the Stairsteps Unit survey area, flight lines are east – west and one mile apart.

The NPS surveys differ from typical line transect surveys. During the surveys, the helicopter follows the flight line as usual. When deer are spotted, the time, location, sex, and age (adult/fawn) are recorded. However, unlike typical surveys, if the deer are too far to identify these characteristics the helicopter leaves the flight line and approaches as close as necessary to identify the deer. If other deer are observed while the helicopter is away from the flight line, the helicopter and crew will continue directly to those deer for identification purposes before returning to the flight line. After the deer have been counted and sexed, the helicopter returns to the flight line at the point of its departure. For this reason, typical statistics cannot be used to obtain a population density estimate. However, this procedure provides better fawn to doe and doe to buck ratios than might be obtained through typical line transect methods. Additionally, the flights have proven useful in tracking deer population trends.

The FWC has also established aerial surveys over some areas in the Preserve. Spotlight counts and morning survey routes to estimate deer numbers along four routes were initially used by the FWC in the Addition in 2006. Estimated deer densities ranged from 1.8 to 7.4 deer/km². However, due to the size of the area, visibility problems, and lack of access to some areas, ground surveys were found to be unfeasible. Aerial surveying using line transects was initiated in 2007. These FWC surveys are not as extensive as those conducted by the NPS, nor have they been conducted for as long. Both fixed-wing and rotary-wing aircraft of different types have been used during these surveys. The FWC surveys follow the typical line transect method of staying on the flight line and only recording those deer falling within a pre-determined distance from the observation point. Well researched statistical tests can be used to estimate deer density. However, data collected from these surveys are not used to estimate either sex ratios or fawn to doe ratios. Deer density estimates using distance sampling techniques from aircraft in the Addition lands north of I-75 ranged from 0.4 to 1.6 deer/km². Results have been difficult to interpret due to changes from ground surveys to aerial surveys, and changes in types of aircraft, observers, and pilots resulting in lack of consistent estimates of transect widths for aerial surveys (FWC 2012). For additional information, please refer to appendix D for a copy of the *Deer Status Report, Big Cypress National Preserve – Addition Lands* (FWC 2012).

Deer check stations have been used in the Preserve since at least 1982. All hunters are required to check-in and check-out through one of the FWC check stations. Hunter check stations in the Preserve currently include four manned and two unmanned check stations monitored by the FWC: 40-Mile Bend, Monroe Station, Dona Drive, Bear Island, and I-75/Alligator Alley (northbound and southbound) (unmanned). The four manned check stations are staffed for at least five days per week during deer season as well as during the weekends of deer season when hunter

pressure is at its greatest¹³. The two check stations located on I-75 (one each on the north and south side of the highway) and are never manned.

General data collected from the check-in/check-out forms includes number of hunters, type of transportation used, area hunted, and time spent hunting. Harvest information gathered includes number and species of all game animals, the count of deer harvested, hunting pressure (or number of hunter-days that the area is hunted) in each management unit, the success rate (number of deer harvested per hunter-day of effort) in each management unit, an acreage based success rate (number of deer harvested per acre of a management unit), and the number of deer harvested in each of six possible age classes. Physical data collected from harvested deer (only bucks may be harvested in the Preserve) include the gutted weight of each deer, the mean antler main beam circumference, the number of points present on the rack, and the spread distance between antlers. If permitted by the hunter, check station operators will also collect a jaw to be used to age the animal. All check station information is specific to those deer that are brought in by hunters to the check station. These data were first collected for the Preserve in 1980 and have been continuously collected since then. These data allow the FWC to estimate buck population age structure for the Preserve as a whole as well as for each hunt unit. Physical characteristics are used to compare age classes within and between hunt units. Trends in herd age structure, physical size, harvest, hunter pressure, and transportation are all available for analysis.

Previous studies have indicated that habitat conditions and predation are the primary sources of stress on the deer population in the Preserve (Labisky et al. 1995, Land et al. 1993). Predation from bobcats and panthers are major sources of mortality for deer, but in most situations predation will not result in a declining deer population (Mech 1984).

¹³ Note that all of the six check stations are typically self-service during small game season, due to the low hunter pressure for these species.

However, habitat impacts, particularly high water levels in combination with other factors can have a dramatic impact on deer survival in the Preserve (Land et al. 1993). Changing water management strategies for south Florida have impacted deer in several ways, affecting reproductive success and recruitment, movement and foraging, and forage production and availability (Fleming et al. 1997). In a study of radio-tagged deer in Bear Island, which is adjacent to the Northeast Addition, Land et al. (1993) found that hunting season activities had little impact on the deer herd. Further, they found that the deer population was stable and that the herd was at equilibrium, with reproduction and recruitment replacing losses caused by predation, hunting and other sources of mortality. The study revealed that fawn mortality seemed to fluctuate with spring surface water conditions, so several successive springs of high surface water may lead to a short-term decrease in herd size. However, with the increase in fawn survivorship during drier springs, these short-term losses can be recovered and thus should not have long-term impacts on the deer population (Land et al. 1993).

The FWC prepared an analysis in 2011 titled "Status of White-Tailed Deer in the Stairsteps Unit of Big Cypress National Preserve." This study concluded (FWC 2011b):

The white-tailed deer population in the Stairsteps Unit of the [Preserve] has sharply declined in the past decade, with recent surveys and harvest numbers indicating a near complete population crash. High water levels have been hypothesized as a cause of the decline. Evaluation of hydrological data confirmed that the number and duration of high water events, weeks where water depth exceeded 50 cm and even 60 cm, has become significantly more common in Stairsteps since the 1994-1995 floods. Comparison of water levels pre-and-post deer population declines also demonstrated a significant change in the hydrological parameters between these periods.

The FWC (2011b) study further concluded:

The Stairsteps Unit deer population appeared to have recovered from the 1994-95 floods. However, the following reoccurring years of high water events and the various impacts high water has on deer populations may have caused the population to decline over time due to lower productivity, reduced recruitment, and higher mortality. Long-term research on causes of mortality and survival rates of fawns and adults may be necessary to clarify the role of hydrology on deer populations in the area. Other factors, such as the role of predators, the impact of hunting, and changes in habitat conditions should also be measured to allow for interpretation of study results.

Following this study, FWC EO 10-37 was approved, placing restrictions on deer hunting in the Stairsteps Unit, which are currently in place¹⁴.

Legal hunting does not seem to be a threat to deer populations in the Preserve, but the cumulative effect of legal and illegal hunting, environmental factors (e.g., extreme high water events), and panther predation is unclear.

Feral Hog. Feral hogs have historically been second to deer in importance as game animals in the Preserve; however, recent data has shown that feral hogs are likely nearly extirpated from the Preserve. Feral hogs were first introduced to Florida by Spanish explorers in the 16th century. Feral hogs are managed by the FWC as a game animal on WMAs and in the past were stocked in many of these areas in south Florida, including Big Cypress as late as 1975. It is now illegal to stock feral hogs in the Preserve; however, illegal stocking in the Preserve may still occur.

Mast-producing hardwood hammocks are probably the preferred habitat for hogs, followed by pinelands (because of their short

hydroperiod), and during the dry season mixed-hardwood swamps (Schortemeyer et al. 1985). As with deer, cypress prairies and prairies are probably the least productive vegetation for hogs (J. L. Schortemeyer, Florida Game and Freshwater Fish Commission, pers. comm. 1986).

Feral hogs are known for their ability to rapidly reproduce. In the Merritt Island National Wildlife Refuge near Cape Canaveral, hogs may produce 1.5 litters per year, with an average of 2.3 piglets at weaning (Ron Hight, USFWS, pers. comm. 1986). In south-central Florida, Belden and Frakenberger (1990) determined litter size to be 3.5 piglets prior to weaning. The summer wet season may be a limiting factor for hog populations. Schortemeyer has observed hogs freely moving through one foot of water or less, but when water is deeper than 16 inches, their movement appears to be greatly restricted, confining the animals to higher ground and limiting available space and food (Schortemeyer et al. 1985). Conversely, a prolonged winter drought appears to reduce hog reproduction and increase hog movements and may cause direct mortality through dehydration (J. L. Schortemeyer, Florida Game and Freshwater Fish Commission, pers. comm. 1986). Given these limits, the hog population in the Big Cypress may be constrained from large or rapid increases by environmental conditions.

In addition to being a popular game animal, feral hogs are a prey species for Florida panthers (Maehr et al. 1990, Dalrymple and Bass 1996). Generally, feral hogs constitute the greatest biomass consumed by panthers north of the Alligator Alley section of I-75 while white-tailed deer are the greatest biomass consumed to the south (Maehr et al. 1990).

Some concerns have been raised about the impact of hogs as a nonnative species on natural and cultural resources in the Preserve. Hogs are known to uproot extensive areas in hardwood hammocks, and this activity could pose a threat to native plants, *Liguus* tree snail eggs, and archeological resources. Rooting could encourage nonnative plants by providing disturbed areas necessary for establishment.

¹⁴ In Zone 3 of the Stairsteps Unit, the bag limit for deer is one annually; hunting deer in Zone 4 of the Stairsteps Unit is prohibited.

However, it has also been suggested that rooting exposes grubs and other foods for turkey, quail, and additional native wildlife and encourages browse plants for deer. Rooting also occurs during the dry season in marshes.

Other hog-related problems include diseases carried by hogs, possible competition between hogs and native wildlife, possible adverse effects on wild turkey nesting, and competition with deer for the annual mast crop (Beckwith 1965); however, negative impacts from competition have not been quantified or confirmed. Hogs are known to be carriers of brucellosis (Becker et al. 1978, van der Leek et al. 1993a), a disease that infects humans, and pseudorabies (van der Leek et al. 1993b), a disease known to be fatal to Florida panthers.

The current population of feral hogs in the Preserve has declined in recent years and is currently very low. Data from the 2006 hunt conducted in the Preserve indicated only four animals were taken by hunters, one during muzzleloading season and three during archery season. Data from recent hunting seasons in the Preserve indicates that feral hogs are likely nearly extirpated from the Preserve (i.e., no hunter take of hogs has been recorded in the latest check station data).

Wild Turkey. Wild turkeys are one of the principal game animals for hunting in the Preserve and are opportunistically taken by panthers as prey (Maehr et al. 1990, Dalrymple and Bass 1996). Wild turkeys are common in the region. Turkey density tends to fluctuate widely from year to year due to environmental conditions (Powell 1965; Frye 1954). Turkey poult mortality is very high if heavy rains occur during April or May when young birds are susceptible, but populations usually bounce back if conditions are favorable during the next breeding season (Powell 1965).

From 2007-2008 to 2011-2012, the total turkey harvest checked and estimated from the Preserve was variable, ranging from a high of 55 in 2008-2009 to a low of 26 in 2010-2011. In 2011-2012, the total turkey harvest checked and estimated (36) was slightly higher than the five-year average (35). The biological data

for turkey adults in relation to juveniles remained fairly constant from 1985-1986 to 2010-2011 (Bartareau 2012). Please see appendix H for the 2011-2012 *Big Cypress National Preserve Small Game and Wild Turkey Harvest and Pressure Summary* for additional information on the recent harvest and pressure on the turkey population in the Preserve.

Small Game Species. Small game species harvested in the Preserve over the past 28 years include: duck, coot, dove, snipe, quail, rabbit, squirrel, raccoon, opossum, armadillo, and coyote. From the 1985-1986 to the 2011-2012 hunting seasons, the total small game harvest was variable, ranging from a high of 921 in 1987-1988 to low of 67 in 1998-1999. The total harvest averaged 333 per year over the past 27 hunting seasons. From the 2007-2008 to the 2011-2012 hunting seasons, the total small game harvest was variable, ranging from a high of 263 in 2009-2010 to low of 104 in 2008-2009. The total harvest averaged 198 per year over the past five hunting seasons. In 2011-2012, total harvest (241) was greater than past five-year average but substantially less than the long-term average. Snipe, duck, and squirrel were the most harvested small game, with at least 13 animals harvested in each of the past five hunting seasons. Quail, raccoon, coot, and rabbit were the least harvested small game, with an average of only one or two animals harvested per year during the past five hunting seasons (Bartareau 2012). Please see appendix H for the 2011-2012 *Big Cypress National Preserve Small Game and Wild Turkey Harvest and Pressure Summary* for additional information on the recent harvest and pressure on the turkey population in the Preserve.

Nonnative/Invasive Wildlife Species

Nonnative species impact natural systems through unchecked predation or consuming and killing of native plant species. In many cases, nonnative wildlife has no natural predators and can displace native species and multiply rapidly. More than 100 nonnative animal species have been introduced into

south Florida (Duever et al. 1986a). Sixty of these are believed to have established breeding populations. At least 22 nonnative species have been collected in the Preserve, 18 of which are known to have breeding populations, such as the feral hog, armadillo, several fish (walking catfish, black acara, spotted tilapia, and oscar), several insects (fire ants and lovebugs), and snakes.

The increasing number of nonnative snakes found in south Florida has been causing concern to biologists, with the Burmese python being the most commonly observed snake. The Burmese python is native to India and southeast Asia and has flourished in the subtropical climate of south Florida. Twenty-nine nonnative snakes were discovered in Big Cypress in 2011, an increase from previous years. In nearby Everglades National Park, as of 2007 more than 624 southeast Asian snakes have been found since 2000. In 2006 and 2007, more than 418 snakes were captured and/or removed from the Everglades.

In 2009, FWC EO 09-08 was approved, which created the Partner with Hunters program to assist in the control of reptiles of concern, particularly the Burmese python, within the Preserve/WMA. The Partner with Hunters Program allows hunters to take reptiles of concern within the Preserve, in accordance with regulations outlined in the EO.

WILDERNESS CHARACTER

WILDERNESS

According to Director's Order 41: *Wilderness Stewardship* (NPS 2011b), wilderness character can be measured by four "tangible qualities" that the NPS can utilize in wilderness planning, stewardship, and monitoring. These four qualities are practical and measureable and are rooted in the Wilderness Act:

- Untrammeled – Wilderness is essentially unhindered and free from modern human control or manipulation. Actions authorized or unauthorized by the federal land manager that manipulate the biophysical environment are indicators used to identify effects to the untrammeled quality.
- Natural – Ecosystems are substantially free from the effects of modern civilization. Plant and animal species and communities, physical resources, and biophysical processes are indicators used to identify effects to the natural quality.
- Undeveloped – Wilderness retains its primeval character and influence and is without permanent improvements or modern human habitation. Nonrecreational structures, installations, and developments, inholdings, use of motor vehicles, motorized equipment, or mechanical transport, loss of statutorily protected cultural resources are indicators used to identify effects to the Undeveloped quality.
- Opportunity for Solitude or Primitive and Unconfined Recreation – Remoteness from sights and sounds of people inside the wilderness, remoteness from occupied and modified areas outside the wilderness, facilities that decrease self-reliant recreation, management restrictions on visitor behavior are indicators used to identify effects to the Solitude or Primitive and Unconfined quality.

There are also many intangible aspects of wilderness character that are important, including scenic, educational, and ecological

resources and values. According to the Addition GMP (NPS 2010a), these values allow visitors to learn about and experience the contrasting scenery of the Preserve's various plant communities, archeological resources, and water-dependent natural systems. All of these resources and values contribute to and enhance the wilderness character of the area.

Wilderness Resources in the Region

According to the Addition GMP (NPS 2010a), there are three designated wilderness areas in the south Florida region:

- Marjory Stoneman Douglas Wilderness (1,296,500 acres in Everglades National Park – the largest wilderness area in the state) managed by the NPS in Collier, Miami-Dade, and Monroe counties
- J.N. "Ding" Darling Wilderness (2,619 acres) managed by the USFWS on Sanibel Island in Lee County
- Florida Keys Wilderness (6,197 acres) managed by the USFWS in the Florida Keys in Monroe County

Wilderness Resources in Big Cypress National Preserve

There is currently no designated wilderness in the Preserve. However, the preferred alternative in the Addition GMP (NPS 2010a) identifies 47,067 acres of land in the Addition to be proposed for designation as wilderness (see figure 3-4). The NPS is currently in the process of formally designating these lands as wilderness by legislative act. Lands identified as being suitable for wilderness designation, wilderness study areas, proposed wilderness, and recommended wilderness (including potential wilderness) must be managed to preserve the wilderness character and values in the same manner as "designated wilderness" until Congress has acted on the recommendations (NPS 2011a). Therefore, for the purpose of this plan, the 47,067 acres of proposed wilderness located in the Addition would be treated as designated wilderness.

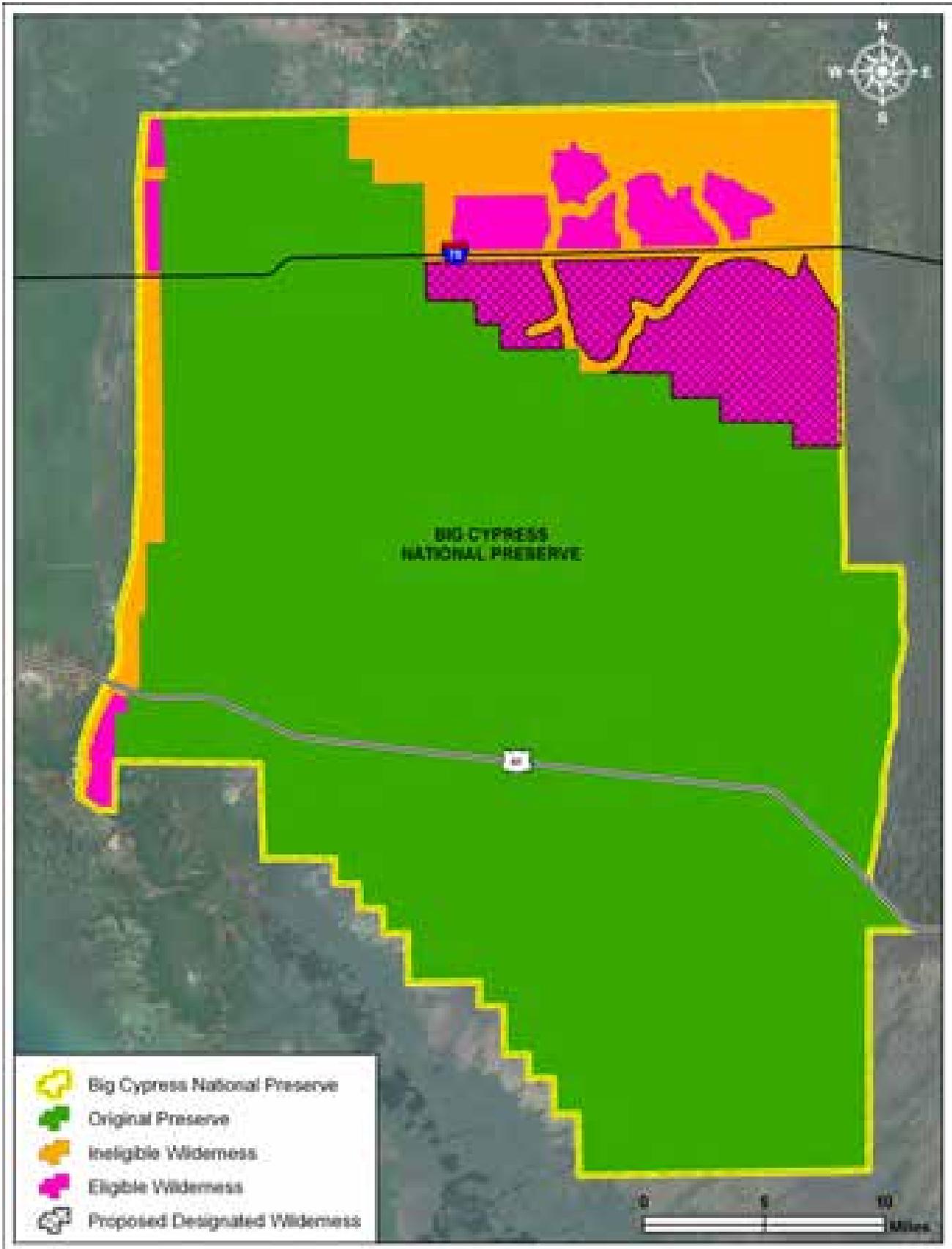


Figure 3-4 – Wilderness Areas in Big Cypress National Preserve

NPS MANAGEMENT AND OPERATIONS

PRESERVE MANAGEMENT AND OPERATIONS

Administrative Organization and Management

The Preserve is administered by a superintendent, responsible for managing and supervising all Preserve operations and activities. The superintendent's office, located at the Preserve headquarters in the southwestern portion of the Preserve in Ochopee, Florida, includes the deputy superintendent, the program assistant, the environmental protection specialist, and the management assistant. Divisions within the Preserve include administration, interpretation, maintenance, resource management, resource and visitor protection, and fire and aviation, each of which is headed by a division chief (NPS 2010a, NPS 2011c). NPS staffing at the Preserve is currently 95-105 employees as of 2012 (NPS 2010a).

- Administration Division – The administration division is the "business office" for the Preserve. Its principal functions include human resources, administering the Preserve's Safety Program, purchasing, property management, budget administration, contracting, housing matters, payroll, technology support (personal computers and telephone system), and mail (NPS 2011c).
- Interpretation Division – The interpretation division is responsible for information/education programs and services provided to Preserve visitors and neighbors. The division manages Preserve publications, interpretive exhibits, and visitor center operations. Interpretive rangers provide a variety of ranger-led programs to the public. A curriculum-based education program reaches many students in local schools in the fall (NPS 2011c).

- Maintenance Division – The maintenance division maintains all roads, trails, buildings, utilities, grounds, vehicles, and other physical facilities in the Preserve to assure their safe use. The division also manages construction and rehabilitation projects to support the Preserve's operation (NPS 2011c).
- Resource Management Division – The resource management division provides scientific guidance to Preserve management on all matters related to natural and cultural resources. The division conducts or oversees studies on physical, biological, and cultural resources. Staff members often work with private landowners to ensure the protection of conservation easements held by the NPS. The division also maintains an extensive museum collection (NPS 2011c).
- Resource and Visitor Protection Division – The resource and visitor protection division is responsible for law enforcement, emergency medical services, dispatch, search and rescue, fire management, fees, and security of Preserve facilities, buildings, and NPS housing (NPS 2011c).
- Fire and Aviation Division – The fire and aviation division is responsible both for fire-fighting activities and for restoring the natural fire regime to areas where fires naturally occur. The effects of fire on natural ecological systems are actively monitored by division staff (NPS 2010a).

Management Units

The original boundaries of the Preserve established in 1974 consisted of 582,000 acres. The original Preserve is divided into six management planning units – Bear Island, Corn Dance, Deep Lake, Loop, Stairsteps, and Turner River units – which are cooperatively managed by the superintendent and each division, as appropriate (see figure 3-5).

The Addition

The Big Cypress National Preserve Addition Act (Public Law 100-301) was passed on April 29, 1988, authorizing the addition of 147,000 acres to the Preserve. These areas – the Northeast Addition and the Western Addition – have not yet been formally divided into management units (see figure 3-5). However, the Northeast Addition and the Western Addition are managed in the same manner as the current management units.

Facilities

NPS facilities are primarily designed to provide safe, enjoyable, and educational access and support to visitors who come to experience Big Cypress National Preserve. Facilities are typically located in areas that can sustain visitation while protecting resources, natural systems, and the generally wild character that was intended upon designation of the Preserve (NPS 2010a). Public facilities present in the Preserve include trails and trailheads, roads, staffed (i.e., Oasis Visitor Center and Big Cypress Swamp Welcome Center) and nonstaffed (i.e., a series of information points along U.S. 41) visitor information centers, and campgrounds (developed and backcountry sites). Administrative facilities include offices, storage, buildings, and Preserve housing. These public and administrative facilities are discussed in detail in the Addition GMP (NPS 2010a).

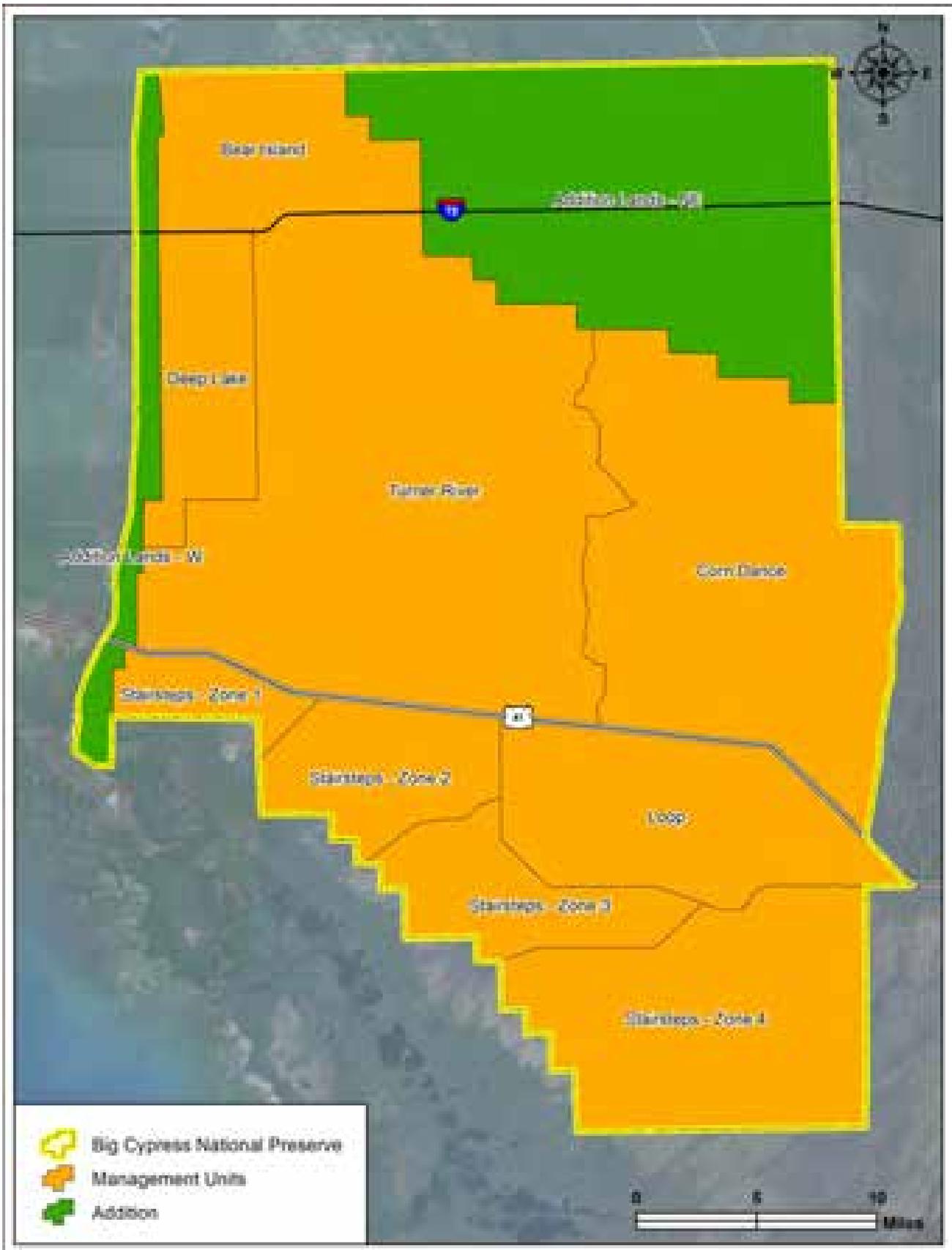


Figure 3-5 – Big Cypress National Preserve Management Units and Addition

VISITOR USE

VISITOR USE AND EXPERIENCE/RECREATIONAL OPPORTUNITIES

Recreational Visitation Data

Table 3-3 shows the annual number of recreational visitors to Big Cypress National Preserve from 1989 to 2010. Approximately 400,000 to 500,000 recreational visitors were recorded annually at the Preserve between 2000 and 2004. In 2005, the Preserve changed its counting methods, adding visitor counts from the Oasis Visitor Center parking lot and vehicle counts from the east and west ends of the Loop Road. This change contributed to the higher visitation figures from 2005 to present (NPS 2010a).

Table 3-3 – Recreational Visits (1989–2010)

Year	Recreational Visitors
1989	81,157
1990	127,790
1991	159,172
1992	212,682
1993	234,830
1994	294,307
1995	365,463
1996	424,920
1997	462,553
1998	474,895
1999	503,110
2000	505,062
2001	409,771
2002	449,481
2003	400,902
2004	385,194
2005	768,687*
2006	825,857
2007	822,864
2008	813,790
2009	812,207
2010	665,523

Source: NPS 2011d

* Change in counting methods.

The Visitor Services Project and Cooperative Park Studies Unit of the University of Idaho conducted a general visitor survey for Big Cypress National Preserve in the spring of 2007 (Papadogiannaki, Le, and Hollenhorst 2007).

Length of Visit. As part of the 2007 visitor study, visitors to the Preserve were asked whether they spent more or less than 24 hours at the Preserve. Twenty-four percent of visitor groups responded that their trip lasted longer than 24 hours (at least one full day). Within this 24% of visitors whose group stayed at the Preserve for one day or longer, 30% of visitors spent seven or more days at the Preserve, and a total of 46% of visitor groups stayed for two or three days (see figure 3-6) (Papadogiannaki, Le, and Hollenhorst 2007).

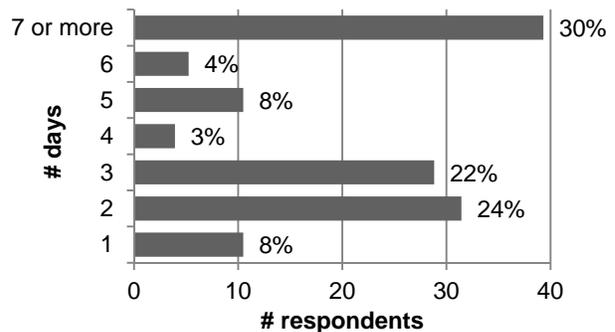


Figure 3-6 – Number of Days Spent Visiting the Preserve

Source: Papadogiannaki, Le, and Hollenhorst 2007
N = 131 visitor groups

Visitor Activities

As part of the 2007 visitor study, one of the questions that visitors were asked was, “On this visit to Big Cypress National Preserve, what activities did you and your group participate in?” The most common activities visitor groups participated in were: viewing wildlife (other than birds) (69%), taking a scenic drive (66%), driving through to another

destination (52%), and birdwatching (48%) (see figure 3-7). “Other” activities (6%) included: biking, taking a boat tour, visiting the Clyde Butcher Gallery or other art galleries, viewing alligators, viewing vegetation, bird song recording, bringing other visitors, taking a cruise, participating in sports,

visiting the visitor center, riding the trolley, visiting the beach, picking up trash, removing Florida holly (i.e., Brazilian-pepper), scouting for hunting, eating at a restaurant, and using restrooms (Papadogiannaki, Le, and Hollenhorst 2007).

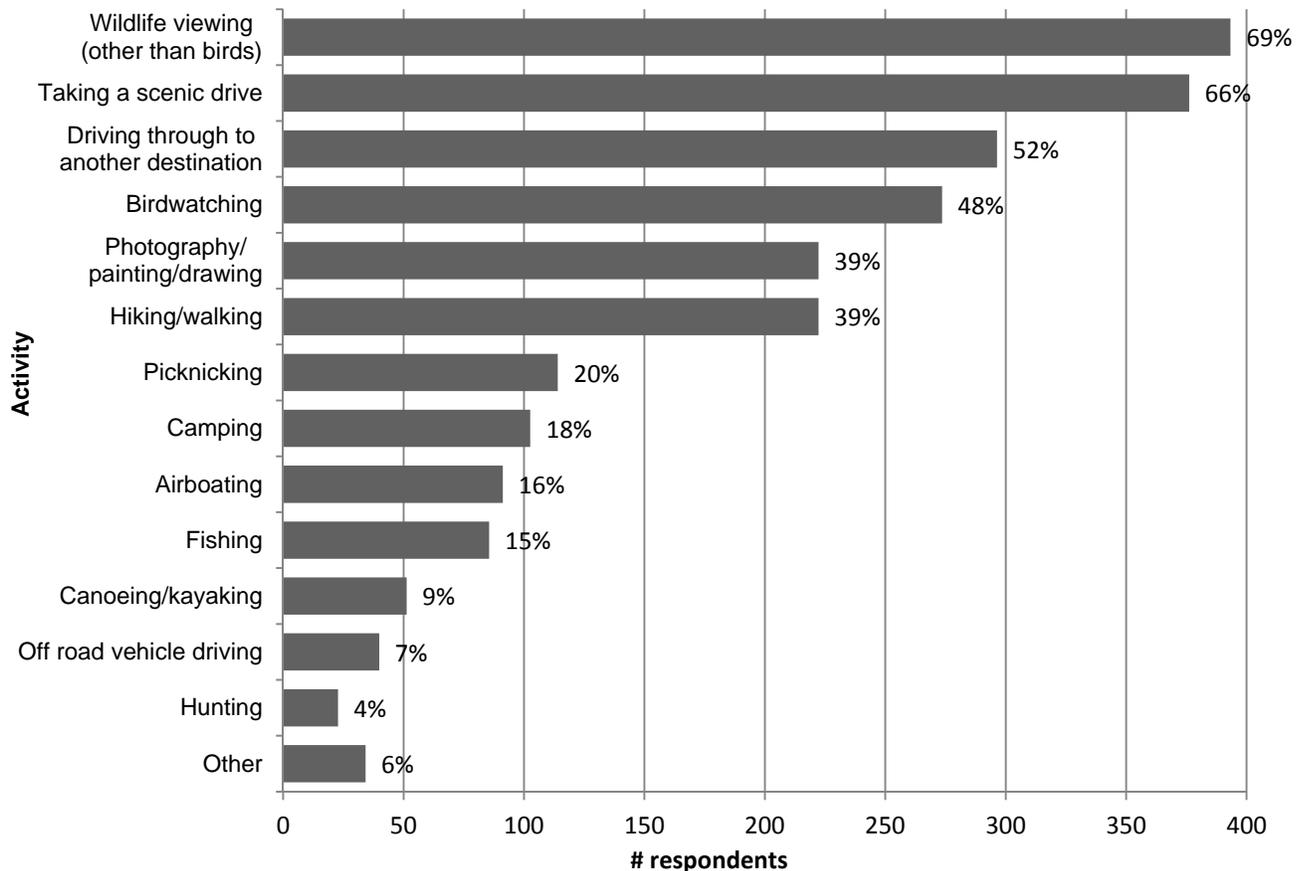


Figure 3-7 – Visitor Activities Participated In

Source: Papadogiannaki, Le, and Hollenhorst 2007

N = 570 visitor groups

Note: Total percentages do not equal 100 because visitors could select more than one answer.

Recreational Opportunities

According to the Addition GMP (NPS 2010a) the primary recreational activities within the Preserve include the following, with the areas in which the activities are currently permissible noted in parentheses:

- frontcountry driving, sightseeing, and visitor centers (original Preserve)
- Walking and hiking (original Preserve and the Addition)
- bird-watching and wildlife viewing (original Preserve and the Addition)
- paddling (original Preserve and the Addition)

- motorboating (original Preserve and limited in the Addition)
- camping (original Preserve and the Addition)
- bicycling (original Preserve and limited in the Addition)
- riding ORVs (original Preserve)
- fishing and frogging (fishing permissible in original Preserve and the Addition; frogging permissible in the original Preserve)
- hunting (original Preserve)¹⁵
- opportunities to experience peace and quiet in a natural environment (original Preserve and the Addition)¹⁶

These primary activities are described below in greater detail. Although other recreational activities may occur (e.g., horseback riding), these listed activities account for the dominant types of use.

Frontcountry Driving, Sightseeing, and Visitor Centers. Several major highways transect or run adjacent to the Big Cypress National Preserve. Interstate 75, also known as Alligator Alley, crosses the northern portion of the Preserve for approximately 30 miles, about 19 of which are within the Addition and are currently used almost solely as a nonrecreationally based travel corridor. Although this highway is the primary transit route between Fort Lauderdale and Naples, it does offer views into the undeveloped land in the Preserve. U.S. 41, also known as the Tamiami Trail, is a paved highway that crosses the southern portion of the Preserve for about 36 miles, 1 mile of which is in the Addition. State Road 29 is a paved highway that runs north/south along the western border of the Addition for approximately 29 miles. Wildlife underpasses have been and are being constructed under I-75 and SR 29 to protect drivers and animals, specifically the Florida panther, from being killed in automobile accidents (NPS 2010a).

¹⁵ Recreational hunting in the Preserve is discussed in the “Hunting” section.

¹⁶ Opportunities to experience peace and quiet in a natural environment are discussed in the “Noise/Soundscapes” section.

Unpaved, graded, gravel-based roads in the original Preserve include the approximately 24-mile Loop Road (south of U.S. 41), the approximately 23-mile Turner River Road, the 10-mile Birdon Road, the almost 3-mile Wagonwheel Road that crosses the Addition for almost 1 mile, and the 3-mile access road to the Burns Lake site. A graded dirt administrative road known as Bear Island Grade exists in the northwestern corner of the Addition and provides access into the Bear Island Unit from SR 29. Other graded roads in the Addition include Bundschu Grade and Nobles Grade, each extending approximately 4 miles into the Addition, north of I-75, although neither of these routes is maintained (NPS 2010a).

Other than the main paved highways, the unpaved roads listed previously, and several rights-of-way to private in-holdings, no other public access roads exist within the Preserve. Numerous unimproved jeep and ORV trails exist in the Preserve (NPS 2010a). A maximum of 130 miles of primary trails would be designated in the Addition as part of the ORV trail system¹⁷ (NPS 2011e).

Preserve headquarters, the Big Cypress Swamp Welcome Center, and the Oasis Visitor Center are on U.S. 41 in the original Preserve. The Big Cypress Swamp Welcome Center and the Oasis Visitor Center offer interpretive displays, printed materials and books for sale, and wildlife viewing platforms. Currently, no visitor centers exist in the Addition (NPS 2010a). According to the ROD for the Addition GMP, a new visitor contact station and some outdoor orientation and interpretive panels would be developed along I-75 (NPS 2011e).

Walking and Hiking. Within the original Preserve, the Florida National Scenic Trail received national designation in 1983. The trail is currently incomplete but is planned to

¹⁷ The Addition GMP is the document which guides the number of miles of trails that would be developed in the Addition as well as the number of ORV permits that would be issued for use of those trails. Any future changes to the Addition GMP would supersede the information in this document regarding trails and ORV permits in the Addition.

extend approximately 1,300 miles from the Preserve to the Gulf Islands National Seashore in Florida's western panhandle. The trail, which is the only designated hiking trail longer than 2.5 miles in the original Preserve, provides backcountry hiking experiences to visitors. Section 1 of this trail (from the Oasis Visitor Center to the original Preserve boundary) was established by the Florida Trail Association in the early 1970s. Section 1 will soon begin at the visitor center trailhead and extend about 35 miles to a rest area along I-75. A temporary trail informally follows Nobles Grade, a nonmaintained road north of I-75, up to the Preserve boundary (NPS 2010a).

Although there are no designated trails or pathways and no facilities in the Addition, existing, nonmaintained roads or trails serve as primary access routes for visitors (NPS 2010a). As stated above, a maximum of 130 miles of primary trails would be designated in the Addition as part of the ORV trail system¹⁸; these trails would be available for walking and hiking. Conceptual hiking trails – one completing a north-south connection and one completing an east-west connection through the Addition – are also being developed (NPS 2011e).

Bird-watching and Wildlife Viewing.

Within the original Preserve, formal wildlife observation platforms are located at the H.P. Williams Picnic Area, the Kirby Storter Boardwalk, the Big Cypress Swamp Welcome Center, and at the Oasis Visitor Center. Bird-watching opportunities are prevalent in the original Preserve because of the large acreage and accessibility along roads, developed trails, boardwalks, and in both frontcountry and backcountry areas. Within the Addition, wildlife viewing and bird-watching opportunities are relatively primitive in nature and self-directed because no infrastructure is available. Most bird-watching and wildlife

¹⁸ The Addition GMP is the document which guides the number of miles of trails that would be developed in the Addition as well as the number of ORV permits that would be issued for use of those trails. Any future changes to the Addition GMP would supersede the information in this document regarding trails and ORV permits in the Addition.

viewing activities in the Addition consist of individual ventures, as well as formal and informal organized group outings (NPS 2010a).

Paddling. Within the original Preserve, most paddling opportunities are south of U.S. 41 where accessible water routes provide deep enough water. The Turner River Canoe Trail and the Halfway Creek Canoe Trail provide the opportunity for nonmotorized paddling experiences. Other areas are open to all boats. In the Addition, the lakes and streams adjacent to Everglades City and Plantation Island are open to paddlers and provide a coastal marsh and mangrove experience (NPS 2010a). According to the ROD for the Addition GMP, new paddling trails would be developed in the tidal areas south of U.S. 41 in the western portion of the Addition (NPS 2011e).

Motorboating. Motorboating in the original Preserve and in the Addition is generally restricted to the deeper water estuarine environments south of U.S. 41 outside of Everglades City and the L-28 Interceptor Canal in the Northeast Addition. Motorboat use in the Addition is generally restricted to smaller vessels because of the shallow waters and tight turning radii in the creeks and open waters. All commercial boat operations are prohibited within the Addition. According to the ROD for the Addition GMP, additional motorized boating opportunities in the Addition would be phased in over time (NPS 2011e).

Motorized vessels are regulated by the FWC, who serves as the state boating law administrator, and by the U.S. Coast Guard navigation rules. All vessels must comply with applicable federal and state laws (NPS 2010a).

Camping.

Developed campgrounds — In the original Preserve, two developed campgrounds (Monument Lake and Midway), and six primitive campgrounds (Bear Island, Burns Lake, Pinecrest, Mitchell's Landing, Pink Jeep, and Gator Head) exist. No developed

campgrounds currently exist in the Addition (NPS 2010a).

Backcountry camping — Backcountry camping is allowed in the entire Preserve, and such camping is subject to Preserve backcountry camping regulations. The NPS maintains regularly updated and published backcountry regulations (NPS 2010a).

Bicycling. In the original Preserve, bicycling occurs along many of the gravel roads and on several of the ORV trails. However, because many of the ORV trails in the original Preserve are in rough condition (i.e., relatively large deep ruts and seasonal standing water), they are oftentimes not conducive to bicycle use. Bicycling in the Addition is currently only allowed on Nobles and Bear Island grades (NPS 2010a).

Riding Off-road Vehicles. The use of off-road vehicles is a popular recreational activity in the original Preserve. In the original Preserve, ORV use is heaviest during the fall, winter, and spring hunting seasons. The greatest use is on opening weekends of hunting seasons and holidays. In the original Preserve, several types of off-road vehicles are used to access the backcountry. These include street-legal four-wheel-drive vehicles (4 x 4s), light-weight all-terrain cycles (ATCs) swamp buggies, and airboats. Recreational activities that can involve the use of ORVs in the Preserve include hunting, fishing, bird-watching, general exploring, and recreational driving. All ORVs are required to have a permit. Within the original Preserve, ORV permit numbers have ranged from 633 in 1995 to 2,271 in 1999, 1,702 in 2006, and 2,000 in 2008. Fluctuations in the number of ORV permits issued each year primarily reflect water levels within the Preserve, with fewer registered vehicles in the wetter years (e.g. 1995) when portions of the Preserve were closed to hunting (NPS 2010a).

ORV use by the general public is currently prohibited within the Addition (NPS 2010a). According to the ROD for the Addition GMP, ORV use would be phased in over time in the Addition. A maximum of 130 miles of primary trails would be designated in the Addition as

part of the ORV trail system. All ORVs used for recreation would be required to have a permit. A maximum of 650 ORV permits would be issued annually for the Addition. This number of ORV permits is based on the ratio of available annual permits to ORV primary trail mileage in the original Preserve (NPS 2011e)¹⁹.

Management of off-road vehicles in the original Preserve is guided by the *Final Recreational Off-Road Vehicle Management Plan Supplemental Environmental Impact Statement* (NPS 2000d). Management of ORVs in the Addition is guided by the Addition GMP (NPS 2010a). Therefore, direct impacts of ORV use associated with hunting will not be analyzed as part of *this Hunting Management Plan*.

Fishing and Frogging. The original Preserve has been designated by the state as a WMA, and the NPS permits fishing and frogging by the public in accordance with state laws and regulations. Fishing is permitted within the Addition subject to applicable laws and regulations. Frogging is currently prohibited within the Addition. Direct impacts of fishing and frogging are not analyzed as part of *this Hunting Management Plan*.

The visitor use features described above are depicted in figure 3-8.

¹⁹ The Addition GMP is the document which guides the number of miles of trails that would be developed in the Addition as well as the number of ORV permits that would be issued for use of those trails. Any future changes to the Addition GMP would supersede the information in this document regarding trails and ORV permits in the Addition.

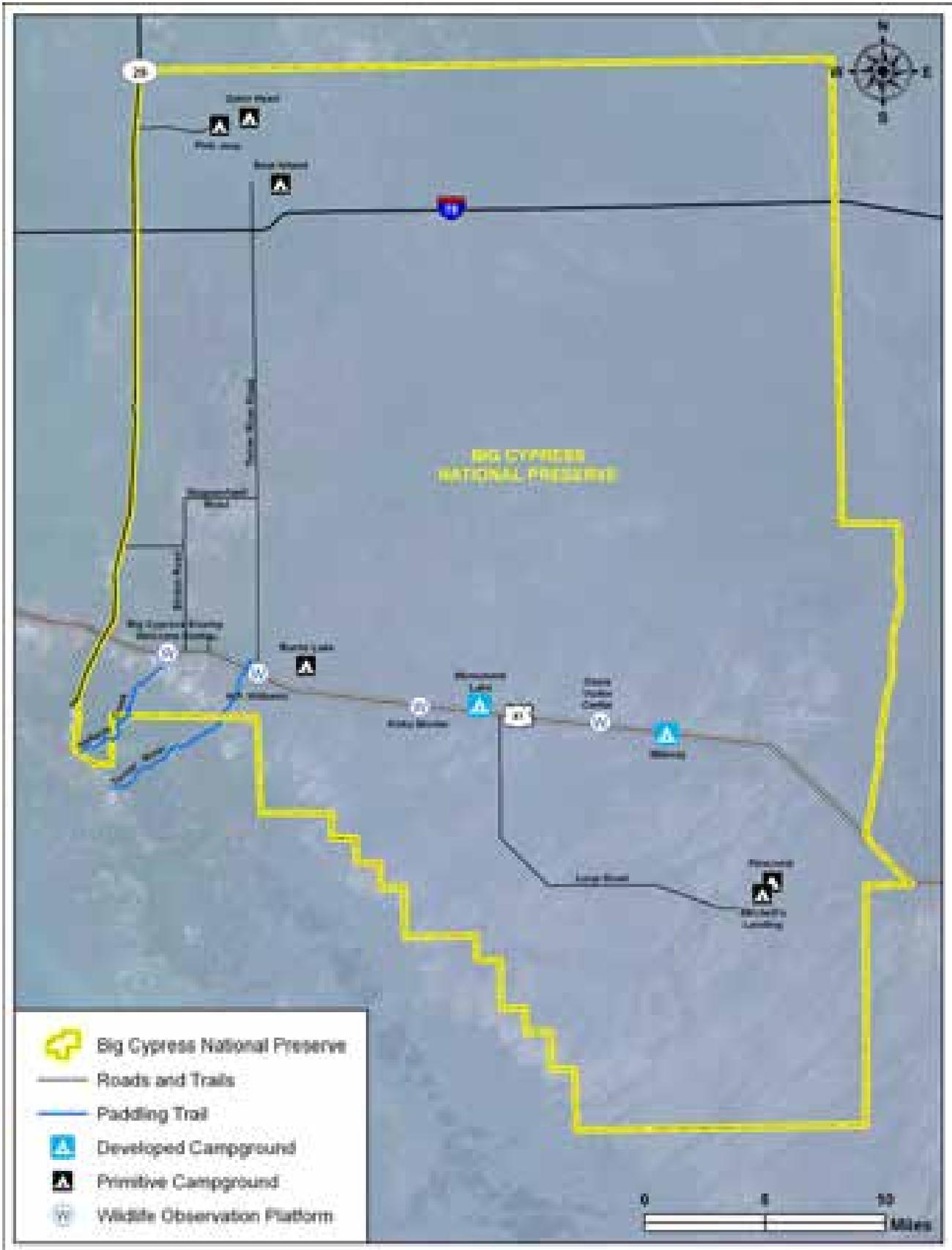


Figure 3-8 – Visitor Use Features Map

Hunting

The original Preserve has been designated by the state as a WMA, and the NPS permits hunting by the public in accordance with state laws and regulations. The Addition has never been open to public hunting since its acquisition by the NPS; however, hunting occurred on private lands in the Addition prior to the acquisition of the lands by the NPS. Therefore, the following information applies only to hunting within the original Preserve.

The NPS and the FWC have concurrent jurisdiction for enforcing game and fish laws in the Preserve. Although the NPS has authority to manage wildlife within the Preserve, the NPS has assigned the management of hunting to the FWC. The FWC consults with the NPS before issuing regulations that affect hunting within the Preserve. Likewise, the NPS consults with the FWC before establishing any temporary or permanent closures or public use limits. This partnership for concurrent management of hunting in the original Preserve is outlined in the *Cooperative Partnership Agreement Between the NPS and the FWC* (2010) (see appendix B).

Current hunting regulations in the Preserve are outlined for the public in the *FWC Big Cypress WMA Regulations Summary and Area Map (July 1, 2013 – June 30, 2014)* brochure (see appendix C), which states (FWC 2013a):

Persons using [WMAs] are required to have appropriate licenses, permits and stamps. The following persons are exempt from all license and permit requirements (except for quota permits when listed as “no exemptions,” recreational use permits, antlerless deer permits and the Migratory Bird Hunting and Conservation Stamp [federal duck stamp]): Florida residents who are 65 years of age or older; residents who possess a Florida Resident Disabled Person Hunting and Fishing Certificate; residents in the U.S. Armed Forces, not stationed in Florida, while home on leave for 30 days or less, upon submission of orders; and children under

16 years of age. Children under 16 years of age are exempt from the federal duck stamp. Anyone born on or after June 1, 1975 and 16 years of age or older must have passed a Commission-approved hunter-safety course prior to being issued a hunting license, except the Hunter Safety Mentoring exemption allows anyone to purchase a hunting license and hunt under the supervision of a licensed hunter, 21 years of age or older.

The brochure provides detailed information on quota permit information, ORV permit requirements, general area regulations, public access and vehicles, check stations, dogs, camping, bag and possession limits, archery season, muzzleloading gun season, general gun season, small game season, trapping (which is prohibited), spring turkey season, migratory bird seasons, fishing and frogging (not covered as part of this plan), and general NPS rules and information (FWC 2013a). While these regulations can change from year to year, the following summarizes some of the current hunting regulations in place for the original Preserve (FWC 2013a). The annually updated brochure can be found on the NPS website for the Preserve at:
<http://www.nps.gov/bicy/planyourvisit/hunting.htm>.

Quota Permit Information. Quota permits in the Preserve are issued for the first nine days of muzzleloading gun season (in the Bear Island Unit) and the first nine days of general gun season (in the Bear Island and Turner River units). Hunters must submit electronic applications for quota permits (FWC 2013a).

ORV Permit Requirements. Vehicle operators must be state licensed (regular or learner’s permit) and obtain an ORV operator’s permit from the NPS for all vehicles, including airboats, used off-road. All ORVs and their operators must be permitted and the vehicles inspected prior to operation in the original Preserve (FWC 2013a).

General Area Regulations. All general laws and regulations relating to wildlife apply in the original Preserve unless specifically

exempted. Hunting or the taking of wildlife is allowed only during the open seasons and in accordance with regulations (FWC 2013a).

Public Access and Vehicles. The original Preserve is open to public recreational access year round in accordance with all local, state, and federal laws and regulations, permit requirements, and posted signage (FWC 2013a).

Check Stations. All hunters must check in at a designated check station when entering the area, retain in their possession a check station pass while hunting, check out at the same check station when exiting the area, and shall check all game taken (FWC 2013a).

Dogs. The possession of dogs for hunting is prohibited, except for bird dogs and waterfowl retrievers. Hunting deer or wild hog with dogs is prohibited. Dogs are completely prohibited in the Loop Unit. Additionally, leashed dogs may not be used for trailing wounded game (FWC 2013a).

Camping. Camping is allowed in accordance with the regulations of the NPS (FWC 2013a).

Bag and Possession Limits. During quota hunts, host hunter and guest must share all bag and possession limits. The following bag and possession limits are currently in place in the Preserve (FWC 2013a):

- deer – daily limit (one), annual limit (two) (all seasons combined), except in Zone 3 of the Stairsteps Unit where the bag limit for deer is one annually; hunting deer in Zone 4 is prohibited²⁰
- wild hog – daily limit (one), annual limit (two) (all seasons combined)
- turkey – daily limit (one), season limit (two), possession limit (two)
- gray squirrel, quail and rabbit – daily limit (12), possession limit (24) for each
- raccoon, opossum, armadillo, beaver, coyote, skunk, and nutria – no bag limits

²⁰ The current hunting restrictions for deer hunting in the Stairsteps Unit were put into place by FWC EO 10-37.

- bobcat and otter – prohibited
- migratory birds – regulated by the *Migratory Bird Hunting Regulations* pamphlet

Archery Season. Archery season currently runs from September 7th through October 6th and October 31st through November 5th in all units of the Preserve and from October 31st through January 1st in the Deep Lake Unit only. The following permits, stamps, and licenses are required to hunt in the Preserve during archery season: check station pass, hunting license, management area permit, archery permit, deer permit (if hunting deer), migratory bird permit (if hunting migratory birds), and both a state waterfowl permit and a federal duck stamp (if hunting waterfowl). Other regulations regarding which game species can be hunted (and sizes) also apply (FWC 2013a).

Muzzleloading Gun Season.

Muzzleloading gun season currently runs from October 12th through 27th and November 6th through 10th, except in the Deep Lake Unit. The following permits, stamps, and licenses are required to hunt in the Preserve during muzzleloading gun season: quota permit (if hunting Bear Island Unit October 12th through 20th), check station pass, hunting license, management area permit, muzzleloading gun permit, deer permit (if hunting deer), and migratory bird permit (if hunting migratory birds). Other regulations regarding which game species can be hunted (and sizes) also apply (FWC 2013a).

General Gun Season. General gun season currently runs from November 16th through January 1st, except in the Deep Lake Unit. The following permits, stamps, and licenses are required to hunt in the Preserve during general gun season: quota permit (if hunting November 16th through 24th in the Bear Island or Turner River units), check station pass, hunting license, management area permit, deer permit (if hunting deer), migratory bird permit (if hunting migratory birds), and both a state waterfowl permit and a federal duck stamp (if hunting waterfowl). Other

regulations regarding which game species can be hunted (and sizes) also apply (FWC 2013a).

Small Game Season. Small game season currently runs from January 2nd through February 1st. The following permits, stamps, and licenses are required to hunt in the Preserve during small game season: check station pass, hunting license, management area permit, migratory bird permit (if hunting migratory birds), and both a state waterfowl permit and a federal duck stamp (if hunting waterfowl). It is legal to hunt gray squirrel, quail, rabbit, raccoon, opossum, armadillo, beaver, coyote, skunk, nutria, and migratory birds in season (FWC 2013a).

Trapping. Trapping is prohibited in the Preserve (FWC 2013a).

Spring Turkey Season. Spring turkey season currently runs from March 1st through April 6th. The following permits, stamps, and licenses are required to hunt in the Preserve during spring turkey season: check station pass, hunting license, management area permit, and wild turkey permit. It is legal to hunt bearded turkey or gobbler. Other regulations also apply (FWC 2013a).

Migratory Bird Seasons. Duck may be hunted during the special September season in all units except the Bear Island and Deep Lake units. Rail, common moorhen, mourning dove, white-winged dove, snipe, duck, geese, coot, woodcock, and crow may be hunted during seasons established by the FWC for those species that coincide with the archery, muzzleloading gun, general gun, or small game seasons. The following permits, stamps, and licenses are required to hunt in the Preserve during migratory bird seasons: quota permit (if hunting during any quota period), check station pass, hunting license, management area permit, migratory bird permit, and both a state waterfowl permit and a federal duck stamp (if hunting waterfowl) (FWC 2013a). Which species are legal to hunt are outlined in the *Migratory Bird Hunting Regulations* pamphlet.

NOISE/SOUNDSCAPES

In accordance with NPS *Management Policies* (2006) and Director's Order 47: *Sound Preservation and Noise Management* (NPS 2000c), an important part of the NPS mission is preservation of natural soundscapes associated with national park units. The NPS defines a soundscape as (NPS 2000c):

... the total ambient acoustic environment associated with a given environment (sonic environment) in an area such as a national park. It also refers to the total ambient sound level for the park. In a national park setting, this soundscape is usually composed of both natural ambient sounds and a variety of human-made sounds.

The NPS Natural Sounds Program differentiates between the use of *sound* and *noise*, since these definitions have been used inconsistently in the literature (NPS 2011f). Humans perceive *sound* as an auditory sensation created by pressure variations that move through a medium such as water or air and is measured in terms of amplitude and frequency (Harris 1998; Templeton and Sacre 1997). Although *noise* is sometimes incorrectly used as a synonym for sound, the NPS defines noise as “an unwanted or undesired sound, often unpleasant in quality, intensity or repetition” (NPS 2000c). Sounds found desirable during times of rest and relaxation are referred to as natural quiet, and include natural, outdoor ambient sounds, without the intrusion of human-caused sounds.

Sound levels are usually measured in A-weighted decibels [dB(A)], and a descriptor such as the energy equivalent noise level (Leq) is commonly used to account for fluctuations of sound over time. Generally, a 3 dB(A) increase in sound level is considered the minimum threshold at which most people can detect a change in the sound environment; an increase of 10 dB(A) is perceived as a doubling of the sound level.

Natural sounds throughout the Preserve – including flowing water, animals, and rustling leaves – are not considered noise. The enjoyment of natural sounds in the Preserve enhances the visitor’s experience, and natural quiet can be essential in order for some individuals to achieve a feeling of peace and solitude. However, sound levels in the Preserve can vary greatly, depending on the area and activities. Ambient sound levels in the Preserve generally range between 24 dB(A) and 40 dB(A), depending on the contribution of sound by insects (NPS 2010a). Since environmental conditions in the Addition are similar to those in the original Preserve, these noise levels are also representative of those that are expected in the Addition. Some of the sounds that can typically be heard in areas of the Preserve are listed in table 3-4.

Table 3-4 – Typical Sounds in Big Cypress National Preserve

Sound	Approximate Level [dB(A)]
Threshold of human hearing at 1 kHz	0
Leaves rustling	20
Whispering (1.5 meters/5 feet)	20
Crickets (5 meters/16 feet)	40
Distant bird calls	45
Rainfall	50
Normal conversation	60
Freeway traffic	70
Motorboats	85 - 115
Thunder	100 - 120
Gunfire	150 - 170

Sources: Center for Hearing and Communication 2011, NPS 2011f

There are no absolute standards that define unacceptable levels, duration, or qualities of environmental noise (NPS 2010a). The U.S. Forest Service (1980) has established subjective audibility guidelines to assess noise impacts for various recreational opportunities. These guidelines are included in table 3-5, and they relate recreational opportunities to the corresponding acceptable level above ambient sound levels. The U.S. Department of Energy suggests that there is a “strong likelihood of individual complaints” when the intruding

noise is greater than 10 dB above ambient sound levels.

Table 3-5 – Acceptable Levels above Ambient Sound Levels for Various Recreational Opportunities

Recreational Opportunity	Acceptable Level (dBA)
Appropriate for primitive recreational area; intruding noise not detectable	0
Appropriate for trail camps; will not wake most sleepers; intruding noise normally not detectable	5
Appropriate for undeveloped roadside camps and those accessible by four-wheel drive and all-terrain vehicles	10
Appropriate for roadside camps accessible by highway vehicles	20
Appropriate for highly developed campgrounds in a quiet, suburban neighborhood	40

Source: U.S. Forest Service 1980

Noise

Current noise sources in the Preserve include: human noise sources (e.g., NPS management activities, recreational activities), hunting-related firearm use, ORVs, oil and gas development noise, aircraft noise, and highway noise (NPS 2010a). While some of these noise sources exist throughout the Preserve, noise from hunting, ORVs, and oil and gas development is mainly confined to the original Preserve.

Hunting Noise. Hunting activities in the original Preserve are long-established and include bow, muzzleloading, and general gun seasons. Gun hunting is permitted only during limited times of the year (e.g.; during October, November, and December). Sound levels for hunting activities would primarily be associated with the weapons used for hunting (e.g., rifles). The sound of an average rifle ranges from 155 dB(A) to 170 dB(A), depending on weapon type (Center for Hearing and Communication 2011). The sound of an average shotgun ranges from 150

dB(A) to 160 dB(A) (Center for Hearing and Communication 2011). Using a commonly accepted sound level drop-off rate of a 6 dB reduction in noise for every doubling of distance from the source, and not accounting for the effects of terrain, ground cover, and atmospheric conditions; firearm noise of this magnitude would be expected to be plainly evident at distances of more than 2 miles. Such noises associated with hunting in the Preserve would be expected to be sporadic and occur only during hunting seasons and hours.

ORV Noise. Management of ORVs in the original Preserve is guided by the *Final Recreational Off-Road Vehicle Management Plan Supplemental Environmental Impact Statement* (NPS 2000d). Management of ORVs in the Addition is guided by the Addition GMP (NPS 2010a). Therefore, direct impacts of ORV use on the soundscape at the Preserve will not be analyzed as part of this *Hunting Management Plan*.

Oil and Gas Development Noise. The Preserve soundscape can be affected by oil and gas development, including geophysical operations, drilling, production, abandonment, and reclamation. According to the Addition GMP (NPS 2010a), noise levels associated with drilling operations in the Preserve were documented by Vibra-Tech South Corporation in 1986. The study was conducted for Exxon Company in December 1985 during typical rotary drilling operations and conductor casing drive hammer operations at the Collier 2B4 well. Noise levels were recorded at varying distances from the operation, ranging from 10 feet to 12,000 feet. During conductor casing drive hammer operations, decibel levels were highest within 10 feet of the drilling rig [93 dB(A)] and lowest [40 dB(A) or less] at distances of 10,000 feet or greater from the rig. During rotary drilling operations, 85 dB(A) was recorded 10 feet from the rig and 40 dB(A) or less was recorded 9,200 feet from the drilling operation. It is important to note that the noise level recording equipment used in this study had a minimum detection limit of 40 dB(A). Using 40 dB(A) as a maximum ambient level, noise from rotary drilling operations can be detected

up to 8,500 feet (1.61 miles) from a rig, and noise generated from a conductor casing drive hammer operation can be detected up to 9,200 feet (1.74 miles) from a rig in the Preserve.

Aircraft Noise. According to the Addition GMP (NPS 2010a), natural soundscapes throughout the Preserve are affected by aircraft noise from a variety of overflight sources. These include high-altitude, commercial jet traffic; military activity; general aviation; NPS administrative operations, such as resource management, prescribed fire activities, emergency response, and facility maintenance; municipal and commercial air traffic from surrounding counties; and the air flight training operating out of the Dade-Collier Training and Transition Airport known locally as the Jetport (NPS 2010a).

In order to minimize aircraft noise, the Federal Aviation Administration recommends a minimum altitude of 2000 feet. The Federal Aviation Administration also limits and regulates noise levels generated by aircraft as authorized under 14 CFR Part 36, "Noise Standards: Aircraft Type and Airworthiness Certification." To be certified for operation within the United States, all aircraft must meet established noise limits based on aircraft type, speed capabilities, operational category (commercial, agricultural, etc.), and age of aircraft. Propeller-driven aircraft, jet aircraft, and helicopters are all included (NPS 2010a).

Helicopter use is of particular interest within the Preserve because this type of aircraft is often used to access the backcountry. The acoustical impact of a helicopter is a function of the size and the type of engine used, as well as the movement of the rotor blades through the atmosphere as they produce lift (NPS 2010a).

Highway Noise. According to the Addition GMP (NPS 2010a), I-75 creates a considerable impact on the natural soundscape in the northern portion of the Addition as a result of the nearly constant traffic. To a lesser degree, SR 29 and U.S. 41 also impact the natural soundscape within the Preserve. The level of

highway traffic noise depends on (1) the volume of the traffic, (2) the speed of the traffic, and (3) the number of trucks in the flow of the traffic. Generally, the loudness of traffic noise is increased by heavier traffic volumes, higher speeds, and greater numbers of trucks. Vehicle noise is a combination of the noises produced by the engine, the exhaust, and the tires. The loudness of traffic noise can also be increased by defective mufflers or other faulty equipment on vehicles. As a person moves away from a highway, traffic noise levels are reduced by distance, terrain, vegetation, and natural and man-made obstacles (Federal Highway Administration 1995). A 61-meter (about 200-foot) width of dense vegetation, for example, can reduce noise by 10 decibels, which reduces the loudness of traffic noise by half (Federal Highway Administration 1995).

PUBLIC HEALTH AND SAFETY

NPS *Management Policies* (2006) states that the NPS “will not intervene in natural biological or physical processes, except: when directed by Congress; in emergencies in which human life and property are at stake; to restore natural ecosystem functioning that has been disrupted by past or ongoing human activities; or when a park plan has identified the intervention as necessary to protect other park resources, human health and safety, or facilities.”

Big Cypress National Preserve contains many remote and rugged areas and natural resources that can pose potential hazards to visitors. Additionally, hunting in the Preserve, similar to many other recreational activities, involves some potential safety risks.

NPS staff strictly enforces regulations at the Preserve to help protect the resources present at the Preserve as well as visitors from health and safety risks.

Hunting Safety

Hunting Incident Statistics. Hunting incidents are designated as Class A, B, C, or D. Class A incidents are hunting related shooting injuries or fatalities. Class B incidents are nonshooting hunting related injuries or fatalities, such as falls from treestands. Class C includes nonhunting related shooting injuries. Class A incidents are applicable to this plan in reference to hunting and nonhunting visitors in the Preserve. Class B incidents are applicable to this plan only in reference to hunters in the Preserve. Class D incidents are property damage reports. Class C and D incidents are not applicable to this plan.

Figure 3-9 shows the nationwide annual sports injuries associated with different sporting activities, including hunting. A total of 239 Class A injuries reported out of approximately 14.6 million individuals participating in hunting for 2007 (International Hunter Education Association 2008).

Of the 239 Class A incidents reported nationwide in 2007, 19 incidents were fatal and 220 were nonfatal, and 66 were self-inflicted while 173 were not self-inflicted (International Hunter Education Association 2008). The major factors attributed to the majority of the Class A incidents included (the number of incidents is noted in parentheses):

- shooter swinging on game (50)
- failure to identify the target (32)
- careless handling of a firearm (29)
- victim out of site of the shooter (29)
- victim moved into the line of fire (15)
- failure to check beyond target (13)
- trigger caught on object (10)
- other or unknown factors (61)



Figure 3-9 – Nationwide Annual Sports Injuries

Sources: National Safety Council 2008; International Hunter Education Association 2009; compiled by Unified Sportsmen of Florida 2009

* Excludes mountain biking.

Note: Because the number of participants, frequency, and duration of the sport varies with the respective sports, these numbers are approximations. Participant numbers include those seven years of age or older who participated more than once per year, except for bicycle riding and swimming, which include those who participated six or more times. Injury numbers include only injuries treated in hospital emergency facilities.

In 2007, there were 106 Class B hunting incidents reported nationwide. The majority of these incidents were tree stand related. Nationally, over 50% of all hunting incidents are related to elevated stands (Maryland DNR 2011). Current research shows that an overwhelming majority (82%) of hunters who experience tree stand accidents were not using a fall restraint system (Neale et al. 2011), and most accidents occurred when climbing into or

out of the elevated stand (International Hunter Education Association 2002).

Hunter Safety Education Requirements.

If a person who was born on or after June 1, 1975, wishes to purchase a Florida hunting license, he or she must first have passed a hunter safety course. The hunter safety certification must be presented when purchasing or being issued a hunting license. For those born after May 31, 1975, and who are 16 years of age or older, they may hunt without a valid hunter safety certificate if they are under the direct supervision of an adult (21 years or older) who holds a valid Florida hunting license. Children under the age of 16 may hunt with adult (21 years or older) supervision without taking a hunter safety course (Fresh Air Educators 2008).

The FWC offers two options – a traditional classroom course and a CD/online course – for fulfilling the Florida hunter safety education requirements to obtain a hunting license in Florida. The traditional hunter safety course covers the knowledge, skills, and attitude needed to be a safe hunter through a 12-hour classroom course, exam, and three-hour range course. The online hunter safety course allows the student to learn a majority of the knowledge portion of the course via distance learning (i.e., online). The remainder of the course is covered in a 4-hour classroom course, exam, and a 3-hour range course (FWC 2011a).

The free Florida online hunter safety course covers the following topics: game care, wildlife (wildlife conservation, wildlife identification, and conservation laws), survival and first aid (orienting and survival), firearms (firearms, ammunition, shooting skills, and firearm maintenance), bow hunting and muzzleloading, hunter responsibilities, tree stands, transportation (ORVs and boating), and additional concerns (turkey hunting and trapping) (Neale et al. 2011).

Hunter Orange Requirement. When hunting deer or accompanying a person who is hunting deer on public land, each person is required to wear a minimum of 500 square

inches of hunter orange as an outer garment, above the waistline and/or on the head. This rule is not applicable during the archery-only season (Fresh Air Educators 2008).

Outdoor/Preserve Safety

Travel Notification and Emergency

Contacts. Before entering backcountry areas of the Preserve, visitors need to fill out a backcountry permit. The forms and instructions are located at each trailhead kiosk. It is also a good idea for visitors to file an itinerary with family and friends. When possible, carrying a personal locator beacon can also reduce the risk to visitors in case of an emergency. In case of an emergency, Preserve Dispatch can be contacted at (800) 788-0511 (NPS 2011c).

Driving. Most visitor injuries and accidental deaths in the Preserve result from vehicle accidents. While driving is a great way to see the Preserve, it can also be dangerous. Visitors can reduce the risk of vehicle accidents by staying alert, following posted speed limits, watching for wildlife that may be crossing the road (especially at night), watching for bicyclists and pedestrians that are sharing the roads in the Preserve, and driving with headlights on (NPS 2011c).

Navigation. Navigating in the backcountry areas of Big Cypress National Preserve can be difficult, even for experienced outdoor enthusiasts. Visitors can reduce the risk of getting lost in the Preserve by familiarizing themselves with the designated trails before entering the Preserve, carrying a global positioning system unit, and carrying a map and compass (NPS 2011c).

Proper Attire and Equipment. Proper attire and equipment can help visitors to reduce the risk of injury or illness when visiting Big Cypress National Preserve. Proper clothing (i.e., hat, long pants, long-sleeved shirt) can help to protect from sun exposure, as well as frequent application of sunscreen (see “weather” section). Similar clothing (i.e., long pants, long-sleeved shirt, closed-toed

shoes) can help visitors to protect themselves from skin abrasions, cuts, and scrapes that could be caused by vegetation or exposed rocks. Proper attire is also important for hunters (see “hunter orange requirement” section). Equipment that should be carried while visiting the Preserve includes a first aid kit, flashlight, whistle, extra food and water, bug spray, warm clothing, and matches or a fire starter (NPS 2011c).

Weather. Extreme weather conditions, such as tropical heat and lightning, are concerns in the south Florida region.

The average high temperature in Florida during the summer months is around 95 degrees. Factoring in humidity, the heat index often soars to over 100 degrees. It is very easy to get overheated or dehydrated while participating in outdoor activities. Visitors can reduce the risks of overheating and dehydration by carrying plenty of clean drinking water (water collection in the backcountry is not recommended due to the risk of microscopic organisms), wearing sunscreen, wearing protective clothing (i.e., hat, long pants, long-sleeved shirt), and conducting outdoor activities such as walking/hiking in the early morning or late evening during times of the year when the temperature peaks.

South Florida receives more lightning strikes than anywhere else in the country, and there are more casualties from lightning strikes than all other natural hazards combined. Thunderstorms are common in the summer months; in the winter months, storms and lightning are less frequent but may be as severe. Visitors can reduce the risks of lightning strikes by avoiding outdoor activities in the Preserve during inclement weather conditions and following lightning avoidance practices when caught in a storm (i.e., stay as close to the ground as possible and stay away from tall trees or isolated tall objects) (NPS 2011c).

Dangerous or Venomous Wildlife. The Preserve is home to a variety of wildlife, including large species such as panthers,

alligators, and black bears, and venomous animals such as snakes, scorpions, and spiders. Although they sometimes appear tame, all of the animals in the Preserve are wild and could pose a threat to visitors' health and safety if visitors attempt to approach or feed them. While most wildlife move away when they become aware of humans in the area, important safety measures regarding potentially dangerous wildlife include not walking/hiking alone, not approaching wildlife, not feeding wildlife, keeping food appropriately contained, and properly disposing of garbage. Visitors can also report sightings of potentially dangerous wildlife to a ranger. Visitors can reduce the risk of a venomous animal or insect bite by inspecting shoes and sleeping bags before use and always carrying a flashlight at night. For additional protection from snake bites, high boots or protective leggings can be worn by visitors. If bitten by a snake, it is important for the visitor to exit the Preserve and go to the nearest emergency room (NPS 2011c).

Poisonous Plants. Two poisonous plants can be found throughout the Preserve – poison ivy and poisonwood (*Metopium toxiferum*). Poison ivy is very common throughout the Preserve, usually found as a creeping vine. Poisonwood is found in the southern portion of the Preserve. Both species can cause red, itchy rashes. Some people may also have a similar reaction to Brazilian-pepper, a nonnative shrub found commonly throughout the Preserve (NPS 2011c).

Fire. Fire danger is always an important safety consideration in the Preserve. Visitors should always exercise caution with the use of camp fires, gas stoves, charcoal grills, and cigarettes. The Preserve occasionally experiences drought conditions necessitating restrictions in the use of these heat sources. Closures in areas of the Preserve may also be necessary in the case of prescribed burns or wildfires (NPS 2011c).

Visitor Study – Safety

The Visitor Services Project and Cooperative Park Studies Unit of the University of Idaho conducted a general visitor survey for Big Cypress National Preserve in the winter of 1999. Visitors were asked to rate how safe they felt on this visit to Big Cypress National Preserve. Fifty-three percent of visitor groups reported feeling extremely safe, while only 5% felt extremely unsafe (see figure 3-10). The most commonly given reasons for feeling unsafe were: hunters, presence of juvenile prison, other visitors, and lack of people (see table 3-6) (Meehan 1999).

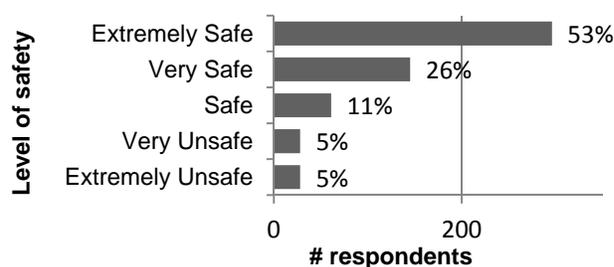


Figure 3-10 – How safe did you and your group feel?

Source: Meehan 1999
N = 558 visitor groups

Table 3-6 – Reasons for Feeling Unsafe

Comment	Number of times mentioned
Hunters	7
Presence of juvenile prison	6
Other visitors	4
Lack of people	4
Lack of rangers	3
Wild animals	3
Other campers	2
Visitors driving too fast	2
ORV users	2
Presence of guns	2
Other comments	4

Source: Meehan 1999
N = 39 comments; some visitors made more than one comment.

SOCIOECONOMIC ENVIRONMENT

SOCIOECONOMICS

As stated in the Addition GMP, Collier County is the primary geographic unit for analysis of the socioeconomic impacts in regards to the Preserve. However, actions at the Preserve also have the potential to cause socioeconomic impacts to surrounding counties. Additionally, when data permit, socioeconomic characteristics for Everglades City, the Big Cypress Seminole Indian Reservation, and the Miccosukee Indian Reservation will also be discussed in this section (NPS 2010a).

Collier County is located on southwest Florida's Gulf Coast, about 150 miles south of Tampa and 100 miles west of Fort Lauderdale, and is comprised of an area of 1,998 square miles (NPS 2010a; U.S. Census Bureau 2011). The Preserve encompasses most of the eastern half of the county (NPS 2010a). The counties overlying the edges and adjacent to the Preserve in the south Florida region are also discussed, including Broward, Lee, Palm Beach, Hendry, Miami-Dade, and Monroe counties.

A discussion of demographic and economic data for Everglades City, the Big Cypress Seminole Indian Reservation, and the Miccosukee Indian Reservation is included. Everglades City, a 1.2 square mile municipality located within Collier County at the southernmost part of the county, is included because it is the closest incorporated area to the Preserve, less than 10 miles from headquarters, and the city caters to visitors to both Everglades National Park and the Preserve. The Big Cypress Seminole Indian Reservation is an 81.97 square mile tract of land that borders the Northeast Addition to the north and lies mostly in Hendry County. The Miccosukee Indian Reservation is a 128.26 square mile tract of land that borders the Northeast Addition to the east and lies mostly in Broward County (NPS 2010a; U.S. Census Bureau 2011).

Demographics

Preserve Visitors. The Visitor Services Project and Cooperative Park Studies Unit of the University of Idaho conducted a general visitor survey for Big Cypress National Preserve in the spring of 2007 (Papadogiannaki, Le, and Hollenhorst 2007).

Group size — Visitors were asked, “For this visit to [the Preserve], how many people were in your personal group, including yourself?” Forty-eight percent of visitor groups were in groups of two, 31% were in groups of three or four, and 13% were in groups of five or more (see figure 3-11) (Papadogiannaki, Le, and Hollenhorst 2007).

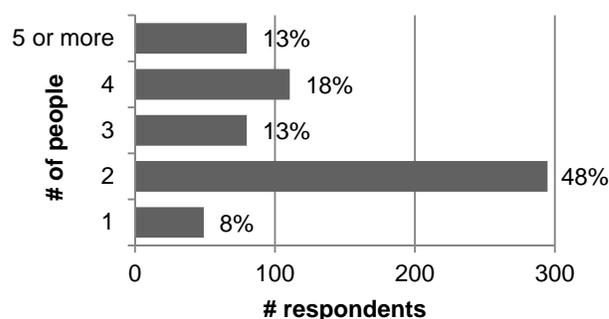


Figure 3-11 – Visitor Group Size

Source: Papadogiannaki, Le, and Hollenhorst 2007
N = 614 visitor groups

Group type — Visitors were first asked whether they were visiting the Preserve with a personal group or with a commercial guided tour group. Ninety-six percent of visitors were traveling with a personal group. Visitors were then asked what type of personal group they were traveling with on this visit to the Preserve. Fifty-two percent of visitor groups responding to this question were comprised of family member groups, 22% were with friends, and 10% were alone (see figure 3-12) (Papadogiannaki, Le, and Hollenhorst 2007).

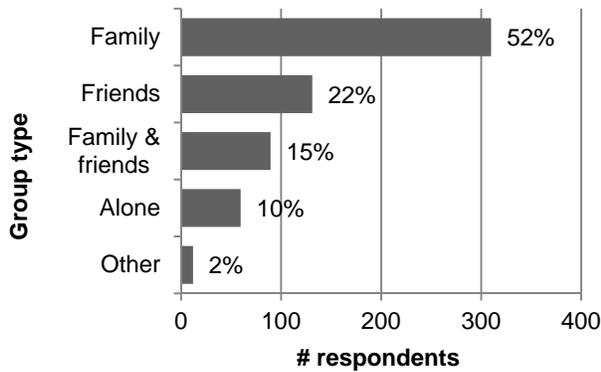


Figure 3-12 – Visitor Group Type

Source: Papadogiannaki, Le, and Hollenhorst 2007
N = 596 visitor groups

Residence — Visitors were asked about their country and state of residence. International visitors comprised 14% of total visitation to the Preserve during the survey period. Forty-eight percent of international visitors came from Canada, 18% came from Germany, and 13% came from the United Kingdom. A smaller percentage of international visitors came from a total of 12 other countries. U.S. visitors comprised 86% of total visitation to the Preserve during the survey period, and 34% of those visitors identified Florida as their state of residency (see figure 3-13) (Papadogiannaki, Le, and Hollenhorst 2007).

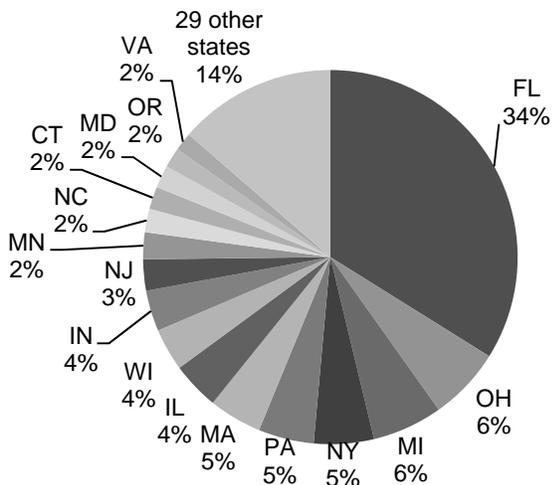


Figure 3-13 – U.S. Visitors' State of Residency

Source: Papadogiannaki, Le, and Hollenhorst 2007
N = 1,334 individual visitors

Age — Visitors were asked about their current age at the time of their visit to the Preserve. Visitor ages ranged from one to 91 years old. Fifty-six percent of visitors to the Preserve were between the ages of 51 and 70, while 5% were 10 or younger, 4% were 11 to 20, and 5% were 21 to 30 (see figure 3-14) (Papadogiannaki, Le, and Hollenhorst 2007).

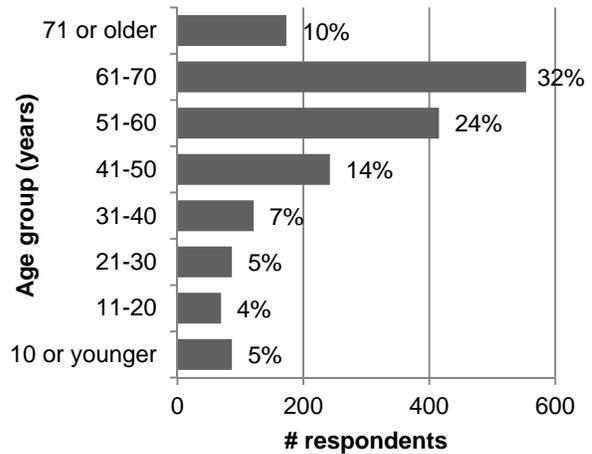


Figure 3-14 – Visitor Age

Source: Papadogiannaki, Le, and Hollenhorst 2007
N = 1,731 individual visitors

Collier County.

Population — The population of Collier County has grown from 38,040 in 1970 to 321,520 in 2010, with an average annual growth rate of 18.63% (see figure 3-15) (U.S. Census Bureau 2011).

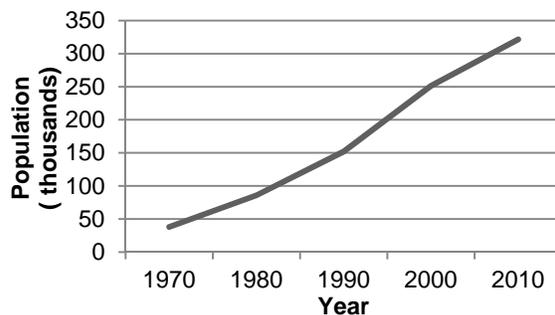


Figure 3-15 – Collier County Population Growth

Source: U.S. Census Bureau 2011

Age distribution — The median age of Collier County residents is 47 years, with the largest represented age bracket being 65 to 69 years of age (7.7% of total county population) (see figure 3-16) (U.S. Census Bureau 2011).

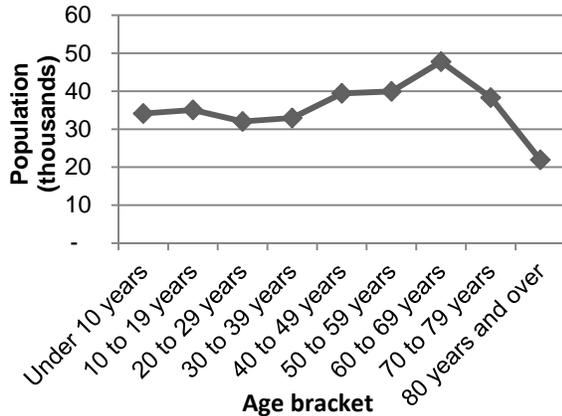


Figure 3-16 – Collier County Age Distribution (2009)

Source: U.S. Census Bureau 2011

Areas within Collier County.

Population — Everglades City has seen an increase in population from 481 in 2000 to 616 in 2009, an average annual population growth rate of 3.12%. The median age in Everglades City is 51 years (U.S. Census Bureau 2011).

Big Cypress Seminole Indian Reservation reported a population increase from 142 in 2000 to 591 in 2010, an average annual population growth rate of 31.62%. The median age for the Big Cypress Seminole Indian Reservation is 27 years (U.S. Census Bureau 2011).

The Miccosukee Indian Reservation has no reported population statistics from either the 2000 or 2010 census (U.S. Census Bureau 2011).

Surrounding Areas.

Population — Current populations of each county as reported by the 2010 U.S. Census are as follows: Miami-Dade – 2,496,435;

Broward – 1,748,066; Monroe – 73,090; Palm Beach – 1,320,134; Lee – 618,754; and Hendry – 39,140 (U.S. Census Bureau 2011).

Economy and Employment

Collier County. Bureau of Labor Statistics data for May 2010 for the Naples-Marco Island metropolitan area show a mean annual wage of \$39,830 (BLS 2011). Tourism has long been a major industry in Collier County, with nearly \$11 million in tourism tax revenue collected annually over the last ten years (see figure 3-17). Figure 3-18 shows the monthly 10-year averages of the tourism taxes in Collier County, illustrating a seasonal fluctuation in tourism (Naples, Marco Island, Everglades Convention and Visitors Bureau 2011).

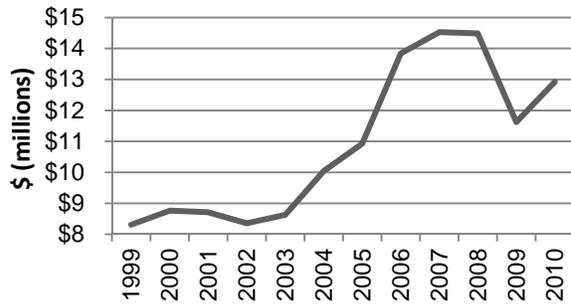


Figure 3-17 – Total Collier County Tourism Taxes (1999-2010)

Source: Naples, Marco Island, Everglades Convention and Visitors Bureau 2011

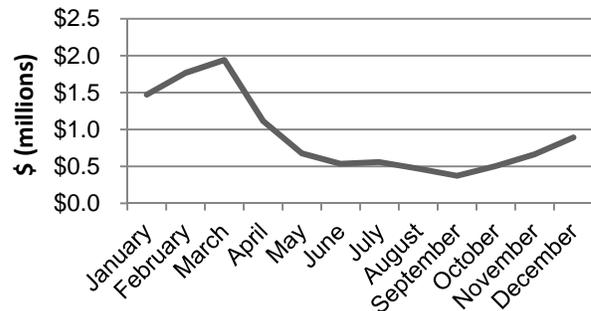


Figure 3-18 – Monthly 10-year Averages of Tourism Taxes (1999-2010)

Source: Naples, Marco Island, Everglades Convention and Visitors Bureau 2011

Employment — According to the Bureau of Labor Statistics for September 2011, Collier County had a civilian workforce of 140,100 and an unemployment rate of 11.4%. May 2010 occupation statistics indicate that 15,300 jobs were in the food preparation and serving industry, 14,120 jobs in the sales industry, and 4,810 jobs in the transportation industry (BLS 2011).

Personal income — The January 2011 cost of living index for Collier County was 90.4 (U.S. average is 100). The per capita income for Collier County was \$36,942 in 2009 with a median household income of \$58,133. By contrast, the state of Florida’s per capita income was \$26,503, with a median household income was \$47,450 (U.S. Census Bureau 2011).

Tourism industry — The tourism industry is the primary driver of economic activity and leading employer in Collier County, responsible for 31,300 jobs. Nearly 1.4 million visitors in 2007 spent over \$791 million, resulting in a total annual economic impact of over \$1.17 billion within Collier County (Collier County 2011).

Areas within Collier County. As of 2000, Everglades City had 424 citizens within the labor force of Collier County with the majority being in the 25 to 54 years of age range and a 3% unemployment rate (BLS 2011). The tourism industry is the primary economic engine for the city and includes three hotels and two campgrounds. Attractions include tours of the nearby Everglades in various vehicles as well as popular fishing locations (Everglades City 2010).

As of the 2000 census, 63% of the population of the Big Cypress Seminole Indian Reservation over the age of 16 was employed in the workforce, with an unemployment rate of 9% of qualified workers (U.S. Census Bureau 2011). On the Big Cypress Reservation, tourism is the major economic driver, with a museum as well other tourist attractions and Everglades tours. No data are available for the Miccosukee Indian Reservation.

Surrounding Areas.

Employment — According to the state of Florida, the state had over 76.8 million visitors in 2004, which had a \$57 billion direct impact on the economy of the state. Other major economic contributors in the state include the agriculture industry and university system. The agriculture industry of Florida represents 75% of the oranges in the U.S. as well as 40% of the world’s orange juice supply. The state university system of Florida has over \$500 million a year in sponsored research grants. The state had a 10.6% unemployment rate as of September 2011 (Florida 2011).

Personal income — Florida reported per a capita income for 2009 of \$26,503 and median household income of \$47,450 (U.S. Census Bureau 2011). In the same period of time, Miami-Dade and Hendry counties had lower per capita incomes and lower median household incomes. However, Lee, Palm Beach, Broward, and Monroe counties had higher per capita incomes and median household incomes with Monroe County being the most similar to Collier County. Collier County had the highest in both statistics of all the counties illustrated below (see figure 3-19).

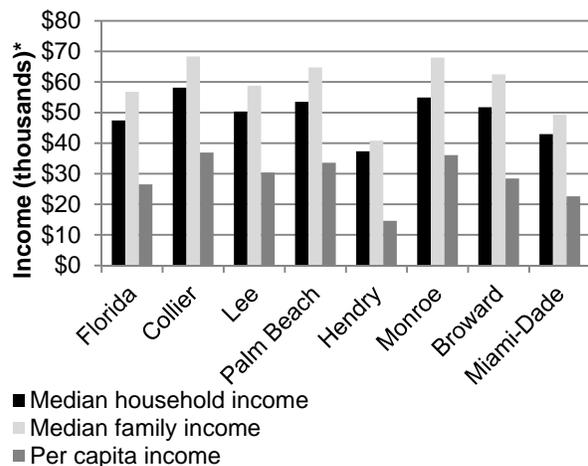


Figure 3-19 – Incomes for Selected Florida Counties (2009)

Source: U.S. Census Bureau 2011
 * Income in 2009 inflation-adjusted dollars.

Economic Impact of Visitor Use

The Visitor Services Project and Cooperative Park Studies Unit of the University of Idaho conducted a general visitor survey for Big Cypress National Preserve in the spring of 2007. A portion of the questions asked for this study pertained to the economic impact of visitor groups visiting the Preserve (Papadogiannaki, Le, and Hollenhorst 2007).

Primary Reason for Visit. Of the visitors surveyed as part of the 2007 visitor study, 21% of visitors to the Preserve were residents of the local area. Nonresident visitors to the Preserve were asked, “What was your primary reason for visiting the south Florida region (areas south of Lake Okeechobee)?” The most common reason for nonresidents visiting the Preserve was visiting other attractions in the area, while 22% of those responding listed visiting the Preserve as the primary reason for visiting the south Florida region (see figure 3-20). “Other” reasons for visiting included primarily recreational activities (e.g., camping, fishing, hiking, hunting, kayaking, sailing, wildlife viewing/birdwatching, etc.) (Papadogiannaki, Le, and Hollenhorst 2007).

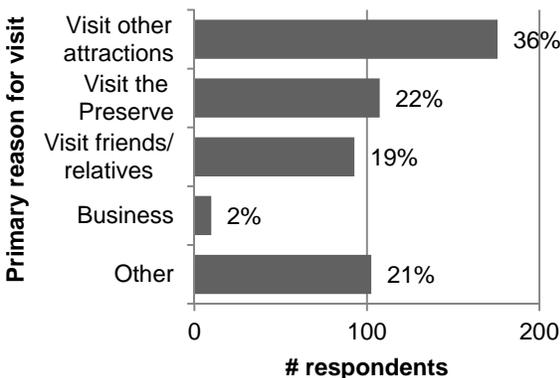


Figure 3-20 – Primary Reason for Visiting the South Florida Region

Source: Papadogiannaki, Le, and Hollenhorst 2007
N = 488 visitor groups

Total Expenditures. The 2007 visitor study conducted by Papadogiannaki, Le, and Hollenhorst (2007) questioned visitor groups about expenditures inside the Preserve, expenditures inside and outside the Preserve associated with their trip to the Preserve, expenditures on the east coast (Atlantic coast) associated with their trip to the Preserve, and expenditures on the west coast (Gulf coast) associated with their trip to the Preserve. The results of the expenditure data analysis from the 2007 visitor study (Papadogiannaki, Le, and Hollenhorst 2007) are discussed in the following sections.

Inside the Preserve — Visitor groups were asked to report all expenditures for the current visit that occurred within the Preserve. The average expenditure of visitor groups inside the Preserve was \$26, with an average total expenditure per person (per capita) of \$11. Fifty-four percent of the visitor groups spent no money, while 15% of visitor groups reported spending \$51 or more (see figure 3-21) (Papadogiannaki, Le, and Hollenhorst 2007).

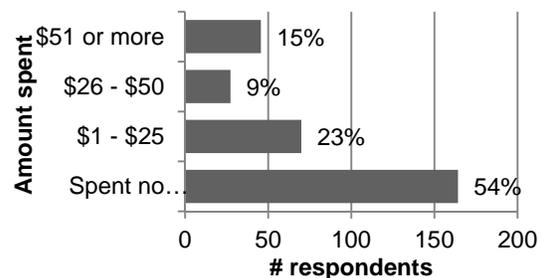


Figure 3-21 – Total Expenditures Inside the Preserve

Source: Papadogiannaki, Le, and Hollenhorst 2007
N = 304 visitor groups

Visitor groups were also asked to list the details of their expenditures inside the Preserve. Of the visitor groups that spent money inside the Preserve, the largest proportion of the total expenditures (56%) was spent on camping fees and charges (see figure 3-22) (Papadogiannaki, Le, and Hollenhorst 2007).

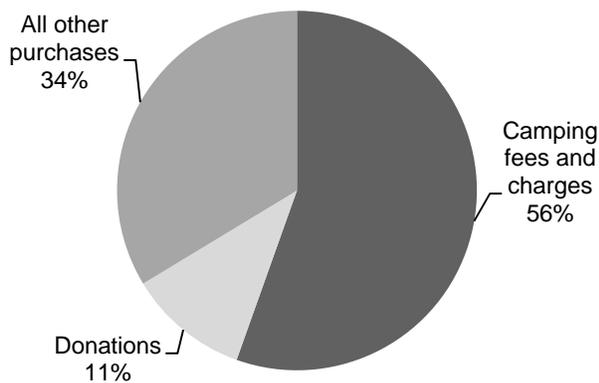


Figure 3-22 – Proportions of Total Expenditures Inside the Preserve

Source: Papadogiannaki, Le, and Hollenhorst 2007
N = 304 visitor groups

Inside and outside the Preserve — Visitor groups were asked to report all expenditures for the current visit to the Preserve and the surrounding areas (areas south of Lake Okeechobee). Surrounding area residents were asked to only include expenditures that were directly related to their visit to the Preserve. The average expenditure of visitor groups was \$1,073, with an average total expenditure per person (per capita) of \$484. Eight percent of the visitor groups spent no money, while 40% of visitor groups reported spending \$601 or more (see figure 3-23) (Papadogiannaki, Le, and Hollenhorst 2007).

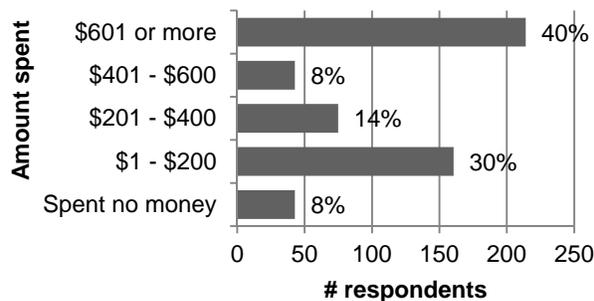


Figure 3-23 – Total Expenditures Inside and Outside the Preserve

Source: Papadogiannaki, Le, and Hollenhorst 2007
N = 535 visitor groups

Visitor groups were also asked to list the details of their expenditures inside and outside the Preserve. The largest proportion of the total expenditures was spent on lodging (36%), restaurants and bars (18%), and groceries and takeout food (11%). Other expenditures that comprised at least 5% of the total proportion of expenditures were: gas and oil (9%), other transportation expenses (6%), and camping fees and charges (5%). Other expenditures comprised 3% or less of the total proportion of expenditures (Papadogiannaki, Le, and Hollenhorst 2007).

East coast (Atlantic coast) — Visitor groups were asked to list their group’s expenditures in the surrounding area (areas south of Lake Okeechobee) on the east coast (Atlantic coast). The average expenditure of visitor groups on the east coast was \$609, with an average total expenditure per person (per capita) of \$257. One-quarter of the visitor groups spent no money in the surrounding area on the east coast, while 29% of visitor groups reported spending \$601 or more (see figure 3-24) (Papadogiannaki, Le, and Hollenhorst 2007).

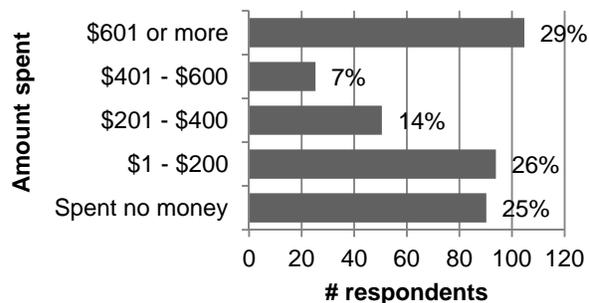


Figure 3-24 – Total Expenditures on the east coast (Atlantic coast)

Source: Papadogiannaki, Le, and Hollenhorst 2007
N = 361 visitor groups

Visitor groups were also asked to list the details of their expenditures on the east coast. The largest proportion of the total expenditures was spent on lodging (35%), restaurants and bars (17%), and groceries and takeout food (12%). Other expenditures that comprised at least 5% of the total proportion of expenditures were: gas and oil (11%), other transportation expenses (5%), and camping

fees and charges (5%). Other expenditures comprised 3% or less of the total proportion of expenditures (Papadogiannaki, Le, and Hollenhorst 2007).

West coast (Gulf coast) — Visitor groups were asked to list their group’s expenditures in the surrounding area (areas south of Lake Okeechobee) on the west coast (Gulf coast). The average expenditure of visitor groups on the west coast was \$872, with an average total expenditure per person (per capita) of \$396. Fifteen percent of the visitor groups spent no money in the surrounding area on the west coast, while 37% of visitor groups reported spending \$601 or more (see figure 3-25) (Papadogiannaki, Le, and Hollenhorst 2007).

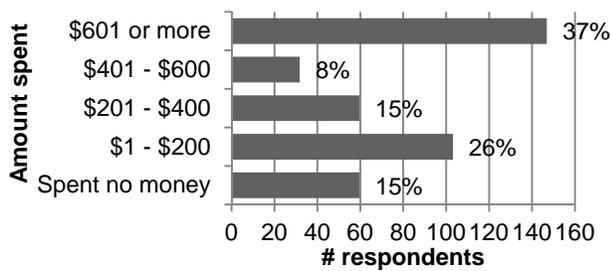


Figure 3-25 – Total Expenditures on the west coast (Gulf coast)

Source: Papadogiannaki, Le, and Hollenhorst 2007
N = 397 visitor groups

Visitor groups were also asked to list the details of their expenditures on the west coast. The largest proportion of the total expenditures was spent on lodging (39%), restaurants and bars (20%), and groceries and takeout food (10%). Other expenditures that comprised at least 5% of the total proportion of expenditures were: gas and oil (8%) and other transportation expenses (6%). Other expenditures comprised 3% or less of the total proportion of expenditures (Papadogiannaki, Le, and Hollenhorst 2007).

Hunting Licenses, Tags, Permits, and Stamps. Table 3-7 provides the hunting license data for Florida collected by the USFWS. Information collected annually includes the number of paid license holders; the number of resident and nonresident licenses, tags, permits and stamps issued; and the gross cost associated with all of the licenses, tags, permits, and stamps purchased. As of November 2011, 176,539 paid license holders were recorded for the year, which represents a gross cost of almost six million dollars. These numbers have remained fairly stable over the last ten years (see table 3-7) (USFWS 2011b).

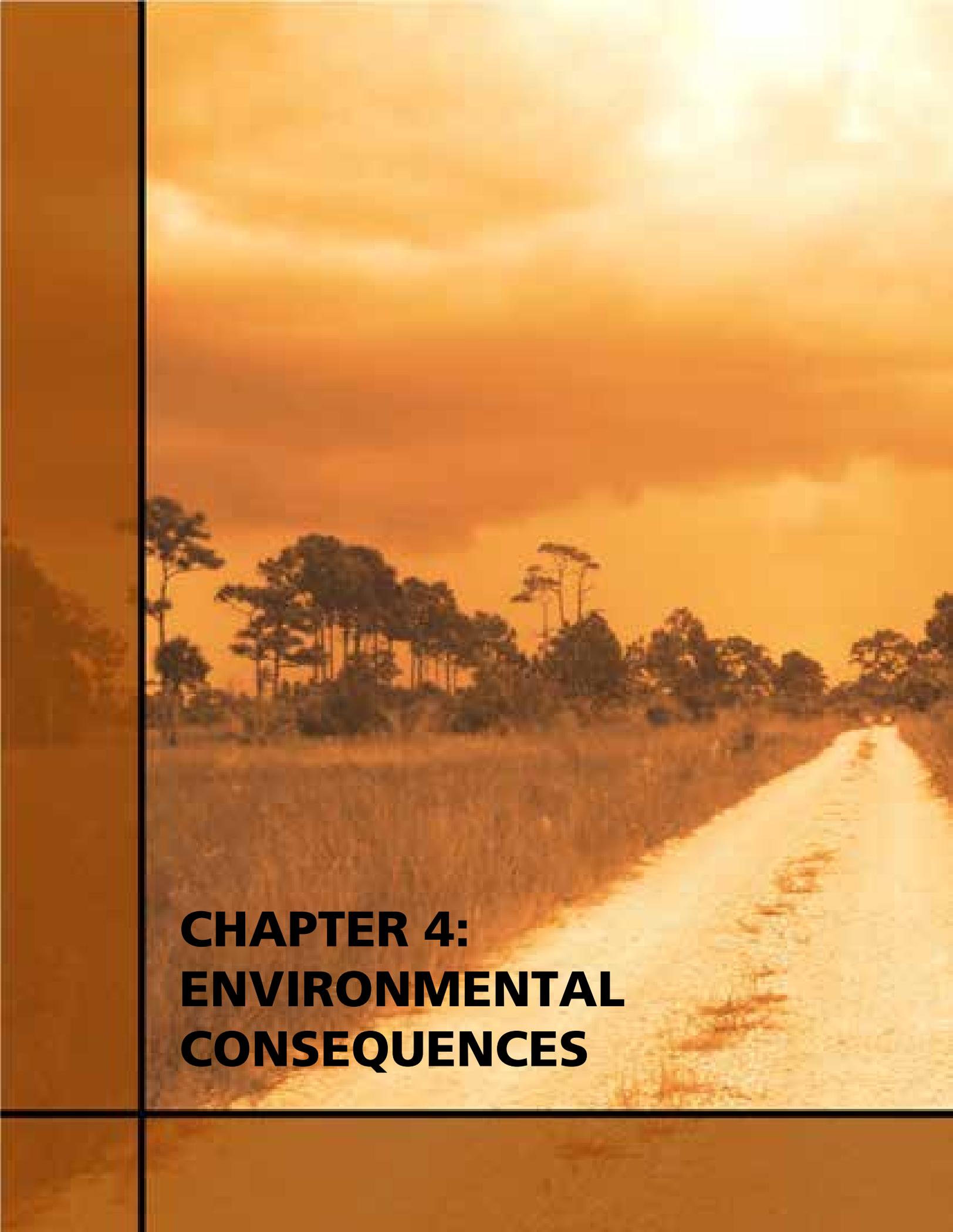
Table 3-7 – USFWS National Hunting License Data (Florida)

Year	Paid License Holders ¹	Resident Licenses, Tags, Permits, and Stamps	Nonresident Licenses, Tags, Permits, and Stamps	Total Licenses, Tags, Permits, and Stamps	Gross Cost
2011	176,539	315,149	12,824	327,973	\$5,956,378
2010	170,554	309,961	12,484	322,445	\$5,851,620
2009	170,282	151,755 ²	7,315	159,070 ²	\$3,505,738 ²
2008	167,524	269,212	11,431	280,643	\$5,002,224
2007	161,273	288,426	6,298	294,724	\$4,975,506
2006	175,067	317,592	6,761	324,353	\$5,308,511
2005	176,320	313,151	8,028	321,179	\$4,717,719
2004	181,857	331,120	7,649	338,769	\$4,816,008
2003	176,320	313,151	8,028	321,179	\$4,717,719
2002	181,857	331,120	7,649	338,769	\$4,816,008
2001	181,635	332,760	7,090	339,850	\$4,787,608
2000	177,116	315,772	6,511	322,283	\$4,690,698

Source: USFWS 2011b

¹ A paid license holder is one individual regardless of the number of licenses purchased.

² There appears to be an anomaly in these data numbers for 2009.

A landscape photograph showing a dirt road that curves from the bottom right towards the center of the frame. The road is flanked by tall, dry grasses. In the background, there is a line of trees, including several tall, thin pine trees. The sky is filled with soft, hazy clouds, and the overall color palette is dominated by warm, golden-brown and orange tones, suggesting a sunrise or sunset. The image is framed by a thin black border.

**CHAPTER 4:
ENVIRONMENTAL
CONSEQUENCES**

INTRODUCTION

For each impact topic discussed in “Chapter 3: Affected Environment,” the environmental consequences, or potential impacts, of each of the alternatives are analyzed. This section analyzes both anticipated beneficial and adverse impacts that would likely result from the implementation of any of the alternatives considered. This section also explains the general methodology used to analyze impacts, including definitions of impact thresholds for measuring the intensity of impacts.

METHODOLOGY FOR ESTABLISHING IMPACT THRESHOLDS AND MEASURING EFFECTS BY RESOURCE

The general approach for measuring the effects of the alternatives on each resource category includes general analysis methods as described in basic assumptions, thresholds used to define the level of impact resulting from each alternative, and methods used to evaluate the cumulative effects. The analysis of impacts follows CEQ guidelines and U.S. Department of the Interior regulations (NPS 2008).

General Analysis Method

Potential impacts of all alternatives are described in terms of type (Are the effects beneficial or adverse?), context (Are the effects site-specific, local, or regional?), duration (Are the effects short-term or long-term?), and intensity (Are the effects negligible, minor, moderate, or major?). Because definitions of intensity vary by impact topic, intensity definitions are provided separately for each impact topic analyzed in this document. In some cases, alternatives are grouped together in the analysis when impacts were determined to be similar, in order to minimize redundancy.

Each alternative is compared to a baseline to determine the context, duration, and intensity of the resource impacts. For purposes of the

impact analysis, the environmental baseline is alternative 2. In the absence of quantitative data, best professional judgment was used to determine impacts. In general, impacts were determined using existing literature, federal and state standards, and consultation with subject matter experts, Preserve staff, and other agencies.

For the purposes of analysis the following assumptions are used for all impact topics:

Beneficial. A positive change in the condition or appearance of the resource or a change that moves the resource toward a desired condition.

Adverse. A change that declines, degrades, and/or moves the resource away from a desired condition or detracts from its appearance or condition.

Context. The affected environment within which an impact would occur, such as local, Preserve-wide, regional, global, affected interests, society as whole, or any combination of these. Context is variable and depends on the circumstances involved with each impact topic.

Duration. The duration of the impact varies according to the impact topic evaluated. However, for the purposes of this analysis, the following assumptions are used for all impact topics:

Short-term impacts — Those impacts occurring in the immediate future or during plan implementation (usually from one to six months or up to one year). For natural systems (vegetation, wildlife, wetlands), recovery would take less than one year.

Long-term impacts — Those impacts occurring after plan implementation through the next 10 years; for natural systems (vegetation, wildlife, wetlands), recovery would take more than one year. Although an impact may only occur for a short duration at

one time, if it occurs regularly over a longer period of time, the impact may be considered to be a long-term impact. For example, the noise from firearm shots would be heard for a short time and intermittently, but because firearm shots would occur every hunting season throughout the life of the plan, the

impact on the natural soundscape would be considered to be long-term.

Intensity. Because definitions of impact intensity (negligible, minor, moderate, and major) vary by impact topic, intensity definitions are provided separately for each impact topic analyzed (see table 4-1).

Table 4-1 – Impact Intensity Definitions by Impact Topic

Impact Topic	Negligible	Minor	Moderate	Major
Natural Resources				
Vegetation and Habitat				
Native Vegetative Communities and Habitat	The action might result in a change in vegetation, but the change would not be measurable or would be at the lowest level of detection.	The action might result in a detectable change, but the change would be slight. This could include changes in the abundance, distribution, or composition of individual species in a local area, but would not include changes that would affect the viability of vegetation communities. Changes to local ecological processes would be minimal.	The action would result in a clearly detectable change in a vegetation community and could have an appreciable effect. This could include changes in the abundance, distribution, or composition of nearby vegetation communities, but would not include changes that would affect the viability of plant populations in the Preserve. Changes to local ecological processes would be of limited extent.	The action would be severely adverse to a vegetation community. The impacts would be substantial and highly noticeable, and they could result in widespread change. This could include changes in the abundance, distribution, or composition of a nearby vegetation community or plant populations in the Preserve to the extent that the population would not be likely to recover. Key ecological processes would be altered, and “landscape-level” (regional) changes would be expected.
Protected Plant Species				
Nonnative Invasive Plant Species				

Table 4-1 – Impact Intensity Definitions by Impact Topic

Impact Topic	Negligible	Minor	Moderate	Major
<p>Wildlife</p> <p>Protected Wildlife Species</p>	<p>There would be no effect on the species. There would be no observable or measurable impacts on the species, their habitats (including designated critical habitat), or the natural processes that sustain them. This impact intensity would equate to a determination of “no effect” under Section 7 of the Endangered Species Act.</p>	<p>Adverse</p> <p>The effects of the action would be discountable (i.e., extremely unlikely to occur and not able to be meaningfully measured, detected, or evaluated). Individuals may temporarily avoid areas. Impacts would not affect critical periods (i.e., breeding, nesting, denning, feeding, resting) or habitat. In addition, essential features of critical habitat would not be impacted. This impact intensity would equate to a determination of “may affect, not likely to adversely affect” under Section 7 of the Endangered Species Act.</p>	<p>Individuals may be impacted by disturbances that interfere with critical periods (i.e., breeding, nesting, denning, feeding, resting) or habitat; however, the level of impact would not result in physical injury, mortality, or extirpation from the Preserve. Some essential features of designated critical habitat would be reduced; however the integrity of the habitat would be maintained. This impact intensity would equate to a determination of “may affect, likely to adversely affect” under Section 7 of the Endangered Species Act.</p>	<p>Individuals may suffer physical injury or mortality, or populations may be extirpated from the Preserve. Essential features of designated critical habitat would be reduced, affecting the integrity of the designated unit. This impact intensity would equate to a determination of “may affect, likely to adversely affect” under Section 7 of the Endangered Species Act.</p>
		<p>Beneficial</p>		
		<p>Impacts would result in slight increases to viability of the species in the Preserve because species-limiting factors (i.e., habitat loss, competition, and mortality) would be kept in check. This impact intensity would equate to a determination of “may affect, not likely to adversely affect” under Section 7 of the Endangered Species Act.</p>	<p>Impacts would result in improved viability of the species, population structure, and species population levels in the Preserve, because species limiting factors (e.g., habitat loss, competition, and mortality) would be reduced. This impact intensity would equate to a determination of “may affect, not likely to adversely affect” under Section 7 of the Endangered Species Act.</p>	<p>Impacts would result in highly noticeable improvements to species viability, population structure, and species population levels in the Preserve, because species limiting factors (e.g., habitat loss, competition, and mortality) would be nearly eliminated. This impact intensity would equate to a determination of “may affect, not likely to adversely affect” under Section 7 of the Endangered Species Act.</p>

Table 4-1 – Impact Intensity Definitions by Impact Topic

Impact Topic	Negligible	Minor	Moderate	Major
Major Game Species	The action might result in a change in game species, but the change would not be measurable or would be at the lowest level of detection.	The action might result in a detectable change, but the change would be slight. This could include changes in the abundance or distribution of individual game species in a local area, but not changes that would affect the viability of local game populations. Changes to local ecological processes would be minimal.	The action would result in a clearly detectable change in a game population and could have an appreciable effect. This could include changes in the abundance or distribution of local game populations, but not changes that would affect the viability of regional game populations. Changes to local ecological processes would be of limited extent.	The action would be severely adverse or exceptionally beneficial to a population. The effects would be substantial and highly noticeable, and they could result in widespread change and be permanent. This could include changes in the abundance or distribution of a local or regional population of a game species to the extent that the population would not be likely to recover (adverse) or would return to a sustainable level (beneficial). Important ecological processes would be altered, and “landscape-level” (regional) changes would be expected.
Nonnative/Invasive Wildlife Species	The action might result in a change in nonnative/invasive wildlife species, but the change would not be measurable or would be at the lowest level of detection.	The action might result in a detectable change, but the change would be slight. This could include changes in the abundance or distribution of individual nonnative/invasive wildlife species in a local area, but not changes that would affect the viability of local native wildlife populations. Changes to local ecological processes would be minimal.	The action would result in a clearly detectable change in nonnative/invasive wildlife species and could have an appreciable effect. This could include changes in the abundance or distribution of local native wildlife populations, but not changes that would affect the viability of regional native wildlife populations. Changes to local ecological processes would be of limited extent.	The action would be severely adverse. The effects would be substantial and highly noticeable, and they could result in widespread change and be permanent. This could include changes in the abundance or distribution of a local or regional population of nonnative/invasive wildlife species to the extent that the native wildlife population would not be likely to recover. Important ecological processes would be altered, and “landscape-level” (regional) changes would be expected.

Table 4-1 – Impact Intensity Definitions by Impact Topic

Impact Topic	Negligible	Minor	Moderate	Major
Wilderness Character				
Wilderness	An action would have no discernible effects on wilderness character.	An action would have detectable effects on wilderness character, affecting the ability for a small area to meet wilderness eligibility criteria or improving and protecting its wilderness characteristics.	An action would have clearly detectable effects on wilderness character, affecting the ability of an area to meet wilderness eligibility criteria or improving and protecting its wilderness characteristics. The impact would be visible to visitors.	An action would have substantial effects on wilderness character, eliminating the characteristics that make substantial areas eligible as wilderness or improving and protecting its wilderness characteristics. The impact would be easily visible to visitors.
NPS Management and Operations				
Preserve Management and Operations	The effect would be at or below the level of detection and would not have an appreciable effect on Preserve operations and management.	The effects would be detectable but would be of a magnitude that would not have an appreciable effect on Preserve operations and management.	The effects would result in a change in Preserve operations and management in a manner readily apparent to staff and possibly to the public.	The effects would result in a substantial and widespread change in Preserve operations and management in a manner readily apparent to staff and the public.
Visitor Use				
Visitor Use and Experience/Recreational Opportunities	Visitors would likely be unaware of any effects associated with implementation of the alternative. There would be no noticeable changes in visitor use and/or experience or in any defined indicators of visitor satisfaction or behavior.	Changes in visitor use and/or experience would be slight but detectable, but would not appreciably diminish or enhance critical characteristics of the visitor experience. Visitor satisfaction would remain stable.	Few critical characteristics of the desired visitor experience would change and/or the number of participants engaging in an activity would be altered. The visitor would be aware of the effects associated with implementation of the alternative and would likely be able to express an opinion on the changes. Visitor satisfaction would begin to either decline or increase as a direct result of the effect.	Multiple critical characteristics of the desired visitor experience would change and/or the number of participants engaging in an activity would be greatly reduced or increased. The visitor would be aware of the effects associated with implementation of the alternative and would likely express a strong opinion about the change. Visitor satisfaction would markedly decline or increase.

Table 4-1 – Impact Intensity Definitions by Impact Topic

Impact Topic	Negligible	Minor	Moderate	Major
Noise/Soundscapes	Natural sounds would prevail; activities associated with noise (human-generated sound) would be very infrequent or absent.	Natural sounds would predominate within the Preserve; human-generated sounds from appropriate recreational activities could be heard occasionally.	Natural sounds would predominate, but activities associated with noise would occur occasionally at low to moderate levels. Human activity associated with noise is consistent with Preserve objectives, noise would predominate during daylight hours during periods of peak use. Noise (activity) would not be overly disruptive to noise-sensitive visitor activities and natural sounds could still be heard.	Natural sounds would be impacted by activities associated with noise frequently or for periods of extended time. Where activities associated with human-generated noise are consistent with Preserve objectives, the natural soundscape would be impacted most of the day throughout the week during the peak season. Noise would disrupt conversation for long periods of time and make enjoyment of other activities in the area difficult.
Public Health and Safety	Public health and safety would not be affected, or the effects would be at the lowest levels of detection and would not have an appreciable effect on the health and safety of visitors, and/or park and concessioner staff.	The effect would be detectable but short-term, would be limited to a relatively small number of visitors and/or park and concessioner staff at a localized area, and would not have an appreciable effect on public health and safety.	The effects would be readily apparent, short-term or long-term, would affect a relatively large number of visitors and/or park and concessioner staff on a local scale, and result in substantial, noticeable effects on public health and safety.	The effects would be apparent, long-term, would affect public health and safety on a regional scale, and result in substantial, noticeable effects on public health and safety.
Socioeconomic Environment				
Socioeconomics	The effect would be below detectable levels or detectable only through direct means, with no discernible effect on the character of the social and economic environment. Effects identified as neutral would be actions that do not produce any changes at all to the social and economic environment.	The effect would be detectable but limited in geographic extent or size of population affected and not expected to alter the character of the established social and economic environment.	The effect would be readily detectable across a broad geographic area or segment of the community and could have an appreciable effect on the social and economic environment.	The effect would be readily apparent, affect a large segment of the population across the entire community and region, and would have substantial effect on the social and economic environment.

Analysis Area

The analysis area for each of the impact topics is shown in table 4-2 below.

Table 4-2 – Analysis Area by Impact Topic

Impact Topic	Analysis Area
Natural Resources [Native Vegetative Communities and Habitat, Protected Plant Species, Nonnative Invasive Plant Species, Major Game Species, Nonnative/Invasive Wildlife Species, and Protected Wildlife Species (except the Florida Panther)]	The boundaries of the Preserve
Protected Wildlife Species (Florida Panther)	The current range of the Florida panther population which inhabits the Preserve
Wilderness Character	The boundaries of the Preserve
Preserve Management and Operations	NPS staff which spend all or part of their time working on the Preserve. Also, FWC staff assigned to hunting management or enforcement at the Preserve
Visitor Use (Visitor Use and Experience/Recreational Opportunities, Noise/Soundscapes, and Public Health and Safety)	All visitors and NPS staff during their time within the boundaries of the Preserve, and all members of the public not within the boundaries of the Preserve but otherwise directly impacted by visitor activities occurring at the Preserve
Socioeconomic Environment	Collier County

Assumptions

Alternative 1 – No Action – Apply Current Management to the Addition.

Under alternative 1 (no action), management of hunting in the entire Preserve would occur in accordance with the *NPS/FWC Cooperative Partnership Agreement* (see appendix B). The most recent *NPS/FWC Cooperative Partnership Agreement* was signed on December 1, 2010, by the NPS (represented by the Superintendent of the Preserve) and the FWC (represented by the Executive Director of the FWC). For the purposes of the analysis in this EA, it was assumed that all 25 conditions of the agreement would apply to the entire Preserve under this alternative.

Alternative 2 – No Hunting in the Addition.

Under this alternative, current hunting management would continue within the original Preserve boundaries, using the guidance outlined in the *NPS/FWC Cooperative Partnership Agreement* (see appendix B). For the purposes of the analysis in this EA, it was assumed that all 25 conditions of the agreement would apply to the original Preserve boundaries under this alternative. In the Addition, public hunting would be prohibited.

Alternative 3 – New Adaptive Management Strategy.

Under alternative 3, the NPS and the FWC, in consultation with the USFWS, would cooperate to implement an adaptive management strategy to manage hunting in the Preserve. The adaptive management strategy is designed to address key uncertainties that exist as a result of allowing hunting throughout the entire Preserve. Adaptive management actions would be taken based on effects to the white-tailed deer population (as measured by hunter success rates) and potential conflicts between hunting and nonhunting visitors in the Preserve.

The adaptive management of hunting that would occur under this alternative is restricted to actions taken in accordance with the objectives, triggers, and monitoring data relating to hunter success rates for the white-

tailed deer population, and potential conflicts between hunting and nonhunting visitors in the Preserve.

For the purposes of analysis in this EA, the following assumptions were made for alternative 3, based on the currently best available scientific data from the NPS and the FWC on current populations and past harvests in the Preserve. These assumptions would result in “no change from current management direction” in the Preserve.

- All current general rules and regulations for hunting in the Preserve would apply Preserve-wide, including the Addition (as described in the “Elements Common to All Alternatives, Hunting Rules and Regulations” section in chapter 2)
- Season lengths, dates, and hours would be the same as currently allowed in the Bear Island Unit (see appendix C)
- Current bag and possession limits would continue to apply Preserve-wide, including the Addition
- Deer hunting in the Addition would be limited to bucks-only harvest with at least one five-inch antler
- Deer hunting in the Northeast Addition and Western Addition would be limited to a maximum of one quota permit per 194 acres²¹

The impacts analysis for alternative 3 contained in the following sections of this chapter is based on these aforementioned assumptions. However, proposed hunting regulations during the first year of hunting under this strategy would be considerably more restrictive, as outlined in the “Proposed Hunting Regulations (Year 1)” section in chapter 2 of this document. Any changes

²¹ This maximum quota limit was calculated based on the current quota limit in the Bear Island Unit of one quota permit per 194 acres. For the Northeast Addition and the Western Addition, the potential maximum quota permit density (hunter density) was determined by extrapolating the available NPS and FWC data for areas in the Preserve that are most similar in habitat types to areas in the Addition, based on the habitat map presented in chapter 3 (“Existing Conditions”) and the habitat comparison analysis in appendix E.

implemented following the regulations for the first year of hunting under this strategy as part of the adaptive management process could be made up to the point of the aforementioned assumptions for this impact analysis (in accordance with the objectives, triggers, and monitoring protocol outlined in chapter 2). Any changes proposed under the adaptive management process that exceed the limits outlined in these assumptions would require additional impact analyses and applicable compliance documentation.

Mitigation Measures

The NPS Organic Act charged the NPS with managing the lands under its stewardship “in such manner and by such means as will leave them unimpaired for the enjoyment of future generations.” As a result, NPS staff routinely evaluate and implement mitigation measures whenever conditions occur that could adversely affect the sustainability of national park system resources. However, no significant environmental impacts were identified from the alternatives analyzed in this plan that would require mitigation measures to be taken. Therefore, a formal mitigation plan was not prepared as part of this *Hunting Management Plan*.

While no significant environmental impacts were identified from the alternatives analyzed in this plan that would require mitigation measures to be taken, the following mitigation measures could be applied to further avoid or minimize potential impacts from implementation of any of the alternatives:

Natural Resources. Visitors would be informed of the importance of protecting the Preserve’s natural resources and leaving these areas undisturbed for the enjoyment of future generations.

Protected Wildlife Species. Protection of federally listed wildlife species would continue to be maintained through current and future compliance with Section 7 of the Endangered Species Act.

Nonnative/Invasive Species. Visitors would be encouraged to check equipment and vehicles to avoid the spread of nonnative nonnative plant species.

Game Species. Existing monitoring efforts would continue.

Visitor Use and Experience. Appropriate closures, guarding, gating, and education would be used as necessary to provide for visitor health and safety.

Hunting. Hunters in the Preserve would be required to have the proper licenses, permits, and stamps to hunt, in accordance with state laws and regulations.

Hunters in the Preserve would be required to complete the hunter safety education course, in accordance with state laws and regulations.

All hunters in the Preserve would be required to comply with the hunter orange requirement.

Hunters would be encouraged to use a fall arrest system or full body harness when hunting from an elevated position.

Nonhunting visitors to the Preserve would be provided with education materials about hunting safety.

Cumulative Impacts Analysis

Cumulative impacts are defined in the CEQ implementing regulations of NEPA (40 CFR 1508.7) as:

... the impact on the environment which results from the incremental impact of the action when added to other past, present, and reasonably foreseeable future actions regardless of what agency (Federal or non-Federal) or person undertakes such other actions. Cumulative impacts can result from individually minor but collectively significant actions taking place over a period of time.

This “Cumulative Impacts Analysis” section is designed to provide the reader with a broad overview of the past, present, and reasonably foreseeable future actions in the south Florida region that may have an impact on the Preserve over a range of impact topics. Each impact topic section below includes a discussion of cumulative impacts in reference to each particular impact topic and may reference the projects discussed here.

Table 4-3 shows a selection of the past, present, and reasonably foreseeable future actions which may have cumulative impacts on the Preserve.

Table 4-3 – Selected Plans and Projects with a Cumulative Impact on the South Florida Region

Plan/Project	Description
Big Cypress National Preserve Plans/Projects	
<i>Big Cypress National Preserve General Management Plan/Final Environmental Impact Statement (NPS 1991a)</i>	The GMP completed in 1991 for the original Preserve was mandated by the National Parks and Recreation Act (1978). This document guides visitor use, natural and cultural resource management, and general development for a period of 10 to 15 years. It provides a clearly defined direction for resource management and preservation as well as appropriate visitor use and interpretation of the resources within the original Preserve boundaries. This document also articulated the need to manage hunting within the Preserve.
<i>Big Cypress National Preserve – Addition Final General Management Plan/Wilderness Study/Off-Road Vehicle Management Plan/Environmental Impact Statement (NPS 2010)</i>	The purpose of the Addition GMP, completed in 2010, is “to provide a comprehensive direction for resource preservation and visitor use and a basic foundation for decision-making for the Addition for the next 15 to 20 years” (NPS 2010a). The Addition GMP outlines diverse frontcountry and backcountry recreational opportunities, enhanced day use and interpretive opportunities along road corridors, and enhanced recreational opportunities with new facilities and services. A substantial amount of ORV access and riding opportunities and a moderate amount of proposed wilderness are also proposed in this document. This document also articulated the need for an independent plan to manage hunting within the Preserve.
<i>Final Recreational Off-Road Vehicle Management Plan and Supplemental Environmental Impact Statement (NPS 2000)</i>	The NPS completed this ORV management plan for the original Preserve in 2000. Included in this plan are the establishment of 15 ORV access points and no more than 400 miles of designated primary trails. A maximum of 2,000 permits per year can be granted to ORV users. The plan requires monitoring of field conditions and impacts from ORVs and outlines an adaptive management framework to do so.
<i>Big Cypress National Preserve Commercial Services Plan and Environmental Assessment (NPS 2009)</i>	The <i>Commercial Services Plan</i> is intended to address the existing conditions and law in a manner that will be compliant with the 1998 National Park Service Concessions Management Improvement Act (PL 105-391) and regulations. As an implementation plan, this <i>Commercial Services Plan</i> must also be consistent with the established planning direction in the 1991 <i>General Management Plan</i> for the Preserve and achieve the desired future conditions or goals for the Preserve. This plan covers the original Preserve only; the Addition would be addressed in an addendum to this plan to be completed in the future.
<i>Long-Range Interpretive Plan, Big Cypress National Preserve (NPS 2002a)</i>	This plan provides the vision for visitor experiences in the Preserve based on the purpose, significance, and mission put forth in the “Preserve’s Strategic Plan.” The <i>Interpretive Plan</i> proposes both development and management activities to satisfy current visitor demands, and identifies a media and activity action plan to meet future visitor needs. The interpretive plan was meant to guide the Preserve’s interpretation direction for 10 years.
<i>Mineral Management Plan, Appendix C: General Management Plan Final Environmental Impact Statement, Big Cypress National Preserve (NPS 1992)</i>	The Minerals Management Plan was prepared concurrently with the <i>General Management Plan I Final Environmental Impact Statement</i> (NPS 1991a). The minerals management plan represents an implementing plan of the general management plan and specifies the strategies that the National Park Service would adopt to manage the development of nonfederal oil and gas rights in Big Cypress over a period of ten to 15 years. Plans for future oil and gas operations are a reasonably foreseeable expectation for the Preserve. Future oil and gas proposals would likely include conducting a geophysical survey and could include the use of specialized off-road equipment that would travel cross-country. An environmental analysis of these proposals and their potential cumulative impacts would be conducted for such submissions.

Table 4-3 – Selected Plans and Projects with a Cumulative Impact on the South Florida Region

Plan/Project	Description
<i>Resource Management Plan, Big Cypress National Preserve</i> (NPS 2001)	The <i>Resource Management Plan</i> for the Preserve is designed to serve as a framework for implementing the natural and cultural resources, research, resources management and resource protection mandates set forth in PL 93-440, 100-301, and 100-696. These and other generic laws provide the purposes for which the Preserve was established and standards for management. This plan outlines the stated and implied goals of PL 93-440 and other legislation, related governmental policies, plans, and regulations that guide management of the Preserve. This plan also includes the initial stages of planning and resource inventorying for the Addition (lands acquired under PL 100-301). The plan serves as a benchmark for determining progress in understanding and managing the natural and cultural resources and in precipitating change when indicated. After initial publication of the document in 2001, it will be in effect for four years with status reports and revisions, published annually.
<i>Water Resources Management Plan, Big Cypress National Preserve</i> (NPS 1996)	The <i>Water Resources Management Plan</i> is complementary to and consistent with the <i>General Management Plan</i> and the <i>Minerals Management Plan</i> for the Preserve. The <i>Water Resources Management Plan</i> is similar to the Preserve's <i>Resources Management Plan</i> , but includes a more thorough review of existing information, an in-depth analysis of water resources issues, and the development of an action plan to address them. The total program represents an ambitious effort to establish a firm, hydrologically-sound basis for competent, rational management of the water resources of the Preserve through detailed understanding of its hydrology, knowledge of major influences on it, and a strong database to support decision-making.
<i>Big Cypress National Preserve Fire Management Plan</i> (NPS 2010d)	The <i>Big Cypress National Preserve Fire Management Plan</i> provides long-term direction for achieving the Preserve goals for protection of life, property, and ecosystem management. It outlines a comprehensive fire program including wildland fire response and fuels management utilizing prescribed fire. The plan also satisfies the requirements and direction given in policy, legislative authority, Preserve purpose statements, higher-level planning documents, and natural and cultural resource management objectives. This plan outlines those actions that will be taken by the NPS in meeting the fire management goals for the Preserve.
<i>Report M-621, Water Management Plan: Turner River Restoration</i> (NPS 1980)	<i>Report M-621, Water Management Plan: Turner River Restoration</i> presents the results of studies conducted by the NPS to determine the possible hydrological consequences of Turner River restoration. The report discusses the hydrologic effects of water quantity and quality and describes the pertinent technical reports, federal and state legislation, and existing water management policies which "point to the urgent need for river restoration."
<i>South Florida/Caribbean Network Vital Signs Monitoring Plan</i> (NPS 2008)	The South Florida/Caribbean Inventory and Monitoring Network is composed of seven parks in South Florida and the U. S. Virgin Islands, including the Preserve. The network monitoring program is designed to complement, not replace, existing park and other agency monitoring programs. The <i>South Florida/Caribbean Network Vital Signs Monitoring Plan</i> is the foundation for a long-term ecological monitoring program that has been designed to build upon existing information and understanding of park ecosystems and to make maximum use of leveraging and partnerships with other programs, agencies, and academia. The plan is the result of a multi-year investment in planning and design to ensure that monitoring will meet the most critical information needs and produce ecologically relevant and scientifically credible data that are accessible to park managers, planners, and other key users of the monitoring results.
<i>Land Protection Plan, Big Cypress National Preserve</i> (NPS 1991c)	The <i>Land Protection Plan</i> identifies what lands or interests are required for federal ownership to achieve the purposes of the Preserve. The purpose of the plan is to identify methods of assuring the protection of the natural, historic, scenic, cultural, recreational, or other significant resources, and to provide for adequate visitor use.
<i>Ochopee Sheetflow Restoration Plan, Big Cypress National Preserve</i> (NPS 2013a)	The <i>Ochopee Sheetflow Restoration Plan</i> consists of several projects aimed at returning regional sheetflow to the Ochopee area, including the <i>Ochopee Sheetflow Engineering/feasibility Study</i> , <i>Synoptic Water Budget Study</i> , <i>Birdon Culvert Pilot Project</i> , <i>Copeland Prairie Mitigation Plan</i> , and NEPA Compliance. The <i>Ochopee Sheetflow Restoration Plan</i> has five components: (1) Rehabilitate existing plug network to higher standard, (2) Remove flow impediments, (3) Strategic addition of new canal plugs, (4) Strategic addition of new culvert locations, and (5) Strategic infill of Diagonal Canal.

Table 4-3 – Selected Plans and Projects with a Cumulative Impact on the South Florida Region

Plan/Project	Description
Everglades National Park Plans/Projects	
<i>Everglades National Park Draft General Management Plan (NPS 2013b)</i>	The NPS is developing a new GMP for Everglades National Park. The plan also includes a wilderness study for the East Everglades Addition, an area added to the park boundary in 1989. The general management plan will provide broad guidance for decisions about natural and cultural resource protection, appropriate types and levels of visitor activities, and facility development. The plan will articulate the park's mission, purpose, and significance, and define the resource conditions and visitor experiences that should be achieved and maintained over time. The plan will consider Everglades National Park both as a unit of the national park system and in a broader ecosystem context that includes the surrounding south Florida region.
Modified Water Deliveries to Everglades National Park	<p>Originally initiated by Congress as part of the 1989 Everglades Expansion and Protection Act, this project aims to improve water deliveries into Everglades National Park. Since the implementation of the Central and Southern Florida Project, artificial distributions of water have left some areas of the park unnaturally wet, while others remain too dry. This project endeavors to restore a more natural flow of water to Northeast Shark Slough, thereby alleviating western Shark Slough from unusually high water levels. Because the <i>Modified Water Deliveries</i> project is expected to increase water levels around some developed areas, full implementation likely remains years away. Project partners must carefully consider the full effects of their actions for endangered species, public roadways, and private residents. It is expected, however, that once such issues have been resolved, the plan will yield new life for the Everglades through enhanced water flows (NPS 2010b).</p> <p>There are five major components of the Modified Water Delivers to Everglades National Park Project (SFWMD 2008):</p> <ul style="list-style-type: none"> • Tamiami Trail Modifications • L-67A Conveyance Features • 8.5 Square Mile Area Protection Features • S-356 Pump Station • Taylor Slough Bridge
Experimental Program of Water Deliveries to Everglades National Park	Public Law 98-181, enacted in November 1983, authorized the USACE, with the concurrence of the SFWMD and the NPS to implement the Experimental Water Deliveries Program. Congress authorized the USACE, in concurrence with the SFWMD and the NPS, to experiment with the delivery of water to Everglades National Park in order to provide ecosystem benefits and reverse the ecological decline in the park. Furthermore, the law authorized the USACE to construct the necessary measures to provide flood protection for homes in order to meet the goals of the program. The law also authorized the USACE to acquire agricultural lands threatening the realization of these objectives. The program was re-authorized every two years until 1989 when permanent authority was issued pending the completion of permanent structural modifications approved under the Everglades Expansion Act of 1989. This legislation provided the USACE with the authority to use the Experimental Water Deliveries Program as an iterative field testing program for developing optimum water delivery plans for Everglades National Park (Van Lent, Snow, and James 1999).
Regional Protected Species Plans/Projects	
<i>Environmental Assessment for the Interagency Florida Panther Response Plan (USFWS 2008)</i>	The USFWS, in partnership with the NPS and the FWC, prepared a final response plan in October 2008 that includes guidelines for the agencies responding to human-panther interactions and depredations. The plan also provides guidelines for developing an outreach and education program to help people understand panther behavior and actions humans should take when living or recreating in panther habitat.

Table 4-3 – Selected Plans and Projects with a Cumulative Impact on the South Florida Region

Plan/Project	Description
<i>Florida Panther Recovery Plan, 3rd Revision</i> (USFWS 2008)	This recovery plan includes specific recovery objectives and criteria to be met in order to reclassify (downlist) and eventually delist the Florida panther under the Endangered Species Act. The plan also includes provisions that contemplate reintroduction of panthers in locations across the Southeast. Last updated in 2008, this is the third update of the plan since 1981 when the first plan was crafted. The revised plan supersedes the panther chapter in the USFWS's <i>Multi-Species Recovery Plan</i> as well as its range-wide species recovery plan for the panther.
<i>Multi-Species Recovery Plan for South Florida</i> (USFWS 1999)	This plan was written to recover multiple species by restoring ecological communities throughout the south Florida ecosystem (26,002 square miles). There are more than 600 species considered either rare or imperiled in south Florida, 68 of which are federally listed as threatened or endangered. A number of limiting factors for habitat-limited species are outlined, including habitat loss, fragmentation, and degradation as a result of urbanization, agriculture or other land-use conversions, wetland drainage and alteration of hydrological patterns, invasion of nonnative species, fire suppression, soil subsidence, degradation of water quality, and increased levels of contaminants. Recovery objectives are identified at the species level, while recovery criteria are identified at the species and community level. Recovery actions have been developed to provide consistency between each of the 68 species, and habitat level recovery actions have been developed to facilitate the integration of individual species needs at the community level. The plan does not replace existing approved species recovery plans, but rather outlines south Florida's contribution to range-wide recovery. A number of threatened and endangered species reside within the Preserve, and the Preserve is a critical habitat link in the ecosystem.
Florida Panther National Wildlife Refuge Comprehensive Conservation Plan	The National Wildlife Refuge System Improvement Act of 1997 requires the USFWS to develop comprehensive conservation plans for all lands and waters of the National Wildlife Refuge System. The <i>Florida Panther National Wildlife Refuge Comprehensive Conservation Plan</i> meets the requirements of the act. The refuge was established to conserve fish, wildlife, and plants listed as endangered and/or threatened species under the Endangered Species Act of 1973, specifically the Florida panther. The Refuge abuts the northwest boundary of the Preserve and functions as a vital habitat linkage for panthers.
<i>Everglades Restoration Transition Plan Final Environmental Impact Statement</i> (USACE 2011)	The purpose of this plan is to define water management operating criteria for Central and Southern Florida Project features and the constructed features of the Modified Water Deliveries and Canal-111 projects until a Combined Operational Plan is implemented. The plan objectives include improving conditions in Water Conservation Area 3A for the endangered Everglade snail kite, wood stork and wading bird species while maintaining protection for the endangered Cape Sable seaside sparrow (CSSS) and Congressionally authorized purposes of the Central and Southern Florida Project. This plan incorporates more flexible operating criteria to better manage Water Conservation Area 3A for the benefit of multiple species and represents a positive step towards balancing the competing needs of a complex system (USACE 2011).
Regional Restoration Plans/Projects	
<i>Comprehensive Everglades Restoration Plan</i> (USACE, SFWMD, and Others 2000)	<p>This plan is a framework and guide to restore, protect, and preserve the water resources of central and southern Florida, including the Preserve. The plan was approved in the Water Resources Development Act (2000), and it is a component of the world's largest ecosystem restoration effort, encompassing 16 counties and an 18,000-square-mile area. The comprehensive plan includes more than 60 elements designed to capture, store, and redistribute fresh water. Implementation of the comprehensive plan is expected take more than 30 years to complete and would improve the quality, quantity, timing, and distribution of water flows through the Preserve. Some of the major elements of CERP include:</p> <ul style="list-style-type: none"> • Big Cypress/L-28 Interceptor Modifications • WCA-3 Decompartmentalization and Hydropattern Restoration feature • ENP Seepage Management • C-111 Spreader Canal • River of Grass Initiative

Table 4-3 – Selected Plans and Projects with a Cumulative Impact on the South Florida Region

Plan/Project	Description
<i>South Florida and Caribbean Parks Exotic Plant Management Plan and Environmental Impact Statement (NPS 2010b)</i>	This plan outlines the management of nonnative plants in nine south Florida and Caribbean parks, including the Preserve. The plan promotes restoration of native plant communities and habitat conditions in ecosystems that have been invaded by nonnative plants and protects resources, values, visitors, staff, and area residents from adverse effects resulting from nonnative plant presence and control activities. The plan takes a collaborative approach to managing nonnative plants across the nine parks, improving effectiveness and efficiency and providing a consistent management framework for responding to this threat. The plan also seeks to establish plant and treatment location priorities, reduce new nonnative plant introductions, and reduce the number of individually targeted plants to protect natural resources (NPS 2010b).
Conceptual Management Plan for the Everglades Complex of WMAs	The Everglades Complex is part of the Kissimmee-Okeechobee-Everglades basin and lies within three counties — southwestern Palm Beach, western Broward, and northwestern Miami-Dade. It includes three management areas — Holey Land, Rotenberger, and Everglades-Francis S. Taylor. Through a cooperative management agreement with the south Florida Water Management District, the FWC has management authority over Everglades Complex WMA lands (mainly lands in Water Conservation Areas 2 and 3) for game and fresh water fish preservation, protection, propagation, and recreational use. The plan lists 28 state and federally listed and endangered or threatened species and their habitat. The majority of the complex is east and northeast of the Preserve; however, the southwest corner of Everglades-Francis S. Taylor WMA abuts the eastern boundary of the Preserve from the Tamiami Ranger Station north to the Broward County line.
Regional Recreation Plans/Projects	
<i>Central and Southern Florida Project, CERP, Master Recreation Plan (USACE, SFWMD, and Others 2004)</i>	The <i>CERP Master Recreation Plan</i> takes “a system-wide approach to identify, evaluate, and address the impacts of CERP implementation on existing recreational use within the south Florida Ecosystem and identify and evaluate potential new recreation, public use and public educational opportunities. A particular focus will be on the identification of additional public use and recreational opportunities to compensate for public use facilities that may be lost” (USACE, SFWMD, and Others 2004).
<i>I-75 Recreational Access Plan and Environmental Assessment (NPS 1991b)</i>	The Addition Act directed the NPS to cooperate with the state to develop three recreation access points along I-75 within the Preserve. Many of the requirements and recommendations included in this access plan are incorporated in the 1991 GMP. The development of recreational access points along I-75 was also included as a component of the Addition GMP.
<i>State Comprehensive Outdoor Recreation Plan – Outdoor Recreation in Florida (FWC 2000)</i>	This plan assesses recreational supply, demand, and needs for 11 regions in the state. Region 9 (Southwest Florida) includes the Preserve and the surrounding area. The plan identifies goals for recreational opportunities and facilities, including hiking, bicycling, horseback riding, camping, fishing, and ORV use.

Table 4-3 – Selected Plans and Projects with a Cumulative Impact on the South Florida Region

Plan/Project	Description
Regional Development Plans/Projects	
Regional Growth and Development Projects	<p>Based on the most recent data from the Southwest Florida Regional Planning Council, southwest Florida is one of the most rapidly growing areas of the nation. Since April 1, 2000, the southwest Florida population has grown by at least 24% and is expected to continue growing at an average rate of 3.4% per annum. It is estimated that the region will double its current capacity by the year 2030. Historically, development has occurred to the east and west of the Addition along the coasts. As population growth continues, the likelihood is greater that natural and agricultural lands close to the Addition will be developed. Recently, private lands northwest of the Addition have received approval for major developments. As this growth occurs, increasing demand will occur on all of the region’s resources. The following projects are among those that could have cumulative impacts:</p> <ul style="list-style-type: none"> • Town of Ave Maria – This project includes the build out of 11,000 housing units on approximately 5,000 acres, including a private university. Some of the housing units, business units, and the university has already been built and is currently open. Current and future development is planned to expand on the existing development. • Town of Big Cypress – This project includes the proposed town of Big Cypress, which would include 9,000 housing units on approximately 3,600 acres. • Florida Gulf Coast University – Florida Gulf Coast University opened as a state university in 1997. Student housing on campus opened in 1998. Current construction projects at Florida Gulf Coast University include new academic buildings and student housing. Future construction projects and land acquisition at Florida Gulf Coast University could be anticipated for the next several decades.
Growth Management Plan	<p>This plan was required under the 1985 Florida Growth Management Act and is to be consistent with state and regional plans. The elements of this plan provide the framework to effectively guide future development, while providing for the protection of open space; natural resources; and public health, safety, and welfare. Development in Collier County directly impacts natural resources in the Preserve. Therefore, managed growth policies outlined in this plan are necessary to reduce negative impacts of development and ensure that the Preserve is protected for future generations.</p>

IMPACTS COMMON TO ALL ALTERNATIVES

OFF-ROAD VEHICLES

This *Hunting Management Plan* does not provide guidance for managing ORV use in the Preserve for hunting. Rather, management of ORVs in the original Preserve is guided by the *General Management Plan/Environmental Impact Statement* (NPS 1991a) and *Final Recreational Off-Road Vehicle Management Plan Supplemental Environmental Impact Statement* (NPS 2000d). Management of ORVs in the Addition is guided by the *Addition GMP* (NPS 2010a). These planning/compliance efforts considered the impacts from ORV use, including use associated with hunting, for Preserve resources and values, including, but not limited to: water flows, water quality, soils, vegetation, wetlands, wildlife and wildlife habitat (including game species), species of special concern (including endangered and threatened species), cultural resources, visitor use and experience (including hunting), wilderness, and socioeconomics. These plans and accompanying NEPA documents, discussed in further detail in the “Cumulative Impacts Analysis” section, should be referenced for a detailed analysis of these effects.

NATURAL RESOURCES

VEGETATION AND HABITAT

This section addresses the potential consequences of the proposed actions and alternatives to native vegetation communities and habitat, protected plant species, and nonnative invasive plant species, which are considered together for the purposes of this impact analysis. The vegetation communities included as part of this analysis are the five major native vegetation communities that can be found on the Preserve as outlined in “Chapter Three: Affected Environment”:

Cypress – cypress strands and domes, mixed-hardwood swamps, and sloughs; Prairie – prairies and marshes; Mangrove; Pinelands; and Hammocks. The thresholds for evaluating impacts on vegetation and habitat (native vegetation communities and habitat, protected plant species, and nonnative invasive plant species) are defined in table 4-1, located at the beginning of this chapter.

Alternative 1 – No Action – Apply Current Management to the Addition

Analysis. Under alternative 1, the no action alternative, the preferred alternative from the Addition GMP (NPS 2010a) would be implemented and hunting would be permitted in the entire Preserve. Within the original Preserve boundaries, hunting would continue as currently managed; within the Addition, hunting would be permitted and managed through the existing framework. Impacts throughout the Preserve would be similar in nature; however, the intensity of impacts could be expected to be greater in the Addition since hunting has not taken place in this area since the acquisition of the lands by the NPS.

Impacts to vegetation and habitat and protected plant species would be negligible in the original Preserve and potentially slightly greater (although still negligible) in the Addition since hunting has not taken place in this area since the acquisition of the lands by the NPS. These impacts would be long-term

(repeated short-term direct impacts while hunters are in the area) and consist of trampling of native vegetation, protected plant species, etc. Such trampling of native vegetation and protected plant species would be expected to occur to only individual specimens in sporadic areas of the Preserve where hunters walk off existing trails. These impacts would not be expected to be measurable and vegetation would be expected to fully recover each year during nonhunting seasons.

Impacts from nonnative invasive plants would be negligible in the original Preserve and potentially slightly greater (although still negligible) in the Addition since hunting has not taken place in this area since the acquisition of the lands by the NPS. These impacts would be long-term and consist of unintentional seed dispersal of nonnative invasive plants by hunters. Such seed dispersal would only be expected to result in the establishment of very few specimens of nonnative plants; this establishment will likely be detected through the Preserve’s systematic nonnative plant reconnaissance and treatment, resulting in no detriment to native plant populations in the greater landscape of the Preserve.

Throughout the Preserve, long-term, negligible, adverse impacts to vegetation and habitat and protected plant species attributable to trampling of native vegetation and protected plant species and long-term, negligible, adverse impacts from nonnative invasive plants from unintentional seed dispersal would result from the selection of alternative 1.

Cumulative Impacts. Implementation of the preferred alternative in the Addition GMP approved development of a maximum of 130 miles of ORV trails²² that would fragment

²² The Addition GMP is the document which guides the number of miles of trails that would be developed in the Addition as well as the number of ORV permits that would be issued for use of those trails. Any future

native habitat and degrade natural conditions in certain areas of the Addition. Impacts would be reduced by the use of a designated trail system, thereby limiting changes to natural resources (native vegetation communities and habitat, protected plant species, and nonnative invasive plant species) outside of the trail system. Impacts would be long-term, moderate, and adverse.

Implementation of the 2000 *Recreational Off-road Vehicle Management Plan* within the original Preserve would have a beneficial effect on vegetation and habitat. Since ORVs are currently permitted in the original Preserve, implementation of this plan would limit the use of these ORVs to the trail system, thereby reducing current impacts, such as trampling, injury, or loss of plant cover, of ORVs on vegetation and habitat. The impact would be long-term, minor to moderate, beneficial, and localized.

The *Resource Management Plan* (NPS 2001) is designed to serve as a framework for resource management and protection of the Preserve, as outlined in the enabling legislation. The *Land Protection Plan* (NPS 1991c) identifies what lands or interests are required for federal ownership to achieve the purposes of the Preserve. The *Water Resources Management Plan* (NPS 1996) provides a basis for understanding and hydrologically-sound management of water resources in the Preserve. As the purpose of these plans are focused on the management and protection of resources in the Preserve, in accordance with the enabling legislation, these plans would have long-term, moderate to major, beneficial effects on natural resources (native vegetation communities and habitat, protected plant species, and nonnative invasive plant species) in the Preserve.

The *Big Cypress National Preserve Fire Management Plan* (NPS 2010d) outlines a comprehensive fire program for achieving the Preserve goals for protection of life, property, and ecosystem management. This plan serves

changes to the Addition GMP would supersede the information in this document regarding trails and ORV permits in the Addition.

to protect visitors, staff, and property at the Preserve while also utilizing prescribed fire for ecosystem management at the Preserve. This plan would have long-term, moderate, beneficial effects on natural resources (native vegetation communities and habitat, protected plant species, and nonnative invasive plant species) in the Preserve.

The NPS *South Florida and Caribbean Parks Exotic Plant Management Plan* (NPS 2010b) outlines the management of nonnative plants in nine south Florida and Caribbean parks, including the Preserve. The plan promotes restoration of native plant communities and habitat conditions in ecosystems that have been invaded by nonnative plants and protects resources, values, visitors, staff, and area residents from adverse effects resulting from nonnative plant presence and control activities. Implementation of this plan in the Preserve would have a long-term, moderate, beneficial effect on natural resources (native vegetation communities and habitat, protected plant species, and nonnative invasive plant species) in the Preserve.

The South Florida/Caribbean Inventory and Monitoring Network outlined in the *South Florida/Caribbean Network Vital Signs Monitoring Plan* (NPS 2008) is the foundation for a long-term ecological monitoring program composed of seven parks in South Florida and the U. S. Virgin Islands, including the Preserve. The long-term partnerships with other programs, agencies, and academia outlined in this plan would have long-term, minor to moderate, beneficial effects on natural resources (native vegetation communities and habitat, protected plant species, and nonnative invasive plant species) in the Preserve.

Implementation of future oil and gas proposals could have adverse impacts on vegetation; however, it is unknown what plant communities would be affected. If such proposals included using off-road equipment and constructing roads and pads, this would alter vegetation. The impacts of these activities would be reduced because NPS approval of the operations plan would require mitigation measures. Short-term impacts on vegetation

would be adverse, moderate, and localized; long-term impacts would be adverse, minor, and localized.

Numerous regional ecosystem restoration plans and projects are in various stages of completion throughout the south Florida region. These plans and projects would improve sheet flow and hydrologic connectivity, which would affect plant communities and would likely improve plant vigor, abundance, and spatial pattern. The impact of these efforts on natural resources (native vegetation communities and habitat, protected plant species, and nonnative invasive plant species) would be expected to be long-term, minor to moderate, and beneficial.

Both *Report M-621, Water Management Plan: Turner River Restoration* (NPS 1980) and the *Ochopee Sheetflow Restoration Plan* (NPS 2013a) propose hydrological restoration of areas within and around the Preserve. Similar to the regional ecosystem restoration plans and projects discussed above, the actions contained within these plans would have long-term, moderate, beneficial effects on natural resources (native vegetation communities and habitat, protected plant species, and nonnative invasive plant species) in the Preserve, although the effects would likely be slightly more beneficial than other projects due to the proximity of the proposed actions to the Preserve.

Regional growth and development is expected to continue and result in an increase in the conversion of natural lands to development in the general area. Increasing urbanization, fragmentation of habitat, and the loss of natural areas have led to the degradation of natural resources and ecosystem function in the region. The impact of these activities on natural resources (native vegetation communities and habitat, protected plant species, and nonnative invasive plant species) is expected to be long-term, moderate, and adverse.

Collectively, beneficial impacts on natural resources (native vegetation communities and habitat, protected plant species, and nonnative invasive plant species) would accrue from

implementation of the *Resource Management Plan, Land Protection Plan, Water Resources Management Plan, and Fire Management Plan*; ecosystem restoration projects; implementation of the *Exotic Plant Management Plan* and *South Florida/Caribbean Network Vital Signs Monitoring Plan*; and ORV management in the original Preserve. Adverse impacts would be expected from creation of ORV trails in the Addition, future oil and gas operations, and regional growth and development projects. Overall, the projects discussed above would have a beneficial effect on the natural resources (native vegetation communities and habitat, protected plant species, and nonnative invasive plant species) in the region, due to the anticipated benefits from regional ecosystem restoration projects.

When the likely effects of implementing the actions contained in alternative 1 are added to the effects of other past, present, and reasonably foreseeable actions as described above, there would be a long-term, moderate, beneficial cumulative impact on natural resources (native vegetation communities and habitat, protected plant species, and nonnative invasive plant species) in the region. The actions contained in alternative 1 would contribute a negligible adverse increment to the cumulative impact of other projects.

Conclusion. Collectively, impacts on native vegetation communities and protected plant species and impacts from nonnative invasive plants from alternative 1 would be long-term, negligible, and adverse throughout the Preserve.

Alternative 2 – No Hunting in the Addition

Analysis. Under alternative 2, the environmental baseline alternative, current hunting management would continue in the original Preserve and there would continue to be no public hunting in the Addition.

Within the original Preserve, impacts would be the same as those described under alternative

1. Long-term, negligible, adverse impacts to vegetation and habitat and protected plant species attributable to trampling of native vegetation and protected plant species and long-term, negligible, adverse impacts from nonnative invasive plants from unintentional seed dispersal would result from the selection of alternative 2.

In the Addition, no direct or indirect short- or long-term adverse impacts to native vegetation communities or protected plant species or from nonnative invasive plant species would occur with implementation of this alternative.

Cumulative Impacts. Cumulative impacts from projects other than this *Hunting Management Plan* would be the same under alternative 2 as described under alternative 1. When the likely effects of implementing the actions contained in alternative 2 are added to the effects of other past, present, and reasonably foreseeable actions as described above, there would be a long-term, moderate, beneficial cumulative impact on natural resources (native vegetation communities and habitat, protected plant species, and nonnative invasive plant species) in the region. The actions contained in alternative 2 would contribute a negligible adverse increment to the cumulative impact of other projects.

Conclusion. Collectively, impacts on native vegetation communities and protected plant species and from nonnative invasive plant species from alternative 2 would be long-term, negligible, and adverse within the original Preserve; no direct or indirect short- or long-term adverse impacts to native vegetation communities or protected plant species or from nonnative invasive plant species would occur within the Addition.

Alternative 3 – New Adaptive Management Strategy

Analysis. Under alternative 3, hunting would be managed in the entire Preserve through a science-based adaptive management process. The impacts of this alternative to native vegetation communities and protected plant

species and from nonnative invasive plant species would be the same as those of alternative 1. Long-term, negligible, adverse impacts to vegetation and habitat and protected plant species attributable to trampling of native vegetation and protected plant species and long-term, negligible, adverse impacts from nonnative invasive plants from unintentional seed dispersal would result from the selection of alternative 3.

Cumulative Impacts. Cumulative impacts from projects other than this *Hunting Management Plan* would be the same under alternative 3 as described under alternative 1. When the likely effects of implementing the actions contained in alternative 3 are added to the effects of other past, present, and reasonably foreseeable actions as described above, there would be a long-term, moderate, beneficial cumulative impact on natural resources (native vegetation communities and habitat, protected plant species, and nonnative invasive plant species) in the region. The actions contained in alternative 3 would contribute a negligible adverse increment to the cumulative impact of other projects.

Conclusion. Collectively, impacts on native vegetation communities and protected plant species and from nonnative invasive plant species from alternative 3 would be long-term, negligible, and adverse throughout the Preserve.

WILDLIFE – PROTECTED WILDLIFE SPECIES

This section address the potential consequences of the proposed actions and alternatives to federal threatened and endangered wildlife species, which are considered together for the purposes of this impact analysis, with the exception of the Florida panther. The federally listed wildlife species included as part of this analysis that can occur on the Preserve, as outlined in “Chapter Three: Affected Environment,” are the West Indian manatee, Florida bonneted bat, Cape Sable seaside sparrow, Everglade

snail kite, red-cockaded woodpecker, wood stork, American crocodile, eastern indigo snake, and American alligator. The potential consequences of the proposed actions and alternatives to the Florida panther are addressed separately below, when impacts are anticipated to differ from the impacts to the other species listed above. The thresholds for evaluating impacts on protected wildlife species are defined in table 4-1, located at the beginning of this chapter.

Alternative 1 – No Action – Apply Current Management to the Addition

Analysis. Under alternative 1, the no action alternative, the preferred alternative from the Addition GMP (NPS 2010a) would be implemented and hunting would be permitted in the entire Preserve. Within the original Preserve boundaries, hunting would continue as currently managed; within the Addition, hunting would be permitted and managed through the existing framework. Impacts throughout the Preserve would be similar in nature; however, the intensity of impacts could be expected to be greater in the Addition since hunting has not taken place in this area since the acquisition of the lands by the NPS.

The federally listed species present in the Preserve are the Florida panther, West Indian manatee, Florida bonneted bat, Cape Sable seaside sparrow, Everglade snail kite, red-cockaded woodpecker, wood stork, American crocodile, eastern indigo snake, and American alligator. Impacts to the Florida panther are discussed separately in the following section. Since this *Hunting Management Plan* only addresses terrestrial hunting activities, no impacts would be anticipated to occur to the West Indian manatee.

The federally listed avian species (Cape Sable seaside sparrow, Everglade snail kite, red-cockaded woodpecker, and wood stork) could be impacted by indirect adverse effects resulting from human use such as flushing and short-term displacement, etc. These impacts would be long-term (repeated short-term impacts while hunters are in the area each

season), but since hunting is a seasonal activity and hunters would be dispersed over a large number of acres in the Preserve, the impacts would be negligible. Such flushing and short-term displacement would be expected to occur only to individual species in localized areas for short periods of time while hunters are in the area. This effect would not be expected to be observable or measurable for any extended period of time once hunters have left the area. The eastern indigo snake could also be impacted by similar flushing and short-term displacement; however, since no construction or other permanent ground disturbing activities are associated with this project, impacts to the eastern indigo snake would be negligible as well. Similar flushing and short-term displacement impacts could occur to the American crocodile and American alligator. Since hunting of alligators is not permitted in the Preserve, no other impacts would be anticipated to occur to these species. Similarly, the Florida bonneted bat could be impacted by flushing and short-term displacement; however, their daytime roosting locations in tree cavities and nocturnal feeding behavior would limit their exposure to hunters; however, since no construction or other permanent ground disturbing activities are associated with this project, impacts to the Florida bonneted bat would be negligible.

The federally listed avian species (Cape Sable seaside sparrow, Everglade snail kite, red-cockaded woodpecker, and wood stork) could also be impacted by indirect adverse effects resulting from direct lead-based ammunition ingestion or ingestion of water/soil contaminated by dissolved lead from lead-based ammunition. The effects would be minor since only a portion of hunters in the Preserve use lead-based ammunition and hunters are dispersed over a large acreage. Due to these factors, the effects to these species resulting from the use of lead-based ammunition for hunting under this alternative would be expected to occur only on rare occasions to individual specimens and therefore be discountable (i.e., not able to be meaningfully measured, detected, or evaluated) in terms of species populations and the greater area of the Preserve. No impacts or very negligible impacts would be anticipated

for other listed species such as the Florida bonneted bat, eastern indigo snake, American crocodile, and American alligator since current literature does not demonstrate any substantial effect on these species from lead-based ammunition ingestion. Under current hunting regulations, lead-based ammunition is prohibited for duck, geese, and coot hunting. In March 2009, the NPS began to research ways to reduce its own use of lead-based ammunition in units of the national park system. In addition, the NPS is currently cooperating with the Association of Fish and Wildlife Agencies in efforts to bring hunters, anglers, and various interests together to determine the need for and nature of any needed management approaches to use of lead ammunition and lead fishing tackle. The Preserve would comply with any future changes in NPS policy regarding the use of lead-based ammunition for hunting in the Preserve, further reducing the potential for impacts.

No impacts would occur to the West Indian manatee. Long-term, minor, adverse impacts to eight federally listed wildlife species (Florida bonneted bat, Cape Sable seaside sparrow, Everglade snail kite, red-cockaded woodpecker, wood stork, American crocodile, eastern indigo snake, and American alligator) attributable to minor impacts from flushing and short-term displacement and minor impacts from lead-based ammunition exposure would result from the selection of alternative 1.

Florida panther — Direct impacts to the Florida panther could occur from misidentification of target by hunters (very rare) and automobile/panther collisions (a common cause of panther deaths²³). Increased visitation could lead to increases in direct panther mortality from both of these causes. The impacts to the Florida panther from misidentification of target by hunters would be long-term, very negligible, and adverse, while the impacts of vehicle accidents would be long-term, minor, and adverse, since visitation is

only expected to increase by a minor amount. These impacts would be expected to have an impact on the panther population of the entire Preserve since the animals tend to use a range of several hundred square miles.

Indirect adverse effects to the Florida panther could result from hunting impacts to the panther prey populations (e.g., deer, hogs, and small mammals) and repeated human use such as flushing and displacement of panthers.

Repeated human use would only be expected to cause negligible to minor impacts since hunters would only be occupying areas of the Preserve for a short period of time and hunters would only be present during hunting season. Therefore, these impacts would be long-term (repeated short-term impacts over time), negligible to minor, seasonal, and adverse.

Indirect impacts to the Florida panther population from reduction in the prey base resulting from hunter take could occur with implementation of this alternative. As stated in the 2008 *Florida Panther Recovery Plan* (3rd Revision), the following actions are required to reach the recovery goals, objectives, and criteria for the Florida panther (USFWS 2008):

1. Maintain, restore, and expand the panther population and its habitat in south Florida.
2. Expand the breeding portion of the population in south Florida to areas north of the Caloosahatchee River.
3. Identify potential reintroduction areas within the historic range of the panther.
4. Reestablish viable panther populations outside of south and south-central Florida within the historic range.
5. Secure, maintain, and restore habitat in reintroduction areas.
6. Facilitate panther conservation and recovery through public awareness and education.

Although the Preserve is in the core of the extant range of the Florida panther, their distribution in this landscape is not static, nor is it contained within any specific management

²³ The FWC documented 24 panther deaths in 2011. Of those mortalities, nine panthers died after being struck by vehicles.

unit or within the Preserve boundaries. As a result, additional variables and stressors may cause changes in panther distribution, use, and occupancy of an area that may be unrelated to any potential effects of hunting activities. Aside from the behavioral change noted by Janis and Clark (2002), there have been no studies that demonstrate a measurable effect of deer hunting on panthers. This is not due to a lack of information on hunting and panthers; rather, it is due to the multitude of stressors that simply cannot be isolated to determine which stressor is the cause of a noted effect. Both Janis and Clark (2002) and Fletcher and McCarthy (2010) surmised that hydrology may play a role in panther movements throughout the hunting season resulting in the noted movement away from trails.

Therefore, using panther numbers or distribution to assess the effects of deer hunting activities is not likely to further inform management decisions. Because the panther is the predator in the predator/prey relationship, any measurable response would be delayed as the population responds to changes in the prey population. There is also the potential to have other stressors, such as epizootic events, affect the panther population while leaving the deer population untouched.

The panther's preferred prey is white-tailed deer. Therefore, for the purposes of this impact analysis, the deer population was used as an indicator for analyzing potential panther impacts. Additionally, feral hogs were not included in this assessment as recent data shows that they are nearly extirpated from the Preserve and are not likely to be as important of a food item as they are in lands to the north of the Preserve.

As discussed in chapter 3 ("Existing Conditions"), annual range-wide surveys of the Florida panther population in central and southern Florida began in 1981 (McBride et al. 2008). Based on documented physical evidence, the population remained relatively stable between 20 to 30 panthers between 1985 to 1995, began increasing after genetic restoration in 1995, reached a peak in 2007, and has remained relatively stable between

104 to 110 panthers from 2008 through 2011 (McBride et al. 2012). Based on radio-collared panthers, track surveys, and camera-trap surveys, the occupancy rate of panthers in the Addition Lands north of I-75 is estimated at seven for a density of 2.4 panthers/100 km² (Roy McBride, Livestock Protection Company, 2012, personal communication). Multiple literature sources (Anderson and Lindzey 2003; Cooley et al. 2008; Ruth and Murphy 2010; Murphy, Nadeau, and Ruth 2011) show that panthers require on average one deer-sized prey per week. It has been estimated that a one-third kill rate would maintain a stable deer population (Beckwith 1965, Dasmann 1971). If the panthers in the Addition Lands north of I-75 were to take 33 percent of the deer herd, the density of deer needed to support the panther population would be 3.9 deer/km².

As discussed in chapter 3 ("Existing Conditions"), based on ground surveys, estimated deer densities in the Addition range from 1.8 to 7.4 deer/km². However, due to the size of the area, visibility problems, and lack of access to some areas, ground surveys were found to be unfeasible. Deer density estimates using distance sampling techniques from aircraft in the Addition lands north of I-75 ranged from 0.4 to 1.6 deer/km². However, results have been difficult to interpret due to changes from ground surveys to aerial surveys, and changes in types of aircraft, observers, and pilots resulting in lack of consistent estimates of transect widths for aerial surveys (FWC 2012). For additional information, please refer to appendix D for a copy of the *Deer Status Report, Big Cypress National Preserve – Addition Lands* (FWC 2012). The NPS and the FWC are continuing research to develop a more effective method for monitoring the deer population.

Deer harvest and hunter pressure have been monitored in the Preserve since 1980. Documented deer harvest has been stable or slightly increasing during the same period as the panther population has been increasing (Bartareau et al. 2011, FWC 2012), suggesting that the conservative deer harvest in the Preserve has not had a significant impact on panther population growth. If harvest rates

reflect deer abundance, the trends in harvest rates compared with trends in panther numbers tend to indicate that panther numbers are a major factor influencing deer abundance. The current deer population is supporting the panther population with expected fluctuations as seen in other predator/prey relationships. Hydrology is the main driver in the Big Cypress ecosystem and can likely have a substantial effect on both the distribution (Janis and Clark 2002, Fletcher and McCarthy 2011) and abundance of deer and panthers, as seen recently in the Stair-Steps Unit of the Preserve [as discussed in chapter 3 (“Existing Conditions”)].

However, since hunting management protocol could not be adaptively managed under this alternative based on annual deer population trends, it would be difficult to make a timely change in hunting regulations if it was determined by the NPS and FWC that the primary prey base (deer) for the Florida panther had dropped below a sustainable level as a result of hunting pressure. Therefore, it is anticipated that implementation of alternative 1 would have long-term, moderate, adverse impact on the Florida panther.

Partnerships between the NPS, FWC, and the USFWS would continue and would contribute to the monitoring and improved understanding of the species, which would have a long-term, moderate, beneficial effect on the Florida panther.

Collectively, long-term, moderate, adverse impacts to the Florida panther would result from reduction in the panther’s prey base, human use/disturbance related to hunting activities (e.g., flushing, displacement, and automobile collisions), and misidentification of intended target by hunters. Long-term, moderate, beneficial effects would result from continued monitoring and improved understanding of the Florida panther. Due to the extended range of the Florida panther, all impacts would be expected to be regional.

Cumulative Impacts. Implementation of the preferred alternative in the Addition GMP

approved development of a maximum of 130 miles of ORV trails²⁴ that would fragment native habitat and degrade natural conditions in certain areas of the Addition. There may be some disturbance to the federally listed species related to human use of the trail system, but because no trees would be cleared as part of the trail system, impacts would be minimized. In general, panther population centers appear to indicate a preference toward large, remote tracts with adequate prey, cover, and reduced levels of human disturbance. Therefore, fragmentation and human disturbance associated with ORVs in the Addition would be expected to have an adverse impact on the Florida panther. Impacts would be reduced by the use of a designated trail system, thereby limiting changes to threatened and endangered species’ habitat. Impacts would be long-term, moderate, and adverse for all federally listed threatened and endangered wildlife species, including the Florida panther.

Implementation of the 2000 *Recreational Off-road Vehicle Management Plan* within the original Preserve would have a beneficial effect on federally listed species and their habitat, including the Florida panther. Since ORVs are currently permitted in the original Preserve, implementation of this plan would limit the use of these ORVs to the trail system, thereby reducing current impacts, such as trampling, injury, or loss of plant cover, of ORVs on threatened and endangered species and their habitat. The impact would be long-term, minor to moderate, beneficial, and localized.

The *Resource Management Plan* (NPS 2001) is designed to serve as a framework for resource management and protection of the Preserve, as outlined in the enabling legislation. The *Land Protection Plan* (NPS 1991c) identifies what lands or interests are required for federal ownership to achieve the purposes of the Preserve. The *Water*

²⁴ The Addition GMP is the document which guides the number of miles of trails that would be developed in the Addition as well as the number of ORV permits that would be issued for use of those trails. Any future changes to the Addition GMP would supersede the information in this document regarding trails and ORV permits in the Addition.

Resources Management Plan (NPS 1996) provides a basis for understanding and hydrologically-sound management of water resources in the Preserve. As the purpose of these plans are focused on the management and protection of resources in the Preserve (including protected species and their habitat), in accordance with the enabling legislation, these plans would have long-term, moderate to major, beneficial effects on threatened and endangered species and their habitat in the Preserve.

The *Big Cypress National Preserve Fire Management Plan* (NPS 2010d) outlines a comprehensive fire program for achieving the Preserve goals for protection of life, property, and ecosystem management. This plan serves to protect visitors, staff, and property at the Preserve while also utilizing prescribed fire for ecosystem management at the Preserve. This plan would have long-term, moderate, beneficial effects on threatened and endangered species' habitat in the Preserve.

The *Interagency Florida Panther Response Plan*, *Florida Panther Recovery Plan*, and *Florida Panther National Wildlife Refuge Comprehensive Conservation Plan* would all be expected to have a long-term beneficial impact on the Florida panther population in the south Florida region. These plans would lead to improved monitoring and management, increased public education, and a better understanding of the Florida panther population in south Florida. This would have a long-term, moderate, beneficial, regional effect on the Florida panther.

The *NPS South Florida and Caribbean Parks Exotic Plant Management Plan* (NPS 2010b) outlines the management of nonnative plants in nine south Florida and Caribbean parks, including the Preserve. The plan promotes restoration of native plant communities and habitat conditions in ecosystems that have been invaded by nonnative plants and protects resources, values, visitors, staff, and area residents from adverse effects resulting from nonnative plant presence and control activities. Implementation of this plan in the Preserve would have a long-term, moderate,

beneficial effect on threatened and endangered species' habitat in the Preserve.

Implementation of future oil and gas proposals could have adverse impacts on threatened and endangered species' habitat; however, it is unknown what plant communities would be affected. If such proposals included using off-road equipment and constructing roads and pads, this would alter vegetation. The impacts of these activities would be reduced because NPS approval of the operations plan would require mitigation measures. Short-term impacts on threatened and endangered species' habitat would be adverse, moderate, and localized; long-term impacts would be adverse, minor, and localized.

Numerous regional ecosystem restoration plans and projects are in various stages of completion throughout the south Florida region. The plans and projects would improve sheet flow and hydrologic connectivity, which would affect plant communities and would likely improve plant vigor, abundance, and spatial pattern. The impact of these efforts on threatened and endangered species' habitat would be expected to be long-term, minor to moderate, and beneficial.

Both *Report M-621, Water Management Plan: Turner River Restoration* (NPS 1980) and the *Ochopee Sheetflow Restoration Plan* (NPS 2013a) propose hydrological restoration of areas within and around the Preserve. Similar to the regional ecosystem restoration plans and projects discussed above, the actions contained within these plans would have long-term, moderate, beneficial effects on threatened and endangered species' habitat in the Preserve, although the effects would likely be slightly more beneficial than other projects due to the proximity of the proposed actions to the Preserve.

The South Florida/Caribbean Inventory and Monitoring Network outlined in the *South Florida/Caribbean Network Vital Signs Monitoring Plan* (NPS 2008) is the foundation for a long-term ecological monitoring program composed of seven parks in South Florida and the U. S. Virgin Islands, including the Preserve. The long-term

partnerships with other programs, agencies, and academia outlined in this plan would have long-term, minor to moderate, beneficial effects on threatened and endangered species in the Preserve.

Regional growth and development is expected to continue and result in an increase in the conversion of natural lands to development in the general area. Increasing urbanization, fragmentation of habitat, and the loss of natural areas have led to the degradation of natural resources and ecosystem function in the region. The impact of these activities on threatened and endangered species' habitat is expected to be long-term, moderate, and adverse.

Collectively, beneficial impacts on threatened and endangered species' habitat would accrue from implementation of the *Resource Management Plan*, *Land Protection Plan*, *Water Resources Management Plan*, and *Fire Management Plan*; implementation of Florida panther plans and projects; ecosystem restoration projects; implementation of the *South Florida/Caribbean Network Vital Signs Monitoring Plan*; and ORV management in the original Preserve. Adverse impacts would be expected from creation of ORV trails in the Addition, future oil and gas operations, and regional growth and development projects. Overall, the projects discussed above would have beneficial effects on threatened and endangered species' habitats (including Florida panther habitat) in the region due to the anticipated benefits from regional ecosystem restoration projects.

When the likely effects of implementing the actions contained in alternative 1 are added to the effects of other past, present, and reasonably foreseeable actions as described above, there would be a long-term, moderate, beneficial cumulative impact on federally listed species and their habitat in the region, except for the Florida panther, which would have a long-term, minor, beneficial result. The actions contained in alternative 1 would not contribute any increment to the cumulative impact of other projects for the West Indian manatee, would contribute a negligible adverse increment for seven federally listed

wildlife species (Cape Sable seaside sparrow, Everglade snail kite, red-cockaded woodpecker, wood stork, American crocodile, eastern indigo snake, and American alligator), and would contribute a moderate adverse increment for the Florida panther.

Conclusion. Collectively, no impacts would occur to the West Indian manatee, and long-term, minor, adverse impacts to eight federally listed wildlife species (Florida bonneted bat, Cape Sable seaside sparrow, Everglade snail kite, red-cockaded woodpecker, wood stork, American crocodile, eastern indigo snake, and American alligator) would result throughout the Preserve from the selection of alternative 1. Impacts on the Florida panther from alternative 1 would be long-term, moderate, and adverse throughout the Preserve.

Alternative 1 would be anticipated to result in a determination of "no effect" for the West Indian manatee, a determination of "may affect, not likely to adversely affect" for eight federally listed wildlife species (Florida bonneted bat, Cape Sable seaside sparrow, Everglade snail kite, red-cockaded woodpecker, wood stork, American crocodile, eastern indigo snake, and American alligator), and a determination of "may affect, likely to adversely affect" for the Florida panther under Section 7 of the Endangered Species Act.

Alternative 2 – No Hunting in the Addition

Analysis. Under alternative 2, the environmental baseline alternative, current hunting management would continue in the original Preserve and there would continue to be no public hunting in the Addition.

Within the original Preserve, impacts would be the same as those described under alternative 1. No impacts would occur to the West Indian manatee. Long-term, minor, adverse impacts to eight federally listed wildlife species (Florida bonneted bat, Cape Sable seaside sparrow, Everglade snail kite, red-cockaded woodpecker, wood stork, American crocodile, eastern indigo snake, and American alligator)

attributable to minor impacts from flushing and short-term displacement and minor impacts from lead-based ammunition exposure would result from the selection of alternative 2. In the Addition, no direct or indirect short- or long-term adverse impacts to federally listed wildlife species or their habitat (except the Florida panther) would occur with implementation of this alternative.

Florida panther — Impacts to the Florida panther would be the same as those described under alternative 1 since the panther uses a range of several hundred square miles and the animals could be expected to wander in and out of the original Preserve and the Addition. Throughout the Preserve, adverse impacts to the Florida panther would result from reduction in the panther's prey base, human use/disturbance related to hunting activities (e.g., flushing, displacement, and automobile collisions), and misidentification of intended target by hunters. Beneficial effects would result from continued monitoring and improved understanding of the Florida panther. Due to the extended range of the Florida panther, all impacts would be expected to be regional.

Cumulative Impacts. Cumulative impacts from projects other than this *Hunting Management Plan* would be the same under alternative 2 as described under alternative 1. When the likely effects of implementing the actions contained in alternative 2 are added to the effects of other past, present, and reasonably foreseeable actions as described above, there would be a long-term, moderate, beneficial cumulative impact on threatened and endangered species' habitat in the region. The actions contained in alternative 2 would not contribute any increment to the cumulative impact of other projects for the West Indian manatee, would contribute a negligible adverse increment for eight federally listed wildlife species (Florida bonneted bat, Cape Sable seaside sparrow, Everglade snail kite, red-cockaded woodpecker, wood stork, American crocodile, eastern indigo snake, and American alligator), and would contribute a moderate adverse increment for the Florida panther.

Conclusion. Collectively, within the original Preserve, no impacts would occur to the West Indian manatee, and long-term, minor, adverse impacts to eight federally listed wildlife species (Florida bonneted bat, Cape Sable seaside sparrow, Everglade snail kite, red-cockaded woodpecker, wood stork, American crocodile, eastern indigo snake, and American alligator) would result from the selection of alternative 2; in the Addition, no direct or indirect short- or long-term adverse impacts to federally listed wildlife species or their habitat (except the Florida panther) would occur with implementation of this alternative. Impacts on the Florida panther from alternative 2 would be long-term, moderate, and adverse throughout the Preserve.

Alternative 2 would be anticipated to result in a determination of "no effect" for the West Indian manatee, a determination of "may affect, not likely to adversely affect" for eight federally listed wildlife species (Florida bonneted bat, Cape Sable seaside sparrow, Everglade snail kite, red-cockaded woodpecker, wood stork, American crocodile, eastern indigo snake, and American alligator), and a determination of "may affect, likely to adversely affect" for the Florida panther under Section 7 of the Endangered Species Act.

Alternative 3 – New Adaptive Management Strategy

Analysis. Under alternative 3, hunting would be managed in the entire Preserve through a science-based adaptive management process.

The impacts of this alternative to federally listed wildlife species and their habitat would be similar to those of alternative 1, except for impacts to the Florida panther. Throughout the Preserve, no impacts would occur to the West Indian manatee. Long-term, minor, adverse impacts to eight federally listed wildlife species (Florida bonneted bat, Cape Sable seaside sparrow, Everglade snail kite, red-cockaded woodpecker, wood stork, American crocodile, eastern indigo snake, and American alligator) attributable to minor

impacts from flushing and short-term displacement and minor impacts from lead-based ammunition exposure would result from the selection of alternative 3. Additionally, while alligator hunting is currently prohibited in the Preserve, if the Preserve is opened to an alligator hunt, impacts to the crocodile would have to be considered through additional NEPA analysis and documentation.

Florida panther — Adverse impacts to the Florida panther would be the same as those of alternative 1, as discussed above, with the exception of the impacts on the panther prey base.

One of the objectives of the adaptive management strategy, as discussed in chapter 2, is “a sustainable deer population in the Preserve, which ensures that the effects of hunting in the Preserve are beneficial, discountable, or insignificant to the Florida panther population.” With the implementation of alternative 3, this objective would be achieved through an iterative adaptive management cycle of baseline management actions, monitoring, triggers, supplemental management actions, and additional monitoring (refer to the description of alternative 3 in chapter 2 for specific details of the adaptive management process).

Under alternative 3, the NPS would undertake the following baseline management action in relation to the deer population to achieve the adaptive management objectives:

- Monitor hunter success rates for the white-tailed deer population in the Preserve (as described in the “Elements Common to All Alternatives, White-Tailed Deer Monitoring” section in chapter 2 and further detailed in step 5 of the adaptive management process described in chapter 2)²⁵.

The occurrence of one or more of the following conditions would trigger implementation of

²⁵ Note that other adaptive management objectives are discussed in chapter 2 and related impacts are discussed in the relevant sections of the impact analysis in this chapter.

additional management actions (in addition to those baseline actions listed above)²⁶:

1. A doubling (100% increase) or halving (50% decrease) trend in hunter days per deer harvested across the most recent five-year period²⁷ for each management unit. To determine significant trend, a regression analysis will be performed on the harvest data²⁸.
2. A doubling (100% increase) or halving (50% decrease) trend in total deer harvest across the entire Preserve (total number of deer harvested from the Preserve), provided that changes in harvest regulations over time are considered. To determine significant trend, a regression analysis will be performed on all available harvest data.
3. An emergency situation, such as a hurricane, high water event, or other unknown or undocumented acute situation that involves major resource impacts, as outlined in NPS policy.

It is important to note why hunter days and deer harvest would be used as triggers for supplemental management actions and why panther population numbers and population numbers for other small game species would not typically be used as triggers. Although the Preserve is in the core of the extant range of the Florida panther, their distribution in this landscape is not static, nor is it contained

²⁶ Note that other adaptive management triggers are discussed in chapter 2 and related impacts are discussed in the relevant sections of the impact analysis in this chapter.

²⁷ Refer to the discussion of follow-up monitoring in step 7 for the reasoning of why five years of data is expected to be necessary to provide an accurate trend of data for triggers and implementation of supplemental management actions.

²⁸ For example, if the regression analysis shows a doubling (100% increase) in hunter days per deer harvested across the most recent five-year period in the Addition (or any other management unit), supplemental management actions would be taken (as discussed in the “Supplemental Management Actions” section, such as decreasing the number of quota permits issued by 50% (or more/less, as appropriate) and/or decreasing season lengths and bag limits and/or placing further restrictions on the legal methods of take.

within any specific management unit or within the Preserve boundaries. As a result, additional variables and stressors may cause changes in panther distribution, use, and occupancy of an area that may be unrelated to any potential effects of hunting activities. Aside from the behavioral change noted by Janis and Clark (2002), there have been no studies that demonstrate a measurable effect of deer hunting on panthers. This is not due to a lack of information on hunting and panthers; rather, it is due to the multitude of stressors that simply cannot be isolated to determine which stressor is the cause of a noted effect. Both Janis and Clark (2002) and Fletcher and McCarthy (2011) surmised that hydrology may play a role in panther movements throughout the hunting season resulting in the noted movement away from trails. Therefore, using panther numbers or distribution to assess the effects of deer hunting activities is not likely to further inform management decisions. Because the panther is the predator in the predator/prey relationship, any measurable response would be delayed as the population responds to changes in the prey population. There is also the potential to have other stressors, such as epizootic events, affect the panther population while leaving the deer population untouched. The panther's preferred prey items are white-tailed deer and feral hogs (Maehr et al. 1990, Dalrymple and Bass 1996). Since recent data has shown that feral hogs are nearly extirpated from the Preserve, factors relating to the deer population were determined to be the best indicator for decision-making regarding supplemental management actions for protection of the Florida panther population.

If any of the adaptive management triggers are documented by the monitoring data, then appropriate and necessary supplemental management actions would be implemented as part of the adaptive framework.

The supplemental management actions that could be taken if triggers 1, 2, or 3 occur include, but are not limited to:

- implementing a scientific study to better inform decisions

- increasing or decreasing bag limits (number of animals allowed to be harvested)
- increasing or decreasing season lengths
- increasing or decreasing the number of quota permits issued
- increasing or decreasing antler restrictions (age of allowable harvest of deer)
- modifying legal methods of take (type of firearms or archery equipment allowed)
- implementing season or unit closures to harvest²⁹

The supplemental management action that could be taken if trigger 3 occurs includes, but is not limited to:

- implementing emergency restrictions or closures to harvest due to high water events, hurricanes, or other emergency situations³⁰

Additional supplemental management actions could be taken if other triggers occur (not related to the white-tailed deer population), which are discussed in the "Visitor Use and Experience/Recreational Opportunities" section of the impact analysis in this chapter.

Implementing these supplemental management actions in a more restrictive/limiting approach (e.g., decreasing bag limits, decreasing season lengths, decreasing quota permits, restricting certain legal methods of take, etc.) would likely result in a directly beneficial effect on protected

²⁹ For units that have been closed to hunting through the adaptive management process, harvest data from adjacent units would be used in combination with all available monitoring data from that unit to conduct a surrogate analysis to make management decisions on these units (i.e., whether to continue closures or reopen units that have been closed to hunting), since no harvest data would be available during the years that the units are closed to hunting.

³⁰ For units that have been closed to hunting through the adaptive management process, harvest data from adjacent units would be used in combination with all available monitoring data from that unit to conduct a surrogate analysis to make management decisions on these units (i.e., whether to continue closures or reopen units that have been closed to hunting), since no harvest data would be available during the years that the units are closed to hunting.

wildlife species, especially the Florida panther, by reducing the take of game species and the associated disturbance of habitat by hunters. Whereas, implementing these supplemental management actions in a less restrictive/limiting approach (e.g., increasing bag limits, increasing season lengths, increasing quota permits, allowing additional legal methods of take, etc.) would likely result in a directly adverse effect on protected wildlife species, especially the Florida panther, by increasing the take of game species and the associated disturbance of habitat by hunters. Additionally, implementing emergency restrictions or closures would likely result in a directly beneficial effect on protected wildlife species, especially the Florida panther, by reducing the overall take of game species and the associated disturbance of habitat by hunters.

Any combination of these supplemental management actions would continue to be implemented in an increasingly restrictive adaptive management approach until follow-up monitoring data (as discussed in step 7 of the adaptive management process in chapter 2) shows that the adaptive management objectives outlined in step 2 of the adaptive management process in chapter 2 are being met.

As previously noted in chapter 2, if additional actions are required, which have not been analyzed as part of the impact analysis in this document, additional impacts analyses, and if applicable, NEPA compliance documentation, would be required to implement the proposed actions.

The iterative cycle of these actions would ensure that the effects of deer hunting in the Preserve are beneficial, discountable, or insignificant to the Florida panther population. Therefore, impacts to the Florida panther population would be expected to be minimized with this alternative and result in long-term, negligible to minor, adverse, regional impacts to the Florida panther.

Cumulative Impacts. Cumulative impacts from projects other than this *Hunting Management Plan* would be the same under

alternative 3 as described under alternative 1. When the likely effects of implementing the actions contained in alternative 3 are added to the effects of other past, present, and reasonably foreseeable actions as described above, there would be a long-term, moderate, beneficial cumulative impact on federally listed species and their habitat in the region, except for the Florida panther, which would have a long-term, minor, beneficial result. The actions contained in alternative 3 would not contribute any increment to the cumulative impact of other projects for the West Indian manatee, would contribute a negligible adverse increment for seven federally listed wildlife species (Cape Sable seaside sparrow, Everglade snail kite, red-cockaded woodpecker, wood stork, American crocodile, eastern indigo snake, and American alligator), and would contribute a negligible to minor adverse increment for the Florida panther.

Conclusion. Collectively, no impacts would occur to the West Indian manatee, and long-term, minor, adverse impacts to eight federally listed wildlife species (Florida bonneted bat, Cape Sable seaside sparrow, Everglade snail kite, red-cockaded woodpecker, wood stork, American crocodile, eastern indigo snake, and American alligator) would result throughout the Preserve from the selection of alternative 3. Impacts on the Florida panther from alternative 3 would be long-term, negligible to minor, and adverse throughout the Preserve.

The NPS has made a determination of “no effect” for the West Indian manatee and a determination of “may affect, not likely to adversely affect” for eight federally listed wildlife species (Florida bonneted bat, Cape Sable seaside sparrow, Everglade snail kite, red-cockaded woodpecker, wood stork, American crocodile, eastern indigo snake, and American alligator) and the Florida panther under Section 7 of the Endangered Species Act.

The NPS initiated consultation with the USFWS under Section 7 of the Endangered Species Act in a memorandum dated March 7, 2012 (see appendix I for the March 7, 2012, memorandum from the NPS to the USFWS). Subsequent to the final rule listing the Florida

bonneted bat as endangered, the NPS contacted the USFWS on January 15, 2014, to initiate consultation for this species.

The USFWS issued a memorandum to the NPS for the Hunting Management Plan under Section 7 of the Endangered Species Act on February 10, 2014. The USFWS subsequently issued a revised memorandum to the NPS for the Hunting Management Plan under Section 7 of the Endangered Species Act on April 23, 2014, which stated: "This memorandum supersedes the [USFWS] February 10, 2014, memorandum ..." Therefore, the subsequent discussion refers to the April 23, 2014, USFWS memorandum.

In the April 23, 2014, memorandum the USFWS stated the following, in part (see appendix I for the April 23, 2014, memorandum from the USFWS to the NPS):

... the NPS has determined the implementation of the [Preferred Alternative] is not likely to adversely affect the [West Indian manatee, wood stork, Everglade snail kite, Cape Sable seaside sparrow, red-cockaded woodpecker, American crocodile, and eastern indigo snake]. The [USFWS] concurs and will not consider these species further in this document.

The April 23, 2014, memorandum (see appendix I) further states the following regarding the Florida bonneted bat, in part:

... the NPS has determined the implementation of the Hunting Management Plan is not likely to adversely affect the Florida bonneted bat. The [USFWS] concurs.

The April 23, 2014, memorandum (see appendix I) further states the following regarding the Florida panther, in part:

The goal of the adaptive management framework is to ensure hunting activities do not alter the existing predator/prey relationship in [the Preserve] and,

therefore, do not have a measurable effect on the Florida panther. Based on this information, the NPS has determined effects to the Florida panther population would be expected to be minimized with the [Preferred Alternative] and result in long-term, negligible to minor, adverse, regional effects to the Florida panther (NPS 2013). As stated in the Hunting Management Plan, this level of effects equates to a determination that implementation of the [Preferred Alternative] "may affect, but is not likely to adversely affect" the Florida panther. Based on this information, the [USFWS] concurs.

The goal of the adaptive management framework is to ensure hunting activities do not alter the existing predator/prey relationship in [the Preserve] and, therefore, do not have a measurable effect on the Florida panther. As actions that result in harm or harassment of panthers would be measurable, and the analysis indicates these types of effects are not likely to occur, we anticipate harm or harassment of panthers would not occur with implementation of the [Preferred Alternative]. As stated earlier, the potential harassment effects of ORV use have been addressed in prior, formal consultations and, as such, are not included in this consultation. Based on this information, the NPS has determined effects to the Florida panther population would be expected to be minimized with the [Preferred Alternative] and result in long-term, negligible to minor, adverse, regional effects to the Florida panther (NPS 2013). As the NPS stated in the Hunting Management Plan, this level of effects equates to a determination that implementation of the [Preferred Alternative] "may affect, but is not likely to adversely affect" the Florida panther. Based on this information, the [USFWS] concurs.

Additionally, it is important to note that the USFWS did not evaluate the American alligator as part of its Section 7 consultation with the NPS under the Endangered Species

Act since this species is only listed due to similarity of appearance with the American crocodile, for which the USFWS concurred with the NPS' finding.

Concluding, the April 23, 2014, memorandum (see appendix I) states the following, in part:

The [USFWS] supports selection of Alternative 3, of the [Preferred Alternative], due to its inclusion of an adaptive management strategy in making decisions regarding hunting activities within [The Preserve]. We believe the [Preferred Alternative] offers the best use of science in decision-making and creates a cooperative atmosphere between NPS, the FWC, and the [USFWS]. Adaptive management focuses on learning and adapting, through partnerships of managers, scientists, and other stakeholders who learn together how to create and maintain sustainable resource systems (Williams et al., 2009). The adaptive management strategy and decision-making framework will ensure the best science is used to formulate decisions regarding hunting in [The Preserve] and the needs of threatened or endangered species like the Florida panther are adequately considered in those decisions. This letter fulfills the requirements of section 7 of the Act and further action is not required ...

WILDLIFE – MAJOR GAME SPECIES

Of the 13 game species in the Preserve, white-tailed deer, wild turkey, and feral hogs require special management consideration because of their importance to recreational hunters. The white-tailed deer is the most important game species in the Preserve in addition to being the most common prey item for the Florida panther (NPS 2010a). Feral hogs are second to deer in importance as game animals and serve as a secondary food item for the Florida panther (NPS 2010a); however, recent data has shown that feral hogs are likely nearly extirpated from the Preserve. Wild turkeys are also taken occasionally as an opportunistic prey resource for the Florida panther and are

one of the principal game animals in the area (NPS 2010a).

This section addresses the potential consequences of the proposed actions and alternatives to white-tailed deer, feral hogs, and wild turkey, which are considered together for the purposes of this impact analysis. The major game species included as part of this analysis that occur on the Preserve are outlined in “Chapter Three: Affected Environment.” The thresholds for evaluating impacts on major game species are defined in table 4-1, located at the beginning of this chapter.

Alternative 1 – No Action – Apply Current Management to the Addition

Analysis. Under alternative 1, the no action alternative, the preferred alternative from the Addition GMP (NPS 2010a) would be implemented and hunting would be permitted in the entire Preserve. Within the original Preserve boundaries, hunting would continue as currently managed; within the Addition, hunting would be permitted and managed through the existing framework. Impacts throughout the Preserve would be similar in nature; however, the intensity of impacts could be expected to be greater in the Addition since hunting has not taken place in this area since the acquisition of the lands by the NPS.

The lands in the Addition would be expected to be incorporated into the Big Cypress WMA, and hunting regulations would be applied according to the current requirements, seasons, season limits, and bag limits in the original Preserve. Within the original Preserve, the impacts to major game species would be minor and adverse; in the Addition, the impacts would be minor to moderate and adverse. These impacts would be long-term and consist of repeated short-term direct impacts from hunter take and from human use such as flushing and short-term displacement, etc. Flushing and short-term displacement would be expected to occur only to individual species in localized areas for short periods of time while hunters are in the area. This effect

would not be expected to be observable or measurable for any extended period of time once hunters have left the area.

While hunting can serve as an effective wildlife management tool, the impacts from hunter take would be considered to be minor to moderate and adverse under this alternative. That is, the repeated removal of individual specimens of major game species from the populations in the Preserve (including the Addition, where these species are not currently being removed from the ecosystem by hunting activities) might result in a detectable change in the overall game populations in the Preserve. Such effects could include changes in the abundance or distribution of local game populations but not changes that would be expected to have any effect on the viability of regional game populations or ecological processes. Since hunting management protocol could not be adaptively managed based on annual population numbers and hunter take, it would be difficult to make a timely change in hunting regulations if it was determined by the NPS and FWC that the game populations had dropped below a sustainable level as a result of hunting pressure combined with predation pressure from the Florida panther.

The major game species as well as small game species and migratory birds could be impacted by indirect adverse effects resulting from direct lead-based ammunition ingestion or ingestion of water/soil contaminated by dissolved lead from lead-based ammunition. The effects would be minor since only a portion of hunters in the Preserve use lead-based ammunition and hunters are dispersed over a large acreage. Due to these factors, the effects to these species resulting from the use of lead-based ammunition for hunting under this alternative would be expected to occur only on rare occasions to individual specimens and therefore be discountable (i.e., not able to be meaningfully measured, detected, or evaluated) in terms of species populations and the greater area of the Preserve. Under current hunting regulations, lead-based ammunition is prohibited for duck, geese, and coot hunting. In March 2009, the NPS began to research ways to reduce its own use of lead-based ammunition in units of the national park

system. In addition, the NPS is currently cooperating with the Association of Fish and Wildlife Agencies in efforts to bring hunters, anglers, and various interests together to determine the need for and nature of any needed management approaches to use of lead ammunition and lead fishing tackle. The Preserve would comply with any future changes in NPS policy regarding the use of lead-based ammunition for hunting in the Preserve, further reducing the potential for impacts.

Long-term, moderate, beneficial effects would result from harvesting and management of game populations, such as disease mitigation and improvements in the diversity of population genetics. The NPS partnership with the FWC would continue and would contribute to the monitoring and improved understanding of these game populations. These actions could be expected to result in clearly detectable positive changes in game populations in the Preserve, observed in the long-term through monitoring data.

Long-term, minor, adverse impacts to major game species within the original Preserve and long-term, minor to moderate, adverse impacts in the Addition would accrue from hunter take, flushing and short-term displacement, and lead-based ammunition exposure from the selection of alternative 1.

Cumulative Impacts. Implementation of the preferred alternative in the Addition GMP approved development of a maximum of 130 miles of ORV trails³¹ that would fragment native habitat and degrade natural conditions in certain areas of the Addition. Impacts would be reduced by the use of a designated trail system, thereby limiting impacts to major game species. Impacts would be long-term, moderate, and adverse for the major game species in the Preserve.

³¹ The Addition GMP is the document which guides the number of miles of trails that would be developed in the Addition as well as the number of ORV permits that would be issued for use of those trails. Any future changes to the Addition GMP would supersede the information in this document regarding trails and ORV permits in the Addition.

Implementation of the 2000 *Recreational Off-road Vehicle Management Plan* within the original Preserve would have a beneficial effect on game species. Since ORVs are currently permitted in the original Preserve, implementation of this plan would limit the use of these ORVs to the trail system, thereby reducing current impacts to game species and their habitat, such as flushing and displacement of animals, and trampling, injury, or loss of vegetation. The impact would be long-term, minor to moderate, beneficial, and localized.

The *Resource Management Plan* (NPS 2001) is designed to serve as a framework for resource management and protection of the Preserve, as outlined in the enabling legislation. The *Land Protection Plan* (NPS 1991c) identifies what lands or interests are required for federal ownership to achieve the purposes of the Preserve. The *Water Resources Management Plan* (NPS 1996) provides a basis for understanding and hydrologically-sound management of water resources in the Preserve. While the NPS does not manage habitat specifically for game species in the Preserve, as the purpose of these plans are focused on the management and protection of resources in the Preserve, in accordance with the enabling legislation, these plans would likely still have long-term, moderate to major, beneficial effects on natural resources in the Preserve, which would likely benefit game species populations.

The *Big Cypress National Preserve Fire Management Plan* (NPS 2010d) outlines a comprehensive fire program for achieving the Preserve goals for protection of life, property, and ecosystem management. This plan serves to protect visitors, staff, and property at the Preserve while also utilizing prescribed fire for ecosystem management at the Preserve. As mentioned above, while the NPS does not manage habitat specifically for game species in the Preserve, this plan would likely still have long-term, moderate, beneficial effects on natural resources in the Preserve, which would likely benefit game species populations.

The *Interagency Florida Panther Response Plan*, *Florida Panther Recovery Plan*, and

Florida Panther National Wildlife Refuge Comprehensive Conservation Plan would all be expected to have a long-term beneficial impact on the Florida panther population in the south Florida region. These plans would lead to improved monitoring and management, increased public education, and a better understanding of the Florida panther population in south Florida. Since these plans are expected to contribute to the further recovery of the Florida panther population and the major game species in the Preserve also serve as the main food items for the panther, these plans would be anticipated to have a long-term, minor, adverse impact on game species because of the additional pressure from panther predation.

The NPS *South Florida and Caribbean Parks Exotic Plant Management Plan* (NPS 2010b) outlines the management of nonnative plants in nine south Florida and Caribbean parks, including the Preserve. The plan promotes restoration of native plant communities and habitat conditions in ecosystems that have been invaded by nonnative plants and protects resources, values, visitors, staff, and area residents from adverse effects resulting from nonnative plant presence and control activities. Implementation of this plan in the Preserve would have a long-term, moderate, beneficial effect on game species and their habitat in the Preserve.

Numerous regional ecosystem restoration plans and projects are in various stages of completion throughout the south Florida region. The plans and projects would improve sheet flow and hydrologic connectivity, which would affect plant communities and would likely improve plant vigor, abundance, and spatial pattern. The impact of these efforts on game species and their habitat would be expected to be long-term, minor to moderate, and beneficial.

Both *Report M-621, Water Management Plan: Turner River Restoration* (NPS 1980) and the *Ochopee Sheetflow Restoration Plan* (NPS 2013a) propose hydrological restoration of areas within and around the Preserve. As mentioned above, while the NPS does not manage habitat specifically for game species in

the Preserve, similar to the regional ecosystem restoration plans and projects discussed above, the actions contained within these plans would have long-term, moderate, beneficial effects on natural resources, which would likely benefit game species populations.

Implementation of future oil and gas proposals could have adverse impacts on game species and their habitat. If such proposals included using off-road equipment and constructing roads and pads, this would alter natural habitats and cause flushing and displacement of animals. The impacts of these activities would be reduced because NPS approval of the operations plan would require mitigation measures. Short-term impacts on game species and their habitat would be adverse, moderate, and localized; long-term impacts would be adverse, minor, and localized.

Regional growth and development is expected to continue and result in an increase in the conversion of natural lands to development in the general area. Increasing urbanization, fragmentation of habitat, and the loss of natural areas have led to the degradation of natural resources and ecosystem function in the region. The impact of these activities on game species and their habitat is expected to be long-term, moderate, and adverse.

Collectively, beneficial impacts on game species and their habitat would accrue from implementation of the *Resource Management Plan*, *Land Protection Plan*, *Water Resources Management Plan*, and *Fire Management Plan*; ecosystem restoration projects; and ORV management in the original Preserve. Adverse impacts would be expected from creation of ORV trails in the Addition, implementation of Florida panther plans and projects, future oil and gas operations, and regional growth and development projects. Overall, the projects discussed above would have a beneficial effect on game species and their habitat in the region due to the anticipated benefits from regional ecosystem restoration projects.

When the likely effects of implementing the actions contained in alternative 1 are added to the effects of other past, present, and reasonably foreseeable actions as described

above, there would be a long-term, moderate, beneficial cumulative impact on game species and their habitat in the region. The actions contained in alternative 1 would contribute a minor to moderate adverse increment to the cumulative impact of other projects.

Conclusion. Collectively, impacts to game species and their habitat from alternative 1 would be long-term, minor, and adverse within the original Preserve and long-term, minor to moderate, and adverse in the Addition.

Alternative 2 – No Hunting in the Addition

Analysis. Under alternative 2, the environmental baseline alternative, current hunting management would continue in the original Preserve and there would continue to be no public hunting in the Addition.

Within the original Preserve, impacts would be the same as those described under alternative 1. Long-term, moderate, beneficial effects would result from harvesting and management of game populations, such as disease mitigation and improvements in the diversity of population genetics. The NPS partnership with the FWC would continue and would contribute to the monitoring and improved understanding of these game populations. Long-term, minor, adverse impacts to major game species would accrue from hunter take, flushing and short-term displacement, and lead-based ammunition exposure from the selection of alternative 2.

In the Addition, no direct or indirect short- or long-term adverse impacts to game species or their habitat would occur with implementation of this alternative.

Cumulative Impacts. Cumulative impacts from projects other than this *Hunting Management Plan* would be the same under alternative 2 as described under alternative 1. When the likely effects of implementing the actions contained in alternative 2 are added to the effects of other past, present, and

reasonably foreseeable actions as described above, there would be a long-term, moderate, beneficial cumulative impact on game species and their habitat in the region. The actions contained in alternative 2 would contribute a minor to moderate adverse increment to the cumulative impact of other projects.

Conclusion. Collectively, impacts to game species and their habitat from alternative 2 would be long-term, minor, and adverse within the original Preserve; in the Addition, no direct or indirect short- or long-term adverse impacts to game species or their habitat would occur with implementation of this alternative.

Alternative 3 – New Adaptive Management Strategy

Analysis. Under alternative 3, hunting would be managed in the entire Preserve through a science-based adaptive management process. The lands in the Addition would be expected to be incorporated into the Big Cypress WMA, and hunting would be cooperatively managed by the NPS and FWC, in consultation with the USFWS. Under this alternative, the adaptive management goals outlined in chapter 2 would be used in conjunction with the “Supplemental Management Actions” discussed in chapter 2 by the NPS and FWC, in consultation with the USFWS, to manage hunting in the Preserve. The goals would be reviewed on an ongoing basis by NPS and FWC, in consultation with the USFWS, and changes made as necessary based on changing ecological conditions, monitoring data, and/or public input.

One of the objectives of the adaptive management strategy, as discussed in chapter 2, is “a sustainable deer population in the Preserve, which ensures that the effects of hunting in the Preserve are beneficial, discountable, or insignificant to the Florida panther population.” With the implementation of alternative 3, this objective would be achieved through an iterative adaptive management cycle of baseline management actions, monitoring, triggers, supplemental management actions, and additional

monitoring (refer to the description of alternative 3 in chapter 2 for specific details of the adaptive management process).

Under alternative 3, the NPS would undertake the following baseline management actions in relation to major game species to achieve the adaptive management objectives³²:

- Monitor hunter success rates for the white-tailed deer population in the Preserve (as described in the “Elements Common to All Alternatives, White-Tailed Deer Monitoring” section in chapter 2 and further detailed in step 5 of the adaptive management process described in chapter 2).

The occurrence of one or more of the following conditions related to major game species would trigger implementation of additional management actions (in addition to those baseline actions listed above)³³:

1. A doubling (100% increase) or halving (50% decrease) trend in hunter days per deer harvested across the most recent five-year period³⁴ for each management unit. To determine significant trend, a regression analysis will be performed on the harvest data³⁵.

³² Note that other adaptive management objectives are discussed in chapter 2 and related impacts are discussed in the relevant sections of the impact analysis in this chapter.

³³ Note that other adaptive management triggers are discussed in chapter 2 and related impacts are discussed in the relevant sections of the impact analysis in this chapter.

³⁴ Refer to the discussion of follow-up monitoring in step 7 for the reasoning of why five years of data is expected to be necessary to provide an accurate trend of data for triggers and implementation of supplemental management actions.

³⁵ For example, if the regression analysis shows a doubling (100% increase) in hunter days per deer harvested across the most recent five-year period in the Addition (or any other management unit), supplemental management actions would be taken (as discussed in the “Supplemental Management Actions” section, such as decreasing the number of quota permits issued by 50% (or more/less, as appropriate) and/or decreasing season lengths and bag limits and/or placing further restrictions on the legal methods of take.

2. A doubling (100% increase) or halving (50% decrease) trend in total deer harvest across the entire Preserve (total number of deer harvested from the Preserve), provided that changes in harvest regulations over time are considered. To determine significant trend, a regression analysis will be performed on all available harvest data.
3. An emergency situation, such as a hurricane, high water event, or other unknown or undocumented acute situation that involves major resource impacts, as outlined in NPS policy.

If either adaptive management trigger 1 or 2 listed above are documented by the monitoring data, then appropriate and necessary supplemental management actions would be implemented as part of the adaptive framework. These supplemental management actions include, but are not limited to:

- implementing a scientific study to better inform decisions
- increasing or decreasing bag limits (number of animals allowed to be harvested)
- increasing or decreasing season lengths
- increasing or decreasing the number of quota permits issued
- increasing or decreasing antler restrictions (age of allowable harvest of deer)
- modifying legal methods of take (type of firearms or archery equipment allowed)

If adaptive management trigger 3 listed above occurs, then appropriate and necessary supplemental management actions would be implemented as part of the adaptive framework, including but not limited to:

- implementing emergency restrictions or closures to harvest due to high water events, hurricanes, or other emergency situations

Additional supplemental management actions could be taken if the other triggers occur (not related to the white-tailed deer population), which are discussed in the “Visitor Use and

Experience/Recreational Opportunities” section of the impact analysis in this chapter.

Implementing these supplemental management actions in a more restrictive/limiting approach (e.g., decreasing bag limits, decreasing season lengths, decreasing quota permits, restricting certain legal methods of take, etc.) would likely result in a directly beneficial effect on the white-tailed deer by reducing take and the associated disturbance of habitat by hunters. Whereas, implementing these supplemental management actions in a less restrictive/limiting approach (e.g., increasing bag limits, increasing season lengths, increasing quota permits, allowing additional legal methods of take, etc.) would likely result in a directly adverse effect on the white-tailed deer by increasing take and the associated disturbance of habitat by hunters. Additionally, implementing emergency restrictions or closures would likely result in a directly beneficial effect on the white-tailed deer by reducing overall take and the associated disturbance of habitat by hunters.

Any combination of these supplemental management actions would continue to be implemented in an increasingly restrictive adaptive management approach until follow-up monitoring data (as discussed in step 7 of the adaptive management process in chapter 2) shows that the adaptive management objectives outlined in step 2 of the adaptive management process in chapter 2 are being met.

As previously noted in chapter 2, if additional actions are required, which have not been analyzed as part of the impact analysis in this document, additional impacts analyses, and if applicable, NEPA compliance documentation, would be required to implement the proposed actions.

Allowing hunting in the entire Preserve under this science-based adaptive management framework would be expected to have long-term, moderate, beneficial effects on the white-tailed deer population. The iterative cycle of these actions could be expected to result in clearly detectable positive changes in

the deer population in the Preserve, observed in the long-term through monitoring data, while ensuring that the effects of deer hunting in the Preserve are beneficial, discountable, or insignificant to the Florida panther population.

Similar to alternative 1, long-term, moderate, beneficial effects would result from harvesting and management of game populations, such as disease mitigation and improvements in the diversity of population genetics. The partnership between the NPS, FWC, and USFWS established through the adaptive management process would contribute to the monitoring and improved understanding of these game populations. These actions could be expected to result in clearly detectable positive changes in game populations in the Preserve, observed in the long-term through monitoring data.

Similar to alternative 1, long-term, minor, adverse impacts to major game species, except the white-tailed deer population, within the original Preserve and long-term, minor to moderate, adverse impacts in the Addition would accrue from hunter take, flushing and short-term displacement, and lead-based ammunition exposure from the selection of alternative 3.

Collectively, long-term beneficial effects would accrue for the white-tailed deer population from science-based adaptive management of hunting in the entire Preserve and from harvesting and management of game populations (e.g., disease mitigation, genetic population diversification). Long-term (repeated short-term) adverse impacts would result from human use causing flushing and displacement of animals and from lead-based ammunition exposure.

Cumulative Impacts. Cumulative impacts from projects other than this *Hunting Management Plan* would be the same under alternative 3 as described under alternative 1. When the likely effects of implementing the actions contained in alternative 3 are added to the effects of other past, present, and reasonably foreseeable actions as described above, there would be a long-term, moderate,

beneficial cumulative impact on game species and their habitat in the region. The actions contained in alternative 3 would contribute a moderate beneficial increment to the cumulative impact of other projects.

Conclusion. Collectively, impacts to game species and their habitat, except the white-tailed deer, from alternative 3 would be long-term, minor, and adverse within the original Preserve and long-term, minor to moderate, and adverse in the Addition. Impacts to the white-tailed deer and their habitat from alternative 3 would be long-term, moderate, and beneficial throughout the Preserve.

WILDLIFE – NONNATIVE/INVASIVE WILDLIFE SPECIES

This section addresses the potential consequences of the proposed actions and alternatives from nonnative invasive wildlife species, which are considered together for the purposes of this impact analysis. Nonnative wildlife species include invertebrate species such as the red imported fire ant (*Solenopsis invicta*) and the Mexican bromeliad weevil (*Metamasius callizona*) as well as vertebrate species such as the feral hog, Burmese python, and fish (walking catfish, spotted tilapia, oscar, etc.). Although feral hogs are considered nonnative invasive wildlife, this species was addressed in the major game species section due to its status as a game species for recreational hunting as well as its importance as a prey item for the endangered Florida panther. Nonnative wildlife species included as part of this analysis can be found on the Preserve as outlined in “Chapter Three: Affected Environment.” The thresholds for evaluating impacts from nonnative wildlife species are defined in table 4-1, located at the beginning of this chapter.

Alternative 1 – No Action – Apply Current Management to the Addition

Analysis. Under alternative 1, the no action alternative, the preferred alternative from the Addition GMP (NPS 2010a) would be

implemented and hunting would be permitted in the entire Preserve. Within the original Preserve boundaries, hunting would continue as currently managed; within the Addition, hunting would be permitted and managed through the existing framework. Impacts throughout the Preserve would be similar in nature; however, the intensity of impacts could be expected to be greater in the Addition since hunting has not taken place in this area since the acquisition of the lands by the NPS.

The impacts from nonnative species would consist of potential spread of invertebrate species throughout areas of the Preserve where hunters trek. These impacts would be long-term (repeated short-term direct impacts while hunters are in the area), negligible, and adverse. Such dispersal would be expected to be limited to individual species in limited areas over a large landscape and would not be expected to result in the establishment of any new populations in the Preserve; this change would likely not be measurable and would not be likely to have any effect on the viability of local native wildlife populations. Additionally, no impacts would be expected in regards to nonnative, invasive vertebrate or fish species.

Long-term, negligible, adverse impacts from nonnative wildlife species would result throughout the Preserve from the selection of alternative 1.

Cumulative Impacts. Implementation of the preferred alternative in the Addition GMP approved development of a maximum of 130 miles of ORV trails³⁶ that would fragment native habitat and degrade natural conditions in certain areas of the Addition. While impacts would be reduced by the use of a designated trail system, the use of ORVs in the Addition would most likely contribute to the spread of nonnative, invasive, invertebrate species.

³⁶ The Addition GMP is the document which guides the number of miles of trails that would be developed in the Addition as well as the number of ORV permits that would be issued for use of those trails. Any future changes to the Addition GMP would supersede the information in this document regarding trails and ORV permits in the Addition.

Impacts to native wildlife populations would be long-term, negligible, and adverse.

Implementation of the 2000 *Recreational Off-road Vehicle Management Plan* within the original Preserve would have a beneficial effect on native wildlife populations in reference to nonnative invasive wildlife. Since ORVs are currently permitted in the original Preserve, implementation of this plan would limit the use of these ORVs to the trail system, thereby reducing current impacts. The impact to native wildlife populations would be long-term, negligible, beneficial, and localized.

The *Resource Management Plan* (NPS 2001) is designed to serve as a framework for resource management and protection of the Preserve, as outlined in the enabling legislation. The *Land Protection Plan* (NPS 1991c) identifies what lands or interests are required for federal ownership to achieve the purposes of the Preserve. As the purpose of these plans are focused on the management and protection of resources in the Preserve, in accordance with the enabling legislation, these plans would have long-term, minor to moderate, beneficial effects on native wildlife populations in the Preserve.

Numerous regional ecosystem restoration plans and projects are in various stages of completion throughout the south Florida region. The plans and projects would improve sheet flow and hydrologic connectivity, which would affect plant communities and would likely improve plant vigor, abundance, and spatial pattern. The impact of these efforts on native wildlife populations would be long-term, minor to moderate, and beneficial from the control of nonnative invasive wildlife species.

Implementation of future oil and gas proposals could have adverse impacts on native wildlife populations from the spread of nonnative invasive wildlife species; however, it is unknown what invasive wildlife species would be affected. If such proposals included using off-road equipment and constructing roads and pads, this would alter vegetation. The impacts of these activities would be reduced because NPS approval of the operations plan

would require mitigation measures. Long-term impacts on native wildlife populations from the spread of nonnative invasive wildlife species would be adverse, negligible, and localized.

Regional growth and development is expected to continue and result in an increase in the conversion of natural lands to development in the general area. Increasing urbanization, fragmentation of habitat, and the loss of natural areas have led to the degradation of natural resources and ecosystem function in the region. The impact of these activities on native wildlife population from nonnative invasive wildlife species is expected to be long-term, minor, and adverse.

Collectively, beneficial impacts to native wildlife populations from the control of nonnative invasive wildlife would accrue from implementation of the *Resource Management Plan* and *Land Protection Plan*, ecosystem restoration projects, and implementation of ORV management in the original Preserve. Adverse impacts would be expected from creation of ORV trails in the Addition, future oil and gas operations, and regional growth and development projects. Overall, the projects discussed above would have a long-term, minor, beneficial effect of native wildlife populations from the control of nonnative invasive wildlife species in the region, due to the anticipated benefits from regional ecosystem restoration projects, which would be slightly reduced by regional growth and development.

When the likely effects of implementing the actions contained in alternative 1 are added to the effects of other past, present, and reasonably foreseeable actions as described above, there would be a long-term, minor, beneficial cumulative impact to native wildlife species from the control of nonnative invasive wildlife species in the region. The actions contained in alternative 1 would contribute a negligible, adverse increment to the cumulative impact of other projects.

Conclusion. Collectively, impacts to native wildlife populations from nonnative invasive wildlife species from alternative 1 would be

long-term, negligible, and adverse throughout the Preserve.

Alternative 2 – No Hunting in the Addition

Analysis. Under alternative 2, the environmental baseline alternative, current hunting management would continue in the original Preserve and there would continue to be no public hunting in the Addition. Within the original Preserve, impacts would be the same as those described under alternative 1. Long-term, negligible, adverse impacts from nonnative wildlife species would result from the selection of alternative 2.

In the Addition, no direct or indirect short- or long-term adverse impacts to native wildlife species from nonnative invasive wildlife species would occur with implementation of this alternative.

Cumulative Impacts. Cumulative impacts from projects other than this *Hunting Management Plan* would be the same under alternative 2 as described under alternative 1. When the likely effects of implementing the actions contained in alternative 2 are added to the effects of other past, present, and reasonably foreseeable actions as described above, there would be a long-term, minor, beneficial cumulative impact to native wildlife species from the control of nonnative invasive wildlife species in the region. The actions contained in alternative 2 would contribute a negligible, adverse increment to the cumulative impact of other projects.

Conclusion. Collectively, impacts to native wildlife species from nonnative invasive wildlife species from alternative 2 would be long-term, negligible, and adverse within the original Preserve; in the Addition, no direct or indirect short- or long-term adverse impacts to native wildlife species from nonnative invasive wildlife species would occur with implementation of this alternative.

Alternative 3 – New Adaptive Management Strategy

Analysis. Under alternative 3, hunting would be managed in the entire Preserve through a science-based adaptive management process. The adverse impacts of this alternative from nonnative invasive wildlife species would be the same as those of alternative 1.

With this alternative the NPS and FWC, in consultation with the USFWS, would have the option of making changes to hunting management protocol if a need arises to control nonnative invasive wildlife species, as documented by monitoring data and the adaptive management triggers outlined in chapter 2. The ability to institute a hunting season (or other hunting regulations) for nonnative invasive wildlife species that pose a threat to native wildlife populations would have a long-term, minor to moderate, beneficial impact on native wildlife populations in the entire Preserve. However, additional NEPA analysis and documentation may have to be conducted to implement such measures.

Long-term, negligible, adverse impacts from nonnative wildlife species throughout the Preserve would result from the selection of alternative 3.

Cumulative Impacts. Cumulative impacts from projects other than this *Hunting Management Plan* would be the same under alternative 3 as described under alternative 1. When the likely effects of implementing the actions contained in alternative 3 are added to the effects of other past, present, and reasonably foreseeable actions as described above, there would be a long-term, minor, beneficial cumulative impact to native wildlife species from the control of nonnative invasive wildlife species in the region. The actions contained in alternative 3 would contribute a negligible adverse increment to the cumulative impact of other projects.

Conclusion. Collectively, impacts to native wildlife populations from nonnative invasive wildlife species from alternative 3 would be long-term, negligible, and adverse throughout the Preserve.

WILDERNESS CHARACTER

WILDERNESS

The Addition GMP proposed 47,067 acres of land to be designated as wilderness (NPS 2010a). The NPS is currently in the process of formally designating these lands as wilderness by legislative act. Lands identified as being suitable for wilderness designation, wilderness study areas, proposed wilderness, and recommended wilderness (including potential wilderness) must be managed to preserve the wilderness character and values in the same manner as “designated wilderness” until Congress has acted on the recommendations (NPS 2011a). Therefore, for the purpose of this impact analysis, the 47,067 acres of proposed wilderness and those lands eligible for wilderness designation [as determined by the Addition GMP (NPS 2010a)] located in the Addition were treated as designated wilderness. Direct impacts to these areas as well as impacts to the wilderness experience of visitors were considered in the impact analysis of all alternatives. The thresholds for evaluating impacts on wilderness are defined in table 4-1, located at the beginning of this chapter.

Alternative 1 – No Action – Apply Current Management to the Addition

Analysis. Under alternative 1, the no action alternative, the preferred alternative from the Addition GMP (NPS 2010a) would be implemented and hunting would be permitted in the entire Preserve, including the provision of walk-in hunting in the 47,067 acres of proposed wilderness and those lands eligible for wilderness designation [as determined by the Addition GMP (NPS 2010a)] located in the Addition. Within the original Preserve boundaries where no designated wilderness exists, hunting would continue as currently managed, and no designated wilderness would be affected. Within the 47,067 acres of proposed wilderness and those lands eligible for wilderness designation [as determined by the Addition GMP (NPS 2010a)] in the

Addition, since hunting would only be permitted via walk-in access, the impacts to the “untrammelled” quality of wilderness character would be negligible to minor. These impacts would be long-term and consist of direct impacts while hunters are in the wilderness area such as trampling vegetation and hunter take of wildlife. Effects such as trampling of native vegetation would be expected to occur to only individual specimens in sporadic areas of the Preserve where hunters walk off existing trails. These impacts would not be expected to be measurable and vegetation would be expected to fully recover each year during nonhunting seasons. Therefore, these effects would not be anticipated to have any discernible impacts on the wilderness resources or values of the area.

Impacts from hunter take could be expected to have a noticeable effect on the game populations in the Preserve under this alternative that is observable through the monitoring data (refer to the section “Wildlife – Major Game Species” earlier in this chapter for a discussion of impacts). This change in game populations could therefore have a detectable effect on the wilderness character in the area; however, it is important to note that this would only be one factor contributing to the wilderness character of an area, which may not be observable to visitors experiencing the wilderness area.

Both beneficial and adverse effects to the wilderness experience would occur for recreational visitors that chose to visit the proposed and eligible wilderness areas of the Addition. For those recreational visitors that choose to participate in hunting activities, the wilderness experience would be enhanced in the long-term by a minor and beneficial amount because of the ability to hunt in the proposed and eligible wilderness areas. For those recreational visitors that enter the wilderness to experience “opportunities for solitude and primitive and unconfined recreation,” this element of wilderness character would be adversely impacted by the

potential presence of hunters in the area and the sporadic sound of firearm shots, These impacts are anticipated to be minor, seasonal, and long-term.

No direct or indirect, short- or long-term adverse impacts to wilderness would result within the original Preserve from the selection of alternative 1. No impacts are expected to the “undeveloped” quality of wilderness character, as alternative 1 does not call for the placement of structures or installations in wilderness. Long-term, negligible to minor adverse impacts to the 47,067 acres of proposed wilderness and those lands eligible for wilderness designation [as determined by the Addition GMP (NPS 2010a)] in the Addition would result from the selection of alternative 1. Long-term, beneficial, and minor effects to the wilderness experience would be experienced by recreational visitors that participate in hunting activities in the proposed wilderness areas and areas eligible for wilderness designation. Long-term, adverse, and minor effects to the wilderness experience would be experienced by visitors that choose to participate in approved nonhunting activities in the proposed and eligible [as determined by the Addition GMP (NPS 2010a)] wilderness areas.

Cumulative Impacts. Implementation of the preferred alternative in the Addition GMP proposed 47,067 acres for wilderness designation in the Addition (66% of those lands considered eligible and 32% of the Addition’s total acreage) (NPS 2010a). No impacts would occur to these lands proposed as designated wilderness or those lands eligible for wilderness designation [as determined by the Addition GMP (NPS 2010a)]. The special status and protection afforded to these lands under the Wilderness Act would preserve their wilderness character in perpetuity – a moderate to major beneficial effect. Opportunities for solitude and primitive and unconfined recreation would continue to be preserved and available. Overall, the impacts of this designation on wilderness character are long-term, moderate, and beneficial (NPS 2010a).

The preferred alternative in the Addition GMP also approved development of a maximum of 130 miles of ORV trails³⁷ in the Addition outside of wilderness eligible areas. ORV use in areas adjacent to wilderness would adversely affect the natural soundscape of the area. Impacts would be reduced by the use of a designated trail system, thereby limiting changes to natural conditions and wilderness character outside of the trail system. Impacts would be long-term, minor, and adverse.

The *Resource Management Plan* (NPS 2001) is designed to serve as a framework for resource management and protection of the Preserve, as outlined in the enabling legislation. The *Land Protection Plan* (NPS 1991c) identifies what lands or interests are required for federal ownership to achieve the purposes of the Preserve. The *Water Resources Management Plan* (NPS 1996) provides a basis for understanding and hydrologically-sound management of water resources in the Preserve. As the purpose of these plans are focused on the management and protection of resources in the Preserve, in accordance with the enabling legislation, these plans would have long-term, moderate to major, beneficial effects on natural resources in the Preserve., which would consequently have a long-term, minor to moderate, beneficial effect on the wilderness character in the Preserve.

The *Big Cypress National Preserve Fire Management Plan* (NPS 2010d) outlines a comprehensive fire program for achieving the Preserve goals for protection of life, property, and ecosystem management. This plan serves to protect visitors, staff, and property at the Preserve while also utilizing prescribed fire for ecosystem management at the Preserve. This plan would have long-term, moderate, beneficial effects on natural resources in the Preserve, which would consequently have a

³⁷ The Addition GMP is the document which guides the number of miles of trails that would be developed in the Addition as well as the number of ORV permits that would be issued for use of those trails. Any future changes to the Addition GMP would supersede the information in this document regarding trails and ORV permits in the Addition.

long-term, minor, beneficial effect on the wilderness character in the Preserve.

Numerous regional ecosystem restoration plans and projects are in various stages of completion throughout the south Florida region. The plans and projects would improve sheet flow and hydrologic connectivity, which would affect natural communities. Restoring natural conditions is expected to have a long-term, moderate, beneficial impact on wilderness character.

Both *Report M-621, Water Management Plan: Turner River Restoration* (NPS 1980) and the *Ochopee Sheetflow Restoration Plan* (NPS 2013a) propose hydrological restoration of areas within and around the Preserve. Similar to the regional ecosystem restoration plans and projects discussed above, the actions contained within these plans would have long-term, moderate, beneficial effects on natural resources in the Preserve, which would consequently have a long-term, moderate, beneficial effect on the wilderness character in the Preserve.

Implementation of future oil and gas proposals could have adverse impacts on wilderness character. If such proposals included using off-road equipment and constructing roads and pads, this would create human disturbances and alter natural habitats. NPS approval of the operations plan would require mitigation to eliminate or reduce the impact of activities on natural resources. Short-term impacts on wilderness character would be moderate, adverse, and localized; residual long-term impacts would be minor, adverse, and localized.

Regional growth and development is expected to continue and result in an increase in the conversion of natural lands to development in the general area. Increasing urbanization, fragmentation of habitat, and the loss of natural areas have led to the degradation of natural resources, ecosystem function, and natural soundscapes in the region. The impact of these activities occurring nearby and adjacent to wilderness resources is expected to be long-term, minor, and adverse.

Collectively, beneficial impacts on wilderness character would accrue from implementation of the *Resource Management Plan, Land Protection Plan, Water Resources Management Plan, and Fire Management Plan*; regional ecosystem restoration projects; implementation of the wilderness plan in the Addition GMP; and implementation of the *Exotic Plant Management Plan*. Adverse impacts associated with ORV use would be expected from implementation of the preferred alternative in the Addition GMP. Adverse impacts would be expected from oil and gas operations and regional growth and development. Overall, the projects discussed above would likely be beneficial to wilderness character in the region, due to the anticipated benefits from regional ecosystem restoration projects.

When the likely effects of implementing alternative 1 are added to the effects of other past, present, and reasonably foreseeable actions as described above, there would be a long-term, minor, beneficial cumulative impact on wilderness character in the region. Alternative 1 would contribute a negligible to minor adverse increment to the cumulative impact of other projects.

Conclusion. Collectively, impacts on wilderness character from alternative 1 would be long-term, negligible to minor, and adverse within the 47,067 acres of proposed wilderness and those lands eligible for wilderness designation [as determined by the Addition GMP (NPS 2010a)].

Alternative 2 – No Hunting in the Addition

Analysis. Under alternative 2, the environmental baseline alternative, no direct or indirect short- or long-term adverse impacts to designated wilderness or lands eligible for wilderness designation [as determined by the Addition GMP (NPS 2010a)] would occur with implementation of the alternative. Within the original Preserve boundaries where no designated wilderness exists, hunting would continue as currently

managed, and no designated wilderness would be affected. Within the Addition, the 47,067 acres of proposed wilderness and those lands eligible for wilderness designation [as determined by the Addition GMP (NPS 2010a)] would be protected from any potential hunting impacts since hunting in the Addition is prohibited under this alternative. Additionally, nonhunting visitors would be able to continue to enjoy the wilderness experience unhindered by potential hunting impacts.

No direct or indirect short- or long-term adverse impacts to wilderness would result from the selection of alternative 2. No impacts are expected to the “undeveloped” quality of wilderness character, as alternative 2 does not call for the placement of structures or installations in wilderness.

Cumulative Impacts. Cumulative impacts from projects other than this *Hunting Management Plan* would be the same under alternative 2 as described under alternative 1. When the likely effects of implementing alternative 2 are added to the effects of other past, present, and reasonably foreseeable actions as described above, there would be a long-term, minor, beneficial cumulative impact on wilderness character in the region. Alternative 2 would not contribute any adverse or beneficial effects to this cumulative impact.

Conclusion. No direct or indirect short- or long-term adverse impacts on wilderness character would result from alternative 2.

Alternative 3 – New Adaptive Management Strategy

Analysis. Under alternative 3, hunting would be managed in the entire Preserve through a science-based adaptive management process. Walk-in hunting would be permitted in the 47,067 acres of proposed wilderness and those lands eligible for wilderness designation [as determined by the Addition GMP (NPS 2010a)] located in the Addition. The impacts of this alternative would be similar to those of alternative 1, with the exception of impacts to

the major game populations in the Preserve and their contribution to the wilderness character in the area.

No direct or indirect, short- or long-term adverse impacts to wilderness character would result within the original Preserve from the selection of alternative 3. Long-term, negligible, adverse impacts to the 47,067 acres of proposed wilderness and those lands eligible for wilderness designation [as determined by the Addition GMP (NPS 2010a)] in the Addition would result from the selection of alternative 3. The impacts from hunter take of game species would be minimized by through the adaptive management process described in chapter 2. Through the reduction of impacts from hunter take of game species (refer to the section “Wildlife – Major Game Species” earlier in this chapter for a discussion of impacts), the wilderness character of the area would be better preserved under this alternative than with alternative 1.

Long-term, beneficial, and minor effects to the wilderness experience would be experienced by recreational visitors that participate in hunting activities in the proposed wilderness areas and areas eligible for wilderness designation. Long-term, adverse, and minor effects to the wilderness experience would be experienced by visitors that choose to participate in approved nonhunting activities in the proposed and eligible [as determined by the Addition GMP (NPS 2010a)] wilderness areas. No impacts are expected to the “undeveloped” quality of wilderness character, as alternative 3 does not call for the placement of structures or installations in wilderness.

Cumulative Impacts. Cumulative impacts from projects other than this *Hunting Management Plan* would be the same under alternative 3 as described under alternative 1. When the likely effects of implementing alternative 3 are added to the effects of other past, present, and reasonably foreseeable actions as described above, there would be a long-term, minor, beneficial cumulative impact on wilderness character in the region. Alternative 3 would contribute a negligible to

minor adverse increment to the cumulative impact of other projects.

Conclusion. Collectively, impacts on wilderness character from alternative 3 would be long-term, negligible to minor, and adverse within the 47,067 acres of proposed wilderness and those lands eligible for wilderness designation [as determined by the Addition GMP (NPS 2010a)].

NPS MANAGEMENT AND OPERATIONS

PRESERVE MANAGEMENT AND OPERATIONS

The impact analysis for Preserve management and operations evaluated the effects of the alternatives on NPS operations at the Preserve, including all six management divisions (administrative, interpretation, maintenance, resource management, resource and visitor protection, and fire and aviation). Since none of the alternatives involve any new facilities or changes to existing facilities, the analysis focused on how NPS staffing and operations might be impacted by the alternatives. Staffing resources of FWC staff assigned to hunting management and enforcement at the Preserve were also considered in the analysis. The analysis is qualitative rather than quantitative because of the nature of the alternatives. Consequently, professional judgment was used to reach reasonable conclusions as to the intensity, duration, and type of potential impact. The thresholds for evaluating impacts on Preserve management and operations are defined in table 4-1, located at the beginning of this chapter.

Alternative 1 – No Action – Apply Current Management to the Addition

Analysis. Under alternative 1, the no action alternative, the preferred alternative from the Addition GMP (NPS 2010a) would be implemented and hunting would be permitted in the entire Preserve and managed through the existing framework.

The existing hunting management framework (i.e., *NPS/FWC Cooperative Partnership Agreement*) would be used to manage hunting in the original Preserve. Existing management (i.e., managing hunting in the original Preserve and enforcing hunting prohibition in the Addition) places a long-term, minor, adverse impact on Preserve management and operations. The effects of this change could potentially be detectable by individual Preserve staff but would be of a magnitude

that would not have any appreciable effect on Preserve operations and management.

This alternative would add 147,000 acres of land in the Addition to hunting areas in the Preserve, which would require management. This could place an additional burden on top of the current demands on existing enforcement staff from the NPS and FWC to enforce hunting regulations; however, it is currently necessary to enforce the prohibition of hunting in the area, so impacts to staffing would be expected to be negligible. That is, the effect of this change would be expected to be at or below the level of detection by Preserve staff and management and would not have any appreciable effect on Preserve operations and management. Consequently, this would not be expected to result in any adverse impacts to Preserve management and operations.

Under this alternative, the existing management framework would be utilized for the entire Preserve, which would continue to cause long-term, minor, adverse impacts to Preserve management and operations. The impacts of managing an additional 147,000 acres (the Addition) of hunting area in the Preserve to NPS staff resources would be neutral due to the fact that the prohibition of hunting in these areas currently has to be enforced anyway.

Cumulative Impacts. Implementation of various existing plans and projects in the Preserve, such as the Addition GMP (NPS 2010a), 2000 *Recreational ORV Management Plan*, *Resource Management Plan* (NPS 2001), *Land Protection Plan* (NPS 1991c), *Water Resources Management Plan* (NPS 1996), *Fire Management Plan* (NPS 2010d), *Commercial Services Plan* (NPS 2009), *South Florida and Caribbean Parks Exotic Plant Management Plan* (NPS 2010b), and *South Florida/Caribbean Network Vital Signs Monitoring Plan* (NPS 2008) would have a long-term and adverse impact on Preserve management and operations due to the additional time and budget requirements put

on NPS staff. All of the plans and projects would put increased responsibility on the administration division of the Preserve.

Implementation of ORV management plans would require additional staff time and budgetary resources from the maintenance division. The *South Florida and Caribbean Parks Exotic Plant Management Plan* (NPS 2010b) would require additional funds and staff time from the resource management division. The expansion of commercial services offered in the original Preserve would require time from staff spent managing the commercial service authorizations and leases. However, the impacts of these plans and projects would only be minor since proper management of Preserve resources under these plans would allow the NPS to more efficiently use their staff resources and budget.

Expansion of nearby communities (including the towns of Ave Maria and Big Cypress), regional restoration activities, and oil and gas exploration activities would require time and attention by senior NPS staff. Cooperation and coordination with neighboring agencies and entities regarding planning, land use resources, and development proposals near the Preserve also would require substantial amounts of staff time and result in minor to moderate, long-term, adverse impacts.

Collectively, long-term, minor, adverse impacts to Preserve management and operations would result from implementation of existing Preserve plans and projects; long-term, minor to moderate, adverse impacts to Preserve management and operations would result from expansion of nearby communities (including the towns of Ave Maria and Big Cypress), regional restoration activities, and oil and gas exploration activities.

When the likely effects of implementing alternative 1 are added to the effects of other past, present, and reasonably foreseeable actions as described above, there would be a long-term, minor to moderate, adverse cumulative impact on Preserve management and operations. Alternative 1 would contribute a minor adverse increment to the cumulative impact of other projects.

Conclusion. Collectively, impacts on Preserve management and operations from alternative 1 would be long-term, minor, and adverse.

Alternative 2 – No Hunting in the Addition

Analysis. Under alternative 2, the environmental baseline alternative, current hunting management would continue in the original Preserve and there would continue to be no public hunting in the Addition.

The existing hunting management framework (i.e., *NPS/FWC Cooperative Partnership Agreement*) would be used to manage hunting in the original Preserve. Existing management (i.e., managing hunting in the original Preserve and enforcing hunting prohibition in the Addition) places a long-term, minor, adverse impact on Preserve management and operations. This requirement could potentially be detectable by individual Preserve staff but would be of a magnitude that would not have any appreciable effect on Preserve operations and management.

Cumulative Impacts. Cumulative impacts from projects other than this *Hunting Management Plan* would be the same under alternative 2 as described under alternative 1. When the likely effects of implementing alternative 2 are added to the effects of other past, present, and reasonably foreseeable actions as described above, there would be a long-term, minor to moderate, adverse cumulative impact on Preserve management and operations. Alternative 2 would contribute a minor adverse increment to the cumulative impact of other projects.

Conclusion. Collectively, impacts on Preserve management and operations from alternative 2 would be long-term, minor, and adverse.

Alternative 3 – New Adaptive Management Strategy

Analysis. Under alternative 3, hunting would be managed in the entire Preserve through a science-based adaptive management process that allows the NPS and FWC, in consultation with the USFWS, to have flexibility to make changes to hunting protocol over time in response to changing ecological conditions, monitoring data, and/or public input.

This alternative would add 147,000 acres of land in the Addition to hunting areas in the Preserve, which would require management. This could place an additional burden on existing enforcement staff from the NPS and FWC to enforce hunting regulations; however, it is currently necessary to enforce the prohibition of hunting in the area, so impacts to staffing would be expected to be negligible. That is, the effect of this change would be expected to be at or below the level of detection by Preserve staff and management and would not have any appreciable effect on Preserve operations and management. Consequently, this would not be expected to result in any adverse impacts to Preserve management and operations.

Key impacts of this alternative to Preserve management and operations would consist mainly of additional monitoring efforts in addition to that which is conducted currently. However, the NPS would be able to gather most of this data from existing monitoring efforts and other sources which conduct research in the Preserve (e.g., FWC, USFWS, universities, etc.). NPS staff would also have to meet with FWC staff, in consultation with USFWS staff, on an annual basis to review currently hunting management protocol and consider changes based on the previous year(s) ecological conditions, monitoring data, and public input. While this would have a long-term adverse impact on Preserve management and operations, the impacts of implementing this adaptive management framework would be minor to moderate since proper management of Preserve resources under this science-based framework would allow the NPS to more efficiently use their staff

resources and budget. The effects of implementation of these actions required as part of the adaptive management process would be readily apparent to individual staff involved in the process as well as management at the Preserve; however, it is unlikely that these changes would be apparent to the general visiting public at the Preserve.

The impacts of managing an additional 147,000 acres (the Addition) of hunting area in the Preserve to NPS staff resources would be neutral due to the fact that the prohibition of hunting in these areas currently has to be enforced anyway. The new science-based adaptive management framework would cause long-term, minor to moderate, adverse impacts to Preserve management and operations due to the additional monitoring and coordination (with the FWC, in consultation with the USFWS) required.

Cumulative Impacts. Cumulative impacts from projects other than this *Hunting Management Plan* would be the same under alternative 3 as described under alternative 1. When the likely effects of implementing alternative 3 are added to the effects of other past, present, and reasonably foreseeable actions as described above, there would be a long-term, minor to moderate, adverse cumulative impact on Preserve management and operations. Alternative 3 would contribute a minor to moderate adverse increment to the cumulative impact of other projects.

Conclusion. Collectively, impacts on Preserve management and operations from alternative 3 would be long-term, minor to moderate, and adverse.

VISITOR USE

VISITOR USE AND EXPERIENCE/RECREATIONAL OPPORTUNITIES

NPS *Management Policies* (2006) addresses “enjoyment of park resources and values by the people of the United States” as “part of the fundamental purpose of all parks.” The NPS is committed to “providing appropriate, high-quality opportunities for visitors to enjoy the parks,” by maintaining “an atmosphere that is open, inviting, and accessible” (NPS 2006). Impacts to recreational opportunities and associated visitor use and experience are addressed in this section. Impacts to public health and safety are analyzed in the “Public Health and Safety” section. Perceived impacts to visitor safety are discussed in this section in regards to the effect on visitor experience. Noise impacts which may have an effect on visitor experience are discussed in the “Noise/Soundscapes” section. The thresholds for evaluating impacts on visitor use and experience and recreational opportunities are defined in table 4-1, located at the beginning of this chapter.

Alternative 1 – No Action – Apply Current Management to the Addition

Analysis. Under alternative 1, the no action alternative, the preferred alternative from the Addition GMP (NPS 2010a) would be implemented and hunting would be permitted in the entire Preserve. Within the original Preserve boundaries, hunting would continue as currently managed; within the Addition, hunting would be permitted and managed through the existing framework. Impacts throughout the Preserve would be similar in nature; however, the intensity of impacts could be expected to be greater in the Addition since hunting has not taken place in this area since the acquisition of the lands by the NPS.

In general, this alternative could be expected to increase visitation in the Preserve. From 2006 to 2009, the Preserve received

approximately 800,000 recreational visitors annually (NPS 2011d). Since the Addition accounts for twenty percent of the total land in the Preserve, opening this area to an additional recreational activity (i.e., hunting) would be expected to have the indirect impact of increasing visitation to the Preserve by at least a minor amount in the long-term. Increased visitation could result in increased congestion and user conflicts, which would be a long-term adverse impact. These changes in visitor use and experience would be expected to be minor but detectable; however, these changes would not likely appreciably diminish critical characteristics of the visitor experience. In light of these impacts, visitor satisfaction could be expected to remain stable.

Two types of direct impacts would occur from implementation of alternative 1 – beneficial impacts to hunters due to the continued allowance of hunting in the original Preserve and the additional 147,000 acres available in the Addition for hunting and adverse impacts to nonhunting visitors from the presence of hunters and hunting activities occurring throughout the Preserve during hunting season.

Beneficial effects to hunters would be moderate and long-term since this alternative would allow continued hunting opportunities in the original Preserve and increase the available hunting areas in the Preserve by twenty-five percent (from 582,000 acres to 729,000 acres). The continued allowance of hunting in the original Preserve and the new availability of hunting opportunities in the Addition could be expected to have a direct impact on the number of participants engaging in hunting in the Preserve. At least some visitors to the Preserve would likely be aware of the effects of this change and would likely be able to express an opinion on the changes. Visitor satisfaction of hunting visitors could be expected to increase as a direct result of the effect.

Adverse impacts to nonhunting visitors would consist of a decreased aesthetic experience from both hunter presence and the take of game species, and a perceived safety risk to nonhunting visitors from hunting activities occurring in proximity. As discussed in chapter 3, a visitor study conducted in the Preserve allowed visitors to express both how safe they felt in the Preserve as well any reasons for feeling unsafe; while only 5% of visitor groups reported feeling “extremely unsafe,” the most commonly given reason for feeling unsafe was hunters/hunting in the area (Meehan 1999). While the allowance of hunting throughout the Preserve would only cause a negligible adverse impact on public health and safety in the Preserve (with the majority of risk being taken on by those participating in hunting as opposed to nonhunting visitors), as discussed in the “Public Health and Safety” section, this perceived safety risk could cause a long-term, minor, seasonal (i.e., during hunting season), adverse impact on the visitor experience of nonhunting visitors. The impact to nonhunting visitors would be expected to be minor and seasonal. That is, the changes in visitor use would be minor, but likely detectable by at least a portion of the nonhunting visitors to the Preserve. These changes would not be expected to appreciably diminish the visitor experience of these visitors. These impacts would be most likely to be noticed while participating in nonhunting activities such as wildlife viewing, bird watching, photography/painting/drawing, hiking/walking, and other activities which are normally experienced in relative peace and quiet. Overall, visitor satisfaction would be expected to remain stable.

Collectively, adverse impacts to visitor use and experience would accrue from anticipated increased visitation to the Preserve. Long-term, minor, seasonal, adverse impacts would also occur to nonhunting visitors from the presence of hunters and hunting activities. Moderate, long-term, seasonal, beneficial effects would occur for hunters in terms of both visitor use and experience and recreational opportunities from continued allowance of hunting in the original Preserve

and from the opening of an additional 147,000 acres of land for hunting.

Cumulative Impacts. Implementation of the preferred alternative in the Addition GMP (NPS 2010a) would provide diverse frontcountry and backcountry recreational opportunities, enhance day use and interpretive opportunities along road corridors, and enhance recreational opportunities with new facilities and services. Implementation of the preferred alternative in the Addition GMP (NPS 2010a) would provide a substantial amount of ORV access and riding opportunities, provide a moderate amount of proposed wilderness, provide nonmotorized trail opportunities and new camping opportunities, and develop a partnership approach to visitor orientation. New visitor and operations facilities along the I-75 corridor would also be provided. Overall, this would have a long-term, moderate, beneficial effect on visitor use and experience in the local area.

Implementation of the 2000 *Recreational ORV Management Plan* would provide up to 400 miles of designated ORV trails, 15 ORV access points, and up to 2,000 annual permits in the original Preserve. The quantity of trail miles and permits provides abundant opportunities for operating off-road vehicles. This would have long-term, moderate, beneficial impacts on ORV users in the local area.

The *Resource Management Plan* (NPS 2001) is designed to serve as a framework for resource management and protection of the Preserve, as outlined in the enabling legislation. The *Land Protection Plan* (NPS 1991c) identifies what lands or interests are required for federal ownership to achieve the purposes of the Preserve. As the purpose of these plans are focused on the management and protection of resources in the Preserve as well as providing for visitor use, in accordance with the enabling legislation, these plans would have long-term, minor to moderate, beneficial effects on visitor use and experience in the Preserve.

Implementation of the *Commercial Services Plan* would initially only affect the original Preserve. The Addition would be addressed in an addendum to the *Commercial Services Plan* to be completed in the future. The *Commercial Services Plan* proposes to enhance the original Preserve's visitor services through the development of one or more new facilities; a new backcountry camping complex; hunting and fishing guides; buggy, van, and hiking tours; boat and bicycle rentals; and expanded opportunities for birding, wildlife viewing, and photography. Enhanced and expanded opportunities in the Preserve, before an addendum to include the Addition, would increase visitation and might result in increased congestion and user conflicts. Impacts resulting from increased visitation and congestion at access points and along the primary and secondary ORV trail network would result in long-term, minor, adverse impacts on visitors. When the Addition is addressed in an addendum, visitor opportunities to explore and use the Addition could be expanded. Impacts from implementing the *Commercial Services Plan* would be long-term, minor to moderate, and beneficial as a result of expanded opportunities.

Numerous regional ecosystem restoration plans and projects are in various stages of completion throughout the south Florida region. The plans and projects would improve sheet flows and hydrologic connectivity and likely restore natural conditions in the Preserve. This effort would enhance the visitor use and experience by providing increased opportunities for wildlife viewing and experiencing natural settings.

Both *Report M-621, Water Management Plan: Turner River Restoration* (NPS 1980) and the *Ochopee Sheetflow Restoration Plan* (NPS 2013a) propose hydrological restoration of areas within and around the Preserve. Similar to the regional ecosystem restoration plans and projects discussed above, the actions contained within these plans would enhance the visitor use and experience by providing increased opportunities for wildlife viewing and experiencing natural settings, although the effects would likely be slightly more

beneficial due to the proximity of the proposed actions to the Preserve.

Regional recreation plans and projects, such as the *CERP Master Recreation Plan, I-75 Recreational Access Plan*, and *State Comprehensive Outdoor Recreation Plan* would provide a long-term, moderate, beneficial effect on visitor use and experience in the region. These plans and projects would enhance the visitor use and experience for the public and provide additional recreational opportunities in the region by providing additional facilities, opportunities and access points to visitors in the region.

Implementation of future oil and gas proposals could adversely impact the experience of visitors. If included in the proposals, the construction of roads and pads and the use of off-road equipment could detract from the experience of those seeking a primitive experience and natural soundscape. Impacts resulting from a reduction in the natural settings of the Preserve due to the operation of oil and gas equipment would be long-term, minor, and adverse in localized areas.

Regional growth and development is expected to continue and result in an increase in the conversion of natural lands to development in the general area. More visitations over time might result in increased congestion and user conflicts at access points and along the primary and secondary ORV trail network. Impacts from growth and development would be long-term, minor to moderate, and adverse as a result of increased congestion and user conflict.

Collectively, long-term beneficial impacts would accrue in the Preserve from implementation of the Addition GMP (NPS 2010a), the 2000 *Recreational ORV Management Plan, Resource Management Plan* (NPS 2001), *Land Protection Plan* (NPS 1991c), *Water Resources Management Plan* (NPS 1996), *Fire Management Plan* (NPS 2010d), and the *Commercial Services Plan* (NPS 2009). Regionally, long-term beneficial effects would result from south Florida ecosystem restoration and recreation plans and projects. Adverse impacts to visitor use

and experience and recreational opportunities would accrue from future oil and gas proposals in the Preserve and regional growth and development projects in the south Florida area.

The likely effects of implementing the preferred alternative in combination with the effects of other past, present, and reasonably foreseeable future actions described above would result in long-term, moderate, beneficial cumulative impacts on visitor use and experience. The actions contained in alternative 1 would contribute a moderate beneficial increment to the cumulative impact of other projects for hunters and a minor adverse increment for nonhunters.

Conclusion. Collectively, impacts on visitor use and experience and recreational opportunities throughout the Preserve from alternative 1 would be long-term, moderate, seasonal, and beneficial for hunters and long-term, minor, seasonal, and adverse for nonhunters.

Alternative 2 – No Hunting in the Addition

Analysis. Under alternative 2, the environmental baseline alternative, the recreational opportunities and associated visitor use and experience would remain unchanged in the Preserve.

Within the original Preserve, long-term, negligible to minor, seasonal, adverse impacts would also occur to nonhunting visitors from the presence of hunters and hunting activities, as discussed in the analysis for alternative 1. Long-term, moderate, beneficial effects would be experienced by hunters from the opportunity to participate in hunting in the original Preserve, as discussed in the analysis for alternative 1.

In the Addition, the recreational opportunities and associated visitor use and experience would remain unchanged since hunting would continue to be prohibited in this area. Long-term, minor, adverse impacts would be

experienced by hunters from the prohibition of hunting in this area. The impacts to these nonhunting visitors would be obviously detectable since hunting would be prohibited in the Addition; however, the prohibition of hunting in this one area of the Preserve would not be expected to appreciably diminish critical characteristics of the visitor experience since hunting could still occur in the original Preserve. Beneficial effects would be experienced by nonhunting visitors since the opportunity would still exist to participate in nonhunting recreational activities free from the presence of hunting in the Addition. These effects would be long-term, moderate, and beneficial. This availability of an area in the Preserve (i.e., the Addition) absent from hunting could potentially encourage additional visitors to participate in nonhunting activities in this area and the visitor satisfaction of these visitors could increase as a direct result.

Cumulative Impacts. Cumulative impacts from projects other than this *Hunting Management Plan* would be the same under alternative 2 as described under alternative 1. When the likely effects of implementing alternative 2 are added to the effects of other past, present, and reasonably foreseeable actions as described above, there would be a long-term, moderate, beneficial cumulative impact on visitor use and experience in the region. The actions contained in alternative 2 would contribute a minor beneficial increment to the cumulative impact of other projects.

Conclusion. Collectively, impacts on visitor use and experience and recreational opportunities in the original Preserve from alternative 2 would be long-term, moderate, seasonal, and beneficial for hunters and long-term, minor, seasonal, and adverse for nonhunters. In the Addition, impacts on visitor use and experience and recreational opportunities would be long-term, minor, seasonal, and adverse for hunters and long-term, moderate, year-round, and beneficial for nonhunters with the implementation of this alternative.

Alternative 3 – New Adaptive Management Strategy

Analysis. Under alternative 3, hunting would be managed in the entire Preserve through a science-based adaptive management process. Most elements of the impacts of this alternative would be the same as those of alternative 1, except that potential conflicts between hunting and nonhunting visitors could be minimized through the adaptive management process.

One of the objectives of the adaptive management strategy, as discussed in chapter 2, is “minimization of conflicts between hunting and nonhunting visitors in the Preserve.” With the implementation of alternative 3, this objective would be achieved through an iterative adaptive management cycle of baseline management actions, monitoring, triggers, supplemental management actions, and additional monitoring (refer to the description of alternative 3 in chapter 2 for specific details of the adaptive management process).

Under alternative 3, the NPS would undertake the following baseline management actions in relation to visitor use to achieve the adaptive management objectives³⁸:

- Monitor potential conflicts between hunting and nonhunting visitors in the Preserve.

The occurrence of the following condition related to visitor use would trigger implementation of additional management actions (in addition to the baseline action listed above)³⁹:

- Five documented substantive visitor use complaints or conflicts between hunting

³⁸ Note that other adaptive management objectives are discussed in chapter 2 and related impacts are discussed in the relevant sections of the impact analysis in this chapter.

³⁹ Note that other adaptive management triggers are discussed in chapter 2 and related impacts are discussed in the relevant sections of the impact analysis in this chapter.

and nonhunting visitors to the Preserve per month per management unit, trail system, or visitor facility⁴⁰.

If this adaptive management trigger is documented, then appropriate and necessary supplemental management actions would be implemented as part of the adaptive framework.

The supplemental management actions that could be taken if this trigger occurs include, but are not limited to:

- implementing a scientific study to better inform decisions
- providing additional educational materials to hunting and nonhunting visitors
- directing nonhunting visitors to areas of the Preserve lesser-used by hunters or off-peak times for hunting
- reducing the amount of hunting and/or nonhunting use in certain areas of the Preserve
- altering levels or types of trail use by hunting and/or nonhunting visitors

Additional supplemental management actions could be taken if the other non-visitor use triggers occur, which are discussed in the “Wildlife – Protect Wildlife Species” section of the impact analysis in this chapter.

Implementing these supplemental management actions in a more restrictive/limiting approach (e.g., directing nonhunting visitors to areas of the Preserve lesser-used by hunters or off-peak times for hunting, reducing the amount of hunting and/or nonhunting use in certain areas of the Preserve, or altering levels or types of trail use by hunting and/or nonhunting visitors) would result in both beneficial and adverse impacts to both hunting and nonhunting visitors, dependent upon which group the restrictions were applied. Whereas, implementation of a scientific study or providing additional education materials to hunting and

⁴⁰ The general metric of five documented visitor use complaints or conflicts for taking management actions in the Preserve was developed as part of the Addition GMP (NPS 2010a).

nonhunting visitors would likely not have any adverse effect. Additionally, implementing emergency restrictions or closures would likely result in an adverse effect on both hunting and nonhunting visitors if an area were no longer open for use.

Any combination of these supplemental management actions would continue to be implemented in an increasingly restrictive adaptive management approach until follow-up monitoring data (as discussed in step 7 of the adaptive management process in chapter 2) shows that the adaptive management objectives outlined in step 2 of the adaptive management process in chapter 2 are being met.

As previously noted in chapter 2, if additional actions are required, which have not been analyzed as part of the impact analysis in this document, additional impacts analyses, and if applicable, NEPA compliance documentation, would be required to implement the proposed actions.

The iterative cycle of these actions would ensure that the conflicts between hunting and nonhunting visitors are minimized under this alternative.

Collectively, adverse impacts to visitor use and experience would accrue from anticipated increased visitation to the Preserve. Long-term, minor, seasonal, adverse impacts would also occur to nonhunting visitors in the Addition from the presence of hunters and hunting activities. Moderate, long-term, seasonal, beneficial effects would occur for hunters in terms of both visitor use and experience and recreational opportunities from the opportunity to hunt in the original Preserve and the opening of an addition 147,000 of land for hunting.

Cumulative Impacts. Cumulative impacts from projects other than this *Hunting Management Plan* would be the same under alternative 3 as described under alternative 1. When the likely effects of implementing alternative 3 are added to the effects of other past, present, and reasonably foreseeable actions as described above, there would be a

long-term, moderate, beneficial cumulative impact on visitor use and experience in the region. Alternative 3 would contribute a minor beneficial increment to the cumulative impact of other projects.

Conclusion. Collectively, impacts on visitor use and experience and recreational opportunities throughout the Preserve from alternative 3 would be long-term, moderate, seasonal, and beneficial for hunters and long-term, minor, seasonal, and adverse for nonhunters.

NOISE/SOUNDSCAPES

For the purposes of this analysis, impacts to the natural ambient soundscape will reference visitor experiences and existing conditions. Context, time of day, duration and intensity of noise together determine the level of impact for an activity associated with human-generated sound. The thresholds for evaluating impacts on soundscapes are defined in table 4-1, located at the beginning of this chapter.

Alternative 1 – No Action – Apply Current Management to the Addition

Analysis. Under alternative 1, the no action alternative, the preferred alternative from the Addition GMP (NPS 2010a) would be implemented and hunting would be permitted in the entire Preserve. Within the original Preserve boundaries, hunting would continue as currently managed; within the Addition, hunting would be permitted and managed through the existing framework.

Hunting is a long-established recreational activity in the original Preserve that includes bow, muzzleloading, and general gun seasons. Gun hunting is permitted only during limited times of the year (e.g., during October, November, and December). During a 2010 NPS study, ambient sound levels in the Preserve were found to range from approximately 24 to 40 dB(A), depending upon time of day and nearby activity. Since

environmental conditions in the Addition are similar to those in the original Preserve, these noise levels are also representative of those that are expected in the Addition.

No short-term effects to the soundscape of the Preserve or the Addition are expected to occur as a result of alternative 1 since the project only involves a change in the hunting status in the Addition and no construction activities would occur.

Any long-term adverse effects to the soundscape of the Preserve associated with alternative 1 are directly attributable to hunting-related firearm noise. Discrete occurrences of firearm shots typically result in very short-duration peak noise levels that can be as high as 170 dB(A) depending upon weapon type. Such events are expected to be plainly and clearly evident during periods when gun hunting is permitted. However, firearm-related noise is expected to be intermittent since hunters typically minimize using their weapons unless presented with a target of consequence so as not to frighten the target away. Additionally, indiscriminate shooting such as target practice is prohibited by existing state hunting regulations in force in the Preserve. Impacts to the soundscape from other noted sources of noise in the Preserve and the Addition such as aircraft and highway traffic are unaffected by this alternative.

Given these factors, disturbances from firearm noise due to alternative 1 are expected to be adverse, intermittent, and long-term, and are expected to result in a minor effect to wildlife, nonhunting visitors, and private residences located in proximity to the Preserve. Natural sounds would continue to predominate within the Preserve except during the discrete occurrences of gunfire; human-generated sounds (i.e., gunfire) from appropriate recreational activities (i.e., hunting) could be heard occasionally.

Cumulative Impacts. Implementation of the preferred alternative in the Addition GMP would create a maximum of 130 miles of ORV

trails⁴¹. ORV use would adversely affect the natural soundscape of the area. Impacts would be reduced by the use of a designated trail system, limiting noise impacts to areas surrounding the trail system. Impacts to the soundscape would be long-term, moderate, and adverse.

Implementation of the 2000 *Recreational Off-road Vehicle Management Plan* within the original Preserve would cause adverse impacts to the natural soundscape; however, the impact on natural soundscapes would be negligible because approximately the same number of ORVs would be using the original Preserve and in roughly the same areas as the current condition. Consequently, impacts to the natural soundscape resulting from the ORV plan would be long-term but negligible.

Implementation of future oil and gas proposals could have adverse impacts on the natural soundscape. If such proposals included using off-road equipment and constructing roads and pads, this would create disturbances to the natural soundscape. NPS approval of the operations plan would require mitigation to eliminate or reduce the impact of activities on natural resources, including the Preserve soundscape. Short-term impacts on the natural soundscape would be moderate, adverse, and localized; residual long-term impacts would be minor, adverse, and localized.

Regional growth and development is expected to continue and result in an increase in the conversion of natural lands to development in the general area. This growth and development would cause impacts to the natural soundscape in areas on the borders of the Preserve as well as areas along roadways. The impact of these activities on the natural soundscape is expected to be long-term, moderate, and adverse.

⁴¹ The Addition GMP is the document which guides the number of miles of trails that would be developed in the Addition as well as the number of ORV permits that would be issued for use of those trails. Any future changes to the Addition GMP would supersede the information in this document regarding trails and ORV permits in the Addition.

Collectively, adverse impacts associated with ORV use would be expected from implementation of the preferred alternative in the Addition GMP and implementation 2000 *Recreational Off-road Vehicle Management Plan*. Other adverse impacts would be expected from oil and gas operations and regional growth and development. Overall, the projects discussed above would likely be adverse to the natural soundscape in the Preserve.

When the likely effects of implementing alternative 1 are added to the effects of other past, present, and reasonably foreseeable actions as described above, there would be a long-term, moderate, adverse cumulative impact on the soundscape in the Preserve. Alternative 1 would contribute a minor adverse increment to the cumulative impact of other projects.

Conclusion. Collectively, impacts to the Preserve soundscape from alternative 1 would be long-term, minor, and adverse.

Alternative 2 – No Hunting in the Addition

Analysis. Under alternative 2, the environmental baseline alternative, current hunting management would continue within the original Preserve boundaries and no hunting would be permitted in the Addition.

Impacts would be similar to those described under alternative 1 since firearm noise could be heard throughout much of the Preserve (including the Addition) even if hunting is only permitted within the original Preserve. However, nonhunting visitors may be able to participate in other approved activities in certain areas of the Addition that are located a farther distance from the original Preserve boundaries unhindered by hunting-related noise impacts.

Disturbances from firearm noise due to alternative 2 are expected to be adverse, intermittent, and long-term, and are expected to result in a minor effect to wildlife,

nonhunting visitors, and private residences located in proximity to the boundaries of the original Preserve. Natural sounds would continue to predominate within the Preserve except during the discrete occurrences of gunfire; human-generated sounds (i.e., gunfire) from appropriate recreational activities (i.e., hunting) could be heard occasionally.

Impacts to the soundscape from other noted sources of noise in the Preserve and the Addition such as aircraft and highway traffic are unaffected by this alternative.

Cumulative Impacts. Cumulative impacts from projects other than this *Hunting Management Plan* would be the same under alternative 2 as described under alternative 1. When the likely effects of implementing alternative 2 are added to the effects of other past, present, and reasonably foreseeable actions as described above, there would be a long-term, moderate, adverse cumulative impact on the natural soundscape of the Preserve. Alternative 2 would contribute a negligible to minor adverse increment to the cumulative impact of other projects.

Conclusion. Collectively, impacts to the Preserve soundscape from alternative 2 would be long-term, negligible to minor, and adverse.

Alternative 3 – New Adaptive Management Strategy

Analysis. Under alternative 3, hunting would be managed in the entire Preserve through a science-based adaptive management process. This alternative is similar to alternative 1, but adds an adaptive management component that would allow review and modification of the management plan if a specific need arises. As such, the impacts of this alternative would be very similar to those of alternative 1.

No short-term effects to the soundscape of the Preserve or the Addition are expected to occur as a result of alternative 3 since the project only involves a change in the hunting status in

the Addition and no construction activities would occur.

The main long-term adverse effects to the soundscape associated with alternative 3 are directly attributable to hunting-related firearm noise. However, with alternative 3, the NPS would have more flexibility to manage hunting in order to minimize any future hunting-related noise impacts to white-tailed deer, panthers, and visitor use in accordance with baseline management actions, adaptive management triggers, and supplemental management actions outlined in chapter 2. As discussed in the impact analysis for alternative 3 under the “Wildlife – Major Game Species” (for impacts to white-tailed deer), “Wildlife – Protected Wildlife Species” (for impacts to panthers), and “Visitor Use and Experience/Recreational Opportunities” (for impacts to visitor use) sections, the iterative cycle of the baseline management actions, adaptive management triggers, and supplemental management actions (as outlined in chapter 2) implemented as part of the adaptive management process would help to minimize future hunting-related noise impacts to white-tailed deer, panthers, and visitor use. Given these factors, new disturbances from firearm noise due to alternative 3 are expected to be adverse, intermittent, and long-term, and are expected to result in minor disturbance to white-tailed deer, panthers, and visitors located in proximity to the Preserve. Natural sounds would continue to predominate within the Preserve except during the discrete occurrences of gunfire; human-generated sounds (i.e., gunfire) from appropriate recreational activities (i.e., hunting) could be heard occasionally.

Other long-term adverse impacts from alternative 3 could include sporadic aircraft noise from additional monitoring flights required for deer and panther monitoring efforts. However, since similar aircraft noise currently occurs from ongoing monitoring efforts at the Preserve, the impact would be minor. Natural sounds would continue to predominate within the Preserve except during the sporadic flights caused by aircraft noise during monitoring activities.

Cumulative Impacts. Cumulative impacts from projects other than this *Hunting Management Plan* would be the same under alternative 3 as described under alternative 1. When the likely effects of implementing alternative 2 are added to the effects of other past, present, and reasonably foreseeable actions as described above, there would be a long-term, moderate, adverse cumulative impact on the natural soundscape of the Preserve. Alternative 3 would contribute a minor adverse increment to the cumulative impact of other projects.

Conclusion. Collectively, impacts to the Preserve soundscape from alternative 3 would be long-term, minor, and adverse.

PUBLIC HEALTH AND SAFETY

NPS *Management Policies* (2006) discusses visitor safety in the NPS units, stating that while “visitors must assume a substantial degree of risk and responsibility for their own safety when visiting areas that are managed and maintained as natural, cultural, or recreational environments ... The saving of human life would take precedence over all other management actions as the [NPS] strives to protect human life and provide for injury-free visits” (NPS 2006). This concern is limited by the constraints of the Organic Act, which only allows discretionary management activities to be undertaken to the extent that they would not impair park resources and values (NPS 2006). While the NPS acknowledges that there are limitations on its ability to protect park employees and visitors from all hazards, the NPS would strive to “provide a safe and healthful environment” (NPS 2006). “When practicable and consistent with congressionally designated purposes and mandates, the [NPS] would reduce or remove known hazards and apply other appropriate measures” (NPS 2006). The NPS would conduct such actions to have the least possible impact on park resources and values (NPS 2006).

The NPS would provide for public health and safety under all of the alternatives. Impacts

associated with implementation of each of the alternatives to public health and safety are discussed below. The impacts of perceived public and safety risks and visitor experience are discussed in the “Visitor Use and Experience/Recreational Opportunities” section. The thresholds for evaluating impacts on public health and safety are defined in table 4-1, located at the beginning of this chapter.

Alternative 1 – No Action – Apply Current Management to the Addition

Analysis. Under alternative 1, the no action alternative, the preferred alternative from the Addition GMP (NPS 2010a) would be implemented and hunting would be permitted in the entire Preserve. Within the original Preserve boundaries, hunting would continue as currently managed; within the Addition, hunting would be permitted and managed through the existing framework.

Based on the information shown in figure 3-9, participating in hunting is less likely to result in injury (two recorded injuries per 100,000 participants annually) than other recreational activities in which visitors would normally participate in the Preserve, such as fishing (180 recorded injuries per 100,000 participants annually) and bicycle riding (1,349 recorded injuries per 100,000 participants annually). These statistics show that continuing to allow hunting in the original Preserve and opening hunting in the Addition would only cause a negligible but long-term adverse impact to public health and safety for both hunters and nonhunting visitors. This negligible risk could be further minimized for both hunters and nonhunting visitors to the Preserve. Risk of Class A injury to those visitors not participating in hunting activities could be eliminated by visiting the Preserve during times of the year out of hunting season. Risk of a Class A injury to those participating in hunting could be further minimized by hunter education and proper adherence to the hunter orange requirement. A study conducted by the Centers for Disease Control and published in the *Morbidity and Mortality Weekly Report* (1996) analyzed 343 two-party

hunting firearm (Class A) injuries in reference to whether the parties involved were wearing hunter orange. The study reported that in 76% of the incidents the injured hunter was not wearing hunter orange, clearly showing an increased safety risk when hunter orange is not worn. Risk of a Class B injury to hunters could be substantially reduced by use of a fall arrest system or full body harness, as currently recommended by the FWC.

Therefore, a negligible, but long-term, adverse impact to public health and safety would result throughout the Preserve from the selection of alternative 1. Generally, based on the data presented in chapter 3 and discussed above, public health and safety would be unaffected by implementation of this alternative.

Cumulative Impacts. Implementation of the preferred alternative in the Addition GMP (NPS 2010a) would provide diverse frontcountry and backcountry recreational opportunities, enhance day use and interpretive opportunities along road corridors, and enhance recreational opportunities with new facilities and services. Since these opportunities are already available within the original Preserve, the expansion of these opportunities into the Addition would not be expected to have any adverse impact on public health and safety. The implementation of ORV use in the Addition would be expected to have a long-term, minor, adverse impact on public health and safety associated with the risk of using ORVs⁴².

Implementation of the 2000 *Recreational ORV Management Plan* would provide up to 400 miles of designated ORV trails, 15 ORV access points, and up to 2,000 annual permits in the original Preserve. While there is a minor safety risk associated with using ORVs [approximately 10 deaths per 100,000 participants in 2006 (U.S. Consumer Product Safety Commission 2006)], this risk already

⁴² The U.S. Consumer Product Safety Commission (2011) attributed 903 estimated deaths to ATV use nationwide in 2006 (the last year for which complete data is available); this correlates to an estimated risk of death of 10 persons per 100,000 participants per year.

exists in the original Preserve and would be mitigated by the implementation of this plan (i.e., ORVs would be limited to designated trails). Therefore, implementation of this plan provides a long-term, minor, beneficial impact on public health and safety.

The *Resource Management Plan* (NPS 2001) is designed to serve as a framework for resource management and protection of the Preserve, as outlined in the enabling legislation. The *Land Protection Plan* (NPS 1991c) identifies what lands or interests are required for federal ownership to achieve the purposes of the Preserve. As the purpose of these plans are focused on the management and protection of resources in the Preserve as well as providing for visitor use, in accordance with the enabling legislation, these plans would have long-term, minor, beneficial effects on public health and safety in the Preserve.

The *Big Cypress National Preserve Fire Management Plan* (NPS 2010d) outlines a comprehensive fire program for achieving the Preserve goals for protection of life, property, and ecosystem management. This plan serves to protect visitors, staff, and property at the Preserve while also utilizing prescribed fire for ecosystem management at the Preserve. By providing protection to visitors from wildfires, this plan would have long-term, minor, beneficial effects on public health and safety in the Preserve.

Implementation of the *Commercial Services Plan* would initially only affect the original Preserve. The Addition would be addressed in an addendum to the *Commercial Services Plan* to be completed in the future. The *Commercial Services Plan* proposes to enhance the original Preserve's visitor services through the development of one or more new facilities; a new backcountry camping complex; hunting and fishing guides; buggy, van, and hiking tours; boat and bicycle rentals; and expanded opportunities for birding, wildlife viewing, and photography. This increased access and new facilities would facilitate safer use of natural areas in the region and cause a long-term, minor, beneficial impact on public health and safety

in the region. Enhanced and expanded opportunities in the Preserve, before an addendum to include the Addition, would increase visitation and might result in increased congestion and user conflicts. Impacts resulting from increased visitation and congestion at access points and along the primary and secondary ORV trail network would result in long-term, minor, adverse impacts on public health and safety. When the Addition is addressed in an addendum, visitor opportunities to explore and use the Addition could be expanded. Impacts from implementing the *Commercial Services Plan* would be long-term, minor, and adverse as a result of potential congestion and use conflicts.

Implementation of future oil and gas proposals would not have any impact on public health and safety. The public would not be allowed access to areas that these operations are occurring in the Preserve, and thus no safety risk would be posed.

Regional recreation plans and projects, such as the *CERP Master Recreation Plan, I-75 Recreational Access Plan*, and *State Comprehensive Outdoor Recreation Plan*, would provide a long-term, minor, beneficial effect on public health and safety in the region. These plans and projects would provide additional recreational opportunities in the region by providing additional facilities, opportunities and access points to visitors in the region. This increased access and new facilities would facilitate safer use of natural areas in the region and cause a long-term, minor, beneficial impact on public health and safety in the region. Potential increased visitation might result in increased congestion and user conflicts, which would cause a long-term, minor, adverse impact to public health and safety.

Regional growth and development is expected to continue and result in an increase in population and tourism in the general area. More visitations over time might result in increased congestion and user conflicts at access points and along the primary and secondary ORV trail network. Impacts to public health and safety from growth and development would be long-term, minor, and

adverse as a result of increased congestion and user conflict.

Collectively, long-term beneficial impacts would accrue in the Preserve from implementation of the *Resource Management Plan* (NPS 2001), *Land Protection Plan* (NPS 1991c), and *Fire Management Plan* (NPS 2010d). Implementation of the preferred alternative in the Addition GMP (NPS 2010a) and the *Commercial Services Plan* would have long-term, minor, adverse impacts on public health and safety. Implementation of the 2000 *Recreational ORV Management Plan* would result in long-term, minor, beneficial impacts. Regional recreation plans and regional growth and development would have a long-term, minor, adverse impact.

The likely effects of implementing alternative 1 in combination with the effects of other past, present, and reasonably foreseeable future actions described above, would result in long-term, minor, adverse cumulative impacts on public health and safety. The actions contained in alternative 1 would contribute a negligible increment to the cumulative impact of other projects.

Conclusion. Collectively, impacts on public health and safety from alternative 1 would be long-term, negligible, and adverse throughout the Preserve.

Alternative 2 – No Hunting in the Addition

Analysis. Under alternative 2, the environmental baseline alternative, the health and safety risks to visitors within the original Preserve would be the same as described under alternative 1 – long-term, negligible, and adverse. The health and safety risks to visitors within the Addition would remain unchanged since hunting would continue to be prohibited in this area.

Within the original Preserve, a negligible, but long-term, adverse impact to public health and safety would result from the selection of alternative 2. Generally, based on the data

presented in chapter 3 and discussed above in the analysis for alternative 1, public health and safety would be unaffected by implementation of this alternative.

In the Addition, no direct or indirect short- or long-term adverse impacts to public health and safety would result from the selection of alternative 2.

Cumulative Impacts. Cumulative impacts from projects other than this *Hunting Management Plan* would be the same under alternative 2 as described under alternative 1. When the likely effects of implementing alternative 2 are added to the effects of other past, present, and reasonably foreseeable actions as described above, there would be a long-term, minor, adverse cumulative impact on public health and safety in the Preserve. The actions contained in alternative 2 would contribute a negligible increment to the cumulative impact of other projects.

Conclusion. Collectively, impacts on public health and safety from alternative 2 would be long-term, negligible, and adverse in the original Preserve; in the Addition, no direct or indirect short- or long-term adverse impacts to public health and safety would result from the selection of this alternative.

Alternative 3 – New Adaptive Management Strategy

Analysis. Under alternative 3, hunting would be managed in the entire Preserve through a science-based adaptive management process. The impacts of this alternative would be very similar to those of alternative 1. Therefore, a negligible, but long-term, adverse impact to public health and safety would result throughout the Preserve from the selection of alternative 3. Generally, based on the data presented in chapter 3 and discussed above in the analysis for alternative 1, public health and safety would be unaffected by implementation of this alternative.

Cumulative Impacts. Cumulative impacts from projects other than this *Hunting Management Plan* would be the same under alternative 3 as described under alternative 1. When the likely effects of implementing alternative 3 are added to the effects of other past, present, and reasonably foreseeable actions as described above, there would be a long-term, minor, adverse cumulative impact on public health and safety in the Preserve. The actions contained in alternative 3 would contribute a negligible increment to the cumulative impact of other projects.

Conclusion. Collectively, impacts on public health and safety from alternative 3 would be long-term, negligible, and adverse.

SOCIOECONOMIC ENVIRONMENT

SOCIOECONOMICS

Analysis of socioeconomic impacts for all of the alternatives was based on anticipated increases in visitation to the Preserve, which in turn would affect visitor spending patterns in the Preserve and Collier County. Impacts in sales of hunting licenses, tags, permits, and stamps, statewide were also considered in the analysis. While no regional impacts are anticipated from any of the alternatives, cumulative impacts to the entire south Florida region were also taken into consideration in the analysis. The thresholds for evaluating impacts on the socioeconomic environment are defined in table 4-1, located at the beginning of this chapter.

Alternative 1 – No Action – Apply Current Management to the Addition

Analysis. Under alternative 1, the no action alternative, the preferred alternative from the Addition GMP (NPS 2010a) would be implemented and hunting would be permitted in the entire Preserve. Anticipated impacts to the Preserve would include a long-term, minor increase in visitor use during hunting season from hunters wishing to participate in hunting activities in the Preserve, and a long-term, negligible increase in visitor expenditures in the Preserve during hunting season.

In terms of hunting licenses, tags, permits, and stamps, statewide revenue from issuance could be anticipated to increase by a negligible to minor amount from the existing 328,000 licenses, tags, permits, and stamps issued statewide in 2011 (at a gross cost of nearly six million dollars). This effect could potentially be detectable through analysis of yearly trends in hunting licenses, tags, permits, and stamps for users in the region of the Preserve, but it would not be expected to have any noticeable impact on the economic environment of the Preserve or surrounding areas.

In Collier County, a negligible increase in tourism might be expected during hunting season from hunters visiting the area to participate in hunting activities in the Preserve. This effect would likely be below any detectable level and would not be expected to have any discernible effect on the economic environment of areas surrounding the Preserve. No impacts would be expected to the population or employment in Collier County.

No regional socioeconomic impacts would be anticipated from opening hunting in the Addition.

Collectively, a long-term, minor increase in visitor use would be expected in the Preserve during hunting season. Long-term, negligible, beneficial impacts to visitor expenditures in the Preserve and Collier County could be expected. A long-term, negligible to minor increase in statewide hunting license revenue could be expected. No impacts would be expected to the population or employment in Collier County. No regional socioeconomic impacts would be anticipated.

Cumulative Impacts. Implementation of the preferred alternative in the Addition GMP (NPS 2010a), the *Commercial Services Plan*, and the 2000 *Recreational ORV Management Plan* would all increase visitor use opportunities in the Preserve and could be expected to increase visitor expenditures in the Preserve by a long-term, minor to moderate amount and tourism expenditures in Collier County by a long-term, negligible amount. No regional socioeconomic impacts would be expected to result from implementation of these plans.

Implementation of future oil and gas proposals could produce a short-term, moderate amount of revenue that would have a county-wide impact. Such proposals would also be expected to have a short-term, minor impact on employment in Collier County.

Numerous regional ecosystem restoration plans and projects are in various stages of completion throughout the south Florida region. The plans and projects would improve sheet flows and hydrologic connectivity and likely restore natural conditions in the Preserve. This effort would enhance the visitor use and experience by providing increased opportunities for wildlife viewing and experiencing natural settings. This would be expected to have a long-term, minor, beneficial impact on revenue and employment in the south Florida region.

Regional recreation plans and projects, such as the *CERP Master Recreation Plan, I-75 Recreational Access Plan*, and *State Comprehensive Outdoor Recreation Plan* would provide a long-term, moderate, beneficial effect on visitor use and experience in the region. These plans and projects would enhance the visitor use and experience for the public and provide additional recreational opportunities in the region by providing additional facilities, opportunities and access points to visitors in the region. This would be expected to have a long-term, minor, beneficial impact on revenue and employment in the south Florida region.

Regional growth and development is expected to continue in the general area. Such growth and development would be expected to have a long-term, moderate, beneficial impact (increase) on tourism, general revenue, and population in the region.

Collectively, implementation of several plans in the Preserve would increase visitor expenditures in the Preserve by a long-term, minor to moderate amount and tourism expenditures in Collier County by a long-term, negligible amount. No regional socioeconomic impacts would be expected to result from implementation of these plans. Implementation of future oil and gas proposals could produce a short-term, moderate amount of revenue that would have a county-wide impact. Such proposals would also be expected to have a short-term, minor impact on employment in Collier County. Regional restoration and recreation plans and projects would be expected to have a long-term, minor,

beneficial impact on revenue and employment in the south Florida region. Regional growth and development projects would be expected to have a long-term, moderate, beneficial impact (increase) on tourism, general revenue, and population in the region.

The likely effects of implementing the preferred alternative in combination with the effects of other past, present, and reasonably foreseeable future actions described above, would result in long-term, minor to moderate, beneficial cumulative impacts on the socioeconomic environment of the Preserve, Collier County, and the region. The actions contained in alternative 1 would contribute a negligible to minor increment to the cumulative impact of other projects.

Conclusion. Collectively, impacts on the socioeconomic environment of the Preserve, Collier County, and the south Florida region from alternative 1 would be long-term, negligible to minor, and beneficial.

Alternative 2 – No Hunting in the Addition

Analysis. Under alternative 2, the environmental baseline alternative, impacts would be very similar to those described under alternative 1 since hunting would be allowed in the Preserve under both alternatives even though hunting would be restricted to a certain portion of the Preserve (the original Preserve boundaries) with alternative 2.

Collectively, a long-term, minor increase in visitor use would be expected in the Preserve during hunting season. Long-term, negligible, beneficial impacts to visitor expenditures in the Preserve and Collier County could be expected. A long-term, negligible to minor increase in statewide hunting license revenue could be expected. No impacts would be expected to the population or employment in Collier County. No regional socioeconomic impacts would be anticipated.

Cumulative Impacts. Cumulative impacts from projects other than this *Hunting Management Plan* would be the same under

alternative 2 as described under alternative 1. When the likely effects of implementing alternative 2 are added to the effects of other past, present, and reasonably foreseeable actions as described above, there would be a long-term, minor to moderate, beneficial cumulative impacts on the socioeconomic environment of the Preserve, Collier County, and the region. The actions contained in the alternative 2 would contribute a negligible to minor increment to the cumulative impact of other projects.

Conclusion. Collectively, impacts on the socioeconomic environment of the Preserve, Collier County, and the south Florida region from alternative 2 would be long-term, negligible to minor, and beneficial.

Alternative 3 – New Adaptive Management Strategy

Analysis. Under alternative 3, hunting would be managed in the entire Preserve through a science-based adaptive management process. The impacts of this alternative would be the same those of alternative 1 since hunting would be permitted in the entire Preserve under both alternatives.

Collectively, a long-term, minor increase in visitor use would be expected in the Preserve during hunting season. Long-term, negligible, beneficial impacts to visitor expenditures in the Preserve and Collier County could be expected. A long-term, negligible to minor increase in statewide hunting license revenue could be expected. No impacts would be expected to the population or employment in Collier County. No regional socioeconomic impacts would be anticipated.

Cumulative Impacts. Cumulative impacts from projects other than this *Hunting Management Plan* would be the same under alternative 3 as described under alternative 1. When the likely effects of implementing alternative 3 are added to the effects of other past, present, and reasonably foreseeable actions as described above, there would be a long-term, minor to moderate, beneficial cumulative impacts on the socioeconomic

environment of the Preserve, Collier County, and the region. The actions contained in alternative 3 would contribute a negligible to minor increment to the cumulative impact of other projects.

Conclusion. Collectively, impacts on the socioeconomic environment of the Preserve, Collier County, and the south Florida region from alternative 3 would be long-term, negligible to minor, and beneficial.

UNAVOIDABLE ADVERSE ENVIRONMENTAL EFFECTS

Implementation of alternatives 1, 2, or 3 would all lead to unavoidable long-term adverse environmental impacts. Alternative 1 (no action) would result in unavoidable adverse impacts to native vegetative communities, protected plant species, nonnative invasive plant species (i.e., impacts to native plant communities from nonnative invasive plants), protected wildlife, major game species, nonnative wildlife species (i.e., impacts to native wildlife population from nonnative wildlife species), wilderness, and soundscapes throughout the entire Preserve, including the Addition. Alternative 2 would result in the same unavoidable adverse impacts as alternative 1 within the original Preserve boundaries; however, no unavoidable adverse impacts would result from alternative 2 in the Addition, since hunting would be prohibited in the Addition under alternative 2. Alternative 3 would lead to unavoidable adverse impacts to native vegetative communities, protected plant species, nonnative invasive plant species (i.e., impacts to native plant communities from nonnative invasive plants), protected wildlife, wilderness, and soundscapes.

IRREVERSIBLE AND IRRETRIEVABLE COMMITMENT OF RESOURCES

NEPA regulations (40 CFR 1502.16) require an EA to address the irreversible and irretrievable commitment of resources caused by the alternatives. An “irreversible” commitment of resources is defined as the loss of future options. The term applies primarily to the effects of using nonrenewable resources (such as minerals or cultural resources) or resources that are renewable only over long periods (such as soil productivity). It could also apply to the loss of an experience as an indirect effect of a “permanent” change in the nature or character of the land. An “irretrievable” commitment of resources is defined as the loss of production, harvest, or use of natural resources; irretrievable resource commitments may or may not be irreversible. No irreversible or irretrievable commitment of resources was identified with any of the alternatives in this plan.



CHAPTER 5: CONSULTATION AND COORDINATION



SCOPING PROCESS AND PUBLIC INVOLVEMENT

INTERNAL SCOPING

The purpose of NPS internal scoping activities was to develop a framework for the planning process and the fundamental foundation (e.g., draft purpose, need, objectives, and alternatives for the project) needed to prepare the *Hunting Management Plan*. The internal scoping supports the planning process by ensuring that the requirements of NEPA and U.S. Department of the Interior regulations are fulfilled throughout the planning process.

Internal Scoping Meetings

Three meetings and two web seminars were held during the NPS internal scoping process (see table 5-1).

Table 5-1 – Internal Scoping Meetings

Date	Location	Attendees
Jan 24, 2011	Big Cypress Swamp Welcome Center	NPS (Big Cypress and contractor), USFWS, FWC
Jul 13, 2011	Big Cypress National Preserve Headquarters	NPS (Big Cypress, Denver Service Center, and contractor), USFWS
Jul 14, 2011	Big Cypress Swamp Welcome Center	NPS (Big Cypress, Denver Service Center, and contractor), USFWS, FWC
Jul 28, 2011	Web Seminar	NPS (Big Cypress, Denver Service Center, and contractor), USFWS, FWC
Aug 1, 2011	Web Seminar	NPS (Big Cypress, Denver Service Center, and contractor), USFWS, FWC

The overall goals of these internal scoping meetings were to review the project background with all of the agencies involved in

the internal scoping process (NPS, USFWS, and FWC); review the NPS NEPA planning process; develop a draft purpose, need, and objectives for the public scoping process; develop draft alternatives for the public scoping process; and prepare for the public scoping portion of the project.

PUBLIC SCOPING

Public scoping is an early and open process to determine public concerns in relation to a proposed action. Public involvement is an important requirement of NEPA, especially in determining the appropriate scope of the analysis. In accordance with U.S. Department of the Interior regulations, the NPS conducted public scoping for the *Hunting Management Plan* to ensure input from all interested parties.

The public scoping period for the *Hunting Management Plan* was scheduled from August 8 through September 16, 2011 (40 days). The public scoping period was initiated by the NPS by publishing a news release on the NPS Big Cypress National Preserve website and by issuing the release to local media.

A public scoping newsletter was posted on the NPS Planning, Environment, and Public Comment (PEPC) website. The public scoping newsletter provided background information on the project, information on how to comment on the project, and the preliminary draft purpose, need, objectives, and alternatives. The public scoping newsletter also posed four questions about the *Hunting Management Plan*:

- *Question 1: Do you feel that the draft purpose, need, and objectives adequately express the goals of the Hunting Management Plan/EA?*
- *Question 2: Do you have any additional alternatives in mind that would better address the draft purpose, need, and*

objectives of the Hunting Management Plan/EA?

- *Question 3: Describe any issues or concerns you feel should be addressed in the Hunting Management Plan/EA.*
- *Question 4: Do you have any other comments related to the Hunting Management Plan/EA?*

Additionally, in order to solicit agency input on the project, scoping letters were sent to the Florida State Clearinghouse, USFWS, the Florida State Historic Preservation Officer, the Miccosukee Tribe of Indians of Florida, Seminole Tribe of Florida, and the Seminole Nation of Oklahoma.

Public Scoping Meetings

Two public scoping meetings were held for the *Hunting Management Plan* in proximity to the areas surrounding the Preserve to initiate public involvement early in the planning stage and to obtain community feedback regarding the preliminary draft project purpose, need, objectives, and alternatives.

The first public scoping meeting was held at Edison State College in Naples, Collier County, Florida, on August 30, 2011. A total of 26 public participants and 19 agency/tribal/contractor personnel attended.

The second public meeting was held at the Hyatt Regency Bonaventure in Weston, Broward County, Florida, on August 31, 2011. A total of 60 public participants and 17 agency/tribal/contractor personnel attended.

Each meeting was structured into the following sessions. Participants were asked to sign in to the meeting and were provided with the project scoping newsletter. From 5:00 p.m. to 6:00 p.m., an open house session was held with a series of exhibits illustrating the preliminary draft project purpose, need, objectives, and alternatives. National Park Service and contractor staff were available to discuss the project, answer questions, and record comments on flip charts. From 6:00 p.m. to 6:30 p.m., there was a brief

presentation about the project, outlining the project background, EA process, public involvement opportunities, and preliminary draft purpose, need, objectives, and alternatives. From approximately 6:30 p.m. to 7:30 p.m., the public was provided with an opportunity to provide official statements on the project while NPS and contractor staff recorded comments on flip charts.

Public Comment Opportunities

The public was invited to participate in the scoping portion of this project in the following ways:

- Participation in the two public meetings. Comments could be provided via the following methods at the public meetings:
 - spoken comments recorded by NPS and contractor staff on flip charts during the open house portion of the meetings
 - spoken comments recorded by NPS and contractor staff on flip charts during the formal comment session
 - written comments via the project comment form provided in the public scoping newsletter
- Submission of comments at any time during the scoping period. Comments could be provided via the following methods:
 - the NPS PEPC website
 - email to NPS Preserve staff
 - hard copy letter to the Preserve superintendent
 - the project comment form provided in the public scoping newsletter

Public Scoping Comments

During the comment period 272⁴³ pieces of correspondence were received with 1,113 comments. Correspondence was received by one of the following methods: web form (NPS PEPC website), public comment form

⁴³ The flip chart comments recorded at each of the public meetings were compiled and entered as one piece of correspondence for each public meeting.

(attached to the public scoping newsletter), hard copy letter, email, fax, and public meeting flip charts. Letters received by hard copy, email, or fax, as well as comments from the public meeting flip charts, were entered into the NPS PEPC system for analysis. Each of these letters or submissions is referred to as correspondence.

Correspondence from respondents regarding the *Hunting Management Plan* ranged from strong support to strong opposition to the project. The remaining correspondence did not express an opinion clearly supporting or opposing a hunting management plan, but only provided comments, questions, recommendations, or concerns.

Regarding Question 1 (“*Do you feel that the draft purpose, need, and objectives adequately express the goals of the Hunting Management Plan/EA?*”), a similar number of commenters responded affirmatively and negatively. A little more than half of respondents either did not answer Question 1 or did not clearly state their opinion in the affirmative or negative.

Regarding Question 2 (“*Do you have any additional alternatives in mind that would better address the draft purpose, need, and objectives of the Hunting Management Plan/EA?*”), slightly more commenters responded by stating ‘yes’ than those respondents that stated ‘no.’ A little more than half of respondents either did not answer Question 2 or did not clearly state their opinion either way.

Regarding the open-ended Questions 3 (“*Describe any issues or concerns you feel should be addressed in the Hunting Management Plan/EA?*”) and 4 (“*Do you have any other comments related to the Hunting Management Plan/EA?*”), varied responses were received from commenters. The responses to these questions have been summarized by topic below and included in the concern statements in the following section.

Comments received that were in favor of the *Hunting Management Plan* included reasons such as the enjoyment of the recreational

opportunity to hunt, appreciation of the natural resources while hunting, and the desire to pass on the hunting opportunity to future generations. A few of the correspondents in favor of the *Hunting Management Plan* also expressed a concern that it has taken a long time to open the Addition for hunting opportunities.

Those respondents that expressed opposition to the *Hunting Management Plan* discussed reasons such as protecting the natural resources, wildlife, and threatened and endangered species present in the Preserve; protecting the Preserve for future generations to enjoy; and the ample availability of other hunting lands both in the state of Florida and in other parts of the Preserve. A few of the respondents opposed to the *Hunting Management Plan* also expressed opposition to the allowance of hunting in other parts of the Preserve.

Several correspondents requested that hunting regulations be reviewed, clarified, and/or revised. A few of the requested changes included: reinstating turkey hunting during regular gun season; instituting an alligator hunt; abolishing the 10:00 p.m. to 5:00 a.m. daily closure to ORV operators; abolishing the requirement that stipulates that hunters must check-in and check-out at the same check station; prohibition of the trapping of small game; and review of the closure of the Stairsteps Unit. There was also a request to provide general hunting information and education as part of the *Hunting Management Plan*.

Many correspondences received included requests to revise the wording in portions of the preliminary draft purpose, need, and objectives presented to the public during the scoping period. A few comments were received which stated that the preliminary draft purpose, need, and objectives only expressed the needs of hunters and did not express the needs of nonhunting visitors. Comments were also received which requested that some of the preliminary draft need and objectives statements be removed from the *Hunting Management Plan*.

Many respondents stated their support for one of the preliminary draft alternatives, including support for alternatives 1, 2, and 3, as they were currently proposed during the public scoping period. Many of those commenting on the alternatives also requested changes to the existing preliminary draft alternatives or proposed new alternatives for the *Hunting Management Plan*. A few pieces of correspondence mentioned that the no action alternative should be no hunting in the Addition. A few respondents also requested that alternative 2 not be included in the *Hunting Management Plan*. A large number of correspondents requested that the USFWS be removed from the decision-making process for alternative 3. Comments were also received which expressed the need for an additional alternative that allows the FWC to independently manage hunting in the Preserve.

Many pieces of correspondence received referenced the enabling legislation for the Preserve. Some commenters stated that the NPS must allow hunting in the Addition in order to comply with the enabling legislation, while other commenters stated that the NPS does not have to allow hunting in the Addition to comply with the enabling legislation. A few pieces of correspondence also referenced NPS regulations, such as the need to implement the “Precautionary Principle” for the *Hunting Management Plan*. Other respondents included requests to comply with NEPA, the Endangered Species Act, the National Historic Preservation Act, and the Americans with Disabilities Act. A few commenters also expressed that it would be undesirable to have to comply with NEPA in the future for changes in hunting protocol within the Preserve.

Correspondence received that referenced public involvement included the following: a request that project information be better disseminated to the public; concern that too much weight is given to local concerns during the public involvement process; concern that too much weight is given to out-of-town concerns during the public involvement process; and a request to start a volunteer program to assist with project-related issues.

A few comments referred to Preserve management issues. Some commenters expressed a concern about enforcement of hunting regulations and the availability of NPS resources for enforcement. A couple of respondents also stated their belief that the NPS and FWC have done a good job of managing hunting in the Preserve.

Wildlife and habitat comments received during the scoping period included the need for additional studies as part of the *Hunting Management Plan* and general concern for impacts associated with implementation of a hunting management plan. Comments were received which expressed a concern that the deer population in the Preserve has been declining in recent years. Other commenters stated that wildlife poaching is a problem in the Addition and the Preserve. Correspondence was also received that mentioned hunting as a wildlife management tool. A few respondents also expressed concern about nonnative species and the need for nonnative species impacts to be analyzed in the *Hunting Management Plan*.

A large number of those commenting on the project expressed a concern for direct and indirect impact to endangered species in the Addition and the Preserve in general, especially the federally and state listed endangered Florida panther. Commenters requested that studies be conducted to determine the abundance and distribution of threatened and endangered species in the Preserve as well as the impacts of hunting on the Florida panther and its prey.

Socioeconomic impacts were mentioned by a number of correspondents. A few commenters requested that the socioeconomic impacts of allowing hunting in the Addition be analyzed in the *Hunting Management Plan*, while other comments were received which state that socioeconomic considerations should not be a part of the decision-making process for the *Hunting Management Plan*. Other socioeconomic concerns expressed by respondents included the need to complete the *Hunting Management Plan* in the most economical manner possible and the potential

for a fee to be charged to visitors of the Preserve.

Visitor use and experience was discussed by many of the respondents. Those opposed to hunting in the Addition expressed concern about a safety conflict between hunters and nonhunting visitors, as well as negative impacts on the visitor experience for nonhunters. Many comments were received which expressed an opposition to ORV use in the Addition. A number of correspondences also mentioned the need for better access options in the Addition.

A concern for cultural and ethnographic resources in the Addition was mentioned by some of the respondents. Commenters requested that cultural resources impacts be fully analyzed in the *Hunting Management Plan*. Other respondents expressed opposition to allowing hunting in the Addition due to concerns about cultural resources impacts. Comments were also received which requested that the Gladesmen culture be recognized in the *Hunting Management Plan*.

Other questions, concerns, and issues that were raised by respondents included: a request to designate the Addition as wilderness lands; the need to analyze indirect, secondary, and cumulative impacts in the *Hunting Management Plan*; the need to define certain terms (i.e., hunting management, science-based, adaptive management) in the *Hunting Management Plan*; and the need for prescribed burning in the Addition.

Agency/Tribal/Organization Comments

Correspondence from agencies, organizations, and businesses included letters and comments from the following entities (see table 5-2). The remaining 232 pieces of correspondence were received from unaffiliated individuals.

Table 5-2 – Agencies/Organizations/Business Providing Correspondence during the Public Scoping Process

Agency/Organization/Business	Number of Corr. Received
Airboat Association of Florida	3
American Indian Movement/Florida Chapter	1
Ancient Trees	1
Animal Welfare Institute	1
Antelope Club/Largo, Florida	1
Audubon Society	6
Big Cypress Sportsmen's Alliance	3
Broward Chapter of the Native Plant Society	1
Broward County Master Gardener	1
Center for Biological Diversity	1
Christian Outdoorsmen of Southwest Florida	1
Citizens Allied for Safe Energy, Inc.	1
City of Cooper City	1
Coastal Conservation	1
Council of Civic Associations, Inc.	1
Council of the Original Miccosukee Simanolee Nation Aboriginal People	1
Defenders of Wildlife	1
Ducks Unlimited	2
Eagle Watch	1
Ecology Party of Florida	1
Everglades Conservation and Sportsman Club	2
Everglades Coordinating Council	1
Federal Bureau of Prisons	1
Florida Biodiversity Project	1
Florida Department of State, Division of Historical Resources	1
Florida State Clearinghouse	1
Florida Trail Association	7
Fulltrack Conservation Club of Dade County	2
GatorGuides.com	2
Green Party	1
Jetport Conservation and Recreation Club	1
Kosher Caregivers	1
National Parks Conservation Association	1
National Rifle Association	6
National Wild Turkey Federation	5
National Wildlife Federation	3
New York Bowhunters	1
Palm Beach County Environmental Coalition	1

**Table 5-2 –
Agencies/Organizations/Business
Providing Correspondence during the
Public Scoping Process**

Agency/Organization/Business	Number of Corr. Received
Pops Hunt Club/Southwest Ranches, Florida	1
Public Employees for Environmental Responsibility	2
Reading Environmental Advisory Council	1
Rocky Mountain Elk Foundation	1
Safari Club International	16
Save our Sovereign Lands, LLC	1
Sea Turtle Oversight Protection	1
Seminole Tribe of Florida	1
Sierra Club	11
South Florida Wildlands Association	2
Southwest Florida Boy Scout Council	1
Tropical Theatre	1
Unified Sportsmen	1
United Waterfowlers of Florida	3
UWF	1

Agency/Tribal Correspondence Summary

On August 5, 2011, letters were sent to the following agencies, which provided information about the development of a hunting management plan for the Preserve and the opportunity to comment on the project.

- Florida State Clearinghouse
- USFWS
- Florida SHPO
- Miccosukee Tribe of Indians of Florida
- Seminole Tribe of Florida
- Seminole Nation of Oklahoma.

Florida Department of State, Division of Historical Resources. The State Historic Preservation Officer reviewed the scoping notice for the project for possible impact to historic properties listed, or eligible for listing, in the National Register of Historic Places. The review was conducted in accordance with Section 106 of the National Historic

Preservation Act of 1966, as amended and 36 CFR Part 800: Protection of Historic Properties. The September 14, 2011, SHPO letter stated the following regarding the *Hunting Management Plan*:

“Based on the information provided, it is the opinion of this office that the above-referenced undertaking will have no effect on historic properties.”

Florida State Clearinghouse. The Florida State Clearinghouse coordinated a review of the scoping notice for the project under the following authorities: Presidential Executive Order 12372; § 403.061(42), Florida Statutes; the Coastal Zone Management Act, 16 U.S.C. §§ 1451-1464, as amended; and NEPA, 42 U.S.C. §§ 4321-4347, as amended.

The Florida State Clearinghouse letter contained the following comment from the FWC:

The [FWC] is pleased to see the opportunity for public input into a Hunting Management Plan for [the Preserve]. FWC has been a full partner with the Preserve staff in drafting the alternatives and looks forward to continued participation at that level throughout the remainder of the plan development process.

The Florida State Clearinghouse letter concluded the following regarding the *Hunting Management Plan*:

Based on the information contained in the scoping notice and state agency comments, at this stage, the state has no objections to the proposed federal action. To ensure the project’s consistency with the Florida Coastal Management Program (FCMP), any concerns identified by our reviewing agencies during future reviews must be addressed prior to project implementation. The state’s continued concurrence will be based on the activity’s compliance with FCMP authorities, including federal and state monitoring of the activity to ensure its continued conformance, and the adequate

resolution of any issues identified during subsequent reviews.

Seminole Tribe of Florida. A member of the Seminole Tribe of Florida commented on the proposed *Hunting Management Plan*, but no official correspondence was received.

**Council of the Original Miccosukee
Simanolee Nation Aboriginal People.**

- Allowing hunting in the Addition violates the traditional, customary, and cultural rights of the Original Miccosukee Simanolee Nation Aboriginal People, including hunting, fishing, harvesting materials for homes, and practicing traditional customs.
- The area that comprises the Addition is a monument to the Aboriginal Indigenous Miccosukee Simanolee People.
- The Council of the Original Miccosukee Simanolee Nation Aboriginal People strongly objects to recreational hunting and recreational ORV use in the Addition.
- The Council of the Original Miccosukee Simanolee Nation Aboriginal People objects to destruction of natural systems, damage to the wildlife habitat, damage to the land, destruction of vegetation, disruption of the natural water flow and water quality, and disruption of the wildlife balance in the Addition.
- Allowing hunting in the Addition will reduce the prey base for the endangered Florida panther.
- Allowing for trails and roads, ORVs, and hunting in the Addition will force wildlife (including the Florida panther) in developed areas, which will increase mortality.
- The remaining habitat for the Florida panther is limited.
- The Addition needs to be preserved for future generations.

DRAFT HUNTING MANAGEMENT PLAN/EA PUBLIC INVOLVEMENT

Pursuant to 42 U.S.C. 4332(2) of NEPA and U.S. Department of the Interior regulations, the NPS made the Big Cypress National Preserve *Draft Hunting Management Plan/EA* available for review.

PUBLIC/AGENCY COMMENT PROCESS

The NPS published a news release about the availability of the *Draft Hunting Management Plan/EA* on March 7, 2012. The news release invited interested parties to submit their comments regarding the *Draft Hunting Management Plan/EA* and/or attend one of the two public meetings scheduled. The comment period for the *Draft Hunting Management Plan/EA* was scheduled from March 7, 2012 through April 6, 2012 (31 days). Upon request from interested parties, the comment period was extended to April 21, 2012 (an additional 15 days, for a total of 46 days).

Additionally, in order to solicit agency input on the *Draft Hunting Management Plan/EA*, letters were sent to the Florida State Clearinghouse, USFWS, the Florida State Historic Preservation Officer, the Miccosukee Tribe of Indians of Florida, Seminole Tribe of Florida, and the Seminole Nation of Oklahoma.

PUBLIC MEETINGS

Two public meetings were held in proximity to the areas surrounding the Preserve to present the *Draft Hunting Management Plan/EA* to the public and invite interested parties to submit their comments. The first public meeting was held at Miccosukee Resort and Gaming (500 Southwest 177th Avenue, Miami, Florida) on March 20, 2012. A total of 23 public participants and 15 agency/tribal/contractor personnel attended. The second public meeting was held at the Big Cypress Swamp Welcome Center (33000 Tamiami Trail East, Ochopee, Florida) on

March 21, 2012. A total of 8 public participants and 13 agency/tribal/contractor personnel attended.

Each meeting was structured into the following sessions. Participants were asked to sign in to the meeting. From 5:00 p.m. to approximately 6:00 p.m., an open house session was held with a series of exhibits illustrating the project purpose, need, objectives, alternatives, and details of the preferred alternative. National Park Service and contractor staff were available to discuss the project, answer questions, and record comments on flip charts. From approximately 6:00 p.m. to 6:30 p.m., there was a brief presentation about the project, summarizing the project purpose, need and objectives; alternatives analyzed in the *Draft Hunting Management Plan/EA*; findings of *Draft Hunting Management Plan/EA*; and details of the preferred alternative. From approximately 6:30 p.m. to 7:30 p.m., the public was provided with an opportunity to provide spoken comments on the project.

PUBLIC COMMENT OPPORTUNITIES

The public was invited to comment on the *Draft Hunting Management Plan/EA* in the following ways:

- Participation in one of the two public meetings. Comments could be provided via the following methods at the public meetings:
 - spoken comments recorded by NPS and contractor staff on flip charts during the open house portion of the meetings
 - spoken comments recorded by NPS and contractor staff during the formal comment session
 - written comments via the project comment form provided at the public meetings
- Submission of comments at any time during the comment period. Comments

could be provided via the following methods:

- the NPS PEPC website
- email to the Preserve Superintendent or staff
- hard copy letter to the Preserve Superintendent or staff
- the project comment form provided at the public meetings

PUBLIC COMMENTS

During the comment period 428⁴⁴ pieces of correspondence were received with 806 comments. Correspondence was received by one of the following methods: web form (PEPC), public comment form (provided at the public meetings), hard copy letter, email, and public meeting comments. Letters received by hard copy or email, as well as comments from the public meetings, were entered into the PEPC system for analysis. Each of these letters or submissions is referred to as correspondence.

Correspondence from respondents regarding the *Draft Hunting Management Plan/EA* ranged from strong support to strong opposition to the *Draft Hunting Management Plan/EA*. Many respondents stated their support for one of the alternatives, including support for alternatives 1, 2, and 3. The remaining correspondence did not express an opinion clearly supporting or opposing the *Draft Hunting Management Plan/EA* or any particular alternative, but provided comments, questions, recommendations, or concerns.

Comments received that were in favor of the *Draft Hunting Management Plan/EA* included reasons such as the enjoyment of the recreational opportunity to hunt, appreciation of the natural resources while hunting, and the desire to pass on the hunting opportunity to future generations. A few of the correspondents in favor of the *Draft Hunting Management Plan/EA* also expressed a

⁴⁴ The comments recorded at each of the public meetings were compiled and entered as one piece of correspondence for each public meeting.

concern that it has taken a long time to open the Addition for hunting opportunities.

Those respondents that expressed opposition to the *Draft Hunting Management Plan/EA* discussed reasons such as protecting the natural resources, wildlife, and threatened and endangered species present in the Preserve (especially the Florida panther); protecting the Preserve for future generations to enjoy; and the ample availability of other hunting lands both in the state of Florida and in other parts of the Preserve. Some of the respondents opposed to the *Draft Hunting Management Plan/EA* also expressed opposition to the allowance of hunting in other parts of the Preserve.

AGENCY/TRIBAL/ORGANIZATION CORRESPONDENCE

Correspondence from agencies, organizations, and businesses included letters and comments from the following entities⁴⁵. The remaining 310 pieces of correspondence were received from unaffiliated individuals.

Table 5-3 – Agencies/Organizations/Business Providing Correspondence during the Draft EA Public Comment Process

Agency/Organization/Business	Number of Corr. Received
African Safari Club of Florida	1
Airboat Association of Florida	1
Alliance for Retired Americans	1
Audubon Society (national and local chapters)	11
Big Cypress Sportsmen Alliance	3
Board of County Commission, Martin County	1
Butterfly Club	1
Care2	8
Center for Biological Diversity	1

⁴⁵ The total number of agencies/tribes/organizations/businesses reported exceeds the total number of correspondences due to the fact that some individuals associated themselves with more than one organization.

**Table 5-3 –
Agencies/Organizations/Business
Providing Correspondence during the
Draft EA Public Comment Process**

Agency/Organization/Business	Number of Corr. Received
Christian Outdoorsmen of Southwest Florida	1
Collier Sportsmen and Conservation Club	1
Conservancy of Southwest Florida	1
Council of the Original Miccosukee Simanolee Nation Aboriginal People	1
D.U. Feather Society	1
Defenders of Wildlife	2
Everglades Archers	1
Florida Bar Association	1
Florida Biodiversity Project	1
Florida Coastal Everglades Long Term Ecological Research Program	1
Florida Department of Environmental Protection, Office of Intergovernmental Programs	1
Florida Fish and Wildlife Conservation Commission, Office of Conservation Planning Services	1
Florida Master Naturalist	1
Florida Native Plant Society	1
Florida Parks	1
Florida Sport Shooting Association	3
Florida Trail Association	5
Florida Wildlife Federation	5
Fort Lauderdale Garden Club	1
Great Old Broads for Wilderness	1
Greenpeace	2
HumaneEducatorsReachingOut.com	1
Jetport Recreation Conservation Club	1
League of Humane Voters	3
Miccosukee Tribe of Indians of Florida	1
Mystic Jungle Educational Facility, Inc.	1
National Parks Conservation Association	3
National Rifle Association	2
National Urban Wildlife Coalition	1
National Wildlife Federation	2
Natural Resources Defense Council	1
Ocean Futures Society	1
Oceana	1

**Table 5-3 –
Agencies/Organizations/Business
Providing Correspondence during the
Draft EA Public Comment Process**

Agency/Organization/Business	Number of Corr. Received
Palm Beach County Environmental Coalition	1
Parkland Enews and Commentary	1
Rare Fruit and Vegetable Council	2
Ridge Ranger	1
Rocky Mountain Elk	1
Safari Club International (national and local chapters)	12
Sea Turtle Oversight Protection Inc.	10
Seminole Tribe of Florida	1
Sierra Club (national and local chapters)	15
South Florida Wildlands Association	5
Southern Brother Grading	1
Southwest Ranches Historical Society	1
Ted Swoboda Photography	1
The Nature Conservancy	2
Town of Briny Breezes, Florida	1
U.S. Fish and Wildlife Service	1
Unified Sportsmen of Florida	1
Unitarian Universalist Church	2
United Hunters of Florida	1
United Waterfowlers of Florida	5
Veterans for Peace	1
WaterWeb Consortium	1
Wilderness Society	1
World Wildlife Federation	1
Yellowstone to Uintas Connection	1

Agency Correspondence

U.S. Fish and Wildlife Service. The USFWS recommended the following revisions to the *Draft Hunting Management Plan/EA* by email:

page 5:

7. Provide guidelines for hunting within the Big Cypress National Preserve/Wildlife Management Area that satisfy all NPS regulations, the Preserve’s

enabling legislation, the NPS/FWC Cooperative Partnership Agreement, and all federal, state, and local laws and regulations that maintains or improves the Preserve's ability to contribute to the conservation of rare, threatened, and endangered species.

page 32:

Manage a sustainable deer population in the Preserve, which ensures that the effects of hunting in the Preserve are beneficial, discountable, or insignificant to the Florida panther population.

Manage the feral hog population in the Preserve in a manner that balances the feral hog as an invasive species and ensures that the effects of hunting in the Preserve are beneficial, discountable, or insignificant to the Florida panther.

Florida State Clearinghouse. The Florida State Clearinghouse coordinated a review of the draft plan under the following authorities: Presidential Executive Order 12372; Section 403.061(42), Florida Statutes; the Coastal Zone Management Act, 16 U.S.C. §§ 1451-1464, as amended; and the National Environmental Policy Act, 42 U.S.C. §§ 4321-4347, as amended.

The letter stated:

Based on the information contained in the draft plan and ... FWC comments, the state has determined that, at this stage, the proposed activities are consistent with the Florida Coastal Management Program (FCMP). The state's continued concurrence will be based on the activities' compliance with FCMP authorities, including federal and state monitoring of the activities to ensure their continued conformance, and the adequate resolution of issues identified during this and any subsequent reviews.

The letter also contained a summary of comments from FWC, which are discussed

separately in this document, under the FWC section.

Florida Fish and Wildlife Conservation Commission. The “FWC supports Preferred Alternative (3) as the best strategy of the three alternatives to manage hunting and to help facilitate the NPS responsibility for allowing public use as intended and in accordance with the [Big Cypress National Preserve] Addition Act (Public Law 100-301), while protecting the [Big Cypress National Preserve’s] fauna and flora.”

Additionally, the FWC provided the following recommendations regarding public access “to disperse [the] hunter on the landscape (especially in the Addition)”:

FWC looks forward to working with NPS staff to improve access and address: 1) general access to the area, 2) access into the Addition via Interstate 75, 3) a trail system and connectivity of trails with other [Big Cypress National Preserve] units, 4) and acceptable off-road vehicle use. These improvements would allow for a level of public use consistent with other units of [Big Cypress National Preserve] while ensuring this use does not adversely affect the Florida panther or other fauna and flora.

State Historic Preservation Officer. The SHPO reviewed the *Draft Hunting Management Plan/EA* for possible impacts to historic properties listed, or eligible for listing, in the National Register of Historic Places, or otherwise of historical, architectural or archaeological value. The review was conducted in accordance with Section 106 of the National Historic Preservation Act of 1966, as amended and 36 CFR Part 800: Protection of Historic Properties. The letter stated:

It is the opinion of this office that the proposed undertaking will have no effect on historic properties if the following conditions are met:

- *All known historic resources should be avoided by potential ground*

disturbing activities. In addition, any areas that will experience ground disturbance that have not been previously subjected to a cultural resources assessment survey should have such an assessment performed. These activities should be coordinated with the Forest Service archaeologists. The final reports of any such investigations should be forwarded to this office in order to complete the project review process.

Tribal Correspondence

Miccosukee Tribe of Indians of Florida.

The Miccosukee Tribe of Florida letter states that “the Tribe was pleased to see that language from the Big Cypress Enabling Act was found throughout the document and that the National Park Service recognizes the traditional cultural uses for the Miccosukee Tribe.”

However, the Tribe would like clarification and additional details on the following topics:

- water quality and quantity impacts from ORV trails
- cultural resource and traditional customary use impacts from increased hunting and/or recreational activity
- extrapolation of data from the original Preserve to set quotas in the Addition – the Tribe believes that “the conditions in the Addition are unique due to its location next to the Miccosukee Federal Reservation”
- uncertainty in the *Draft Hunting Management Plan/EA* about the white-tailed deer population
- availability of baseline data for adaptive management
- the designation of alternative 1 as the no action alternative as it allows hunting in the Addition, while alternative 2 does not allow hunting in the Addition
- designation of wilderness in specific units of the Preserve – the Tribe opposes this
- any construction activity in the Addition lands – the Tribe opposes this

Seminole Tribe of Florida. The Seminole Tribe of Florida (STOF) is “encouraged that the [NPS] acknowledges the STOF's usual and customary usage hunting rights within the Preserve and Addition. The STOF is further encouraged that the NPS recognizes that the Hunting Plan is not intended to interfere with or define the STOF' s customary usage and occupancy rights within the Preserve and Addition.”

However, the STOF letter expresses concern that the hunting management plan could be used to limit the usual and customary usage rights of the STOF. The letter states: “As the public begins to utilize and enjoy these new hunting privileges, it will be even more difficult to curtail them if they conflict with the STOF's customary usage rights.”

Other concerns expressed in the letter from the STOF include:

- lack of security that could result in trespassing on the STOF's Big Cypress Reservation
- safety of members of the STOF from hunters while participating in traditional activities
- potential impacts that hunting may have on the STOF's traditional cultural ceremonies that are conducted within the Preserve
- decline of game populations (especially the white-tailed deer) from public hunting that would interfere with the ability of the STOF to continue traditional hunting

Council of the Original Miccosukee Simanolee Nation Aboriginal People

The letter from the Council of the Original Miccosukee Simanolee Nation Aboriginal People expressed concern about the *Draft Hunting Management Plan/EA*, the cultural and ethnographic resource impacts of the plan, and the natural resource impacts of the plan. The letter stated the following:

No matter why kind of so-called management plan you create on your own, giving you the right to disturb our Grounds, we still know it is wrong what you are doing because the Council of the Original Miccosukee Simanolee Nation Aboriginal People has their own Law- The Natural Law - the Law of the Human Beings. The Council of the Original Miccosukee Simanolee Nation Aboriginal People has carried the Natural Law from the beginning of Creation of Life, and we are not going to change that, no matter what kind of plan you come up with on your own. Aboriginal Indigenous People are not breaking anybody's laws. Illegal, immigrant european americans and other immigrants are the ones who are breaking the law - The Natural Law of this Land.

Organizational Correspondence

(Listed in alphabetical order by organization)

Center for Biological Diversity. The Center for Biological Diversity supports alternative 2 and states in their letter:

The Center supports Alternative 2 because opening the area to hunting would diminish an already small prey-base for the panther and would further impair valuable panther habitat. As a federal agency charged with managing public lands, the NPS should consider the benefits of maintaining the no-hunting status quo in the Addition lands. Our comments focus on Addition lands' natural resources and are organized according to how the NPS presents environmental consequences in Chapter 4 of the EA. The comments also incorporate impacts from ORVs that were not directly assessed in the EA. The primary, direct impacts from ORV and hunting use should not be ignored in this EA just because ORV use is currently authorized pursuant to a separate management document. Hunters will be permitted to use ORVs in the Addition lands under the preferred alternative, therefore, the

impacts of ORVs to Addition lands' natural resources are discussed in these comments and should be included in the NPS' analysis.

Their letter also provides details regarding the following concerns:

- Vegetation and habitat – ORV impacts to soil, water, and vegetation must be analyzed and compared to the status quo of no hunting or ORVs in the Addition.
- Waterways – The NPS should assess whether motorized hunting would result in ORV roads in close proximity to streams or waterways and should take steps to avoid and mitigate this impact.
- Pathogens – The NPS should also consider whether pathogens and nutrients will be introduced into the soil and water at elevated levels in association with dispersed recreation.
- Soils – The NPS must consider the impacts of soil compaction (road surfaces, unauthorized routes, trails) and erosion in assessing Alternatives 1 and 3 and weigh those impacts against the relative benefit of maintaining the Addition lands-status quo.
- Avian species, eastern indigo snake, American crocodile, and American alligator – The impacts to these species are classified as negligible in the Draft EA. Hunting currently occurs in the Preserve in various forms and for a variety of species for about eight months out of the year. The analysis in the EA does not explain how an impact that occurs ¾ of the time could be considered negligible.
- Florida panther – While the likelihood of the threat to panthers from the *Hunting Management Plan* could be characterized as low, the impact from that threat should be analyzed in the context of the panther population already being under tremendous stress.
- Florida panther - The EA's analysis is lacking with respect to the white-tail deer population, use of ORVs, and lead contamination from spent lead ammunition in Big Cypress.

- White-tailed deer – Unnecessary direct competition with the panther for its primary food source is not supported by science or defensible under the Endangered Species Act or National Environmental Policy Act. Also, the EA somehow concludes that the impacts to panther would be the same under the no hunting alternative as the hunting alternatives because panthers would travel between the Preserve and Addition. To the contrary, the benefits of leaving 1/5 of Big Cypress free from ORVs and hunting – a refuge to species and other recreational users, should be weighed against the impacts from Alternatives 1 and 3.
- ORVs - As hunters will no doubt utilize ORVs to access areas of the Addition, this impact must be assessed as part of this proposal.
- Lead ammunition - Another deficiency in NPS' assessment of the impact of hunting in the Addition lands is the failure to discuss impacts from lead ammunition on nontarget species (major game species, bald eagle, turkey vulture, other raptors, waterfowl, game birds, cranes and rails, song birds, mammals, and amphibians and reptiles). Additionally, the NPS has both the authority and mandate to protect nontarget wildlife from lead ammunition. Regardless of the alternative NPS adopts here, it should work toward banning lead ammunition in Big Cypress.
- Additional alternative – An additional alternative should be analyzed that consists of no hunting in the Addition and adaptive management in the original Preserve.

Defenders of Wildlife. Defenders of Wildlife supports alternative 3, but offers the following concerns:

... we recognize hunting as an authorized activity throughout the Preserve, including the Addition Lands, that the three agencies (NPS, FWS and FWC) each must play a significant role in developing the hunting plan, that ensuring a healthy prey base exists for the endangered Florida panther and other predators

should be among the priorities while managing for overall native biological diversity, and that hunting and related activities must not adversely affect wildlife, ecological integrity or the experience of visiting Big Cypress for the non-hunter.

Unfortunately, the Draft EA provides neither sufficient scientific information and analysis nor the level of detail regarding impacts and hunt plans that are needed to proceed toward opening hunting in the Addition Lands at this time. Among the deficiencies, Defenders finds the Draft EA:

- *Does not provide adequate studies, data and analysis on the status, demographics and condition of the deer population and other game animals*
- *Does not provide adequate scientific data on the status of the panther population in the Addition Lands*
- *Does not provide sufficient detail regarding the options the agencies will consider with respect to what hunting regimes/schedules will be allowed and how they will be managed*
- *Does not provide adequate analysis of the impacts of hunting on rare and imperiled species and on game species*
- *Does not provide adequate information on how Adaptive Management will [be] carried out and how decisions will be made*

Defenders believes that hunting can be conducted in a manner that is compatible with endangered species management and recovery. We do not find that the Draft EA makes the case that this would be so in all areas of the Big Cypress. The National Environmental Policy Act requires (see Draft EA page 30) that the range of alternatives include reasonable alternatives that must be rigorously and objectively explored. NPS has not done due diligence in adhering to this standard. Defenders has read the comments

submitted by the National Parks Conservation Association (dated 4/16/2012) and supports their extensive analysis of these matters.

Florida Biodiversity Project. The Florida Biodiversity Project letter states that the organization is:

... disappointed with the single-minded vision the National Park Service (NPS) has for the future in all public units of the Preserve. We see a new NPS direction towards construction, development and wildlife removal without adequate baseline data, species counts and/or wildlife and endangered species monitoring. The Endangered Species Act (ESA) requires this research before any agency creates policy to put them further at risk. NPS has made the decision to take the Preserve on a new "industrial park" type setting to promote vehicle use to service hunting and wildlife removal. We choose to speak for the health of the Preserve, the natural processes that still offer respite to the red cockaded woodpecker, the Everglades snail kite, and even the insects no one cares about. We respond accordingly.

The letter offers the following concerns:

- The Florida Biodiversity Project disagree with the project purpose.
- The objectives are designed to limit nonhunting uses.
- The scoping questions seemed biased to increased hunting and ORV use.
- Allowing hunting in the Preserve and Addition precludes other users from using the areas due to safety concerns.
- The *Hunting Management Plan* will require the NPS to become dependent upon hunting and ORV use in the Preserve.
- Hunting-related ORV use should be addressed in the document.
- The NPS's "Precautionary Principle" should be applied to hunting management in the Preserve.

Florida Wildlife Federation. The Florida Wildlife Federation letter compliments the "mutual cooperation with the State of Florida's Fish & Wildlife Conservation Commission" on the *Draft Hunting Management Plan/EA* and offers the following comments on the document:

- Page III.
Quote: " the Addition has never been open to public hunting either before or after its acquisition".
Comment: This statement is somewhat misleading and incomplete. It is true that since the National Park Service acquired these public lands that there has been no hunting. However, the statement is incomplete in that someone (most people) that are unfamiliar with the history of prior ownership and use on what is now the Addition, would be under the impression that the area had never been hunted. Example: I recently heard a litigant state that the NPS Hunt Plan says that the Addition Lands had "Never" been hunted and were pristine so we should never allow hunting on these lands. A more complete statement would be that the area was privately owned and hunting leases were made available to members of the public prior to acquisition by the federal government. (example WD ranch). I suggest that this oversight be corrected in the final Hunting Management Plan.
- Page 20. "Issues"
Quote: "Allowing hunting in the Addition could adversely impact the visitor experience of non-hunting visitors in the Addition."
Comment: Conversely, one could say correctly that non-hunting visitors could adversely impact the visitor experience of hunters in the Addition. Talking loudly and disturbing game by their noise/scent.
- Page 91. "Hunting Noise"
Comment: I frequently spend a week in the backcountry of the Preserve. During that time whether it be muzzleloading, general gun or spring gobbler season I hear very few gunshots. Most of the gunshots occur in the first couple of days at the opening of each season when the game is

undisturbed. It is not unusual to go several days without hearing a gunshot or a buggy. Many of us in fact go an entire season some years without firing a single shot. I don't feel that this is a major "noise" issue. Of course, if you are going to have hunting, then you will expect a gun shot occasionally.

- Page 96.
Quote: "Visitors Study-Safety. Table 3-6, Reasons for feeling unsafe . Hunters. Number of times mentioned...7".
Comment: These comments reflect a lack of knowledge and comprehension on the part of visitors unfamiliar with the Big Cypress and hunting. And I would say , frequently a basic anti-hunting viewpoint in general. Statistics show that hunting is far safer than driving your car to Publix or trying to see an alligator at a roadside viewing area.
- Page 120. "Florida Panther"
Quote: "Direct impacts to the Florida panther could occur from misidentification of target by hunters (very rare)."
Comment: The above statement only serves to create a problem with public perception that hunting is a threat to the panther. Better left unsaid due to the misconceptions that it spawns in the minds of uninformed individuals. I have been hunting in the Big Cypress for over 60 years. I have no knowledge of anyone ever confusing a long-tailed, round eared, round headed panther with an antlered deer. If that "rare" individual were to do so, then I would not call them a hunter. I would refer to them properly. They would be an uninformed idiot, not an ethical or responsible hunter.
- Page 121.
Quote: "Indirect impacts to the Florida panther population from reduction in the prey base resulting from hunter take would occur with implementation of this Alternative. (1)"
Comment: Obviously under alternatives one and three, hunter take would reduce the prey base to some extent during the hunting season. However, how significant the reduction might be is an open question. The existing hunting season in

the original preserve with a total of two bucks is conservative in comparison to most other areas in Florida. While legal hunters would take some of the available prey base, this take is not the major threat to the Panther's recovery in my opinion. Far more of a threat is loss of habitat to the north and west of the preserve. Another major threat is the political realities affecting the six recovery goals mentioned by the USFWS Recovery Plan

National Parks Conservation Association (NPCA).

NPCA does not oppose hunting in the Preserve as a general matter, either in the Addition or in the Original Preserve. NPCA recognizes that Congress authorized hunting there, subject to limitations and controls needed to carry out the Preserve's primary purpose, which is "to assure [the Preserve's] natural and ecological integrity in perpetuity." NPCA recognizes that there are a number of people who enjoy and support hunting in the Preserve and that the disputes about hunting and related use of off-road vehicles ("ORVs") has been contentious.

The purpose of a document such as the Draft Hunting EA, however, is to set out what alternative limits and controls are being considered, what the environmental consequences would be if specified alternatives were adopted, and how those limits and controls would meet the statutory standard. Unfortunately, the Draft Hunting EA fails to address those subjects except in vague terms that fail to meet the applicable legal and policy requirements. In some cases, the EA misstates what the legal standard is. While the NPS's preferred alternative relies on an adaptive management approach, that alternative is so lacking in parameters or specifics concerning the limits and controls that might be adopted or of the environmental consequences of the range of options being considered that it is really nothing more than a plan to develop a plan in the future. This is not

what the applicable laws and policies require.

This letter describes the significant defects of the Draft Hunting EA. NPCA respectfully requests that NPS abandon this draft EA and prepare an Environmental Impact Statement ("EIS") that complies with applicable laws and policies for hunting in Big Cypress National Preserve. To facilitate your response to comments, we have numbered our individual comments.

To summarize, our key points are:

- No Hunting in the Addition Is the 'No Action' Alternative. The Draft Hunting EA misstates Alternatives 1 and 2 as they relate to the Addition. No hunting is now allowed in the Addition. Therefore, the true NEPA "no action" alternative is to continue the policy of no hunting in the Addition.*
- Affirmative NPS Findings Are Needed to Allow Hunting in the Addition. NPS must adopt affirmative findings under its regulations and management policies to allow hunting in the Addition. No such findings have been made at this time. The EA incorrectly assumes that hunting is now permitted in the Addition.*
- NPS, Not the State, Must Make Final Decisions About Hunting. The Draft Hunting EA fails to recognize NPS's primary responsibility to make decisions about hunting in the Preserve.*
- The NEPA Analysis of Alternative 3 Is Flawed. The NEPA analysis of the preferred option, Alternative 3 (adaptive management strategy) fails to comply with Department of the Interior's ("DOI's") own NEPA regulations. The adaptive management plan is simply too vague. The EA fails to specify actions to be taken under the plan; i.e., it does not describe or analyze any specific hunting programs that may be implemented in the future. Thus, the*

EA lacks any serious analysis of the environmental effects of possible future hunting plans. It also lacks objective, measurable criteria to ascertain whether and how future "management responses" will mitigate adverse impacts to Preserve users, plant and animal species, and natural eco-systems. Also absent from the EA is the quantitative analysis and scientific data to support its conclusions that hunting will not cause significant adverse impacts.

- A Mitigation Plan Is Needed. Council on Environmental Quality ("CEQ") regulations require the preparation of a formal mitigation plan for any EA that results in a finding of no significant impact ("FONSI") with mitigation measures. This element is wholly absent from the Draft Hunting EA.*
- A Full EIS Is Needed. An environmental assessment is only appropriate where federal actions will not result in significant impacts. That is not the case with hunting in the Preserve. In particular, there will certainly be significant impacts on plants, animals and eco-systems if hunting is allowed in the 147,000 Addition which has long been a sanctuary where no public hunting was permitted. NPS should prepare a full EIS for hunting in the Original Preserve and in the Addition.*

Additionally, the NPCA letter provided the following general and specific comments on the Draft Hunting Management Plan/EA:

- General Comment 1.0 – The Draft Hunting EA Misstates Alternatives 1 and 2 as They Relate to the Addition*
- Specific Comment 1.1 – The No Action Alternative Should Be a Continuation of the No Hunting Policy in the Addition*
- Specific Comment 1.2 – Affirmative Steps Are Needed to Permit Hunting in the Addition*

- *Specific Comment 1.3 – The Draft Hunting EA Must Be Amended to Correctly Specify the No-Action Alternative*
- *General Comment 2.0 – The Draft Hunting EA Misstates the Purpose of the Preserve*
- *General Comment 3.0 – The Draft Hunting EA Ignores NPS Regulations and Policies*
- *Specific Comment 3.1 – Rule 2.2(b) Requires Findings for Hunting in the Addition*
- *Specific Comment 3.2 – NPS Management Policies Require Findings to Allow Hunting in Any Part of the Preserve*
- *General Comment 4.0 – The EA Does Not Recognize NPS's Primary Role, and the Cooperative Partnership Agreement Disclosed with the Draft Hunting EA Cannot Legally Abandon or Delegate that Role*
- *General Comment 5.0 – The Adaptive Management Strategy Does Not Comply with NEPA*
- *Specific Comment 5.1 – Alternative 3 is Too Vague*
- *Specific Comment 5.2 – The Draft Hunting EA Violates DOI Regulations and NEPA by Not Describing Specific Options*
- *Specific Comment 5.3 – The EA Violates DOI Regulations and NEPA by Not Analyzing the Environmental Consequences of Specific Hunting Programs*
- *Specific Comment 5.4 – The Draft Hunting EA's Conclusions Are Not Based on Scientific Studies and Data*
- *General Comment 6.0 – The EA Will Not Withstand Judicial Scrutiny*
- *Specific Comment 6.1 – Courts Require Adaptive Management Plans to Have Detailed Triggering Criteria*
- *Specific Comment 6.2 – Courts Look for Criteria and Triggers for Mitigation*
- *General Comment 7.0 – A Formal Mitigation Plan Is Needed*

National Urban Wildlife Coalition. The National Urban Wildlife Coalition letter supports alternative 2 and expresses concerns about the following substantive issues:

- NPS has acknowledged that Alternative 2, and not the preferred Alternative 3, best meets the needs of the public to enjoy the preserve.
- With regard to impacts on the Florida panther and its prey base, the decision to open up the Addition Lands to hunting is a clear violation of the NPS's "precautionary principle". ... As stated in the preserve's own Off-Road Vehicle Management Plan (2000): "In cases of uncertainty as to the impacts of activities on park natural resources, the protection of natural resources will predominate."

Safari Club International. The Safari Club International "agree[s] with the National Park Service's choice of Alternative 3, the Adaptive Management Strategy, as long as the shift to that management strategy for hunting in the Preserve does not in any way interfere with ongoing hunting opportunities and/or does not further delay the allowance of hunting in the Addition." Additionally, the Safari Club International "support(s) an expeditious and well-supported plan that will finally give Safari Club members and the general hunting community access to those hunting opportunities."

The Safari Club International's letter expresses the following concerns about the *Draft Hunting Management Plan/EA*:

- *The goal of the planning process must be to facilitate and implement hunting – not to impose obstacles to those who wish to carry out that recreational use.*
- *The Hunt Plan ... devotes pages and pages to reducing the impact of hunting on other activities, rather than on enhancing the activity of hunting itself. Safari Club reminds the NPS that the primary purpose of developing a hunt plan should be to provide the most enjoyable and sustainable hunting experience possible, as opposed to reducing the impact of hunting on other Preserve activities.*
- *Safari Club was concerned to see that the Hunt Plan applies Wilderness Act management restrictions, not only on designated Wilderness Areas but also on*

"lands identified as being suitable for wilderness designation, wilderness study areas, proposed wilderness and recommended wilderness (including potential wilderness) ... the wilderness purposes and management of those wilderness purposes for any of the aforementioned areas should never interfere with the facilitation of hunting activities on those lands.

- *Safari Club supports the "adaptive management" approach of Alternative 3, particularly because it allows the NPS and its state and federal partners to plan ahead and accommodate changes without conducting unnecessary incremental planning that could stall or interfere with hunting opportunities. Nevertheless, Safari Club cautions the NPS that it should not allow adaptive management authority to substitute for soliciting the input of the members of the hunting community that utilize the area and that often have valuable information about on-the-ground issues affecting wildlife and habitat in the Preserve and Addition.*

South Florida Wildlands Association (SFWA).

The South Florida Wildlands Association letter states that the "SFWA is deeply concerned with the adequacy of the research that has gone into the preparation of the current EA and draft decision. We are particularly concerned with future impacts to the Addition Lands which have never in history been open to either public hunting or off-road vehicle use."

In regards to the alternatives in the *Draft Hunting Management Plan/EA*, the SFWA letter states:

In the official alternatives offered to the public, we are at a complete loss as to why a more protective alternative for the Addition (no introduction of public hunting) would not have been coupled with a more protective framework for the original preserve (scientific and adaptive management in consultation with the U.S. Fish and Wildlife Service). But there is

much about this decision that we do not understand.

Regarding visitor use and enjoyment and coordination with the public on the *Draft Hunting Management Plan/EA*, the SFWA letter states:

Other than acknowledging the fact that current users (outside a handful of inholders and illegal users - 100% non-hunters and non-motorized) are going to be impacted negatively by this decision, NPS has made virtually no effort to reach out to this population to ascertain the specific ways that the current users will be affected.

The SFWA letter also expresses concern that the NPS has asserted in public meetings and in the *Draft Hunting Management Plan/EA* "that hunting throughout the preserve is a 'mandate'":

In fact there are a host of legislative mandates, executive orders, regulations and policies which emphasize again and again, that although off-road vehicle use, hunting, oil extraction, etc. are "allowable uses" inside the Big Cypress National Preserve, the overarching management mandate is the protection of natural resources and "use and enjoyment" by the public in "such a way" that leaves those resources unimpaired. Any allowable use can be disallowed - temporarily or permanently, locally or preserve-wide - so as to fulfill that mandate.

The SFWA letter expresses a concern about impacts to the endangered Florida panther and believes that the NPS should implement the "Precautionary Principle":

As we have already spoken about this issue at length in previous comments, there is no need to once again stress the importance of these lands to the future survival of Florida's critically endangered state animal. And the impacts of hunting (predation) by panthers on this unknown number of prey are also considered "unknown" by NPS according to their EA.

Into this complete vacuum of information, the NPS intends to insert something called "adaptive management" to avoid negative consequences to the panther. The NPS must implement the "Precautionary Principle."

Finally, the SFWA letter requests data about the deer herd in the Preserve and the effects of deer harvest and ORV use on the Florida panther:

While reviewing the NPS adaptive management plan for hunting, Jane Tutton of the FWS asked the following question of the NPS and URS (NPS contractor for this project). "Do we not have ecological effects for deer harvest and ORV use? I would need to think more on this conceptual model to see if we need to add or move things." To date she has received no response from either NPS or URS. Likewise, SFWA has requested all data on the extent of the deer herd in the herd in the Addition Lands to assist us in writing these comments. We have received no data as of this date.

REVISED DRAFT HUNTING MANAGEMENT PLAN/EA PUBLIC INVOLVEMENT

In response to the agency, public, and organization comments received during the public comment period for the *Draft Hunting Management Plan/EA*, the NPS made revisions to the *Hunting Management Plan*. To ensure full public involvement throughout the entire process of the plan's development, the NPS made the Big Cypress National Preserve *Revised Draft Hunting Management Plan/EA* available for review to solicit public input on the revisions to the document.

PUBLIC/AGENCY COMMENT PROCESS

The NPS published a news release about the availability of the Big Cypress National Preserve *Revised Draft Hunting Management Plan/EA* on July 19, 2012. The news release invited interested parties to submit their comments regarding the *Revised Draft Hunting Management Plan/EA* and/or attend the public meeting scheduled for the *Revised Draft Hunting Management Plan/EA*. The comment period for the *Revised Draft Hunting Management Plan/EA* was scheduled from July 19, 2012 through August 24, 2012 (37 days).

Additionally, in order to solicit agency input on the *Revised Draft Hunting Management Plan/EA*, letters were sent to the Florida State Clearinghouse, USFWS, the Florida State Historic Preservation Officer, the Miccosukee Tribe of Indians of Florida, the Seminole Tribe of Florida, and the Seminole Nation of Oklahoma.

PUBLIC MEETINGS

One public meeting was held to present the *Revised Draft Hunting Management Plan/EA* to the public and invite interested parties to submit their comments. The public meeting was held at the Big Cypress Swamp Welcome Center (33000 Tamiami Trail East, Ochopee, Florida) on August 9, 2012. A total of 16 public

participants and 15 agency/tribal/contractor personnel attended.

Each meeting was structured into the following sessions. Participants were asked to sign in to the meeting. At 5:00 p.m., an open house session was held with a series of exhibits illustrating the project purpose, need, objectives, alternatives, and details of the preferred alternative. National Park Service and contractor staff were available to discuss the project and answer questions. From approximately 5:30 p.m. to 5:45 p.m., there was a brief presentation about the project, summarizing the project purpose, need, and objectives; alternatives analyzed in the *Revised Draft Hunting Management Plan/EA*; findings of *Revised Draft Hunting Management Plan/EA*; the details of the preferred alternative; and the revisions from the previously published *Draft Hunting Management Plan/EA*. From approximately 5:45 p.m. to 7:00 p.m., the public was provided with an opportunity to provide spoken comments on the project. During the remainder of the public meeting, NPS and contractor staff were available to answer questions in an open house format.

PUBLIC COMMENT OPPORTUNITIES

The public was invited to comment on the *Revised Draft Hunting Management Plan/EA* in the following ways:

- Participation in the public meeting. Comments could be provided via the following methods at the public meetings:
 - spoken comments recorded by NPS and contractor staff during the formal comment session
 - written comments provided at the public meetings
- Submission of comments at any time during the comment period. Comments could be provided via the following methods:
 - the NPS PEPC website

- email to the Preserve Superintendent or staff
- hard copy letter to the Preserve Superintendent or staff

PUBLIC COMMENTS

During the comment period 131⁴⁶ pieces of correspondence were received with 254 comments. Correspondence was received by one of the following methods: web form (PEPC), hard copy letter, email, and public meeting comments. Letters received by hard copy or email, as well as comments from the public meetings, were entered into the PEPC system for analysis. Each of these letters or submissions is referred to as correspondence.

Correspondence from respondents regarding the *Revised Draft Hunting Management Plan/EA* ranged from strong support to strong opposition to the *Revised Draft Hunting Management Plan/EA*. Many respondents stated their support for one of the alternatives, including support for alternatives 1, 2, and 3. The remaining correspondence did not express an opinion clearly supporting or opposing the *Revised Draft Hunting Management Plan/EA* or any particular alternative, but provided comments, questions, recommendations, or concerns.

Comments received that were in favor of the *Revised Draft Hunting Management Plan/EA* included reasons such as the enjoyment of the recreational opportunity to hunt, appreciation of the natural resources while hunting, and the desire to pass on the hunting opportunity to future generations. A few of the correspondents in favor of the *Revised Draft Hunting Management Plan/EA* also expressed

a concern that it has taken a long time to open the Addition for hunting opportunities.

Those respondents that expressed opposition to the *Revised Draft Hunting Management Plan/EA* discussed reasons such as protecting the natural resources, wildlife, and threatened and endangered species present in the Preserve (especially the Florida panther); and protecting the Preserve for future generations to enjoy.

The following substantive issues were received from individuals that did not identify themselves as officially representing any agency, tribe, or organization.⁴⁷

NEPA Compliance, Documentation, and Impact Analyses:

- The two General Management Plan documents do not mandate hunting in the Preserve.
- Additional text from the enabling legislation should be included in chapter 1 of the *Revised Draft Hunting Management Plan/EA*.
- The NPS is improperly applying Director's Order 12 and not adhering to NEPA in reference to the no action alternative.
- Alternative 2 should be the environmentally preferred alternative.
- There is insufficient scientific data to support the conclusion in the *Revised Draft Hunting Management Plan/EA* that hunting will not cause significant adverse impacts.
- Impacts from ORV usage should be included in the *Revised Draft Hunting Management Plan/EA*.

Alternatives:

- It is not necessary to include the USFWS in alternative 3.

⁴⁶ A total of 533 pieces of correspondence are entered into PEPC for this project; however, 402 of these pieces of correspondence were determined to be "spam," with fake names and content unrelated to the project; therefore, these comments were not considered in the comment analysis for the project. Additionally, the comments recorded at the public meeting were compiled and entered as one piece of correspondence.

⁴⁷ If a commentator listed themselves as a "member" of an organization but not an "official representative," then their comments are included under this section. Those comments received by designated "official representatives" of an organization are included in the discussion of agency, tribal, and organization correspondence in the following section of this report.

- The NPS/FWC Cooperative Partnership Agreement should be included in alternative 3.
- Alternative 1 should state that there has not been previous public hunting in the Addition.
- A stakeholders group should be established for the adaptive management process for alternative 3.

Hunting Regulations:

- Access points and trails for hunting, hiking, and ORVs in the Preserve should be increased.
- Quota permits are not needed for the Addition.
- The FWC’s hunting seasons should be adopted in the Addition.
- Hunting of nonnative species should be allowed in the Preserve.
- Hunting should only be allowed via walk-in access.
- There should be a separation between hunters and property owners in the Preserve.
- The Addition should not be closed to hunting due to drought or flood conditions alone, without other factors being present.

Wildlife and Habitat:

- The NPS should reintroduce feral hogs into the Preserve.
- Ecosystem management should be conducted that would encourage quail or doves to inhabit the Preserve.
- Better data and data collection efforts for the deer population are needed in the Preserve.
- Additional data and surveys for deer populations estimates should be included in the *Revised Draft Hunting Management Plan/EA*.
- Feral hogs are a main prey item for the Florida panther and impacts should be addressed in the *Revised Draft Hunting Management Plan/EA*.

Visitor Use and Experience:

- Noise from hunting activities (i.e., gunfire) would have a negative impact on the visitor experience of nonhunters.

- Mixing hunters and nonhunters in the same areas of the Preserve poses a safety risk to visitors.

Threatened and Endangered Species:

- A decline in the panther population (observed in less than three to five years) should be added to the list of triggers in the *Revised Draft Hunting Management Plan/EA*.

Prescribed Burning:

- Land management actions should be conducted to encourage a more natural fire regime in the Preserve.

Preserve Management:

- There are not an adequate number of rangers to properly enforce regulations in the Preserve.

AGENCY/TRIBAL/ORGANIZATION CORRESPONDENCE

Correspondence from agencies, organizations, and businesses included letters and comments from the following entities⁴⁸. The remaining 78 pieces of correspondence were received from unaffiliated individuals.

Table 5-4 – Agencies/Organizations/Business Providing Correspondence during the Revised Draft EA Public Comment Process

Agency/Organization/Business	Number of Corr. Received
Airboat Association of Florida	2
Big Cypress Sportsman Alliance	2
Boy Scouts of America	1
Broward County Airboat, Halftrack, and Conservation Club	2
Council of the Original Miccosukee Simanolee Nation Aboriginal Peoples	1

⁴⁸ The total number of agencies/tribes/organizations/businesses reported exceeds the total number of correspondences due to the fact that some individuals associated themselves with more than one organization.

**Table 5-4 –
Agencies/Organizations/Business
Providing Correspondence during the
Revised Draft EA Public Comment
Process**

Agency/Organization/Business	Number of Corr. Received
Florida Bowhunters Council	1
Florida Department of State, Division of Historical Resources, State Historic Preservation Officer	1
Florida Fish and Wildlife Conservation Commission, Office of Conservation Planning Services	1
Fulltrack Conservation Club of Dade County	3
National Parks Conservation Association (Arnold and Porter, LLP)	1
National Rifle Association	22
National Wild Turkey Federation	4
NCOA	1
North Lake Tea Party	1
Palm Beach County Airboat and Halftrack Conservation Club	1
Quail Unlimited	1
Safari Club International	9
Save our Sovereign Lands, LLC	1
Sawgrass Rifle Club	1
South Florida Wildlands Association	1
United Waterfowlers	2

Agency Correspondence

Florida Fish and Wildlife Conservation Commission. The FWC reviewed the *Revised Draft Hunting Management Plan/EA* and attended the public meeting. The FWC “continues to support Preferred Alternative (3).” Additionally, the FWC letter states that the comments provided on the previous draft still apply. The FWC letter dated April 9, 2012, stated:

[The] FWC supports Preferred Alternative (3) as the best strategy of the three alternatives to manage hunting and to help facilitate the NPS responsibility for allowing public use as intended and in accordance with the BCNP Addition Act

(Public Law 100-301), while protecting the BCNP's fauna and flora.

FWC looks forward to working with NPS staff to improve access and address: 1) general access to the area, 2) access into the Addition via Interstate 75, 3) a trail system and connectivity of trails with other BCNP units, 4) and acceptable off-road vehicle use. These improvements would allow for a level of public use consistent with other units of BCNP while ensuring this use does not adversely affect the Florida panther or other fauna and flora.

State Historic Preservation Officer. The SHPO reviewed the *Revised Draft Hunting Management Plan/EA* for possible impacts to historic properties listed, or eligible for listing, in the National Register of Historic Places. The review was conducted in accordance with Section 106 of the National Historic Preservation Act of 1966, as amended and 36 CFR Part 800: Protection of Historic Properties. The letter stated: “Based on the information provided, it is the opinion of this office that the proposed Alternatives 1-3 described in the Hunting Management Plan will have no effect on historic properties.”

Council of the Original Miccosukee Simanolee Nation Aboriginal People

The letter from the Council of the Original Miccosukee Simanolee Nation Aboriginal People expressed concern about the *Revised Draft Hunting Management Plan/EA*, the cultural and ethnographic resource impacts of the plan, and the natural resource impacts of the plan (particularly the Florida panther). The letter also stated objections to comments made by members of the public during the public meeting held on August 9, 2012. The letter stated the following, in part:

The Council of the Original Miccosukee Simanolee Nation Aboriginal Peoples hold on to our Traditional, Customary, and Cultural Rights in Big Cypress National Preserve and so-called new addition

lands, Everglades and beyond, to hunt, fish, cut materials for our homes, and live our Way of Life because it is the Council of the Original Miccosukee Simanolee Nation Aboriginal Peoples' Aboriginal Indigenous Land (Soil/Territories).

The Council of the Original Miccosukee Simanolee Nation Aboriginal Peoples strongly objects to what you have done illegally in our Land, and strongly objects to your ideas of recreational hunting and recreational ORV use and bicycle trails in the so-called new addition lands. Which is, the Council of the Original Miccosukee Simanolee Nation Aboriginal Peoples' Aboriginal Indigenous Land (Soil/Territories). You all have no right to continue destroying Natural Systems, damaging the Wildlife Habitat, damaging the Land, destroying the Vegetation, and disrupting the Natural Water flow, Water quality, and disrupting the Wildlife balance in our Land.

Organizational Correspondence

(Listed in alphabetical order by organization)

NPCA.

NPCA does not oppose hunting in the Preserve as a general matter, either in the Original Preserve or in the Addition. NPCA recognizes that Congress authorized hunting there, subject to limitations and controls needed to carry out the Preserve's primary purpose, which is "to assure [the Preserve's] natural and ecological integrity in perpetuity." NPCA recognizes that there are a number of people who enjoy and support hunting in the Preserve and that the disputes about hunting and related use of off-road vehicles ("ORVs") have been contentious.

This letter describes the significant defects of the Revised EA. NPCA continues to respectfully request that NPS abandon this draft Revised EA and prepare an Environmental Impact Statement ("EIS") that complies with applicable laws and policies for hunting in Big Cypress

National Preserve. To facilitate your response to comments, we have numbered our individual comments.

To summarize, our key points are:

- The "No Action" Alternative Is No Hunting in the Addition. The Revised EA continues to misstate Alternatives 1 and 2 as they relate to the Addition. No hunting is now allowed in the Addition. Therefore, the true NEPA "no action" alternative is to continue the policy of no hunting in the Addition.
- Affirmative NPS Findings Are Needed to Allow Hunting in the Addition. NPS must adopt affirmative findings under its regulations and management policies to allow hunting in the Addition. No such findings have been made at this time. The Revised EA incorrectly assumes that hunting is now permitted in the Addition.
- NPS, Not the State, Must Make Final Decisions About Hunting. The Revised EA fails to recognize NPS's primary responsibility to make decisions about hunting in the Preserve.
- The NEPA Analysis of Alternative 3 Is Flawed. The NEPA analysis of the preferred option, Alternative 3 (adaptive management strategy) in the Revised EA still fails to comply with Department of the Interior's ("DOI's") own NEPA regulations. The adaptive management plan is simply too vague. The Revised EA now contains some general "triggers." But it fails to describe or analyze any specific hunting programs that may be implemented in the future if those still vague triggers are reached. Thus, the Revised EA lacks sufficient serious analysis of the environmental effects of possible future hunting plans. It also still lacks objective, measurable criteria to ascertain whether and how future "management responses" will mitigate adverse impacts to Preserve users, plant and animal species, and natural eco-systems. Also absent from the Revised EA is the quantitative

analysis and scientific data to support its conclusions that hunting will not cause significant adverse impacts.

- *A Mitigation Plan Is Needed. Council on Environmental Quality (“CEQ”) regulations require the preparation of a formal mitigation plan for any EA that results in a finding of no significant impact (“FONSI”) with mitigation measures. This element is wholly absent from the Revised Draft Hunting EA.*
- *A Full EIS Is Needed. An environmental assessment is only appropriate where federal actions will not result in significant impacts. That is not the case with hunting in the Preserve. In particular, there will certainly be significant impacts on plants, animals and eco-systems if hunting is allowed in the 147,000 Addition which has long been a sanctuary where no public hunting is permitted. Moreover, the Revised EA’s analyses of impacts are flawed, in part because NPS has not performed the studies needed to assess those impacts. NPS should prepare a full EIS for hunting in the Original Preserve and in the Addition.*
- *The Preferred Alternative Relies Heavily on Future Monitoring and Enforcement, but NPS Lacks the Staff and Funding to Do So. The NPS has conceded in its Addition General Management Plan (“Addition GMP”) that it lacks the staff to monitor and enforce the Off-Road Vehicle (“ORV”) plan adopted for the Addition. Yet the Revised EA relies on that same inadequate current staff to monitor the preferred alternative in the Revised EA and to enforce whatever limitations on hunting are adopted. The fact is that there is inadequate monitoring and enforcement even in the Original Preserve. Yet the Addition GMP and the Revised EA propose to open another 147,000 acres to hunting and ORV use on top of the vast expanse of the Original Preserve. The Revised EA is also flawed for its*

failure to address this critical issue of funding and resources to implement adaptive management.

Additionally, the NPCA letter provided the following general and specific comments on the Revised Draft Hunting Management Plan/EA:

- *General Comment 1.0 The Revised EA Misstates Alternatives 1 and 2 as They Relate to the Addition.*
- *Specific Comment 1.1 The No Action Alternative Should Be a Continuation of the No Hunting Policy in the Addition.*
- *Specific Comment 1.2 Affirmative Steps Are Needed to Permit Hunting in the Addition.*
- *Specific Comment 1.3 The Revised Draft Hunting EA Must Be Amended to Correctly Specify the No Action Alternative.*
- *General Comment 2.0 The Revised Draft Hunting EA Misstates the Purpose of the Preserve.*
- *General Comment 3.0 The Revised EA Ignores NPS Regulations and Policies.*
- *Specific Comment 3.1 Rule 2.2(b) Requires Findings for Hunting in the Addition.*
- *Specific Comment 3.2 NPS Management Policies Require Findings to Allow Hunting in Any Part of the Preserve.*
- *General Comment 4.0 The Revised EA Does Not Recognize NPS’s Primary Role, and the Cooperative Partnership Agreement Disclosed with the EA Cannot Legally Abandon or Delegate that Role.*
- *General Comment 5.0 The Adaptive Management Strategy Does Not Comply with NEPA.*
- *Specific Comment 5.1 Alternative 3 Is Too Vague.*
- *Specific Comment 5.2 The Revised EA Violates DOI Regulations and NEPA by Not Describing Specific Options.*
- *Specific Comment 5.3 The Revised EA Violates DOI Regulations and NEPA by Not Analyzing the Environmental*

Consequences of Specific Hunting Programs.

- *Specific Comment 5.4 The Draft Hunting EA's Conclusions Are Not Based on Scientific Studies and Data.*
- *General Comment 6.0 The EA Will Not Withstand Judicial Scrutiny.*
- *Specific Comment 6.1 Courts Require Adaptive Management Plans to Have Detailed Triggering Criteria.*
- *Specific Comment 6.2 Courts Look for Criteria and Triggers for Mitigation.*
- *General Comment 7.0 A Formal Mitigation Plan Is Needed.*
- *General Comment 8.0 The Analysis Fails To Consider Whether Hunting In The Addition Would Increase The Number of ORVs.*
- *General Comment 9.0 The EA's Analysis Of Impacts To Wilderness, Natural Soundscapes and Non-Hunter Visitors Is Flawed.*
- *Specific Comment 9.1 The EA Provides Nothing But Conclusory Statements About The Impacts Of ORV Use On Wilderness Resources And Values Which Lack Any Rational Connection with the Facts.*
- *Specific Comment 9.2 Noise Impacts to Natural Soundscapes Will Be Significant and Severe.*
- *Specific Comment 9.3 NPS's Wilderness Eligibility Determination For The Addition Violates The Wilderness Act And Is Being Challenged In Court.*
- *Specific Comment 9.4 Allowing Hunting in the Addition Will Have Significant Adverse Impacts to the 96% of Visitors Who Do Not Hunt and the 42% Who Are Elders*
- *General Comment 10.0 NPS Has Admitted That It Lacks Funding To Conduct Adequate Monitoring.*

In conclusion, the NPCA letter stated the following:

We find this Revised EA deficient, for the reasons we have stated. A full EIS should be prepared to study the effects of hunting in the Preserve, especially in the 147,000

acre Addition. The 'no action' alternative should be to continue the policy of 'no hunting' in the Addition. NPS needs to make affirmative findings about public safety and resource management under its own regulations and management policies before the Addition is opened to hunting. And NPS, not FWC, needs to take responsibility for future decisions about hunting.

If adaptive management planning remains an alternative, the NEPA document must present an adequate plan. An acceptable adaptive management plan needs to include: (i) clearly defined actions and outcomes, (ii) mitigation measures, (iii) monitoring and assessment following initial implementation to determine whether outcomes are met, and (iv) adjustments based on monitoring. The NEPA document needs to describe specific management decisions (hunting programs) that are being considered as alternatives. It then needs to analyze the environmental impacts of those alternatives. It needs to study and plan for mitigation, with objective criteria that will trigger the implementation of mitigation measures. It needs to have a formal mitigation plan. Finally, NPS needs to address the issue of whether it has the staff and funding to implement the preferred alternative, adaptive management.

SFWA.

[The] SFWA continues to support a combination of Alternatives 2 and 3 for the final [Big Cypress National Preserve] Hunting Management Plan - no introduction of public hunting in the Addition Lands and "adaptive management" in the original preserve. We agree that where existing hunting takes place in the Big Cypress National Preserve (BCNP), it requires full consultation with the U.S. Fish and Wildlife Service (FWS), Florida Fish and Wildlife Conservation Commission (FWC), and other outside scientific expertise as needed. This will help insure full

compliance with the Organic Act, Redwoods Act, Endangered Species Act, Big Cypress Enabling Act and Addition Act, and all other legislation, rules, regulations, executive orders, and management plans intended to protect the preserve's natural resources - including federally listed species. This mandate to protect resources is given the highest priority - and is not permitted to be compromised by recreational interests, "traditional" or otherwise. As stated in the "Underlying Principles" section of the 2006 Department of the Interior Management Policies for the National Park Service (applying to all NPS units) - "The key principles were that the policies must...ensure that conservation will be predominant when there is a conflict between the protection of resources and their use." To be clear, conservation vs. recreation issues are clearly at play here in this proposed action - which includes the introduction of public hunting to the 146,000 Addition Lands for the first time in its history.

The SFWA letter details specific concerns about the following issues regarding the *Revised Draft Hunting Management Plan/EA* and hunting in the Preserve in general:

Enabling legislation – The SFWA states: “... there is absolutely no mandate to allow for hunting in the preserve. Like off-road vehicle use, hunting is an allowable use which can take place, provided that resources are protected and the activity does not interfere with the ‘use and enjoyment’ of other visitors,” as specified in Section 5 of the enabling legislation. “The Superintendent has repeatedly omitted the last section of this key sentence on hunting in the preserve during public presentations on this topic - and clearly attempted to give the public the impression that hunting is a mandated activity that the enabling legislation requires.”

Florida panther and prey availability – The SFWA disagrees with the “decision to drop quota hunts in the original Preserve.” The SFWA states that the “FWC acknowledges poor data on harvested deer throughout the state” and believes that additional deer harvest

data collection efforts are needed. The SFWA further believes that there is “an insufficient number of deer to allow for the introduction of public hunting” due to potential impacts to the Florida panther, in regards to prey availability, human disturbance, development in adjacent panther habitat outside of the Preserve, and increased take due to a forced increase in home range. On this topic of the Florida panther and prey availability, the SFWA states that NPS’s “precautionary principle” should be applied, and “no introduction of public hunting in the Addition Lands” should be implemented.

Further elaborating on “food availability (white-tailed deer, hogs, turkey, small mammals)” for the Florida panther, the SFWA states that estimates are “all over the place.” “For all other species that are potential prey for the Florida panther - feral hogs, wild turkey, possums, raccoons, and other small mammals and reptiles - no baseline has been provided at all.” The “FWC estimates that feral hogs actually make up the bulk of the panther’s diet ... and are their most important food supply – even if the ‘preferred’ food supply is white-tailed deer;” however, the “NPS has opted not to study the feral hog population as an impact at all ...” Additionally, the statement in the *Revised Draft Hunting Management Plan/EA* that feral hogs are nearly extirpated from the Preserve is not accurate, and “It is extremely likely that the hog population is in fact one of the most important resources sustaining a healthy panther population in the Addition ...”

Other NPS plans and policies (including recreational motorized vehicles) – The SFWA states that “It should also be noted that the NPS plan to open the Addition Lands to recreational motor vehicles will also play a role in the future quality of panther habitat in the Addition.” “The introduction of 130 miles of primary ORV trails in the Addition Lands, a still unspecified number of secondary trails in the Addition, the construction of a motor vehicle accessible campground deep in the heart of the northern Addition Lands, and the opening of the Addition to public hunting for the first time in its history will affect the natural resources - including the panther - and

the many human visitors to the Addition must be fully understood PRIOR to any decision.”

Visitor use and experience – The SFWA states: “... we are deeply opposed to public hunting in the Addition Lands due to the known impacts the activity will have on the many non-hunting users” and notes specific organizations (e.g., Florida Trail Association, Sierra Club) that would potentially be impacted by the plan. Further, the SFWA calls for “social science research” and states that “separate areas for hunters and non-hunters would best meet the needs of all preserve users.” “Aside from the protection of irreplaceable natural resources, allowing all visitors a positive experience of the preserve is central to NPS management priorities and philosophy,” and the “NPS fully acknowledges that Alternative 2 - No Hunting in the Addition - provides the best possible outcome for visitors.” The SFWA further points out that in the chart from the *Revised Draft Hunting Management Plan/EA*, “hunting is ranked dead last in terms of recreational activities carried out in the preserve (4% of visitors participating).” Regarding noise impacts on visitor use and experience, the SFWA states: “The introduction of gunfire to the Addition Lands - by far the loudest noise on the chart - would have profound impacts on the current visitor experience in the Addition that NPS is simply not responding to. It would also severely interfere with the natural soundscape, have negative impacts for the vast majority of human visitors (the 96 percent that NPS says do not hunt), and possibly cause behavioral changes in resident wildlife including federally listed species.” Finally, regarding visitor use, the SFWA disagrees with the conclusion in table 2-1 (Analysis of How the Alternatives Meet Project Objectives) of the *Revised Draft Hunting Management Plan/EA* that “hunting management rules would differ between the original Preserve and the Addition, which would make the information more difficult for the public to understand,” stating that this conclusion is “clearly not supported by any documentation.”

In closing, the SFWA letter states:

Upon review, SFWA finds that the Revised Plan/EA is flawed, in that it fails to comply in several respects with the requirements of the National Environmental Policy Act (NEPA) and Federal regulations implementing NEPA found in 40 CFR Part 1508.

(1) NPS should have prepared an EIS, instead of an EA ...

(2) NPS's hunting quota for deer in the Addition (explained on p. 39 of the Revised Plan/EA as equaling approximately 757 deer annually) is not based on any available data indicating that this quota will allow for sustainable management of deer, consistent with panther management, particularly in light of the Bozzo and other studies indicating far fewer deer actually exist in the Addition.

(3) The Revised Plan/EA violates NEPA by failing to adequately consider the adverse impacts of the proposal on non-motorized recreational users who have long used the Addition for hiking, photographing, bird watching, etc. without disturbance from hunting noise and safety concerns. This failure is particularly egregious since a 2007 study of visitors to the Preserve found that only 4% identified hunting as one of their activities in the Preserve (Revised Plan/EA, pp. 89-90, including Table 3-7 on p. 90).

(4) The Revised Plan/EA violates NEPA by skewing the no-action alternative, and thus the environmental baseline upon which all other alternatives are compared and judged in assessing their beneficial or adverse impacts, by using a no-action alternative that contemplates hunting in the Addition. The current status quo, and thus what must serve as the no-action alternative, is that there is no public hunting in the Addition. By failing to assess impacts against that baseline/backdrop, the entire effects

analysis has been skewed and thus the public has not been properly and fairly apprised of the effects that the preferred alternative will cause in the Addition.

(5) Particularly because there will be significant impacts to endangered panthers, whose primary prey are deer and hogs which NPS for the first time is allowing to be hunted in the Addition, and further because the deer quota imposed in the Addition does not appear to be supported by available data, the Revised Plan/EA should be reopened once the U.S. Fish and Wildlife Service renders a final biological opinion so that the public can review the Service's data and conclusions with respect to panther and panther prey and comment on how that affects the preferred alternative as a long-term sustainable management action in the Preserve (including the Addition).

SECOND REVISED DRAFT HUNTING MANAGEMENT PLAN/EA PUBLIC INVOLVEMENT

In response to the agency, public, and organization comments received during the public comment period for the *Revised Draft Hunting Management Plan/EA*, the NPS made revisions to the *Hunting Management Plan*. To ensure full public involvement throughout the entire process of the plan's development, the NPS made the Big Cypress National Preserve *Second Revised Draft Hunting Management Plan/EA* available for review to solicit public input on the revisions to the document.

PUBLIC/AGENCY COMMENT PROCESS

The NPS published a news release about the availability of the Big Cypress National Preserve *Second Revised Draft Hunting Management Plan/EA* on December 21, 2012. The news release invited interested parties to submit their comments regarding the *Second Revised Draft Hunting Management Plan/EA*. The comment period for the Draft Hunting Management Plan/EA was originally scheduled from December 21, 2012 through February 4, 2013 (46 days). Per a request from a member of the public, the comment period was extended until February 14, 2013 (56 days).

Additionally, in order to solicit agency input on the *Second Revised Draft Hunting Management Plan/EA*, letters were sent to the Florida State Clearinghouse, USFWS, the Florida State Historic Preservation Officer, the Miccosukee Tribe of Indians of Florida, the Seminole Tribe of Florida, and the Seminole Nation of Oklahoma.

PUBLIC COMMENT OPPORTUNITIES

The public was invited to comment on the *Second Revised Draft Hunting Management Plan/EA* in the following ways:

- Submission of comments at any time during the comment period. Comments

could be provided via the following methods:

- the NPS PEPC website
- email to the Preserve Superintendent or staff
- hard copy letter to the Preserve Superintendent or staff

PUBLIC COMMENTS

During the comment period 256 pieces of correspondence were received with 417 comments. Correspondence was received by one of the following methods: web form (PEPC), hard copy letter, and email. Letters received by hard copy or email, were entered into the PEPC system for analysis. Each of these letters or submissions is referred to as correspondence.

Correspondence from respondents regarding the *Second Revised Draft Hunting Management Plan/EA* ranged from strong support to strong opposition to the *Second Revised Draft Hunting Management Plan/EA*. Many respondents stated their support for one of the alternatives, including support for alternatives 1, 2, and 3. The remaining correspondence did not express an opinion clearly supporting or opposing the *Second Revised Draft Hunting Management Plan/EA* or any particular alternative, but provided comments, questions, recommendations, or concerns.

Comments received that were in favor of the *Second Revised Draft Hunting Management Plan/EA* included reasons such as the enjoyment of the recreational opportunity to hunt, appreciation of the natural resources while hunting, and the desire to pass on the hunting opportunity to future generations. A few of the correspondents in favor of the Draft Hunting Management Plan/EA also expressed a concern that denial of hunting opportunities in the Addition is in violation of the enabling legislation for the Preserve and that it has

taken a long time to open the Addition for hunting opportunities.

Those respondents that expressed opposition to the *Second Revised Draft Hunting Management Plan/EA* discussed reasons such as protecting the natural resources, wildlife, and threatened and endangered species present in the preserve (especially the Florida panther); and protecting the preserve for future generations to enjoy. Commenters also expressed that they believed that the enabling legislation allowed for prohibition of activities such as hunting in parts of the Preserve for reasons of public safety or resource protection.

The following substantive comments were received from individuals that did not identify themselves as officially representing any agency, tribe, or organization.⁴⁹

Alternative 3 – Adaptive Management:

- The NPS’s methods for collecting deer data and estimating deer populations in the Preserve are inadequate and inaccurate. Therefore, this information cannot be used as a trigger for the adaptive management process.
- Panther data should be used as a trigger in the adaptive management process.
- The USFWS should not be included in the adaptive management process for alternative 3.
- The NPS/FWC Cooperative Partnership Agreement should be included in alternative 3.
- Deer data collection methods and population estimates in the Preserve are inadequate to support the adaptive management process.

Hunting Regulations:

- The statement that “The Addition has never been open to public hunting either

before or after its acquisition” is not accurate.

- Hunting regulations in the Preserve should be managed by FWC.
- Harvest regulations should be changed to allow hunters to field dress/butcher their harvest as long as the data required about the animal is collected.
- Deer harvest should be limited to at least one fork on one side with no harvest of spikes permitted.
- Additional hunting regulations should be included in alternative 3.
- A doe harvest should be instituted in the Preserve.
- Hunting of invasive species such as pythons should be permitted in the Preserve.

Threatened and Endangered Species:

- There is no scientific data that shows ORV use has an adverse impact on the Florida panther.
- Small game species are an important part of the Florida panther’s diet and should be considered in the hunting management plan.
- The studies cited in the EA do not include any nighttime research/data, which skews the data set since panthers are typically nocturnal.

ORVs and Access:

- ORV access should be addressed as part of the hunting management plan.
- Access and connectivity of ORV trails in the Preserve and the Addition need to be improved.
- Denial of ORV use throughout the Preserve is out of compliance with the “traditional use” clause of the enabling legislation.

Wilderness:

- There should be no wilderness designation in the Preserve.
- Public lands surrounding the Preserve that are managed as wilderness, but not designated as such, should be included in the wilderness discussion and analysis in the EA.

⁴⁹ If a commentor listed themselves as a “member” of an organization but not an “official representative,” then their comments are included under this section. Those comments received by designated “official representatives” of an organization are included in the discussion of agency, tribal, and organization correspondence in the following section of this report.

Preserve Management:

- Management of the Addition should be combined with the original Preserve.

Enabling Legislation:

- The Preserve’s enabling legislation does not mandate hunting in the Addition lands.

AGENCY/TRIBAL/ORGANIZATION CORRESPONDENCE

Correspondence from agencies, organizations, and businesses included letters and comments from the following entities⁵⁰. The remaining 183 pieces of correspondence were received from unaffiliated individuals. The following sections summarize the substantive comments received from the agencies, tribes, and organizations listed in the table below.⁵¹

Table 5-5 – Agencies/Organizations/Business Providing Correspondence during the Second Revised Draft EA Public Comment Process

Agency/Organization/Business	Number of Corr. Received
Airboat Association of Florida	1
ARFF	1
ASF	1
Audubon	6
Beaver County	1
Big Cypress Sportsman Alliance	5
Botanical, Environmental, and Conservation Consultants	1
Boy Scouts of America	1
Broward County Airboat, Halftrack, and Conservation Club	1

⁵⁰ The total number of agencies/tribes/organizations /businesses reported exceeds the total number of correspondences due to the fact that some individuals associated themselves with more than one organization.

⁵¹ Only those substantive comments received from organizations are summarized below. If the “official representative” from an organization only provided non-substantive comments, they are not detailed in the following sections.

Table 5-5 – Agencies/Organizations/Business Providing Correspondence during the Second Revised Draft EA Public Comment Process

Agency/Organization/Business	Number of Corr. Received
Clean Energy Coalition of South Florida	1
Collier Sportsmen and Conservation Club	2
Cypress Creek Hunt Club	1
Defenders of Wildlife	2
Environmental Services	1
Florida Trail Association	4
Florida Wildlife Federation	2
Friends of Arthur R. Marshall Loxahatchee National Wildlife Refuge	2
Friends of the Tampa Bay National Wildlife Refuge	3
GatorGuides.com	1
Green Peace	1
International Society for the Preservation of the Tropical Rainforests, Pink Amazon River Dolphin, Amazon Expeditions	1
Lake Harney Hunt Club	1
Museum of Discovery and Science	1
National Park Service	1
National Parks Conservation Association	3
National Rifle Association	1
National Wild Turkey Federation	2
Nature Conservancy	1
North American Hunting Club	1
Northwest Arkansas Community College	1
Ocean Futures Society	1
PDA	1
People for the Ethical Treatment of Animals	1
Safari Club International	15
Sierra Club	8
Society of Soil Scientists of Southern New England	1
South Florida Wildlands Association	3
Superstar Productions	1
Timberline Hunt Club	1
Touching Earth Sangha	1
United Sportsmen for Traditional Heritage	1
United Waterfowlers	2
Yahi Group	1

Organizational Correspondence

(Listed in alphabetical order by organization)

Collier Sportsmen and Conservation

Club. The Collier Sportmen and Conservation Club letter supported alternative 3 and stated that “We feel it offers distinct advantages with adaptive management that will benefit the [Preserve] and allow for more timely decisions when conditions arise.” The letter also stated that the organization believes that it is important to continue the NPS/FWC Cooperative Partnership Agreement because the FWC is “well versed in the management of Florida wildlife and makes an effective partner in decisions concerning native wildlife situations.”

The letter stated the following regarding hunting impacts on the Florida panther:

We also appreciate their non-biased research including the 1999 Memorandum from Steve Coughlin to Nick Wiley on the subject "Big Cypress Panther Report by Janis and Clark." Careful analysis shows hunting can and is occurring without negative results on the Florida/Texas Panther. In fact, scientists have concluded that the panther is at near carrying capacity in the BICY. I know of no better success story to show hunting and wildlife can survive together!

Finally, the letter stated the organization’s objection to designated wilderness in the Preserve.

Defenders of Wildlife. The Defenders of Wildlife letter stated the organization’s recommendation of alternative 3 and provided the following comments:

1. *All three agencies, the National Park Service, US Fish and Wildlife Service and the Florida Fish and Wildlife Conservation Commission, must have a meaningful role in the decisions to be made regarding hunting regulations, implementation, and adaptive management, and in evaluating the information that forms the basis for such decisions.*

*Ultimately, NPS is responsible for the management of wildlife and other resources on these federal lands, subject to the federal Endangered Species Act and other applicable laws. NPS not only has the authority to regulate wildlife on the national parks and preserves, it also has an obligation to do so. While hunting is mandated by the Big Cypress NP enabling legislation, NPS has an overriding responsibility to preserve, conserve and protect the natural and cultural resources of the Preserve. Although states have historically been responsible for wildlife management within their borders, the seminal Supreme Court case on this issue, *Kleppe v. New Mexico*, confirms it is in fact the federal government, and not the individual states, who maintains ultimate power over the regulation of federally held lands. In that case, the Court stated "we have repeatedly observed that the power over public land thus entrusted to Congress is without limitations,"[1] and went on to say that "[i]n our view, the 'complete power' that Congress has over public lands necessarily includes the power to regulate and protect the wildlife living there."[2]*

Due to the importance of the preserve to the highly endangered Florida panther and other federally listed species, the US Fish and Wildlife Service role in the adaptive management process must go beyond informal consultation and include active engagement in research and monitoring design and priority setting, lending expertise to the analysis of habitat conditions and prey and predator status, and assuring decisions made for Preserve management further the recovery of imperiled species. These are our public lands, this is where species recovery actions must of the highest standard.

2. *If hunting is to be initiated in the Addition Lands it should begin under a very conservation plan due to the lack of information about the deer population and panther population in the area. Defenders is concerned not only about the difficulty that has been encountered in assessing the prey base, but also with the personnel resources of the agencies. We are skeptical regarding the document's description of staff needs as we believe it minimizes what will actually be an increased workload if Add Lands management, hunt management and monitoring, as well as research and management throughout the Preserve, is to be conducted properly.*
3. *Maintaining a suitable prey base for the panther and preventing disturbance of the population is a top priority. This is a matter of assuring survival and recovery of the panther. It is also of concern because the public lands should support thriving wildlife populations and adjacent private lands should not bear the responsibility of providing the panther's main hunting grounds. The result can be increased conflicts between people and panthers that are difficult and costly to resolve and ultimately can harm recovery efforts.*
4. *Thirty-one animal species and numerous imperiled plants are present on the Preserve. In both Alternatives 1 and 3 hunting is predicted to have long term, negligible to minor impacts on listed species and habitat. Naturally we prefer to see the elimination of any adverse impacts to wildlife, and further, we view the hunting community as offering an opportunity to increase the capacity of the Preserve to collect data and enhance monitoring efforts. One aspect of the improvements that could be made would be a Preserve led and peer implemented initiative to stop all use of lead based ammunition.*

Florida Wildlife Federation. The Florida Wildlife Federation “supports alternative 3 using science based decision making when possible and making future changes through the adaptive management protocols” and provided the following specific comments on the *Second Revised Draft Hunting Management Plan/EA*.

- *Executive Summary: Introduction: Page II. Quote " The Addition has never been open to public hunting either before or after its acquisition." Comment: We pointed out in previous comments that we thought this statement was somewhat misleading and incomplete. While it is correct that this area was not previously a "public" Wildlife Management Area , it was hunted prior to NPS Acquisition and closure. A more correct statement would be that the area was privately owned and hunting leases were held by the public. Examples being WD Ranch and a number of hunt clubs documented on a map previously provided to the NPS. The quoted statement above gives the impression to all those unfamiliar with the history of prior ownership and use that hunting never took place on these lands. Therefore no hunting should ever be allowed to occur on the Addition Lands (ADL's). Some of the current litigants against the NPS on the Addition lands are quoting the above statement as justification for not allowing hunting on the ADL's. We suggest that this statement be changed to reflect that there was hunting on these lands when it was privately owned.*
- *Page 43. Comment: Discussion of using hunter days and deer harvest as "triggers for supplemental management actions" appears to be the right choice. Discussion of hunting and the impacts of hydrology on seasonal panther movements is a much more balanced presentation than the previous Hunt*

Plan draft contained. (Janis & Clark 2002, Fletcher & McCarty 2011).

- *Figure 3-2.*
Dinner Island WMA is not shown on the map.
- *Pages 107-108. "Public Health and Safety." "Hunting Safety."*
Comment: This second draft gives much more detail regarding these subjects. "Annual injuries (per 100,000 participants) addresses the very small number of hunting related injuries. Hunting is much safer than bowling or bicycle riding.
- *Page 138. Quote: " Florida Panther." Direct impacts to the Florida Panther could occur from identification of target by hunters." "Very rare."*
Comment: We realize that in preparing your broad based inclusive comments that you try to cover all possibilities . However, the only legal game that has any color resemblance to a Florida Panther is a white-tailed deer. A hunter can only take antlered deer with at least a 5" spike. An ethical, knowledgeable hunter would not "misidentify" a Florida Panther with its lower profile, long tail ,round head and ears. One has to know their target in order to be legal and ethical. If an unethical "hunter" were to "misidentify" and harm a Florida Panther , than that person could be charged with a very serious violation of the ESA, fined, jailed, and possibly suffer a loss of hunting privileges for many years.
- *Page 140. Quote: " Cumulative Impacts" "Implementation of the preferred alternative in the Addition General Management Plan approved development of a maximum of 130 miles of orv trails (19) that would fragment habitat and degrade natural conditions in certain areas of the Addition...Therefore, fragmentation and human disturbance associated with orv's in the Addition would be expected to have an adverse impact on the Florida Panther."*

Comment: These comments are purely speculative and only serve to confuse this issue of panthers and orv's in the minds of some individuals in a negative way. These comments are not supported by any scientific documentation. The 130 miles of primary trails would be on old existing trails and orv's would be restricted to these already in place "designated" trails. Frequent users of the Preserve observe and document panthers using the orv trails in the original Preserve frequently. Suggest removal of this speculative statement. It would be more appropriate to simply state the obvious, that human disturbance to Florida Panthers in the Big Cypress are unknown and undocumented scientifically at this time.

- *Page 141. Paragraph 6. Quote: " Adverse impacts would be expected from the creation of orv trails in the Addition."*
Comment: Again this statement is misleading and inflammatory to anti-orv individuals and organizations. There would be NO "creation" of orv trails. The trails contemplated already exist and have for many years. Suggest that this be changed to reflect more accurately that the trails already are on the ground. So that uninformed individuals and organizations reading the NPS statement would not wrongly assume that 130 miles of new trails are being "created" in a pristine environment.
- *Under "cumulative impacts" on page 140 regarding orv's. Quote " " would fragment native habitat abd degrade natural conditions." Comment, orv's would be restricted to already impacted designated trails.*
- *Page 143. "Prescribed burns" "Vegetation Management."*
Comment: Suggest that hardwood hammocks and pine islands be evaluated for areas of excessive fuel loads. In some areas of the Preserve due to past lack of prescribed burns,

suppression of natural lightning strike fires and hurricane debris there is excessive fuel loads in the interior of hardwood hammocks and pine islands (RCW habitat). When fire eventually enters these areas it will be catastrophic, destroying the hammocks and mature pines as has occurred in the past. While it is labor intensive, fuel loads should be reduced/cleared from these areas, whenever possible, otherwise they will be lost.

- *Page 144. "Prey base Florida Panther."
Comment: At present Chronic Wasting Disease (CWD) is not known to be present in Florida. CWD infects and is fatal to cervids such as our white-tailed deer which is the primary prey of the endangered Florida Panther. CWD could come into Florida from other states through transport of deer from from states where CWD now exists. This could possibly devastate the native Florida deer population and quite possibly the Florida Panther due to primary prey loss. There are a significant number of "deer farms", ranches, in Florida that raise white-tails for the "trophy antler" business. There are some who desire to bring in deer from other locations in order to increase genetic possibilities for big Antlers. The Florida Fish & Wildlife Conservation Commission is extremely knowledgeable about this possible threat of CWD. Suggest continuing close monitoring and involvement of the NPS working with the FF&WCC in opposing the risky desire to bring cervids into Florida from other states.*

NPCA. The NPCA stated in their letter that the NPCA “believes that the Second Revised EA is still legally deficient.” The letter also requests that “NPS abandon this Second Revised EA and prepare an Environmental Impact Statement ("EIS") that complies with applicable laws and policies for hunting in the Preserve.” The letter provides a summary of

comments and concerns and detailed supporting comments and documentation.

The summary of comments and concerns, as provided in the letter, include:

- ***The Second Revised EA Mischaracterizes the Preserve Enabling Act and Misapplies NPS Regulations To Avoid the Need To Make Required Findings Before Permitting Hunting.*** In a reversal of position from earlier drafts, the Second Revised EA now asserts, incorrectly, that the Enabling Act makes hunting mandatory in the Preserve. That conclusion provides a supposed basis for NPS to avoid taking the steps required by 36 C.F.R. § 2.2(b)(2) whenever NPS permits hunting where doing so is discretionary. The Enabling Act, however, clearly gives NPS discretion in that regard. NPS must therefore (i) make affirmative findings that the hunting permitted is consistent with public safety and enjoyment and sound resource management principles and (ii) adopt specific regulations governing such hunting. NPS has not complied, and appears not to plan to comply, with these requirements.
- ***The Preferred Alternate Relies on an Adaptive Management Plan That Focuses on Only One Aspect of Expected Impacts.*** That plan focuses on nothing more than the continued availability of prey for the Florida panther. While that is an important consideration, it is not the only consideration for evaluating the ongoing impacts of NPS's preferred plan on the resources and values of the Preserve. If NPS uses an adaptive management approach to managing hunting here, the Preserve's Enabling Act and NPS regulations and policies call for an ongoing evaluation of, and triggers and reactions based on, a wider set of the impacts to Preserve resources and values. For example,

the adaptive management plan fails to address the impact on panthers' habitat and behavior of fragmenting their habitat in a significant part of the Addition and encircling each fragmented segment with off-road vehicle ("ORV") trails which panthers will avoid, at least during hunting season. NPS has not even provided any analysis in the EA of whether panthers will remain in that part of the Addition, at least during that season, when the places sufficiently far from the encircling ORV trails will be reduced to the center of each such fragment, constituting a fraction of the habitat panthers now enjoy in that part of the Addition. And critically, the proposed adaptive management plan has no criteria or triggers taking this consideration into account.

- **That Adaptive Management Plan Relies in Any Event on a Trigger that Lacks a Rational Connection to The Goal It Seeks to Achieve.** While that plan seeks to assure that there is enough prey available to sustain the Florida panther, the plan uses as its triggering event for further action the ratio of deer killed per hunter per day. There is a lack of rational explanation of and/or support for how that trigger would supposedly achieve even that limited objective.
- **That Adaptive Management Plan is Still Lacking in Criteria Necessary for it Not To Be Simply "A Plan to Make A Plan."** The adaptive management plan continues to be too vague to meet the requirements of NEPA and the Department of the Interior regulations thereunder. The Second Revised EA now contains a few "triggers" tied to deer harvest numbers, but the proposed triggers are flawed and insufficient. The Second Revised EA also still fails to describe with specificity the menu of future management actions that would be taken if the triggers are met.

In addition, the Second Revised EA lacks serious analysis of the environmental effects of possible future hunting plans. It also still lacks objective, measurable criteria to ascertain whether and how future "management responses" will mitigate adverse impacts to Preserve users, plant and animal species, and natural ecosystems. Also absent from the Second Revised EA is the quantitative analysis and scientific data to support its conclusions that hunting will not cause significant adverse impacts.

- **A Mitigation Plan Is Needed.** The Council on Environmental Quality requires the preparation of a formal mitigation plan for any EA that results in a finding of no significant impact ("FONSI") with mitigation measures. This element is wholly absent from the Second Revised EA.
- **NPS, Not the State, Must Make Final Decisions About Hunting.** The Second Revised EA expands the description of the extent to which NPS intends to rely on the Florida Fish and Wildlife Conservation Commission ("FWC") for the development and implementation of a hunting plan for the Preserve. While consultation and even some cooperation with FWC would be appropriate, it is NPS's responsibility to make decisions about hunting in the Preserve, and, as discussed above and detailed below, those decisions must be supported by appropriate and supported findings and detailed in special regulations. The preferred alternative fails to recognize these responsibilities or to implement necessary measures to fulfill them. To the contrary, NPS's "partnership agreement" with FWC gives FWC an apparent veto power over regulatory actions that are the legal responsibility of NPS.
- **The Preferred Alternative Relies Heavily on Future Monitoring and Enforcement, but NPS Lacks the Staff and Funding to Do So.**

NPS lacks the staff to monitor and enforce the ORV plan previously adopted for the Addition, and the Preserve now also intends to open that 147,000-acre area to hunting for the first time. NPS already has critical operational funding shortages, which are likely to get worse. Nevertheless, the Second Revised EA relies on that same inadequate level of current staff to implement the hunting adaptive management plan and to monitor and enforce whatever limitations on hunting are ultimately adopted. The Second Revised EA relies on help from FWC in implementing, monitoring and enforcing the adaptive management and hunting plans, but the Second Revised EA fails to evaluate whether the extent of such assistance is likely to be sufficient to meet the gap in NPS's own funding and resources. And, again, the proposed adaptive management plan makes no provision for closing areas or taking other steps if monitoring and enforcement resources prove inadequate.

- **The "No Action" Alternative Is No Hunting in the Addition.** The Second Revised EA continues to misstate Alternatives 1 and 2 as they relate to the Addition. No hunting is now allowed in the Addition. Therefore, the true NEPA "no action" alternative is to continue the policy of no hunting in the Addition.
- **A Full EIS and a Fish and Wildlife Service Biological Opinion Are Needed.** A full EIS is required unless federal actions will not result in significant impacts. That is not the case with hunting in the Preserve. In particular, there will certainly be significant impacts on resources and values if hunting is now allowed for the first time in the 147,000-acre Addition. Moreover, the Second Revised EA's analyses of impacts are flawed, in part because NPS has not performed the studies needed to assess those impacts. Those

studies should include an analysis of the additional adverse impacts resulting from heightened ORV use if hunting is permitted in the Addition. In addition, in a full EIS, NPS should set forth a proposed non-impairment determination so the public would be permitted to comment on that determination before a final decision is made, an opportunity that would be denied under the approach taken by the Second Revised EA. NPS should prepare a full EIS for hunting in the Original Preserve and in the Addition. Furthermore, NPS must consult with the Fish and Wildlife Service ("FWS") about the impact of the hunting plan on the Florida panther, which NPS apparently does not propose to do based on the Second Revised EA.

Detailed comments, concerns, and issues provided in the letter included:

- *Additional Comment 1.0 – The Second Revised EA Incorrectly Characterizes the Preserve's Enabling Legislation and Other Guiding Authorities.*
- *Specific Comment 1.1 – Enabling Act.*
- *Specific Comment 1.2 – Management Policies and Organic Act.*
- *Additional Comment 2.0 – The Second Revised EA Persists in Misstating the No Action Alternative.*
- *Additional Comment 3.0 – Any Adaptive Management Plan Must Consider All Impacts of the Hunting Plan on Resources and Values.*
- *Additional Comment 4.0 – The Proposed Adaptive Management Plan Still Fails to Comply with NEPA and Lacks the Specificity Required to Withstand Judicial Scrutiny.*
- *Specific Comment 4.1 – The "Baseline Management Actions" Are Too Indefinite and Must be Developed Further.*
- *Specific Comment 4.2 – Triggered Management Actions Are Still Too Defined.*
- *Additional Comment 5.0 – The Second Revised EA Exposes the Critical Need*

for a Full EIS, with Additional Data and Monitoring Before the Preferred Alternative Is Implemented.

- *Additional Comment 6.0 – The Second Revised EA Does Not Live Up to the Commitments NPS Made in the Addition GMP.*
- *Additional Comment 7.0 – The Second Revised EA Does Not Meet the Requirement that NPS Make an Impairment Determination Before Hunting Is Allowed in Any Part of the Preserve, and a Later Determination Would Deprive the Public of the Opportunity to Comment.*
- *Additional Comment 8.0 – ORV-Related Impacts Must be Analyzed.*
- *Additional Comment 9.0 – NPS Cannot Legally Abandon or Delegate Its Primary Role in Making Final Decisions About Hunting in the Preserve.*

In conclusion, the NPCA letter stated the following:

We find this Second Revised EA deficient, for the reasons we have stated in this comment letter and in NPCA's prior comment letters. A full EIS should be prepared to study the effects of hunting in the Preserve, especially in the 147,000 acre Addition. The "no action" alternative should be to continue the policy of no hunting in the Addition. NPS needs to make affirmative findings about public safety and resource management under its own regulations and management policies before the Addition is opened to hunting. And NPS, not FWC, needs to take responsibility for future decisions about hunting.

If adaptive management planning remains an alternative, the NEPA document must present an adequate plan. Though the Second Revised EA has made some steps in the right direction, it is still legally inadequate. An acceptable adaptive management plan needs to include: (i) clearly defined actions and outcomes, (ii) mitigation measures, (iii)

monitoring and assessment following initial implementation to determine whether outcomes are met, and (iv) adjustments based on monitoring. The NEPA document needs to describe specific management decisions (hunting programs) that are being considered as alternatives. It then needs to analyze the environmental impacts of those alternatives. It needs to study and plan for mitigation, with objective and well-founded criteria that will automatically trigger the implementation of mitigation measures. It needs to have a formal mitigation plan. Finally, NPS needs to address the issue of whether it has the staff and funding, alone or together with FWC, to implement the preferred alternative, adaptive management.

Safari Club International.

Safari Club generally supports Alternative 3 because it will open the Addition to the hunting mandated by Congress in 1988, when the Addition was established. In addition to providing these comments, Safari Club urges the [NPS] to (1) expeditiously finalize this planning process by issuing a Record of Decision, if necessary; (2) work cooperatively with and enlist the expertise and experience of the Florida Fish and Wildlife Conservation Commission and interested stakeholders; (3) open the Addition to hunting and otherwise maximize hunting opportunities consistent with the law and resources of the area; and (4) finally fulfill Congress' mandate that the Service "shall permit hunting ... in the Addition"

Safari Club International provided the following comments/recommendations in their letter:

- The NPS should expeditiously finalize the hunting plan so that hunting can commence in the Addition
- Safari Club generally supports alternative 3
- Safari Club requests that the NPS clarify and/or correct its statement

that the lands that became the Addition were never open to public hunting before federal acquisition

- Safari Club understands why the NPS established "no hunting in the addition" as alternative 2 instead of the "no action" alternative

SFWA. The letter from the SFWA provided the following comments and concerns about the *Second Revised Draft Hunting Management Plan/EA*.

The very fact that NPS has now written and shared with the public for comment three versions of this plan clearly indicates that this project is anything but routine for the agency. The most salient feature of the HMP - the opening up of the 146,000 Addition Lands of the Big Cypress National Preserve to public hunting for the first time in history - is complex and completely unprecedented. It could also have major consequences for endangered species - particularly the endangered Florida panther - and for the human visitors, none of whom currently use the Addition for the purpose of hunting and who have expressed strong reservations about this major federal action. As stated in the current HMP (page 4) - "The Addition has never been open to public hunting either before or after its acquisition."

The SFWA letter excerpted comments from their letter during the previous public comment period, which stated that "the Revised Plan/EA is flawed, in that it fails to comply in several respects with the requirements of NEPA and Federal regulations implementing NEPA found in 40 CFR Part 1508." The letter provides the following detailed comments supporting this statement:

- (1) *NPS should have prepared an EIS, instead of an EA ...*
- (2) *NPS's hunting quota for deer in the Addition (explained on p. 39 of the Revised Plan/EA as equaling approximately 757 deer annually) is not based on any available data*

indicating that this quota will allow for sustainable management of deer, consistent with panther management, particularly in light of the Bozzo and other studies indicating far fewer deer actually exist in the Addition.

- (3) *The Revised Plan/EA violates NEPA by failing to adequately consider the adverse impacts of the proposal on non-motorized recreational users who have long used the Addition for hiking, photographing, bird watching, etc. without disturbance from hunting noise and safety concerns. This failure is particularly egregious since a 2007 study of visitors to the Preserve found that only 4% identified hunting as one of their activities in the Preserve (Revised Plan/EA, pp. 89-90, including Table 3-7 on p. 90).*
- (4) *The Revised Plan/EA violates NEPA by skewing the no-action alternative, and thus the environmental baseline upon which all other alternatives are compared and judged in assessing their beneficial or adverse impacts, by using a no-action alternative that contemplates hunting in the Addition. The current status quo, and thus what must serve as the no-action alternative, is that there is no public hunting in the Addition. By failing to assess impacts against that baseline/backdrop, the entire effects analysis has been skewed and thus the public has not been properly and fairly apprised of the effects that the preferred alternative will cause in the Addition.*
- (5) *Particularly because there will be significant impacts to endangered panthers, whose primary prey are deer and hogs which NPS for the first time is allowing to be hunted in the Addition, and further because the deer quota imposed in the Addition does not appear to be supported by available data, the Revised Plan/EA should be reopened once the U.S. Fish and Wildlife Service renders a final biological opinion so that the public can review the Service's data and conclusions with respect to panther*

and panther prey and comment on how that affects the preferred alternative as a long-term sustainable management action in the Preserve (including the Addition).

The letter also provided detailed comments about the following concerns:

- Regarding impacts to the Florida panther, the relationship between hunting and prey needs to be carefully examined.
- FWC's breakdown of the Florida panther diet includes: other (7.5%), rabbit (4.3%), armadillo (7.8%), raccoon (11.7%), deer (27.4%), and hog (41.3%). This data shows that "far from being the most important prey for panthers, deer are actually third behind hogs, and small animals." Therefore, these other species should be considered as triggers in the adaptive management process.
- NPS's estimates for the deer population in the Preserve are varied and inaccurate.
- There is an "insufficient number of deer to allow for the introduction of public hunting."
- "FWC estimates that feral hogs actually make up the bulk of the panther's diet." However, "NPS has opted not to study the feral hog population as an impact at all." Additionally, the "our experience regularly hiking throughout the Addition shows this not to be the case at all. In fact we regularly encounter hog tracks, tufts of hog hair, and clear evidence of hog feeding (rooting) throughout the Addition Lands. It is extremely likely that the hog population is in fact one of the most important resources sustaining a healthy panther population in the Addition."
- "... within the current boundaries of the Big Cypress Wildlife Management Area - there are virtually no limits on the number of hunters who can access the preserve during most hunting seasons." This decision was not based on scientific management.
- Data in the supporting documentation used by the NPS for the EA is not properly analyzed. For example, the *Harvest and Pressure Summary 2010-2011* shows an

annual decline in deer harvest but does not document the reasoning for such.

- Hunting will have an adverse impact on non-hunters who are currently the primary users of the Preserve.
- The USFWS needs to prepare a Biological Opinion for this federal action.

Concluding, the SFWA letter stated:

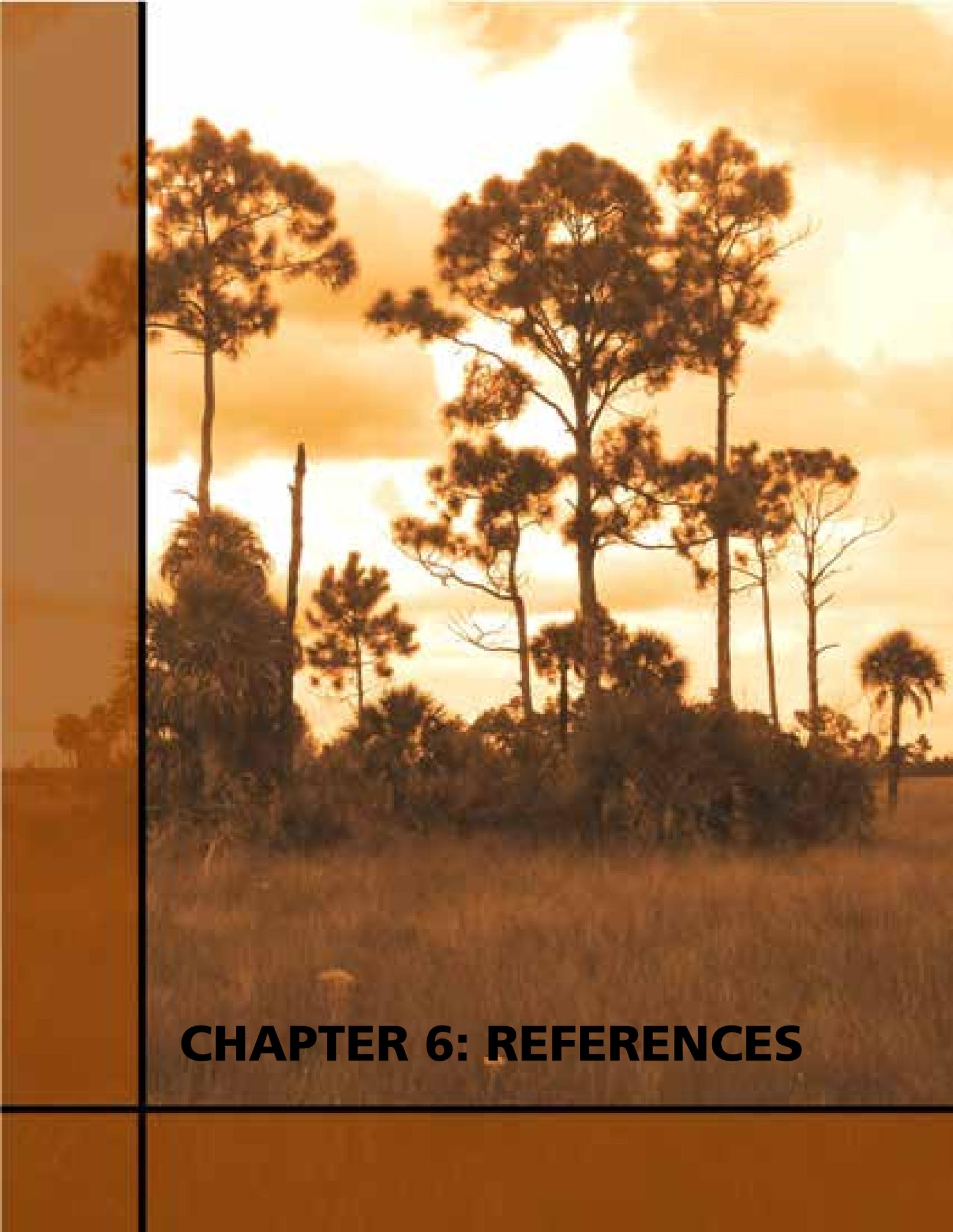
In conclusion we continue to support an alternative for hunting in the Big Cypress that unfortunately was not offered to the public as a reasonable alternative. No hunting in the Addition Lands and adaptive management of hunting in the original preserve with full consultation by the U.S. Fish and Wildlife Service. We also believe that all NPS laws and regulations which favor resource protection over use and recreation must be brought in here. As we have noted in many of our previous comments - the Superintendent has the ability to preclude hunting at any time and location in the preserve to protect resources and provide for visitor enjoyment. The alternative SFWA has put forward will accomplish that task.

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The following NPS staff, agency personnel, and contractors contributed to the preparation or review of this *Hunting Management Plan*.

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ACRONYMS

Addition GMP	<i>Big Cypress National Preserve – Addition Final General Management Plan/Wilderness Study/Off-Road Vehicle Management Plan/Environmental Impact Statement</i>
CBA	Choosing By Advantages
CERP	Comprehensive Everglades Restoration Plan
CEQ	Council on Environmental Quality
CFR	Code of Federal Regulations
dB(A)	A-Weighted Decibels
EA	Environmental Assessment
EO	Executive Order
FWC	Florida Fish and Wildlife Conservation Commission
GMP	General Management Plan
GPS	Global Positioning System
I-75	Interstate 75
MM	Mile Marker
NEPA	National Environmental Policy Act
NPCA	National Parks Conservation Association
NPS	National Park Service
ORV	Off-Road Vehicle
PEPC	Planning, Environment, and Public Comment
PIT	Passive Integrated Transponder
PL	Public Law
Preserve	Big Cypress National Preserve
ROD	Record of Decision
SFWA	South Florida Wildlands Association
SFWMD	South Florida Water Management District
SHPO	State Historic Preservation Officer
SR	State Road
STOF	Seminole Tribe of Florida
USACE	U.S. Army Corps of Engineers
USC	U.S. Code
USFWS	U.S. Fish and Wildlife Service
WMA	Wildlife Management Area



APPENDIXES

Appendix A

Big Cypress National Preserve Enabling Legislation
(PL 93-440, as amended by PL 100-301)



Enabling Legislation

P.L. 93-440, AN ACT TO ESTABLISH BIG CYPRESS NATIONAL PRESERVE, AS AMENDED BY P.L. 100-301, THE BIG CYPRESS NATIONAL PRESERVE ADDITION ACT

(ALL UNDERLINED SECTIONS ARE FROM THE 1988 ADDITION LEGISLATION)

An Act to establish the Big Cypress National Preserve in the State of Florida, and for other purposes. (88 Stat. 1255) (P.L. 93-440)

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled,
That (a) in order to assure the preservation, conservation, and protection of the natural, scenic, hydrologic, floral and faunal, and recreational values of the Big Cypress Watershed in the State of Florida and to provide for the enhancement and public enjoyment thereof, the Big Cypress National Preserve is hereby established.

(b) The Big Cypress National Preserve (hereafter referred to as the “preserve”) shall comprise the area generally depicted on the map entitled “Big Cypress National Preserve”, dated November 1971 and numbered 60-91,001, which shall be on file and available for public inspection in the Offices of the National Park Service, Department of the Interior, Washington, District of Columbia, and shall be filed with appropriate offices of Collier, Monroe, and Dade Counties in the State of Florida. The Secretary of the Interior (hereafter referred to as the “Secretary”) shall, as soon as practicable, publish a detailed description of the boundaries of the preserve in the Federal Register which shall include not more than five hundred and seventy thousand acres of land and water.

(c) The Secretary is authorized to acquire by donation, purchase with donated or appropriated funds, transfer from any other Federal agency, or exchange, any lands, waters, or interests therein which are located within the boundaries of the preserve or the Addition: *Provided*, That any lands owned or acquired by the State of Florida, or any of its subdivisions in the preserve may be acquired by donation only and any land acquired by the State of Florida. or any of its subdivisions, in the Addition shall be acquired in accordance with subsection (d): *Provided further*, That no Federal

funds shall be appropriated until the Governor of Florida executes an agreement on behalf of the State which (i) provides for the transfer to the United States of all lands within the preserve *previously owned* or acquired by the State and (ii) provides for the donation to the United States of all lands acquired by the State within the preserve pursuant to the provision of “the Big Cypress Conservation Act of 1973 (Chapter 73-131 of the Florida Statutes) or provides for the donation to the United States of any remaining moneys appropriated pursuant to such Act for the purchase of lands within the preserve. No improved property, as defined by this Act, nor oil and gas rights, shall be acquired without the consent of the owner unless the Secretary, in his judgment, determines that such property is subject to, or threatened with, uses which are, or would be, detrimental to the purposes of the preserve. The Secretary may, if he determines that the acquisition of any other subsurface estate is not needed for the purposes of the preserve and the Addition, exclude such interest in acquiring any lands within the preserve and the Addition. Notwithstanding the provisions of section 301 of the Uniform Relocation Assistance and Real Property Acquisition Policies Act of 1970 (84 Stat. 1894, 1904) the Secretary (i) may evaluate any offer to sell land within the preserve and the Addition by any landowner and may, in his discretion, accept any offer not in excess of \$10,000 without an appraisal and (ii) may direct an appraisal to be made of any unimproved property within the preserve and the Addition without notice to the owner or owners thereof. Notwithstanding any other provision of law, and federally owned lands within the preserve or the Addition shall, with the concurrence of the head of the administering agency, be transferred to the administrative jurisdiction of the Secretary for the purposes of this Act, without transfer of funds. Nothing in this Act shall be construed to interfere with the right of the State of Florida to acquire such property rights as may be necessary for Interstate 75.

(d)(i) The aggregate cost to the United States of acquiring lands within the Addition may not exceed 80 percent of the total cost of such lands.

(2) Except as provided in paragraph (3), if the State of Florida transfers to the Secretary lands within the Addition, the Secretary shall pay to or reimburse the State of Florida (out of funds appropriated for such purpose) an amount equal to 80 percent of the total costs to the State of Florida of acquiring such lands.

(3) The amount described in paragraph (1) shall be reduced by an amount equal to 20 percent of the amount of the total cost incurred by the Secretary in acquiring lands in the Addition other than from the State of Florida.

(4) For purposes of this subsection, the term ‘total cost’ means that amount of the total acquisition costs (including the value of exchanged or donated lands’ less the amount of the costs incurred by the Federal Highway Administration and the Florida Department of Transportation, including severance damages paid to private property owners as a result of the construction of Interstate 75.

Sec. 2. (a) In recognition of the efforts of the State of Florida in the preservation of the area, through the enactment of chapter 73-131 of the Florida statutes, ‘The Big Cypress Conservation Act of 1973’, the Secretary

is directed to proceed as expeditiously as possible to acquire the lands and interests in lands necessary to achieve the purposes of this Act.

(b) Within one year after the date of the enactment of this Act, the Secretary shall submit, in writing, to the Committee on Interior and Insular Affairs and to the Committees on Appropriations of the United States Congress a detailed plan which shall indicate:

- (i) the lands and areas which he deems essential to the protection and public enjoyment of this preserve.
- (ii) the lands which he has previously acquired by purchase, donation, exchange or transfer for administration for the purpose of this preserve, and
- (iii) the annual acquisition program (including the level of funding) which he recommends for the ensuing five fiscal years.

(c) It is the express intent of the Congress that the Secretary should substantially complete the land acquisition program contemplated by this Act within six years after the date of its enactment.

SEC 3. (a) The owner of an improved property on the date of its acquisition by the Secretary may, as a condition of such acquisition, retain for himself and his heirs and assigns a right of use and occupancy of the improved property for a definite term of not more than twenty-five years or, in lieu thereof, for a term ending at the death of the owner or the death of his spouse, whichever is later. The owner shall elect the term to be reserved. Unless this property is wholly or partially donated to the United States, the Secretary shall pay the owner the fair market value of the property on the date of acquisition less the fair market value, on that date, of the right retained by the owner. A right retained pursuant to this section shall be subject to termination by the Secretary upon his determination that it is being exercised in a manner inconsistent with the purposes of this Act, which shall include the exercise of such right in violation of any applicable State or local laws and ordinances, and it shall terminate by operation of law upon the Secretary's notifying the holder of the right of such determination and tendering to him an amount equal to the fair market value of that portion of the right which remains unexpired.

(b) As used in this Act, the term "improved property" means:

- (i) a detached, one family dwelling, construction of which was begun before November 23, 1971, with respect to the preserve and January 1, 1986 with respect to the Addition which is used for noncommercial residential purposes, together with not to exceed three acres of land on which the dwelling is situated and such additional lands as the Secretary deems reasonably necessary for access thereto, such land being in the same ownership as the dwelling, and together with any structures accessory to the dwelling which are situated on such lands and

(ii) any other building, construction of which was begun before November 23, 1971, with respect to the preserve and January 1, 1986 with respect to the Addition which was constructed and is used in accordance with all applicable State and local laws and ordinances, together with as much of the land on which the building is situated, such land being in the same ownership as the building, as the Secretary shall designate to be reasonably necessary for the continued enjoyment and use of the building in the same manner and to the same extent as existed in November 23, 1971, or January 1, 1986, as the case may be, together with any structures accessory to the building which are situated on the lands so designated. In making such designation the Secretary shall take into account the manner of use in which the building, accessory structures, and lands were customarily enjoyed prior to November 23, 1971 or January 1, 1986 as the case may be.

(c) Whenever an owner of property elects to retain a right of use and occupancy as provided in this section, such owner shall be deemed to have waived any benefits or rights accruing under sections 203, 204, 205, and 206 of the Uniform Relocation Assistance and Real Property Acquisition Policies Act of 1970 (84 Stat. 1894), and for the purposes of such sections such owner shall not be considered a displaced person as defined in section 101(6) of such Act.

SEC 4. (a) The area within the boundaries depicted on the map referred to in section 1 shall be known as the Big Cypress National Preserve. Such lands shall be administered by the Secretary as a unit of the National Park System in a manner which will assure their natural and ecological integrity' in perpetuity' in accordance with the provisions of this Act and with the provisions of the Act of August 25, 1916 (39 Stat. 535; 16 U.S.C. 1-4), as amended and supplemented.

(b) In administering the preserve, the Secretary shall develop and publish in the Federal Register such rules and regulations as he deems necessary and appropriate to limit or control the use of Federal lands and waters with respect to:

- (1) motorized vehicles,
- (2) exploration for and extraction of oil, gas, and other minerals,
- (3) grazing,
- (4) draining or constructing of works or structures which alter the natural water courses,
- (5) agriculture,
- (6) hunting, fishing, and trapping,
- (7) new construction of any kind, and
- (8) such other uses as the Secretary determines must be limited or controlled in order to carry out

the purposes of this Act: *Provided*, That the Secretary shall consult and cooperate with the Secretary of

Transportation to assure that necessary transportation facilities shall be located within existing or reasonably expanded rights-of-way and constructed within the reserve in a manner consistent with the purposes of this Act.

SEC. 5. The Secretary shall permit hunting, fishing, and trapping on lands and water under his jurisdiction within the preserve and the Addition in accordance with the applicable laws of the United States and the State of Florida, except that he may designate zones where and periods when no hunting, fishing, trapping, or entry may be permitted for reasons of public safety, administration, floral and faunal protection and management, or public use and enjoyment. Except in emergencies, any regulations prescribing such restrictions relating to hunting, fishing, or trapping shall be put into effect only after consultation with the appropriate State agency having jurisdiction over hunting, fishing, and trapping activities. Notwithstanding this section or any other provision of this Act, members of the Miccosukee Tribe of Indians of Florida and members of the Seminole Tribe of Florida shall be permitted, subject to reasonable regulations established by the Secretary, to continue their usual and customary use and occupancy of Federal or federally acquired lands and waters within the preserve and the Addition, including hunting, fishing, and trapping on a subsistence basis and traditional tribal ceremonials.

SEC. 6. Notwithstanding any other provision of law, before entering into any contract for the provision of revenue producing visitor services,

(i) the Secretary shall offer those members of the Miccosukee and Seminole Indian Tribes who, on January 1, 1972, (January 1, 1985 in the case of the Addition) were engaged in the provision of similar services, a right of first refusal to continue providing such services within the preserve and the Addition subject to such terms and conditions as he may deem appropriate, and

(ii) before entering into any contract or agreement to provide new revenue-producing visitor services within the preserve or within the Addition the Secretary' shall offer to the Miccosukee Tribe of Indians of Florida and the Seminole Tribe of Florida the right of first refusal to provide such services, the right to be open for a period of ninety days. Should both tribes respond with proposals that satisfy the terms and conditions established by the Secretary, the Secretary may allow the Tribes an additional period of ninety days in which to enter into an inter-Tribal cooperative agreement to provide such visitor services, but if neither tribe responds with proposals that satisfy the terms and conditions established by the Secretary', then the Secretary shall provide such visitor services in accordance with the Act of October 9, 1965 (79 Stat. 969, 16 U.S.C. 20). No such agreement may be assigned or otherwise transferred without the consent of the Secretary.

SEC. 7. Within five years from the date of the enactment of this Act, with respect to the preserve and five years from the date of the enactment of the Bid Cypress National Preserve Addition Act. with respect to the Addition the Secretary shall review the area within the preserve or the area within the Addition (as the case

may be and shall report to the President, in accordance with section 3 (c) and (d) of the Wilderness Act (78 Stat. 891; 16 U.S.C. 1132 (c) and (d)), his recommendations as to the suitability or nonsuitability of any area within the preserve or the area within the Addition (as the case may be) for preservation as wilderness, and any designation of any such areas as a wilderness shall be accomplished in accordance with said subsections of the Wilderness Act.

SEC. 8. (a) Except as provided in subsection (b), there are authorized to be appropriated such sums as may be necessary to carry out the provisions of this Act, but not to exceed \$116,000,000 for the acquisition of lands and interests in lands and not to exceed \$900,000 for development. Any funds donated to the United States by the State of Florida pursuant to chapter 73-131 of the Florida statutes shall be used solely for the acquisition of lands and interests in land within the preserve.

(b) There is hereby authorized to be appropriated from the Land and Water Conservation Fund not to exceed \$49,500,000 for the acquisition of lands within the Addition. There is hereby authorized to be appropriated such sums as may be necessary for development in the Addition.

Approved October 11, 1974.

(The following are completely new sections added from Addition Legislation)

Sec. 9. (a) In order to -

(1) achieve the purposes of the first section of this Act:

(2) complete the preserve in conjunction with the planned construction of Interstate Highway 75: and

(3) insure appropriately managed use and access to the Big Cypress Watershed in the State of Florida.

the Big Cypress National Preserve Addition is established.

(b)The Big Cypress National Preserve Addition (referred to in this Act as the 'Addition') shall comprise approximately 146,000 acres as generally depicted on the map entitled Big Cypress National Preserve Addition, dated April 1987, and numbered 176-910000, which shall be on file and available for public inspection in the Office of the National Park Service, Department of the Interior, Washington, D.C., and shall be filed with appropriate offices of Collier County in the State of Florida. The Secretary shall, as soon as practicable publish a detailed description of the boundaries of the Addition in the Federal Register.

(c) The area within the boundaries depicted on the map referred to in subsection (b) shall be known as the 'Big Cypress National Preserve Addition' and shall be managed in accordance with section 4.

(d) For purposes of administering the Addition and notwithstanding section 2(c), it is the express intent of the Congress that the Secretary should substattially complete the land acquisition program contemplated with

respect to the Addition in not more than five years after the date of the enactment of this paragraph.

Sec. 10. The Secretary and other involved Federal agencies shall cooperate with the State of Florida to establish recreational access points and roads, rest and recreation areas, wildlife protection, hunting, fishing, frogging and other traditional opportunities in conjunction with the creation of the Addition and in the construction of Interstate Highway 74. Three of such access points shall be located within the Preserve (including the Addition).

Sec. 11. Not later than two years after the date of the enactment of this section, the Secretary shall submit to the Congress a detailed report on, and further plan for, the preserve and Addition including -

(1) the status of the existing preserve, the effectiveness of past regulation and management of the preserve, and recommendations for future management of the preserve and the Addition:

(2) a summary of the public's use of the preserve and the status of the access points developed pursuant to section 10:

(3) the need for involvement of other State and Federal agencies in the management and expansion of the preserve and Addition:

(4) the status of land acquisition; and

(5) a determination, made in conjunction with the State of Florida, of the adequacy of the number, location, and design of the recreational access points on 1-75/Allicator Alley for access to the Big Cypress National Preserve, including the Addition.

The determination required by paragraph (5) shall incorporate the results of any related studies of the State of Florida Department of Transportation and other Florida State agencies. Any recommendation for significant changes in the approved recreational access points, including any proposed additions, shall be accompanied by an assessment of the environmental impact of such changes.

Sec. 12. (a) Within nine months from the date of the enactment of the Big Cypress National Preserve Addition Act the Secretary shall promulgate, subject to the requirements of subsections (b)-(e) of the section, such rules and regulations governing the exploration for and development and production of non-Federal interests in oil and gas located within the boundaries of the Big Cypress National Preserve and the Addition, including but not limited to access on, across, or through all lands within the boundaries of the Big Cypress National Preserve and the Addition for the purpose of conducting such exploration or development and production, as are necessary and appropriate to provide reasonable use and enjoyment of privately owned oil and gas interests, and consistent with the purposes for which the Big Cypress National Preserve and the Addition were established. Rules and regulations promulgated pursuant to the authority of this section may be made by appropriate amendment to or in substitution of the rules and regulations respecting non-Federal oil and gas rights (currently codified at 36 CFR 9.30, et seq. (1986)).

(b) Any rule or regulation promulgated by the Secretary under subsection (a) of this section shall

provide that -

(1) exploration or development and production activities may not be undertaken, except pursuant to a permit issued by the National Park Service authorizing such activities or access; and

(2) final action by the National Park Service with respect to any application for a permit authorizing such activities shall occur within 90 days from the date such an application is submitted unless -

(A) the National Park Service and the applicant agree that such final action shall occur within a shorter or longer period of time; or

(B) the National Park Service determines that an additional period of time is required to ensure that the National Park Service has, in reviewing the application, complied with other applicable law, Executive orders and regulations; or

(C) the National Park Service, within 30 days from the date of submission of such application, notifies the applicant that such application does not contain all information reasonably necessary to allow the National Park Service to consider such application and requests that such additional information be provided. After receipt of such notification to the applicant, the applicant shall supply any reasonably necessary additional information and shall advise the National Park Service that the applicant believes that the application contains all reasonably necessary information and is therefore complete, whereupon the National Park Service may -

(i) within 30 days of receipt of such notice from the applicant to the National Park Service determine that the application does not contain all reasonably necessary additional information and, on that basis, deny the application; or

(ii) review the application and take final action within 60 days from the date that the applicant provides notification to the National Park Service that its application is complete.

(c) Such activities shall be permitted to occur if such activities conform to requirements established by the National Park Service under authority of law.

(d) In establishing standards governing the conduct of exploration or development and production activities within the boundaries of the Big Cypress National Preserve or the Addition, the Secretary shall take into consideration oil and gas exploration and development and production practices used in similar habitats or ecosystems within the Big Cypress National Preserve or the Addition at the time of promulgation of the rules and regulations under subsection (a) or at the time of the submission of the application seeking authorization for such activities, as appropriate.

(e) Prior to the promulgation of rules or regulations under this section, the Secretary is authorized, consistent with the purposes of which the Big Cypress National Preserve Addition was established, to enter into interim agreements with owners of non-Federal oil and gas interests governing the conduct of oil and gas exploration, development or production activities within the boundaries of the Addition, which agreements shall be superseded by the rules and regulations promulgated by the Secretary when applicable: Provided. That such

agreement shall be consistent with the requirements of subsections (b) -(d) of this section and may be altered by the terms of rules and regulations subsequently promulgated by the Secretary: Provided further, That this provision shall not be construed to enlarge or diminish the authority of the Secretary to establish rules and regulations applicable to the conduct of exploration or development and production activities within the Big Cypress National Preserve or the Addition.

(f) There is hereby authorized to be established a Minerals Management Office within the Office of the Superintendent of the Big Cypress National Preserve, for the purpose of ensuring, consistent with the purposes for which the Big Cypress National Preserve was established, timely consideration of and final action on applications for the exploration or development and production of non-Federal oil and gas rights located beneath the surface of lands within the boundaries of the Big Cypress National Preserve and the Addition.

(g) There are hereby authorized to be appropriated such sums as may be necessary to carry out the activities set forth in this section.

Legislative History.

House Report No. 93-502 (Comm. on Interior and Insular Affairs).

Senate Report No. 93-1128 (Comm. on Interior and Insular Affairs).

Congressional Record:

Vol. 119 (1973): Oct. 3, considered and passed House.

Vol. 120 (1974); Sept 9, considered and passed Senate, amended.

Sept. 24, House concurred in Senate amendments with amendments.

Oct. 1 Senate concurred in House amendments to Senate amendments.



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Appendix B

*National Park Service /
Florida Fish and Wildlife Conservation Commission
Cooperative Partnership Agreement*

COOPERATIVE PARTNERSHIP AGREEMENT

BETWEEN

THE NATIONAL PARK SERVICE AND

THE FLORIDA FISH AND WILDLIFE CONSERVATION COMMISSION

This Cooperative Partnership Agreement ("Agreement") is made and entered on this 1st day of December, 2010 by and between the National Park Service, represented by the Superintendent of the Big Cypress National Preserve ("NPS," "Preserve") and the Executive Director of the Florida Fish and Wildlife Conservation Commission ("FWC").

WHEREAS, the Preserve was established as a unit of the National Park System by Public Law 93-440, effective October 11, 1974. As established, the Preserve consisted of 580,000 acres for purposes of assuring the preservation, conservation and protection of natural, scenic, hydrologic, floral and fauna, and recreation values of the Big Cypress Watershed and providing for the enhancement and public enjoyment thereof; and

WHEREAS, Public Law 100-301, effective April 29, 1988, added 147,000 acres ("the Addition") to the Preserve and further stated that NPS shall cooperate with the State of Florida to establish recreational access points, roads, rest and recreation areas, wildlife protection, hunting, fishing, frogging and other traditional recreational opportunities in conjunction with the creation of the Addition; and

WHEREAS, NPS's special regulations for the Preserve at 36 CFR § 7.86 (a)(2)(iii) state with respect to Motorized Vehicle travel: "...Prior to making a temporary or permanent closure the Superintendent shall consult with the executive director of the Florida Game and Freshwater Fish Commission..."; and

WHEREAS, 36 CFR § 7.86 (e) states that hunting, fishing and trapping are permitted in the Preserve in accordance with the NPS general regulations and applicable Florida law governing Cooperative Wildlife Management Areas; and

WHEREAS the NPS is fulfilling its mission to assure the preservation, conservation and protection of natural, scenic, hydrologic, floral and fauna, and recreation values of the Big Cypress Watershed and to provide for the enhancement and public enjoyment thereof in accordance with all applicable Federal regulations and NPS policies and in a manner consistent with State of Florida regulations; and

WHEREAS, the federal and state statutes establishing the Preserve and the Addition distinguish these public lands from typical national parks and thereby recognize the importance of local traditional values, and integrate those values in a unique and cooperative partnership between the Federal government and the State of Florida; and

WHEREAS, the State of Florida has been a major financial contributor and partner in creating the Preserve by spending \$40 million on land acquisition and by donating 140,000 acres to the creation of the Preserve; and

WHEREAS, the State of Florida has designated the Big Cypress Area as an "area of critical state concern" by Section 380.055, Florida Statutes in order to protect the Preserve and the Addition as an environmental natural resource of regional and statewide significance for the state; and

WHEREAS, FWC is the state agency empowered by Article IV, Section 9, Florida Constitution to execute the executive and regulatory powers of the state over wild animal life, freshwater aquatic life and marine life and is also empowered by sections 375.311-314, Florida Statutes to regulate motor vehicle access and traffic control on Florida's public lands to prevent damage to environmentally sensitive lands; and

WHEREAS, FWC has developed partnership relationships with the federal government for the regulation of fishing, hunting and other outdoor recreational activities in national forests, US Department of Defense lands, US Army Corps of Engineers lands, and for the enforcement of federal marine fishery regulations in state and federal waters and has capably and effectively carried out its partnership responsibilities with other federal agencies; and

WHEREAS, FWC is fulfilling its mission to conserve the fish and wildlife resources of the Preserve by effectively regulating and managing hunting, fishing, and imperiled fish and wildlife in cooperation and as authorized by the NPS, through Rule 68A-15.064(5), Florida Administrative Code and other regulations, and through FWC law enforcement; and

WHEREAS, NPS and FWC [and its predecessor agency the Florida Game and Fresh Water Fish Commission ("GFC")] executed a Memorandum of Understanding in 1974 to promote collaboration, consultation, and cooperation in the regulation and management of the fish and wildlife resources on the Preserve; and

WHEREAS, said Memorandum of Understanding expired in 1990; and

WHEREAS, based upon the aforesaid expressed intent of the above-described state and federal authorities both parties desire to continue to collaborate, consult, and cooperate on Preserve management issues related to recreational access points and roads, rest and recreation areas, wildlife protection, hunting, fishing, frogging and other traditional opportunities to ensure the good and stability of the greater Everglades ecosystem; and

WHEREAS, this Agreement is desirable in order to fulfill the mandate and intent of the Acts of Congress and Florida Statutes for the management of the Preserve and the Addition.

THEREFORE, NPS and FWC agree as follows:

1. NPS and FWC will implement this Agreement through joint and cooperative endeavors which will focus the resources, expertise, skills, and abilities of the FWC and the NPS toward achieving the proper management of the lands and waters involved, the proper management of fish and wildlife resources, and the maximum public benefit from these endeavors.

2. NPS and FWC will offer reasonable public access as provided for in Public Law 93-440 and Public Law 100-301, allowing the public to engage in authorized traditional uses in the Preserve and the Addition such as hunting, fishing, camping and other wildlife-oriented recreational activities, which can be compatible with fish and wildlife conservation and are integral to fulfilling the mandate and intent of said public laws, without compromising the integrity of Preserve natural and cultural resources.
3. NPS and FWC shall collaborate, consult, and cooperate with one another to ensure that their actions do not adversely affect the ability of the Miccosukee Tribe of Indians of Florida and the Seminole Tribe of Indians of Florida to continue their usual and customary use and occupancy of Federal or federally acquired lands and waters within the Preserve and Addition.
4. FWC and NPS shall collaborate, consult and cooperate with one another when developing management plans, environmental assessments or environmental impact statements or other management instruments that affect fish and wildlife resources of the Preserve and the Addition and the public's ability or access to enjoy such resources.
5. FWC and NPS shall collaborate, consult and cooperate with one another regarding management of imperiled species of fish and wildlife on the Preserve and/or the Addition.
6. FWC and NPS shall collaborate, consult and cooperate with one another on courses of action to control or eradicate exotic or nonnative fish and wildlife or plants in the Preserve and the Addition. Nothing herein shall restrict or constrain the ability of NPS to implement management measures necessary to control or eradicate exotic fish, wildlife or plants.
7. When practicable, the NPS and FWC shall collaborate, consult, and cooperate on ecological research and resource monitoring to address questions of mutual interest to NPS and FWC. Authorship rights to publications resulting from such collaboration, consultation, and cooperation shall follow the guidelines in Dickson, J. G., R. C. Conner,

and K. T. Adair. 1978. Guidelines for Authorship of Scientific Articles. Wildlife Society Bulletin 6:260-261

8. NPS and FWC shall have the opportunity to review and comment upon each other's research and monitoring proposals when related to fish and wildlife in the Preserve and the Addition prior to commencement of the research and monitoring.
9. FWC and NPS shall freely exchange with each other, upon request and in consideration of the Freedom of information Act and Florida's public records law, their biological data about flora and fauna of the Preserve and the Addition and shall acknowledge use of the other's data in any publication of such data.
10. The NPS shall facilitate reasonable access to the Preserve and the Addition by the FWC for ecological research and natural resource monitoring of mutual interest to NPS and FWC.
11. NPS and FWC shall permit the harvest of fish and wildlife by the public in such areas of the Preserve and the Addition as provided for in the aforementioned Acts of Congress.
12. Areas within the Preserve and the Addition where public hunting, fishing, and other activities associated with taking or possession of fish and wildlife are allowed shall be open for said activities as provided by and in accordance with all applicable federal and state statutes, rules or regulations.
13. This Agreement recognizes the authority of the Preserve Superintendent to promulgate regulations and implement management limits and controls as they relate to public access, including but not limited to actions in response to changing resource conditions during emergencies as described in paragraph 19 below, but in any case where such actions relate to fish and wildlife management or the taking of fish and wildlife or associated activities, these actions shall be promulgated in collaboration, consultation, and cooperation with FWC.

14. All state licenses and permits required under State law shall be required for public hunting, fishing and activities associated with the taking or possession of game fish and wildlife species in the Preserve and the Addition.
15. FWC shall consult with and secure the concurrence of NPS before establishing any regulation of fishing, hunting, and other activities associated with the taking or possession of game fish and wildlife on the Preserve and the Addition.
16. FWC shall provide law enforcement support for sufficient enforcement of FWC regulations effective in the Preserve and the Addition. Furthermore the FWC and NPS will develop and adopt a specific Memorandum of Understanding that sets forth the procedures for mutual aid and law enforcement in the Preserve and the Addition.
17. FWC and NPS shall act in good faith and as true partners to resolve disagreements that may arise in the implementation of this Agreement. In the event of a disagreement, the parties agree to contact each other in a timely manner and make a reasonable effort resolve the conflict at the lowest level. Should elevation of the dispute become necessary, the Superintendent and Executive Director will serve as final decision makers on behalf of their respective agencies in resolving points of disagreement within a mutually agreed upon time frame and as expeditiously as possible.
18. NPS and FWC will collaborate, consult, and cooperate on the development of news releases and/or public comments to the media concerning fish and wildlife, access, recreation, law enforcement, and emergencies that may affect the Preserve and Addition. Additionally NPS and FWC will collaborate, consult, and cooperate on outreach that may pertain to other related areas of mutual interest.
19. When necessary to address emergencies, NPS may issue regulations or orders to restrict or prohibit public use and access in the Preserve and the Addition or portions thereof. With the concurrence of NPS, FWC may issue regulations or orders to restrict or prohibit hunting or fishing or other activities associated with the taking of fish and wildlife in the Preserve and the Addition or portions thereof. When practicable,

regulations and orders of the nature referenced in this provision should be jointly or cooperatively issued.

20. FWC and NPS shall enter into a separate agreement to render mutual assistance as practicable in times of emergency or natural disaster affecting the Preserve or its employees.
21. FWC and NPS may enter into separate working arrangements as occasion demands for the use of lands, buildings, equipment and other facilities owned and operated by either party.
22. FWC and NPS shall assist each other in supporting and defending mutually agreed rules, regulations and policies relating to the Preserve and the Addition.
23. The Superintendent and the Executive Director or their designees will meet at least annually to insure that the provisions of the cooperative partnership established under this Agreement are being fully implemented and to identify any measures necessary to improve this cooperative partnership.
24. Modifications to this Agreement may be made through mutual consent of the NPS and FWC as approved by the Superintendent and the Executive Director
25. Termination of this agreement shall be by mutual consent of the NPS and FWC as executed by the Superintendent and the Executive Director.

WHEREFORE, the Parties hereto, through their designated Representatives, have executed this Agreement on the last date listed and signed below.



Pedro Ramos
Superintendent
Big Cypress National Preserve



Nick Wiley
Executive Director
Florida Fish & Wildlife Conservation Commission

Appendix C

*Big Cypress Wildlife Management Area
Regulations Summary and Area Map
(July 1, 2013 - June 30, 2014)*

REVISED: Special regulations for Stairsteps Unit. Monroe Checkstation has re-opened. Hunt Dates amended for Archery and Muzzleloading Gun Seasons

2013-2014
Hunting Season

Big Cypress

Wildlife Management Area

Regulations Summary and Area Map
July 1, 2013 - June 30, 2014



A cooperative public wildlife and recreational area
National Park Service



Florida Fish and Wildlife Conservation Commission
MyFWC.com

This brochure is designed to provide the public with information and a summary of regulations pertaining to hunting and other recreational use on the Big Cypress Wildlife Management Area. **Regulations that are new or differ substantially from last year are shown in bold print.** Area users should familiarize themselves with all regulations. For exact wording of the wildlife laws and regulations, see the Florida Fish and Wildlife Conservation Commission's wildlife code, on file with the Secretary of State and state libraries. This brochure, the Florida Hunting Regulations handbook and quota permit worksheets should provide the information necessary for you to plan your hunting activities. These publications are available from any Commission office, county tax collector and at MyFWC.com.

Persons using wildlife management areas are required to have appropriate licenses, permits and stamps. The following persons are exempt from all license and permit requirements (except for quota permits when listed as "no exemptions," recreational use permits, antlerless deer permits and the Migratory Bird Hunting and Conservation Stamp [federal duck stamp]): Florida residents who are 65 years of age or older; residents who possess a Florida Resident Disabled Person Hunting and Fishing Certificate; residents in the U.S. Armed Forces, not stationed in Florida, while home on leave for 30 days or less, upon submission of orders; and children under 16 years of age. Children under 16 years of age are exempt from the federal duck stamp. Anyone born on or after June 1, 1975 and 16 years of age or older must have passed a Commission-approved hunter-safety course prior to being issued a hunting license, except the Hunter Safety Mentoring exemption allows anyone to purchase a hunting license and hunt under the supervision of a licensed hunter, 21 years of age or older.

Licenses and permits may be purchased from county tax collectors, license agents, at MyFWC.com/license or by telephone at 888-486-8356. A no-cost Migratory Bird Permit is available when purchasing a hunting license. Any waterfowl hunter 16 years of age or older must possess a federal duck stamp; available where hunting licenses are sold, at most post offices or at www.duckstamp.com.

Quota Permit Information:

Muzzleloading Gun (first 9 days) - 200 (Bear Island Unit), no-cost, quota permits.
General Gun (first 9 days) - 200 (Bear Island Unit), 500 (Turner River Unit), no-cost, quota permits.

Permit applications: Hunters must submit electronic applications for quota and special-opportunity permits through the Commission's **Recreational Licensing Issuance Services (RLIS)**. Worksheets listing hunts, application periods, deadlines and instructions are available at county tax collector's offices, FWC offices or MyFWC.com. Quota application periods occur throughout the year beginning April 1; please refer to the hunting handbook or MyFWC.com for specific dates. Worksheets will be available about 2 weeks prior to each application period.

Guest hunters: For each non-transferable archery, muzzleloading gun, general gun, wild hog, spring turkey and mobility-impaired quota permit issued through the Commission's **RLIS**, a quota permit holder (host) may take a guest hunting by obtaining a guest permit. A guest hunter must possess a completed guest permit while hunting except the following persons may be a guest hunter without a guest permit: a youth under 16 years of age, a youth supervisor, a mentor license holder or a mentor license supervisor. A host may only bring 1 guest hunter at a time **and may only use 1 guest permit per day**. The following persons are not considered to be guest hunters: other quota permit holders, non-hunters and exempt hunters (on areas and during seasons that allow exemptions). The host must share the bag limit with the guest hunter and the host is responsible for violations that exceed the bag limit. The guest hunter and host must enter and exit the area together and must share a street-legal vehicle while hunting on the area; ATVs may be ridden independently. The guest hunter may hunt only while the host is on the area. Refer to the quota hunt worksheets for additional information.

Youth and mentor license holders: A youth hunter (less than 16 years of age) must be supervised by a person at least 18 years of age. A mentor license holder must be supervised by a licensed hunter at least 21 years of age. Unless exempt, only those supervisors with proper licenses and permits may hunt. If the supervisor is hunting during any hunt for which quota permits are issued, at least 1 person in the party must be in possession of a quota permit. During a hunt that allows exemptions, a non-exempt supervisor of a youth must have a quota permit to hunt. A non-hunting supervisor is allowed to accompany a youth or mentor license holder during any hunt.

Transfer of permits: Quota and guest permits are not transferable. A positive form of identification is required when using a non-transferable permit, except for a youth under 16 years of age. The sale or purchase of any quota permit or guest permit is prohibited.

National Park Service Off-road Vehicle (ORV) Permit:

Vehicle operators must be state licensed (regular or learner's permit) and obtain an ORV operator's permit from the NPS for all vehicles, including airboats, used off-road on the Big Cypress Wildlife Management Area. All ORVs and their operators must be permitted and the vehicles inspected prior to operation in the preserve. The ORV permit is issued for the vehicle, but NPS maintains a record of applicant and ownership information for each permitted ORV. Vehicle operators are responsible for knowing NPS regulations that apply to ORV use in the preserve. Please contact the Big Cypress National Preserve ORV Office, 33100 Tamiami Trail East, Ochopee, FL 34141, 239-695-1205, regarding vehicle use regulations or at nps.gov/bicy/planyourvisit/orv-use.htm. The NPS ORV permit is available at the Oasis Visitor Center.

General Area Regulations:

All general laws and regulations relating to wildlife and fish shall apply unless specifically exempted for this area. Hunting or the taking of wildlife or fish on this area shall be allowed only during the open seasons and in accordance with the following regulations:

1. Any person hunting deer or accompanying another person hunting deer shall wear at least 500 square inches of daylight fluorescent-orange material as an outer garment, above the waistline. These provisions are not required when hunting with a bow and arrow during archery season.
2. Taking of spotted fawn, swimming deer or roasted turkey is prohibited. Species legal to hunt are listed under each season.
3. It is illegal to hunt over bait or place any bait or other food for wildlife on this area.
4. Driving a metal object into any tree, or hunting from a tree into which a metal object has been driven, is prohibited.
5. No person shall cut, damage or remove any natural, man-made or cultural resource without written authorization of the landowner or primary land manager.
6. Taking or attempting to take any game with the aid of live decoys, recorded game calls or sounds, set guns, artificial light, net, trap, snare, drug or poison is prohibited. Recorded calls and sounds can be used to hunt furbearers, wild hog and crows.
7. The wanton and willful waste of wildlife is prohibited.
8. Hunting, fishing or trapping is prohibited on any portion of the area posted as closed to those activities.
9. People, dogs, vehicles and other recreational equipment are prohibited in areas posted as "Closed to Public Access" by FWC administrative action.
10. Taking or herding wildlife from any motorized vehicle, aircraft or boat which is under power is prohibited, until power and movement from that power, has ceased.

11. Most game may be hunted from ½ hour before sunrise until ½ hour after sunset (see exceptions under each season).
12. The release of any animal is prohibited, without written authorization of the landowner or primary land manager.
13. The head and evidence of sex may not be removed from the carcass of any deer or turkey on the area.
14. The planting or introduction of any non-native plant is prohibited, without written authorization of the landowner or primary land manager.
15. Wild hog may not be transported alive.
16. Littering is prohibited.
17. It is unlawful to set fire to any forest, grass or woodlands.
18. A Fish and Wildlife Conservation Commission Law Enforcement Officer may search any camp, vehicle or boat, in accordance with law.
19. Falconers may hunt during the statewide falconry season anytime a management area is open for public access. Falconers are not exempt from quota permits during hunts requiring them.
20. Construction of buildings or other structures is prohibited, unless permitted by the National Park Service.
21. Cutting or damaging fences used to contain animals (including cattle fences) is a felony of the third degree.
22. The collection of plants, rocks, minerals, animal life or other natural objects is allowed only in accordance with written permits obtained in advance from the National Park Service.

Public Access and Vehicles:

1. Open to public recreational access year round.
2. All vehicles and airboats used off-road on the Big Cypress Wildlife Management Area shall have a National Park Service ORV permit. See National Park Service Off-road Vehicle (ORV) Permit section, page 1.
3. To access the Bear Island Unit, all persons shall enter and exit the area at the Bear Island check station on the north end of Turner River Road or at the I-75 walk-in only access check station, located north of I-75 in the southeast portion of the Bear Island Unit.
4. Vehicle use on Eleven-mile Road or the Florida Trail is prohibited; however, vehicles may cross Eleven-mile Road at marked designated crossing points. Maps are available at the Visitor Center.
5. On Jetport Road, only vehicles with pneumatic tires may be operated and parked vehicles are prohibited.
6. Parked vehicles may not obstruct a road, gate or firelane.
7. No motor vehicle shall be operated on any part of any wildlife management area that has been designated as closed to vehicular traffic.
8. All airboats must be equipped with an orange flag at least 10 inches wide and 12 inches long and displayed at a minimum height of 10 feet above the bottom of the vessel.
9. Public access inside any fenced portion of the Jetport property is prohibited.

Hunters and Check Stations:

1. **Hunting deer in Zone 4 of the Stairsteps Unit is prohibited.**
2. **In Zone 3 of the Stairsteps Unit harvested deer must have at least one antler having 2 or more points (each point 1-inch or more in length) and at least one antler 5 inches or more in length. Bag limit for deer in Zone 3 is 1 annually.**
3. Hunters must check in at a designated check station upon entering the area, retain in their possession a check station pass while hunting and check out at the same check station when exiting the area and shall check all game harvested.
4. Hunters using the Bear Island Unit shall enter and exit only at the designated entrance at the north end of Turner River Road or designated entrances along I-75. The I-75 entrances are walk-in only and equipped with self-service check stations.
5. Deer, wild hog and turkey may be divided or consumed in the field, but each portion shall be identified with the license number of the person who took the game and be readily traceable to the portion of the animal bearing sex identification.
6. It is important that game stay intact as much as possible and be brought to the check station as soon as possible. Important biological data are obtained from the following animals and parts: deer (head, heart, kidney, and liver), hog (head) and turkey (wings and tail). If game is processed in the field, the above items should be brought to the check station along with the meat.
7. Deer jawbones shall be saved and brought to the check station.
8. Hunting equipment may not be taken onto the WMA until after 8 a.m. the day before the opening of a season and shall be removed by 6 p.m. 1 day after the end of the season, but see #s 4 and 16 under the National Park Service Rules and Information section.
9. Licensed hunters are allowed to take Conditional Reptiles incidental to lawful hunting activities during established hunting seasons. Conditional reptiles shall not be transported alive from the area. Persons that take any Conditional Reptiles shall report the take within 36 hours, and shall provide all data requested. Report all take of Conditional Reptiles at 888-IVE-GOT1 (888-483-4681) or at IveGot1.org.

Guns:

1. Hunting on or from the rights-of-way of Burns Road; County Roads 839, 841, 837; State Roads 84 (I-75) or 94; or U.S. 41 is prohibited.
2. In the Deep Lake Unit, only muzzleloading guns, bows or raptors may be used for hunting. Muzzleloading guns may only be used for hunting in the Deep Lake Unit during the small game season.
3. Hunting at night with a gun is prohibited.
4. Muzzleloading guns used for taking deer must be .40 caliber or larger, if firing a single bullet, or be 20 gauge or larger if firing 2 or more balls.
5. Hunting deer with rimfire or non-expanding, full metal jacket (military ball) ammunition is prohibited.
6. Children under the age of 16 hunting with a firearm must be in the presence of a supervising adult.
7. No person shall discharge a firearm or have a loaded firearm in hand while under the influence of alcohol or drugs.
8. For hunting non-migratory game, only shotguns, rifles, pistols, bows, crossbows or falconry may be used. Hunting during the spring turkey season with firearms other than shotguns or using a shot size larger than #2 is prohibited.
9. For hunting migratory game, only shotguns, bows or falconry may be used. Shotguns shall not be larger than 10 gauge and shall be incapable of holding more than 3 shells in the magazine and chamber combined.
10. Hunting with full automatic or silencer-equipped firearms, centerfire semi-automatic rifles having a magazine capable of holding more than 5 rounds, explosive or drug-injecting devices and set guns is prohibited.

Dogs:

1. Hunting deer or wild hog with dogs is prohibited.
2. The possession of dogs is prohibited, except bird dogs or retrievers are allowed for hunting purposes only.
3. Dogs are prohibited in the Loop Unit.
4. No person shall allow any dog to pursue or molest any wildlife during any period in which the taking of wildlife by the use of dogs is prohibited.
5. Leashed dogs may not be used for trailing wounded game.

Camping:

1. Camping is allowed in accordance with the regulations of the National Park Service. See the National Park Service Rules and Information section for additional camping rules.
2. Primitive camping is not limited to designated campsites except in Bear Island Unit and in Zone 4 when the campsite is accessed by airboat.
3. Camping on Bear Island Unit is allowed at designated campsites only; only tents, trailers and self-propelled camping vehicles may be used in the Bear Island Campground. Only tents may be used in the Gator Pit and Pink Jeep Trail designated campsites.
4. Draining or dumping refuse or waste from any trailer or other vehicle is prohibited.
5. Fires are allowed only on designated camping areas or in backcountry campsites and must be completely extinguished prior to the user leaving the campsite.

Bag and Possession Limits: A guest hunter must share the host's bag limit. No person shall exceed statewide bag limits.

1. **Deer - Daily limit 1, annual limit 2 (all seasons combined), except in Zone 3 of the Stairsteps Unit where the bag limit for deer is 1 annually. Hunting deer in Zone 4 is prohibited.**
2. Wild hog - Daily limit 1, annual limit 2 (all seasons combined).
3. Turkey - Daily limit 1, season limit 2, possession limit 2.
4. Gray squirrel, quail and rabbit - Daily limit 12, possession limit 24 for each.
5. Raccoon, opossum, armadillo, beaver, coyote, skunk and nutria - No bag limits.
6. Bobcat and otter - Prohibited.
7. Migratory birds - See Migratory Bird Hunting Regulations pamphlet.

Archery Season:

September 7 through October 6 (all Units).

October 31 through November 5 (all Units).

November 16 through January 1 (Deep Lake Unit only).

Permit, Stamp and License Requirements - Check station pass, hunting license, management area permit, archery permit, deer permit (if hunting deer), migratory bird permit (if hunting migratory birds) and state waterfowl permit and federal duck stamp (if hunting waterfowl).

Legal to Hunt - **Deer with at least one antler 5 inches or more in length, except in Zone 3 of the Stairsteps Unit deer must also have at least one antler having 2 or more points (each point 1-inch or more in length), wild hog with shoulder height of 15 inches or more, gray squirrel, quail, rabbit, raccoon, opossum, armadillo, beaver, coyote, skunk, nutria and migratory birds in season.**

Regulations Unique to Archery Season-

1. Hunting with guns or crossbows (except by disabled crossbow) is prohibited, except that centerfire shotguns are allowed for taking migratory birds when 1 or more species are legal to hunt in all units except Deep Lake Unit (see Migratory Bird section and the current Migratory Bird Hunting Regulations pamphlet).
2. Duck hunting is prohibited in the Bear Island and Deep Lake Units during the special September season.
3. **Hunting deer in Zone 4 of the Stairsteps Unit is prohibited.**

Muzzleloading Gun Season:

October 12-27 (except Deep Lake Unit).

November 6-10 (except Deep Lake Unit).

Permit, Stamp and License Requirements - Quota permit (if hunting Bear Island Unit Oct. 12-20), check station pass, hunting license, management area permit, muzzleloading gun permit, deer permit (if hunting deer), and migratory bird permit (if hunting migratory birds).

Legal to Hunt - Deer with at least one antler 5 inches or more in length, except in Zone 3 of the Stairsteps Unit deer must also have at least one antler having 2 or more points (each point 1-inch or more in length), wild hog with shoulder height of 15 inches or more, gray squirrel, quail, rabbit, raccoon, opossum, armadillo, beaver, coyote, skunk, nutria and migratory birds in season.

Regulations Unique to Muzzleloading Gun Season-

1. Hunting with archery equipment or guns, other than muzzleloading guns, is prohibited, except that centerfire shotguns are allowed for taking migratory birds when 1 or more species are legal to hunt in all units except Deep Lake Unit (see Migratory Bird section and the current Migratory Bird Hunting Regulations pamphlet).
2. **Hunting deer in Zone 4 of the Stairsteps Unit is prohibited.**

General Gun Season:

November 16 through January 1 (except Deep Lake Unit).

Permit, Stamp and License Requirements - Quota permit (if hunting Nov. 16-24 in the Bear Island or Turner River Units), check station pass, hunting license, management area permit, deer permit (if hunting deer) migratory bird permit (if hunting migratory birds) and state waterfowl permit and federal duck stamp (if hunting waterfowl).

Legal to Hunt - Deer with at least one antler 5 inches or more in length, except in Zone 3 of the Stairsteps Unit deer must also have at least one antler having 2 or more points (each point 1-inch or more in length), wild hog with a shoulder height of 15 inches or more, gray squirrel, quail, rabbit, raccoon, opossum, armadillo, beaver, coyote, skunk, nutria and migratory birds in season.

Regulations Unique to General Gun Season - **Hunting deer in Zone 4 of the Stairsteps Unit is prohibited.**

Small Game Season:

January 2 through February 1.

Permit, Stamp and License Requirements - Check station pass, hunting license, management area permit, migratory bird permit (if hunting migratory birds), and state waterfowl permit and federal duck stamp (if hunting waterfowl).

Legal to Hunt - Gray squirrel, quail, rabbit, raccoon, opossum, armadillo, beaver, coyote, skunk, nutria and migratory birds in season.

Regulations Unique to Small Game Season-

1. In the Deep Lake Unit, only muzzleloading guns, bows or raptors may be used.
2. Hunting with centerfire rifles is prohibited.

Trapping: Prohibited.

Spring Turkey Season:

March 1 through April 6.

Permit, Stamp and License Requirements - Check station pass, hunting license, management area permit and wild turkey permit.

Legal to Hunt - Bearded turkey or gobbler.

Regulations Unique to Spring Turkey Season:

1. In the Deep Lake Unit, only muzzleloading guns, bows or raptors may be used.
2. Legal shooting hours are ½ hour before sunrise until 1 p.m.
3. Hunting other animals is prohibited.
4. Hunting with firearms other than shotguns or using a shot size larger than #2 is prohibited.

Migratory Bird Seasons:

Ducks may be hunted during the special September season in all units except Bear Island and Deep Lake units. Rail, common moorhen, mourning dove, white-winged dove, snipe, ducks, geese, coot, woodcock and crow may be hunted during seasons established by the Commission for these species that coincide with the archery, muzzleloading gun, general gun or small game seasons.

Permit, Stamp and License Requirements - Quota permit (if hunting during any quota period), check station pass, hunting license, management area permit, migratory bird permit, and state waterfowl permit and federal duck stamp (if hunting waterfowl).

Legal to Hunt - See Migratory Bird Hunting Regulations pamphlet.

Regulations Unique to Migratory Bird Seasons - All Migratory Bird Regulations shall apply.

1. Hunting with bird dogs or waterfowl retrievers is allowed except in the Loop Unit.
2. Hunting ducks, geese and coot with lead shot is prohibited.
3. Centerfire shotguns are allowed for hunting during established area seasons when 1 or more migratory birds are legal to hunt, except in the Deep Lake Unit.

Fishing and Frogging:

Allowed year round.

Permit, Stamp and License Requirements - Fishing license (not required when frogging).

Legal to Take - See Florida Freshwater Fishing Regulations Summary.

Regulations Unique to Fishing and Frogging - All General Freshwater Fishing Regulations shall apply. Frogs may be taken by gig only. See #s 13, 14 and 15 in the National Park Service Rules and Information section.

General Information:

1. Information for persons with disabilities can be found at MyFWC.com/ADA
2. If you have any questions about this material, please call the Fish and Wildlife Conservation Commission South Region Office at 561-625-5122 (TDD 800-955-8771).
3. FWC is not responsible for protection of personal property and will not be liable for theft of or damage to personal property.
4. Please report the location of any sick or extremely skinny deer to the Chronic Wasting Disease hotline, toll free at 866-293-9282.
5. Small tracts of private property are located within the boundary of the wildlife management area. These lands may be posted against trespass and should not be considered to be part of the wildlife management area.

National Park Service Rules and Information:

This area is a national preserve and Big Cypress National Preserve regulations shall apply. For further information, contact the Big Cypress National Preserve, 33100 Tamiami Trail East, Ochopee, Florida 34141, 239-695-1205 or www.nps.gov/bicy/.

1. Time limits apply to camping. Please contact Big Cypress NP for current camping regulations and limitations on the maximum number of days an individual may camp.
2. Backcountry camping in the Bear Island Unit is allowed only at designated campsites: Gator Pit and Pink Jeep Trail sites.
3. Backcountry camping in Zone 4 is allowed as follows: Airboat users must camp in designated campsites only. Those gaining access by foot or non-motorized vessels may camp anywhere as long as the campsite is at least ½ mile from Loop Road and ¼ mile from any designated campsite or airboat trail.
4. Except for Zone 4, during archery, muzzleloading gun, general gun and spring turkey hunting seasons, an individual may camp or leave camping gear unattended for the length of the season in backcountry areas and the designated campsites in Bear Island, Gator Pit and Pink Jeep Trail, provided such equipment / camps are marked with the owner's name, address and telephone number. Sites / equipment may be occupied after 8 a.m. 1 day before the opening of the season and must be removed by 6 p.m. 1 day after the close of that season.
5. Dead wood lying on the ground may be collected as fuel for campfires within the preserve. This wood cannot be removed from the Preserve.
6. Primitive campsites must be located at least ½ mile from and out of sight of designated state or county roads.
7. All backcountry users are required to have a backcountry use permit (free).
8. Consumption of alcohol or possession of an open container of alcohol in or on a motor vehicle, including off-road vehicles and airboats, is prohibited.
9. All private property owners in the preserve are required to obtain a burn permit in advance from the Florida Division of Forestry by calling 239-690-3502 between 9 a.m. and 4:30 p.m. Call Big Cypress Dispatch at 800-788-0511 on the day of the burn to avoid false reports of fire caused by others reporting your smoke.
10. The preserve is closed to the viewing of wildlife with an artificial light, except that artificial lights may be used during frogging activities.
11. It is prohibited to destroy, injure, deface, remove, dig or disturb from their natural state living or dead wildlife, fish, plants, non-fossilized and fossilized paleontological specimens, cultural or archaeological resources or the parts of each thereof.
12. The taking, feeding or intentional disturbance of wildlife (including snakes and other reptiles) is prohibited except as authorized by specific hunting regulations.
13. Frogging regulations: 1) Commercial frogging is prohibited; 2) frogs may be taken by gig only; 3) the daily bag limit is 1 five-gallon bucket per vessel or individual; and 4) the possession limit is 18 lbs of dressed frog legs. Recreational frogging for personal use is allowed.
14. Fishing in freshwater must be by hook and line.
15. Fishing is prohibited in the canal on the north side of U.S. Highway 41 in front of the Oasis Visitor Center for a distance of 200 yards east and west from a midpoint located directly opposite of the front door of the building and the Turner River Canal from the bridge on U.S. Highway 41 to 1/10 of a mile North.
16. During archery, muzzleloading, general gun and spring turkey seasons an individual may leave treestands or similar devices unattended for the length of the specific season provided such equipment is marked with the owner's name, address and telephone number. Individuals may bring this equipment into the preserve after 8 a.m. 1 day before the opening of the specific season and must be removed by 6 p.m. 1 day after the close of that season.
17. Off-road vehicle use is prohibited between 10 p.m. and 5 a.m.

Cooperation Requested:

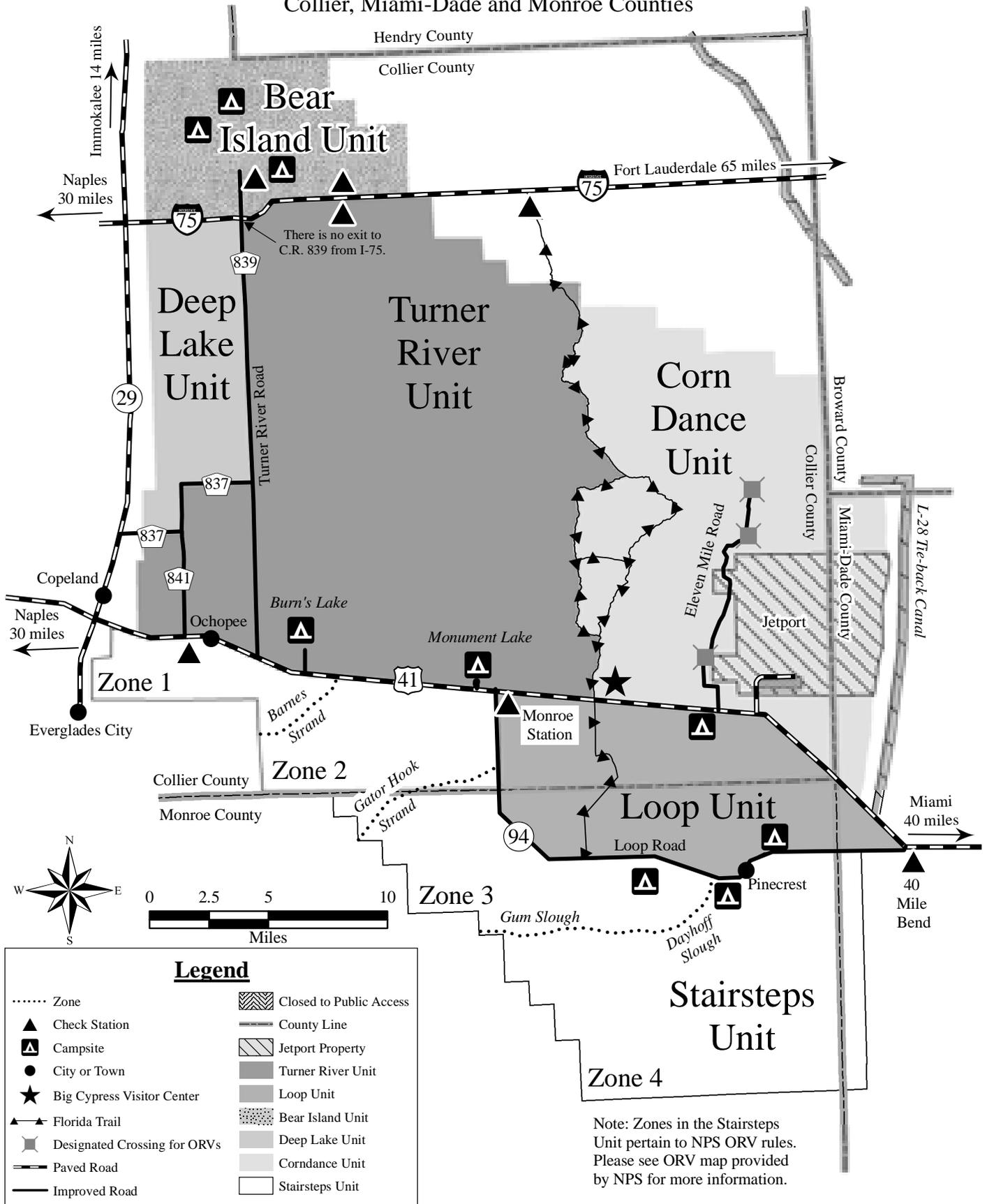
If you see law violators or suspicious activities, contact your nearest Commission regional office or call 888-404-FWCC. You may qualify for a cash reward from the Wildlife Alert Reward Association.

The U.S. Department of the Interior prohibits discrimination on the basis of race, color, national origin, age, sex or handicap. If you believe that you have been discriminated against in any program, activity or facility as described above, or if you desire further information, please write to: The Office for Human Resources, U.S. Fish and Wildlife Service, Department of the Interior, Washington, D.C. 20240. The project described in this publication is part of a program funded by federal dollars under the Wildlife Restoration Act. Federal funds pay 20 percent of the cost of the program.

BIG CYPRESS WILDLIFE MANAGEMENT AREA

565,848 acres

Collier, Miami-Dade and Monroe Counties



Note: Zones in the Stairsteps Unit pertain to NPS ORV rules. Please see ORV map provided by NPS for more information.

Appendix D

*Deer Status Report,
Big Cypress National Preserve –
Addition Lands (April 2012)*

Deer Status Report
Big Cypress National Preserve – Addition Lands



April 2012

Introduction

Big Cypress National Preserve (BCNP), comprising approximately 582,000 acres in southwest Florida, was initially established on October 11, 1974, by P.L. 93-440. BCNP was expanded by an additional 146,000 acres in 1988 by P.L. 100-301, which is known as the “Addition Act.” Under P.L. 93-440, the purpose for designating these lands as a national preserve was “...to assure the preservation, conservation, and protection of the natural, scenic, hydrologic, floral and faunal, and recreational values of the Big Cypress Watershed in the State of Florida and to provide for the enhancement and public enjoyment thereof...” Section 5 of P.L. 93-440 requires that the Secretary of Interior shall permit hunting, fishing, and trapping in accordance with federal and state laws and further requires that any restrictions relating to hunting, fishing, or trapping can be put into effect only after consultation with the appropriate State agency having jurisdiction over hunting, fishing, and trapping activities. Section 10 of P.L. 100-301 states that “The Secretary and other involved Federal agencies shall cooperate with the State of Florida to establish recreational access points and roads, rest and recreation areas, wildlife protection, hunting, fishing, frogging, and other traditional opportunities in conjunction with the creation of the Addition...”

The Florida Fish and Wildlife Conservation Commission (FWC) (and its predecessor agency the Florida Game and Fresh Water Fish Commission) has enjoyed a nearly four-decade history of partnering with National Park Service (NPS) at BCNP, having dedicated staff to help co-manage the original BCNP as the Big Cypress Wildlife Management Area (WMA). Since the BCNP Addition was established in 1988, FWC has supported and encouraged including these public lands into the Big Cypress WMA to provide a full suite of public access and recreation including hunting, fishing, trapping, and other forms of recreational access consistent with the original purposes for establishing BCNP.

The Addition Lands consist of about 128,000 acres northeast of the original preserve boundary and approximately 18,000 acres along the western boundary. The northeast portion of the Addition Lands is divided by Interstate 75 (I-75). The area north of I-75 is referred to as the Addition Lands North and the area south of I-75 is referred to as the Addition Lands South.

The Addition Lands North (70,905 acres) is characterized by an overstory of pond cypress (*Taxodium ascendens*) and an understory that includes wax myrtle (*Myrica cerifera*), pond apple (*Annona glabra*), swamp fern (*Blechnum serrulatum*), and air plants (genus *Tillandsia*)(43.4%) (Duever et al. 1979, University of Georgia 1999). The mesic pine forest, which comprise almost 20% of the area, is dominated by South Florida slash pine (*Pinus elliottii* var. *densa*) accompanied by a shorter mid-canopy and understory of cabbage palm (*Sabal palmetto*) and saw palmetto (*Serenoa repens*) growing in loamy soils overlaying bedrock (Duever et al. 1979, University of Georgia 1999).

The Addition Lands South (57,329 acres) is dominated almost exclusively by cypress forest (41.3%) and scrub cypress (42.5%). Low density dwarf pond cypress (*Taxodium ascendens*) (usually less than 10 m tall) occurs in seasonal marshes along the interface between upland pine communities and deeper wetland areas. The understory of these areas consist of a dense mixture of grasses and sedges of the genera *Rynchospora* and *Cyperus* in many places (Duever et al. 1979).

Deer Population Surveys

Ground Surveys

In 2006, the FWC began efforts to estimate the white-tailed deer population on the Addition Lands. Initially ground based surveys were used. Ground surveys were conducted from a swamp buggy along established trails at sunrise and half an hour after sunset. Spotlights were used to observe deer during the night time surveys. Three routes were established in the Addition Lands North (Bakers Grade 13.7 km, East Route 18.2 km and Short West Route 13.9 km), and one route was established in the Addition Lands South (South Route 7.5 km). Visibility indices were developed for each route, and routes were surveyed twice for each starting time (Mitchell 1986). Measurements of visibility were taken every 176 meters along each survey route using a laser range finder. Measurements were taken on each side of the vehicle with a maximum visibility distance set at 83 meters. Measurements were averaged for each route to get a visibility index.

The average width of visibility (both sides combined) for the survey routes was very limited and ranged from 19.93 meters to 78.62 meters (Garrison et al. 2012). Vegetation, particularly exotic shrubs, along the trail sides greatly reduced visibility. Limited visibility and short transects resulted in small sampling areas (0.28 to 1.07). Average deer density estimates were similar between spotlight and morning surveys in East and South routes, however, in West Short and Bakers Grade routes estimates derived from spotlight count data were lower than their commensurate morning surveys. The greatest deer densities occurred along the Bakers Grade route with 7.43 deer/ for the morning surveys (Table 1) and 6.04 deer/ for the spotlight surveys (Table 2). The lowest deer densities during the morning surveys occurred on the South route (3.11 deer/). The lowest densities during the spotlight surveys occurred on the West Short route (1.80 deer/).

We are reluctant to extrapolate results from the land cruise surveys to broader areas of the Addition Lands for several reasons. This method only sampled 0.7% and 0.2 %, of the Addition Lands North and South, respectively, because of the small area in which deer were visible along the routes and the limited lengths of the routes. Although additional trails were available for sampling, the sheer size of the area and the visibility problems rendered this method unfeasible. Approximately 439 km of transects would need to be surveyed for adequate sampling (Mitchell, 1986). In addition, some portions of the area were not accessible, even to swamp buggies and vegetative communities were not sampled proportionally to their occurrence. Roads and trails can influence deer behavior and may confound results of roadside surveys. We found it challenging to estimate the visibility distances for the land cruise surveys, especially at night, making it difficult to describe the area sampled, rendering accurate population or density estimates impossible. Although distance sampling applied to land cruise surveys can correct for visibility issues, the low number of observations obtained during the land cruise surveys made applying that method impractical as well. Because of these issues, we decided to change to aerial surveys. We thought this would provide us with the ability to sample areas beyond vehicle reach, sample habitats relative to their proportion and increase visibility of animals.

Aerial Surveys

In 2007 aerial surveying using the line transect method was initiated. With the line transect method, observers survey one or more transects and record the number of individual animals or groups of animals (along with group size) and the location of the animals with respect to the

transect, recorded as the perpendicular distance of the animal or group of animals from the transect. The distance data can then be used to model a detection function, which represents the probability of detecting an animal as a function of its distance from the line. The logic of this approach is that not every animal along a transect is observed, and the probability of seeing an animal decreases as the distance from the transect increases (Williams et al. 2002). By estimating the detection probability, the proportion of animals missed can be estimated and the population density estimated accordingly. The method provides confidence intervals and other measures that allow the manager to evaluate the reliability of the estimates.

There are three assumptions that are essential for reliable density estimation from line transect sampling (in order of importance): (1) animals directly on the line are always detected, (2) animals are detected at their initial location, prior to any movement in response to the observer, and (3) distances are measured accurately. Violation of the first assumption will result in low biased density estimates if animals near or on the line are missed. Violation of the second assumption can also lead to a low biased estimator if animals move away from the transect prior to detection in response to disturbance by the observer. Violation of the third assumption is problematic only when significant errors are made in the distance measurements or if errors produce a consistent bias in distance estimates, particularly for animals close to the transect.

We conducted aerial surveys annually from late April through mid-June, 2007-2011. In 2007 and 2008, the surveys were flown with a fixed-wing airplane. In 2007, transects (4 in Addition Lands North and 6 in Addition Lands South) were based on systematic reconnaissance flight transects established to survey wading bird populations and were spaced 2 km apart. In 2008, in an effort to increase the sample size, transects were placed 1 km apart, and, therefore, the number of transects was doubled. Transects were placed parallel in a systematic grid extending between the western and eastern boundaries of each area. However, low numbers of deer were observed on and close to the transects, which resulted in poor fit of the models and, therefore, unreliable density estimates. From 2009 on, surveys were conducted from a helicopter, rather than a fixed-wing plane, to resolve this problem. The benefit of using a helicopter for aerial surveys has been well established, mainly due to greater visibility of animals, particularly close to the transect. The Bear Island Unit was added to the surveys in 2009. Bear Island has historical deer harvest data, which could facilitate estimating sustainable harvest in the Addition Lands.

Each study area was surveyed 3 times (one area per flight), except in 2008 when each area was surveyed 6 times. Flights began at sunrise (~0650) and typically ended by 1030. Two observers surveyed and recorded deer; one observer surveyed deer from a front seat of the aircraft and the other observer surveyed deer from a rear seat of the aircraft (behind the pilot) and on the opposite side of the aircraft from the front seat observer. Locations of deer and the perpendicular distances of the animals from the transect were recorded in distance intervals or bins (0-50 m, 50-100 m, 100-150 m, 150-200 m, and 200-250 m and 250 m+). In 2007 and 2008, the bin marks were made on the airplane windows using a mathematical formula calculated from observer eye height while seated in a grounded fixed wing plane. In 2009, the surveys were flown with a Bell Jet Ranger helicopter. With the helicopter hovering at survey-flight altitude, the bin markings were determined by each observer placing line-of-sight markers on a transparency attached to the helicopter window corresponding to distance intervals marked on the ground along a runway. Beginning in 2010 the surveys were flown with an Alouette

helicopter, and, in an effort to further increase visibility, the doors of the helicopter were removed for the survey flights. This necessitated modifying the method used to mark the bins. Bin widths were determined using the same method as in 2009, except the bins were marked on the door frame instead of the windows. Additionally the first bin was split into 2, resulting in 7 bins (0-25 m, 25-50 m, 50-100 m, 100-150 m, 150-200 m, 200-250 m and 250+m), in an attempt to better model the observations near the transect.

As an index of deer observations, we used the distance surveyed as the effort and calculated deer/km surveyed. Density and abundance estimates and corresponding confidence intervals were computed with the software DISTANCE 6.0 Release 2 (Thomas et al. 2010). To address the non-independence of repeated surveys within one transect, all the data from a given transect were pooled prior to analysis (Buckland et al. 2001).

The number of deer observed per kilometer of transect was highest in Bear Island and lowest in Addition Lands South (Table 3). The number of deer observed per kilometer surveyed did not change considerably between years in Addition Lands North or Bear Island (Table 3). In Addition Lands South, the number of deer observed fluctuated from 0.05 deer/km to 0.17 deer/km, with the second highest number of deer (0.12 deer/km) observed in 2011 (Table 3).

Although the numbers of deer observed per kilometer of transect in Addition Lands North and Bear Island did not change greatly over the years, the effective strip width (ESW) varied notably from year to year in all areas. This led to considerable changes in the effective survey area and, therefore, the density estimates within the areas (Table 4). Population density estimates in Addition Lands North ranged from a low of 0.36 deer/ (686 acres per deer) to a high of 1.56 deer/ (158 acres per deer, Table 4). In Addition Lands South density estimates varied from 0.21 deer/ (1177 acres per deer) to 0.71 deer/ (348 acres per deer, Table 4). In Bear Island estimates varied from 1.12 deer/ (221 acres per deer) to 5.18 deer/ (48 acres per deer, Table 4).

In 2007, goodness-of-fit tests for the Addition Lands surveys indicated good fit of the detection functions (Table 4, Garrison et al. 2012). However, the number of observations (clusters of deer) was lower than the sample size of 60-80 recommended by Buckland et al. (2001) for a reliable estimate. In 2008, the chi-square goodness-of-fit test indicated very poor fit of the detection functions in the Addition Lands due to the low number of observations near the line (Table 4). In 2009, the sample sizes were more than sufficient, histograms of detection function satisfied the shape criterion and chi-square goodness-of-fit demonstrated good fit for the models for all three areas (Table 4, Garrison et al. 2012). However, in 2010 and particularly in 2011, the histograms for all areas lacked the “shoulder” near the line, violating the shape criterion and, therefore, resulting in unreliable density estimates (Buckland et al. 2001, Garrison et al. 2012).

Changing from fixed-wing aircraft to helicopters in 2009 to conduct the line transect surveys improved visibility and allowed the pilot to keep the altitude and flight speed more consistent compared to fixed-wing planes, reducing the chances of variation among transects and areas. Although the number of replications was reduced from 6 to 3 per transect to accommodate the higher cost of using helicopters, the numbers of observations were not significantly reduced and were close to or above the sample size of 60-80 recommended by Buckland et al. (2001), presumably due to better visibility. The helicopter window was larger and was positioned lower

than the fixed-wing plane window, allowing for significantly better visibility for the front observer, particularly close to the “0” line. In addition, compared to the fixed-wing, the helicopter was less cramped and more comfortable to sit in and view deer, reducing observer fatigue.

One of the key assumptions of distance sampling is that animals are not missed on the “0” line (transect line). Although use of the helicopter improved the visibility at “0,” there were areas in the Addition Lands and in Bear Island where the transect was not visible, regardless of aircraft used, due to tree canopy. Violating this assumption causes the estimate to be biased low (Buckland et al. 2001).

The change in the distribution of observations, from the majority of deer being observed near the transect (e.g., 2009 data) to more dispersed distribution (e.g., 2010, 2011), led to change in the estimated strip width, or the width of the survey area. Therefore, even when the number of deer observed did not change considerably among years, in years when the surveyed area was larger due to wider strip widths, the density estimates dropped significantly. The reason for the change in the distribution of observations and, therefore, the drastic change in the ESW is unclear. Possible explanations include that the distribution truly did change (deer were located further from the line); density had changed and, therefore, observers had more time to search the farther bin; or the observations were placed in incorrect distance intervals.

The change in deer distribution is not likely due to environmental factors, since the transect lines do not follow any habitat feature that would cause such a shift in the distribution (e.g., transects do not follow roads or other features where distribution may not be random). In Bear Island, the April 2009 wildfire, which burned over 49 (12,000 acres) may have increased visibility and, therefore, the number of observations that year, but that would not explain the coincident changes in the Addition Lands’ estimates. The change in deer distribution in respect to the transects may have occurred if the change in helicopter type resulted in change in deer behavior, i.e., if the helicopter used in 2010 and 2011 caused the deer to flush and move farther from the transects before detection. If this occurred, the density estimates would have been biased low. Additional clues, such as remaining deer (if grouped) and water or vegetation movement, however, were used to minimize the potential for this occurring. There was no change in the search method which could have resulted in the change in distributions (i.e., observers mainly focus on the line). A true change in density could potentially have caused the shift, if the observers had more time, due to low observations near the line, to search further. This would have led to a proportionally higher number of observations being placed in the farther bins. It is unlikely, however, that the population changed as drastically over the survey time as the population estimates suggest (Table 4.)

Placement of observations into incorrect bins, particularly in 2010 and 2011, when the most drastic shift in the ESW and the subsequent decline density occurred is another possibility. The type of helicopter used changed from 2009 to the subsequent years. The helicopter used in 2009 surveys was flown with doors on, and the distance bins were marked on transparencies on the windows. The 2010 and 2011 surveys were flown with doors off, and distance bins were marked on the door frame. This may have led to less accurate placement of bin distances on the door frame versus the windows and errors in placement of deer in the appropriate bins. Observers

were able to look through the windows with bin marker lines when the doors of the helicopter were on. This enabled the observer to look at the deer and the lines simultaneously, allowing for better bin identification. The door frame and bin markers were located outside of the observers field of view when the doors were off, which made it more challenging to line the deer up with the correct bin. In addition, the accuracy of the distance bin measurements requires a relatively constant altitude during flight. Pilot and aircraft changes may have resulted in variation in flight elevations, potentially affecting the accuracy of the distance bin measurements.

The decline in deer densities estimated from helicopter surveys after 2009 was not evident in the Bear Island harvest data from 2008-2010 nor in the aerial survey indices (Table 3). Effort per harvested deer remained consistent with 47 hunter days /deer in 2008, 46 hunter days/deer in 2009 and 47 hunter days/deer in 2010. However, in 2011 effort per harvested deer increased to 57 hunter days/deer requiring an additional 10 days to harvest a deer. It is important to point out, however, that many factors, not just the density of deer, influence the effort/harvest ratio. Some of these factors include water levels, habitat conditions and weather. The number of deer observed per kilometer has fluctuated some in each area; however, there is not a clear decline in any of the areas in this index. The overall trend of the deer abundance and densities in the Addition Lands and Bear Island therefore is not clear.

Despite the variable results of the recent surveys, aerial surveys remain the most promising way to survey an area of the size and complexity of the BCNP. We recommend continuing the aerial surveys to get an index to the deer population and refining the methodology to improve the results of the distance sampling techniques. Our goal is to address all the possible violations of the line transect assumptions prior to the 2012 surveys, in particular the assumption that the distances are measured correctly. To accomplish this, we will evaluate our current distance intervals by conducting an experimental survey where we will place objects at known distances from a transect line and determine the accuracy of the observer bin placement. In addition, we will investigate additional methods to improve the accuracy of the distance measurements and to account for the potential variation in altitude (Laake et al. 2008a, Laake et al. 2008b).

Public Use and Harvest

The FWC and NPS have been partners in fulfilling the legislative mandate that created the BCNP, namely, the preservation of traditional uses along with continual conservation of important natural resources within the BCNP boundaries. Resource management decisions, particularly those related to public hunting and recreational access, have evolved over the 30+ years since the BCNP was created, and some of those changes have been directed toward improving conditions for the endangered Florida panther and its primary prey (deer and hogs). Some of these changes included: prohibitions on the use of off-road vehicles (ORVs) in Deep Lake and Loop Road units of BCNP; combined hunting season lengths reduced from 270 to 170 days, including a reduction in general gun hunting from 58 to 49 days; buck-only harvest with at least a 5-inch antler; elimination of dogs for deer and hog hunting; and mandatory hunter check-in/check-out system coupled with quota permits (Schortemeyer et al. 1991). Designated trails were created in the Bear Island unit of BCNP in 1989 to further lessen any potential impacts of ORV's in this relatively accessible and popular area. All management units that allow ORV use restrict this type of use to designated trails.

Hunter pressure and deer harvest have been monitored in Big Cypress WMA since at least 1980 (Figure 1). Hunter pressure peaked at 24,360 days of pressure in 1984-85 and reached a low of 9,735 during 1994-95, when most of the area was closed during the general gun season due to high water (Bartareau et al, 2011). There was a general decline in hunter participation over this time period which is similar to statewide and national trends. The historical average (1980-2011) was 15,764 days of pressure while the latest 5-year average (2006-2010) was 14,309. The area was wholly or partially closed to hunting due to weather related events (i.e., hurricanes, high water events) during seasons 1994-95, 1995-95, 1998-99, 1999-00, 2004-05, and 2005-06. Deer harvest has had a slight upward trend since 1980. The historical average (1980-2011) is 202 deer harvested per year with a high of 346 harvested in 1998 and a low of 103 in 1980.

White-tailed deer are a polygynous species, meaning that a single male can breed with multiple females. By allowing the take of only males, hunting has a negligible effect on the overall deer population. Of the 139 public hunting areas in the state of Florida that allow the take of deer, the BCNP is among the 75 (54%) that have a more restrictive harvest than the limit allowed on private land. On private lands, hunters are allowed a bag limit of two deer per day of the deer season. Many public hunting areas with more restrictive harvest allow the take of one or two deer per quota permit and have quota permits for each hunt; however, on BCNP, only one buck may be taken per day and only two annually. The use of dogs for taking deer or hogs is prohibited. Hunting deer and hogs without the use of dogs is less efficient and serves to decrease the number of animals harvested. Establishing a check station requirement for hunters allows us to collect vital biological information on harvest data so that we can detect population trends and determine if our management goals are being met.

The FWC's has over 60 years of managing hunting on similar properties as the BCNP. Season lengths, bag limits, methods of take and hunter quotas are much more restrictive on BCNP than on surrounding private lands and should allow sustainable harvest of popular game species into the future, while providing for conservation of the Florida panther.

Current Harvest Strategies

Deer harvest in BCNP has been restricted to harvest of bucks with at least one 5-inch antler since at least 1985, when an external, professional review panel was established by BCNP to make recommendations for deer management (Warren et al. 1986). The panel expressed that it was highly unlikely that bucks-only hunting could detrimentally affect the deer herd, as hunting under such a regulation rarely removes more than 10 percent of the population (Warren et al. 1986). Harvest rates have been relatively stable on BCNP since the 1990-91 season, fluctuating between 54 and 85 man-days per deer taken (except 1999-00 when 3 units were closed for muzzleloading gun and general gun seasons due to an extreme high water event) (Smith et al. 2009), suggesting a relatively stable population under the bucks-only regulation.

Available data also support the premise that less than 10 percent of the population has been harvested. Although historical deer population estimates are variable and potentially unreliable, they suggest recreational harvest levels in Bear Island have ranged between 5 and 7 percent of the estimated deer population in that unit (Adams and Bozzo 2002). Also, estimated harvests in the Corn Dance and Bear Island units in 2009-10 were 9 and 7 percent of their 2009 population estimates, respectively. These harvest rates occurred without regulating hunter numbers to

protect the deer herd. For example, hunter quotas on the Corn Dance Unit were eliminated in the 2008-09 season because they were not being filled. Likewise, although hunting pressure in Bear Island has been restricted to 200 hunters per day during the first 9 days of the hunting season, hunter participation only approaches 40 percent (80 hunters) at its peak.

From 1989 to 2009 (prior to changes in the quota system), the average participation by hunters on Bear Island was <40 percent of the 200 permits issued during archery, muzzleloading gun, and general gun seasons (Bozzo, unpublished data). Even at peak levels of hunter participation on Bear Island, deer-hunter density was only one hunter per 483 acres (80 hunters/38,640 acres), well below densities on similar public hunting lands.

Like other hunted units within BCNP, deer hunting on the Addition Lands would be conducted under a “bucks-only” rule with harvest restricted to deer with at least one 5-inch antler. Based upon the success of this hunting format on other hunted portions of BCNP in providing sustainable deer hunting opportunities while also providing for a stable deer population, it is not anticipated that hunter numbers (quotas) would need to be restricted on the Addition Lands once vehicular access is allowed.

Florida Panther Use of BCNP

FWC biologists began intensive research on the Florida panther in 1981, and this work continues today. The first panthers equipped with radio collars were captured in BCNP and the Fakahatchee Strand Preserve State Park. BCNP was recognized as the center of the Florida panther’s known range (Florida Panther Recovery Plan, 1981, USFWS, Atlanta, GA) and the BCNP, including the Addition Lands, still comprises the single largest block of panther habitat in public ownership. Panther numbers were estimated to be as low as 20-30 animals in the 1980s, and most of these panthers were found in the Big Cypress area. Panther numbers today are estimated to be around 100-160 cats (Figure 2) (McBride 2010) and they are distributed throughout a variety of State and Federal properties as well as on private lands.

Kautz et al. (2006) mapped the extent of occupied panther range where reproduction occurred and referred to this area as the Primary Zone. The Primary Zone is roughly 2.2 million acres in size; over 70% of this zone is in public ownership or is otherwise protected as conservation lands. Public hunting is allowed on approximately 880,000 acres of the Primary Zone. Although the rules are not identical among the various wildlife management areas, all allow deer and hog hunting and most allow some ORV use.

Panther numbers have increased dramatically since the mid-1990s. This increase is likely the result of a combination of factors: genetic restoration, better habitat management, increasing prey base, and the acquisition and protection of thousands of acres of quality panther habitat. Within BCNP south of I-75 and north of US 41, Jansen (2000) reported sign of 2 panthers circa 1995. Documented panther numbers within this same area rose to 17-25 between 2003-10 (McBride 2003, 2004, 2005, 2006, 2007, 2010). In all of the Big Cypress (including the Big Cypress Seminole Indian Reservation with which BCNP shares an approximately 20 mile border), documented panther numbers have ranged from 33 panthers in 2004 to 60 panthers in 2007 and was reported at 55 in 2010 (McBride 2004, 2007, 2010). BCNP supports more panthers today than have been documented since panthers were listed as an endangered species in 1967. The

current management of BCNP appears to have created conditions that have fostered increased use by panthers, and these numbers do not suggest that there are significant conflicts with human use of the BCNP.

The aforementioned panther population size increase followed the time period during which Janis and Clark (2002) studied panther responses to hunting activities on the Bear Island Unit of BCNP (1989-1998). These authors reported no detectable differences in panther activity rates, movement rates, or female predation success rates during deer hunting seasons. This study did report that panthers were located 180 meters further from designated ORV trails during hunting seasons than before hunting seasons (683 meters and 503 meters away from a trail, respectively), and there was a 6% decrease in time spent on the Bear Island Unit during hunting seasons. The authors, however, indicated the movement away from ORV trails was of minor biological importance and may have been related to deer moving away from trails and panthers responding to these prey movements. The authors also acknowledged that the magnitude of the difference in time spent on the Bear Island Unit during and outside of hunting seasons was not great. The concern was that human disturbance may have played a causative role in these movements. Fletcher and McCarthy (2011) re-analyzed the data used in Janis and Clark (2002) and analyzed additional data through 2009. Using additional and more refined data, and more advanced analytical methods they found little evidence to support the notion that hunting affects panther movements and distributions. Although Fletcher and McCarthy (2011) found that panthers were located farther from trails during hunting seasons that trend continued into the post-hunting period. Their analysis showed that hydrological effects had more influence on panther distribution than ORV use. They also found an increase in frequency of use of panthers in Bear Island during hunting seasons contrary to the findings of Janis and Clark (2002). They suggested that panthers and hunter ORV use can co-occur at least at the hunter ORV levels observed from 1989-2009 in the Bear Island unit.

The FWC has advocated that the NPS manage ORV use of the Addition Lands at a level equivalent to that applied to the Bear Island Unit of BCNP. The system of designated trails in the Bear Island Unit allowing for diverse methods of public access (including ORVs) provides a successful model for providing public access in the Addition Lands where public use is well balanced with conservation imperatives including protection of panthers.

Documented deer harvest in BCNP has been stable or slightly increasing over the past 30 years (Figure 1). Panther numbers have increased throughout their range during the past 30 years and, in particular, within BCNP, strongly suggesting that traditional uses of BCNP, including hunting and managed ORV use on designated trails, are compatible with panther conservation.

Conclusion

The FWC and NPS are committed to managing habitat and wildlife populations in the BCNP in such a manner that allows public enjoyment of the resource, while providing the necessary requirements for threatened and endangered species. The healthy and expanding population of Florida panthers is one example of how these goals can co-exist.

Table 1. Number of deer seen and deer density estimates for morning surveys in the Big Cypress National Preserve Addition Lands, 2006.

Date	Route	Area	Transect length (Km)	# of Deer	Deer/	Average Acres/Deer
31-May-06	West Short	Addition Lands North	13.9	0		
30-May-06	West Short	Addition Lands North	13.9	2	3.60	68.72
5-Jun-06	Bakers Grade	Addition Lands North	13.7	11		
9-Jun-06	Bakers Grade	Addition Lands North	13.7	5	7.43	33.22
21-Apr-06	East	Addition Lands North	18.2	2		
19-Apr-06	East	Addition Lands North	18.2	4	4.15	59.48
26-Apr-06	South	Addition Lands South	7.5	1		
27-Apr-06	South	Addition Lands South	7.5	2	3.11	79.52

Table 2. Number of deer seen and deer density estimates for spotlight surveys in Big Cypress National Preserve Addition Lands, 2006.

Date	Route	Area	Transect length (Km)	# of Deer	Deer/	Average Acres/Deer
9-May-06	West Short	Addition Lands North	13.9	0		
8-May-06	West Short	Addition Lands North	13.9	1	1.80	137.44
10-May-06	Bakers Grade	Addition Lands North	13.7	7		
11-May-06	Bakers Grade	Addition Lands North	13.7	6	6.04	40.88
4-May-06	East	Addition Lands North	18.2	5		
3-May-06	East	Addition Lands North	18.2	1	4.15	59.48
2-May-06	South	Addition Lands South	7.5	0		
1-May-06	South	Addition Lands South	7.5	3	3.11	79.52

Table 3. White-tailed deer aerial survey index, deer per kilometer surveyed, Big Cypress National Preserve, 2007-2011.

Area	Year	Total km surveyed	No. of	No. of deer	Deer/km surveyed	Comment
Add Lands North	2007	355	46	80	0.22	Fixed-wing survey
	2008	1414	150	226	0.16	Fixed-wing survey
	2009	707	106	157	0.22	Helicopter
	2010	707	82	129	0.18	Helicopter
	2011	707	88	154	0.22	Helicopter
Add Lands South	2007	363	34	63	0.17	Fixed-wing survey
	2008	1459	62	92	0.06	Fixed-wing survey
	2009	674	49	57	0.08	Helicopter
	2010	674	27	32	0.05	Helicopter
	2011	674	54	84	0.12	Helicopter
Bear Island	2009	449	179	327	0.73	Helicopter
	2010	449	143	255	0.57	Helicopter
	2011	449	161	303	0.67	Helicopter

^a = Groups of deer

Table 4. White-tailed deer population density estimates and associated statistics based on aerial line-transect surveys, Big Cypress National Preserve, 2007-2011.

Study Area	Year			Density (deer/)	95% CI			95% CI		Density (acres per deer)	CV% ^d	χ^2	df	P
					Lower	Upper		Lower	Upper					
Add Lands North	2007	356	161	0.70	0.55	0.92	197	155	258	350.3	13.3	0.64	3.00	0.89
	2008	1414	175	0.46	0.34	0.52	130	95	144	532.5	11.9	34.68	4.00	0.00
	2009	707	72	1.56	1.10	2.17	437	307	608	158.2	14.	0.52	3.00	0.91
	2010	707	103	0.85	0.42	2.10	239	117	588	290.7	46.7	12.20	4.00	0.01
	2011	707	300	0.36	0.33	0.61	102	92	171	686.4	17	11.40	6.00	0.77
Add Lands South	2007	363	167	0.54	0.28	0.82	124	64	188	459.5	29.3	1.30	3.00	0.73
	2008	1458	146	0.23	0.18	0.28	52	42	65	1090.0	11.5	16.70	3.00	0.00
	2009	674	61	0.71	0.44	1.01	164	101	235	348.0	20.5	5.78	4.00	0.22
	2010	674	100	0.25	0.09	0.38	58	21	89	988.4	29.3	18.00	4.00	0.00
	2011	674	300	0.21	0.18	0.46	48	42	108	1176.7	30.7	14.10	6.00	0.29
Bear Island	2009	449	71	5.18	4.01	6.17	810	627	965	47.7	10.7	2.92	2.00	0.23
	2010	449	162	1.57	0.97	2.32	246	152	363	157.4	25.8	3.70	2.00	0.16
	2011	449	300	1.12	1.04	1.60	176	163	251	220.6	12.1	3.16	6.00	0.78

= Total distance surveyed in kilometers

= Effective strip width (ESW) in meters. Area surveyed = Length of the transect * 2ESW

= Estimate of number of deer in the area

= Coefficient of variation for estimates of acres per deer

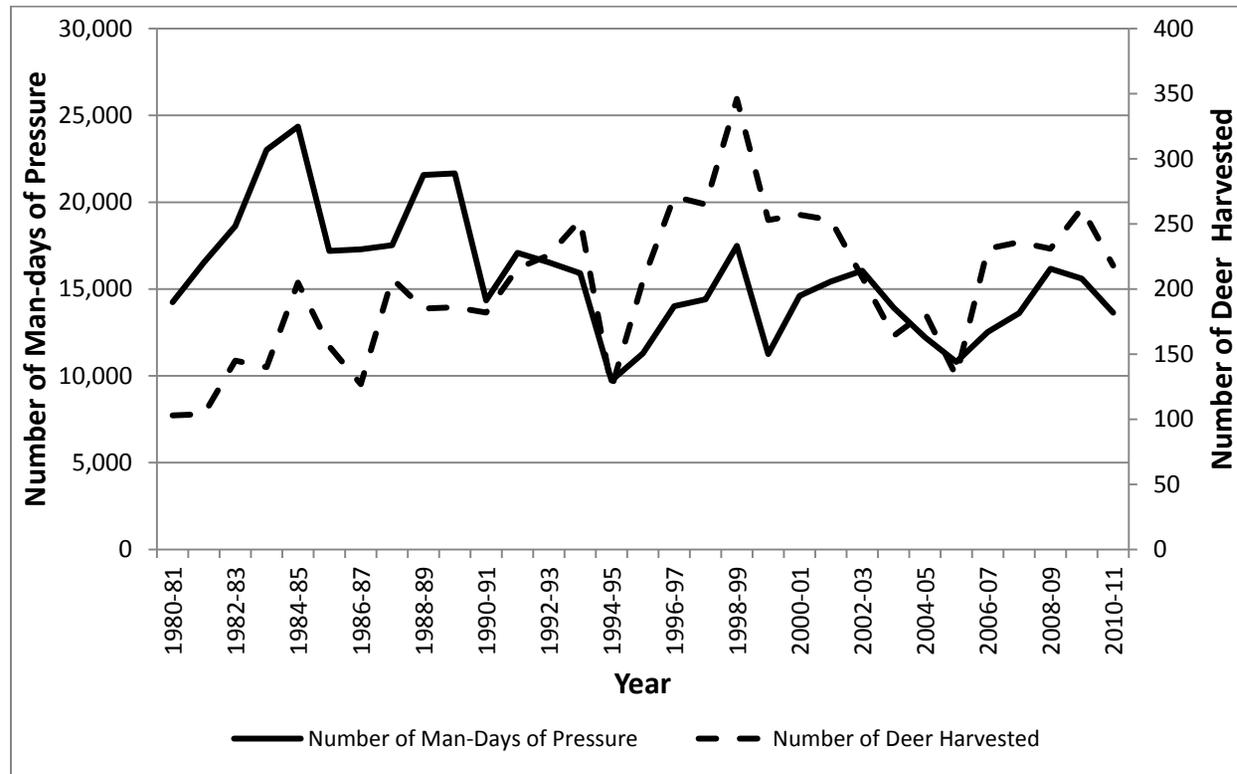


Figure 1. Hunter pressure and deer harvest from Big Cypress Wildlife Management Area, 1980-2010.

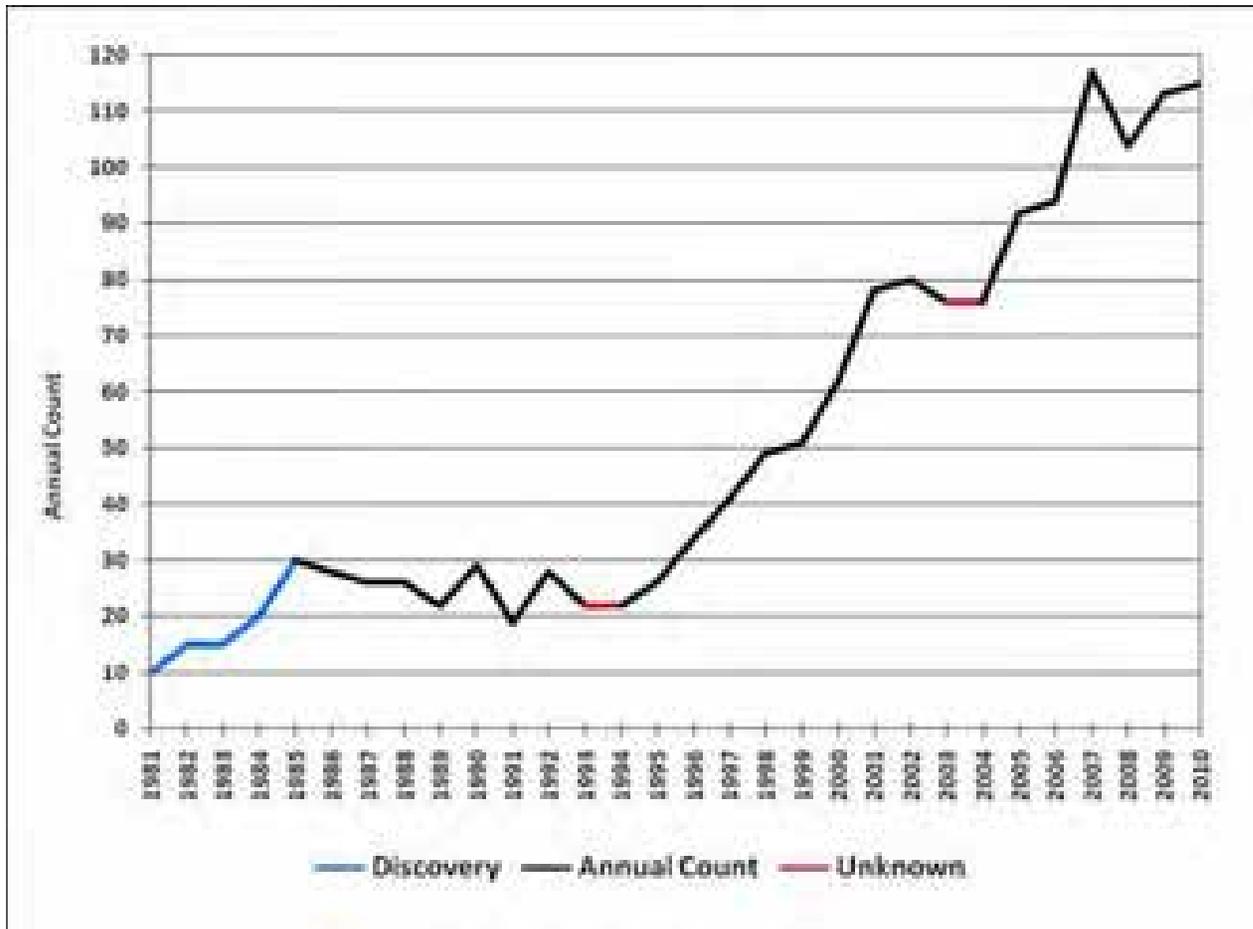


Figure 2. Florida panther annual count 1981-2010.

(Excerpted from McBride, R., C. McBride, and R. Sensor. 2010. Synoptic surveys of Florida Panthers, 2010. Unpublished report. Ranchers Supply, Inc., Alpine, TX. 144pp.)

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Appendix E

National Park Service
White-Tailed Deer and Panther
Monitoring Program Analysis
and U.S. Fish and Wildlife Service
Concurrence Letter
(November 1, 2013)



United States Department of the Interior



NATIONAL PARK SERVICE

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

In reply refer to:
L7617

September 19, 2013

Mr. Larry Williams
Field Supervisor
U.S. Fish and Wildlife Service
South Florida Ecological Services Field Office
1339 20th Street
Vero Beach, Florida 32960-3559

Dear Mr. Williams:

Thank you for your email message of July 10th seeking assurance that changes to our wildlife monitoring strategy will continue to satisfy requirements of the biological opinions previously issued for the Preserve's Recreational Off-Road Vehicle Management Plan, the Addition Lands General Management Plan/Wilderness Study/Off-Road Vehicle Management Plan, and that our monitoring plan will support our effects determination for the pending Hunting Management Plan. As part of our analysis for our hunting plan, and to accommodate the need to best utilize available funding, we evaluated Florida panther monitoring scenarios based on a single aerial survey per week compared to three aerial surveys per week (attached). We believe the resulting analysis demonstrates that we will continue to satisfy the requirements in the biological opinions and provide sufficient information to meet the objectives of the hunting plan.

We conducted a comparison of our ability to detect individual radio-collared Florida panthers, estimate population change, find and access dens, and detect mortality based on a single aerial survey per week versus the three times weekly used as the environmental baseline in the biological opinions. In summary, the analysis demonstrates that estimating decline in our panther population can be statistically accomplished; that we would have been able to find den sites on the ground and access kittens for 94.4% of dens that were accessed under the original survey frequency; and that mortalities under a one-time per week scenario would yield detection approximately 5.40 ± 1.25 days post mortem. While we cannot assess whether the difference in mortality detection time would have inhibited our ability to determine cause of death, additional information would likely have led us to arrive at the same conclusions for some cases. Acknowledging the potential differences in statistical probability and actual activities, we propose to review our findings after a full breeding season to demonstrate using the once-per-week flights in finding and accessing dens, and handling kittens, to compare our success with our predictions.

We believe the attached analysis demonstrates that the change in monitoring frequency will not affect our ability to measure take relevant to existing biological opinions and to the Hunt Plan. While we agree that biological information gained by more frequent monitoring may allow us to detect subtle changes in movement and other behavior, it may be necessary to separate the objectives of the Florida panther recovery goals from the ESA Section 7 consultation for the Hunt Plan. That being said, our attached analysis illustrates that monitoring radio-collared panthers once per week is more than sufficient to satisfy our ability to make sound recreational management decisions.

As outlined in the environmental assessment for our Hunting Management Plan, hunter check station data will be the primary method used for monitoring the white-tailed deer population. The data will be used to estimate buck population age structure for the Preserve as a whole as well as for each hunt unit; to compare age classes within and between hunt units; trends in herd age structure; physical size; as well as harvest and hunter pressure. Secondly, as a complement to this analysis, our buck/doe, doe/fawn deer survey program will continue at approximately 23% of former years' capacity. The objectives of the deer monitoring program will remain the same, but will concentrate on fewer areas annually as compared to the past. As the Hunting Plan states, the data collected from the check stations will continue to provide trend data relative to deer as a prey base for Florida panthers.

An adaptive management framework revision has been provided to your office for review to address how we will continue to make decisions about hunting management to balance panther needs with recreational harvest, and population trends for deer and hogs. The specific discussion in the Plan appears on pages 46-50. We have attached the statistical analysis you requested comparing detection probabilities for radio-collared panthers arising from a single aerial survey per week vs. multiple aerial surveys per week.

Our analysis of existing panther survey data focuses on our ability to estimate and monitor the primary demographic parameters of the panthers inhabiting the Preserve. These parameters are birth, death, and emigration, which ultimately form the basis for detecting and understanding selection pressures potentially operating in the system. Neither our current nor proposed monitoring strategy aim to answer specific research questions such as panther response to ORV use, predation success rate, or home range composition and change. Such questions should be answered under data collection protocols aimed specifically at those objectives and with rigorous design that would yield appropriate statistical power for proper analysis.

However, our current and proposed monitoring strategies can yield data that help inform us about some of these questions. Specifically, by monitoring den success, number of kittens, and adult and kitten survival, we can detect a potential decline in predation success because the decreasing body condition that arises from predation failure cascades to smaller litter size, decreased kitten survival, and ultimately decreased adult survival. Minimum home range size for collared panthers will still be collected under the once-per-week scenario and emigration from the population can still be estimated based on emigration of collared animals. Increases in such rates may indicate displacement by human activities, changing prey availability, or a number of other issues that would be acted upon using the adaptive management strategy.

To further guide the adaptive management process, the Preserve will convene an annual meeting of representatives from the National Park Service, U.S. Fish and Wildlife Service, and the Florida Fish and Wildlife Conservation Commission to review the results, and to continue to evaluate new technologies and monitoring techniques as part of the deer and panther monitoring programs in the Preserve.

We appreciate this opportunity to provide this information and look forward to expanding this dialog and look forward to more discussion on these issues.

Sincerely,

A handwritten signature in black ink, appearing to read 'Pedro Ramos', written in a cursive style.

Pedro Ramos
Superintendent

Attachment

BICY Florida panther monitoring scenario analysis

Prepared by Jason Ransom, PhD

NPS Natural Resource Stewardship and Science, Biological Resource Management Division

Objectives:

1. Determine the weekly detection probability for individual radio-collared panthers arising from a single aerial survey per week vs. multiple aerial surveys per week.
2. Estimate our ability to detect population decline using aerial surveys of radio-collared panthers.
3. Determine our ability to detect den sites using a single aerial survey per week vs. multiple surveys per week and calculate the difference in time that could have arisen between den determination and access to kittens.
4. Assess our ability to detect mortalities using a single aerial survey per week vs. multiple surveys per week and calculate the difference in time that could have arisen before a carcass could be located and accessed.

Methods and Assumptions:

We analyzed the last 3 years of NPS aerial survey data for panthers in Big Cypress National Preserve (BICY) including all surveys ($n= 429$ flights) from January 29, 2010 to January 30, 2013. Throughout this period, three surveys of the area were completed per week for 73.2% of the 157 weeks, two complete surveys per week were completed 26.1% of the time, and there was one week where only one survey was completed.

There were 26 different individual radio-collared panthers detected during this sample period. We excluded 7 individuals from our analyses because they were only detected on one or two occasions across all three years. This was related to detection of Florida Wildlife Commission (FWC)-monitored collars that intermittently strayed into BICY, but also includes one collar deployed in BICY that failed after a single location. We also excluded a female that was intermittently in and out of BICY with a known den location outside of BICY (detected by FWC). The resulting sample for these analyses included 18 individual radio-collared panthers (12 females, 6 males) that were detected on multiple surveys inside BICY, across the sampling period.

We assumed for these analyses that if a radio-collar was not detected on some individual surveys, the collar was still available in the survey area and was missed (even though the animal could have temporarily left the survey area). This is the most conservative approach because it negatively biases our estimates of detection probability. If we assumed animals had left the area when they had not, detection probability could be artificially inflated and thus interpreted as higher monitoring success than actually occurred.

For the original survey strategy, we used the guideline that if a female was detected at the same location for 3 consecutive surveys, it would have triggered a ground search for a den site. For the sample scenario using data for only a single survey per week, we used the assumption that if a female was detected in the same location for 2 consecutive weeks, it would have triggered a ground search for a den site. On 4

occasions, females moved their kittens to a new den site after managers handled and marked kittens. Because these moves were likely triggered by human perturbation on the ground, we counted aerial detections of these alternate den sites as repeat locations of a den even if it was a second or third novel den location. From a statistical perspective, if humans had not perturbed the den site the female would likely have remained at the first site and been detected in that location on subsequent surveys until the den was found.

To estimate the differences between the scenarios of a single survey per week vs. multiple surveys per week, we used only the first survey in each calendar week as the representative single survey. This was preferred over drawing a random survey from each week because the first survey of the week was the most naïve, having followed the most consecutive days without a survey (typically a weekend). This more closely represents conditions (lack of prior location knowledge) than would be the case if we randomly selected from all surveys each week, when some surveys would have occurred the previous day, or at most every other day.

Results

Detection of collars and population change:

From January 29, 2010 to January 30, 2013, we monitored an average of 9.80 ± 0.20 (SE) individuals each week and this increased by year (2010 = 6.73 ± 0.12 , 2011 = 10.42 ± 0.21 , 2012 = 11.95 ± 0.11). Our probability of detecting an individual during the first survey each week was 0.988 ± 0.003 (SE), and our probability of detecting an individual arising from all surveys each week was 0.986 ± 0.002 . There was no statistical difference between these detection probabilities (normal approximation test for the equality of proportions: $\alpha = 95\%$, $z = 0.455$, $P = 0.650$), suggesting that if we had only flown once per week, our ability to detect all known collars would not have been impaired.

Estimating decline in a population from a sample of known-fate radio-collared animals can be statistically accomplished using the hypergeometric distribution. This distribution arises from sampling a discrete population without replacement (we are monitoring the same collared animals each survey and they can't die and then reappear in the population) and the state of interest fits as a binomial coefficient (dead or alive). Assuming the radio collars represent a random selection of animals in the population that could be radio-collared (there is no bias as to who is collared), then the probability of detecting a population decline in adults changes with each death. Statistically, the probability mass function for this problem is:

$$P(x = k) = \frac{\binom{K}{k} \binom{N-K}{n-k}}{\binom{N}{n}}$$

where,

$N = 25$ panthers

$K =$ the number of true deaths in the population

$n =$ the number of collars monitored

$k =$ the number of deaths of collared animals

The resulting answer is a matrix of values that can be read as ‘given K true deaths in the population, what is the probability of k deaths among monitored collars?’ A more useful answer is achieved by applying Bayes Theorem and reversing the question to ‘given k deaths among monitored collars, what is the probability of K true deaths in the overall population?’ Given that Florida panther is an endangered species, we chose the most conservative question, which is ‘given k deaths among monitored collars, what is the probability that *at least* K true deaths occurred in the overall population?’

We calculated this matrix based on the current 12 radio-collared animals in a population of approximately 25 panthers (within the BICY survey area):

Table 1. Given the number of known dead radio-collared individuals, what is the probability of *at least* a given true number of dead in the adult population when we are monitoring 12 radio collars?

True No. Dead	No. Dead in Sample												
	0	1	2	3	4	5	6	7	8	9	10	11	12
0	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
1	50.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
2	24.0%	76.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
3	11.0%	50.0%	89.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
4	4.8%	29.7%	70.3%	95.2%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
5	2.0%	16.1%	50.0%	83.9%	98.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
6	0.7%	8.0%	32.2%	67.8%	92.0%	99.3%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
7	0.3%	3.7%	18.9%	50.0%	81.1%	96.3%	99.7%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
8	0.1%	1.5%	10.1%	33.6%	66.4%	89.9%	98.5%	99.9%	100.0%	100.0%	100.0%	100.0%	100.0%
9	0.0%	0.6%	4.8%	20.5%	50.0%	79.5%	95.2%	99.4%	100.0%	100.0%	100.0%	100.0%	100.0%
10	0.0%	0.2%	2.1%	11.3%	34.4%	65.6%	88.7%	97.9%	99.8%	100.0%	100.0%	100.0%	100.0%
11	0.0%	0.0%	0.8%	5.5%	21.4%	50.0%	78.6%	94.5%	99.2%	100.0%	100.0%	100.0%	100.0%
12	0.0%	0.0%	0.2%	2.4%	11.9%	34.8%	65.2%	88.1%	97.6%	99.8%	100.0%	100.0%	100.0%
13	0.0%	0.0%	0.1%	0.8%	5.8%	21.7%	50.0%	78.3%	94.2%	99.2%	99.9%	100.0%	100.0%
14	0.0%	0.0%	0.0%	0.2%	2.4%	11.9%	34.8%	65.2%	88.1%	97.6%	99.8%	100.0%	100.0%
15	0.0%	0.0%	0.0%	0.0%	0.8%	5.5%	21.4%	50.0%	78.6%	94.5%	99.2%	100.0%	100.0%
16	0.0%	0.0%	0.0%	0.0%	0.2%	2.1%	11.3%	34.4%	65.6%	88.7%	97.9%	99.8%	100.0%
17	0.0%	0.0%	0.0%	0.0%	0.0%	0.6%	4.8%	20.5%	50.0%	79.5%	95.2%	99.4%	100.0%
18	0.0%	0.0%	0.0%	0.0%	0.0%	0.1%	1.5%	10.1%	33.6%	66.4%	89.9%	98.5%	99.9%
19	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.3%	3.7%	18.9%	50.0%	81.1%	96.3%	99.7%
20	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.7%	8.0%	32.2%	67.8%	92.0%	99.3%
21	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	2.0%	16.1%	50.0%	83.9%	98.0%
22	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	4.8%	29.7%	70.3%	95.2%
23	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	11.0%	50.0%	89.0%
24	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	24.0%	76.0%
25	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	50.0%

Estimating population decline from an instantaneous aerial survey sample does not have a temporal component. The probability at any given time of sampling remains the same whether we monitor collars three times per week or once per week. The probability that we detect K by sampling k is always the same.

Given the demographic parameters that characterize panther populations and the biological mechanisms driving change in those parameters, we suggest that estimating population change is most prudent on an annual interval rather than every other day. As such, we believe that monitoring radio-collars once per week is more than sufficient to satisfy our mandate to monitor population trend. The biological information gained by sampling interval is important, however, and more intensive monitoring may allow us to detect subtle changes in location and persistence of location that indicate predation success, illness, and denning behavior. If such locations are known, then on-the-ground information regarding den success, litter size, and juvenile survival, and cause of death can contribute critical data toward recovery efforts.

Detection of dens and access to kittens:

From January 29, 2010 to January 30, 2013, we identified 21 den locations in BICY from 10 individual females. No kittens were found at three of the potential den sites, so analyses were conducted for $n=18$ confirmed dens where kittens were found. Using the full survey dataset, all of these den sites were detected by three consecutive surveys and the date of entry into the den for marking of kittens averaged 11.22 ± 1.27 days after the date of the third aerial location. Mean age of the kittens at the time of handling was 17.92 ± 0.43 days (range = 12–28 days old). All of these 18 dens were also detected for two consecutive weeks and therefore would have been located during the once-per-week scenario. In that scenario, dens would have been detected an average of 3.78 ± 0.51 days later (range = 0–7) than the realized dates that resulted from multiple surveys per week (one-tailed paired t-test: $\alpha = 95\%$, $t = -7.856$, $P < 0.001$).

The mean length of time females were detected at dens (time elapsed from first survey to last survey where a female was aerially detected at a den location) was 50.17 ± 3.31 days (range = 19–74 days). At 17 of 18 dens, females would have still been present at the den with their kittens 15 days after the second once-per-week survey, suggesting that had surveys been conducted once per week and the average time to den access remained the same (~ 4 day observed lag in den detection + ~ 11 day lag from the last location until den access), we would have been able to find den sites on the ground and access kittens for 94.4% of dens that were accessed under the original survey frequency. Kittens would have been roughly 4 days older at the time of handling under the once-per-week scenario (average of 22 days old instead of 18 days old), and all accessed kittens would have been in the same age range as kittens actually handled during the years of data used. The one den that may not have been accessed under the once-per-week scenario was the shortest length of time a female was observed at a den site (19 days) and represents an outlier in the data (all other den sites were occupied at least 35 days: see Fig. 1). This den still might have been accessed, however, because in reality additional information allowed managers to access this den at the same time as the first location. Applying the real information to our sample timeline, access after the first once-per-week location would have been temporally sufficient to access the kittens.

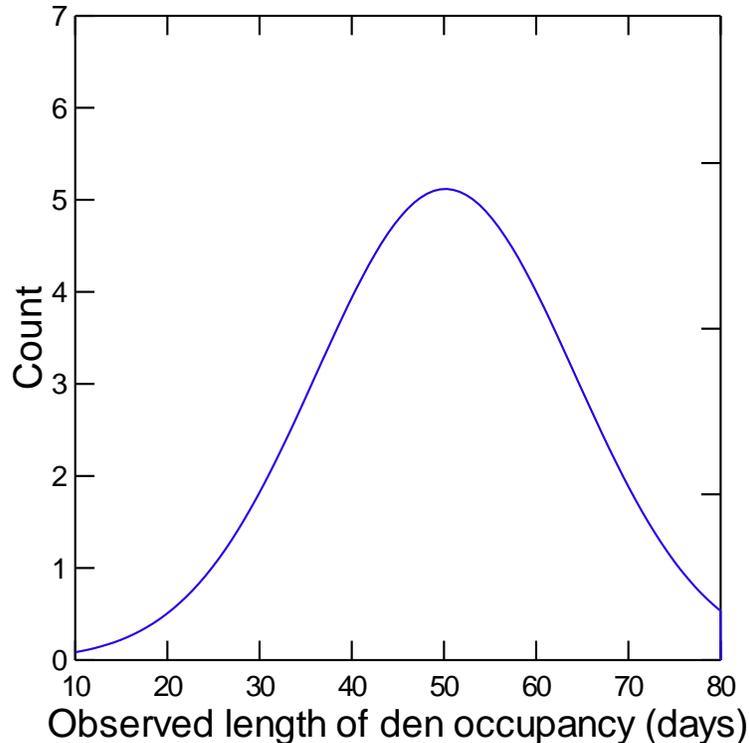


Fig 1. Density plot showing the length of time that female panthers were observed at a den location, using aerial survey data collected three times per week, January 29, 2010 to January 30, 2013.

Detection of mortalities:

Five of the 18 individuals (27.8%) we were monitoring from the air between January 29, 2010 and January 30, 2013 died. We detected three of these mortalities from aerial surveys and one of those presented an aberrant signal for 5 surveys (over 10 days) prior to visual detection of the carcass from the airplane. The remaining two mortality detections arose when a persistent location of each individual was detected on two or three consecutive flights and managers investigated the locations on the ground. One of these individuals was found severely ill and died the same day it was found. The other individual was found by a ground crew to be emitting a mortality signal after the aerial surveys detected a live signal. Movement of the collar by vultures was thought to be the source of the live signal.

The sample size for mortalities was too small to draw any statistical inferences from ($n=5$); however, we did compare the date of each survey when a mortality was determined (either mortality signal or last of the consecutive locations that triggered a ground search) to the date of the once-per-week scenario survey that would have detected the mortality or last of persistent locations based on previous one-per-week survey dates. Under the once-per-week scenario, mortalities would have been detected 3.80 ± 1.24 days later than was realized with multiple surveys per week. The approximate number of days that individuals were dead before being detected under the multiple surveys-per-week scenario was 1.60 ± 0.93 . In the once-per-week scenario, those carcasses would have been detected 5.40 ± 1.25 days post mortem. We cannot assess whether the approximate 4-day delay in detection under the once-per-week scenario would have inhibited our ability to determine cause of death or not; however, additional information would likely have led us to arrive at the same conclusions for some cases. For example, the location of an adult

male at the same location as another male's carcass provided evidence that intraspecific aggression may have contributed to the mortality, and in another case a carcass was found on the road shoulder implicating likely collision with a vehicle. These attributes would have presented in either the multiple-survey-per-week scenario or the once-per-week scenario.



United States Department of the Interior



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

November 1, 2013

Memorandum

To: Pedro Ramos, Superintendent, Big Cypress National Preserve

From: Larry Williams, Field Supervisor, South Florida Ecological Services Office *Larry Williams*

Subject: Big Cypress National Preserve Panther Monitoring Proposal

This memorandum responds to the National Park Service's (NPS) September 19, 2013, letter requesting technical assistance with respect to NPS' proposal to alter panther monitoring in Big Cypress National Preserve (BICY). It provides the U.S. Fish and Wildlife Service's (Service) comments, in accordance with section 7 of the Endangered Species Act of 1973, as amended (87 Stat. 884; 16 U.S.C. 1531 *et seq.*) (Act). In short, based on the information provided by the BICY, it is the opinion of the Service that reducing the number aircraft monitoring flights for panthers from three to one time per week will meet the requirements of the Biological Opinions (BOs), associated National Environmental Policy Act (NEPA) documents, and management plans for which the monitoring flights were initiated, although the timeframe to locate dens will likely increase. The BICY, Service, and Florida Fish and Wildlife Conservation Commission (FWC) will meet annually to review the results of the biological data collection to determine if the monitoring program is appropriate/effective and to discuss any potential changes to the Hunt Plan.

BACKGROUND

In early 2013, due to budget constraints, NPS curtailed over flights to monitor panthers within BICY. Bear Island and the Addition Lands are monitored by the FWC; the FWC monitoring schedule did not change at that time.

Shortly thereafter, the Service initiated discussions with NPS on monitoring requirements from past Biological Opinions and NPS-generated NEPA documents and management plans. As a result of discussions with NPS, the Service agreed to submit questions regarding the change in monitoring and how that change in monitoring would comply with the non-discretionary terms and conditions of the Off-Road Vehicle Management Plan (ORV Plan) Biological Opinion (Service 2000) as well as the above-mentioned commitments in NPS' NEPA documents.

On September 19, 2013, NPS transmitted a letter to the Service including an analysis comparing the effectiveness of once a week monitoring with three times per week monitoring. It should also be noted that NPS has proposed 50 monitoring events per year.



NPS applied the following objectives to provide the requested analysis.

1. *Determine the weekly detection probability for individual radio-collared panthers arising from a single aerial survey per week vs. multiple aerial surveys per week.*
2. *Estimate our ability to detect population decline using aerial surveys of radio-collared panthers.*
3. *Determine our ability to detect den sites using a single aerial survey per week vs. multiple surveys per week and calculate the difference in time that could have arisen between den determination and access to kittens.*
4. *Assess our ability to detect mortalities using a single aerial survey per week vs. multiple surveys per week and calculate the difference in time that could have arisen before a carcass could be located and accessed.*

While detailed information on the analysis may be found in the attachment to NPS' September 19, 2013, letter, we will provide some of the details and assumptions in this memorandum. To accomplish the analysis, NPS took the last 3 years of panther monitoring information including all surveys (n= 429 flights) from January 29, 2010 to January 30, 2013. The sample size included 18 individual radio-collared panthers. To detect whether females were potentially at a den site, NPS assumed that female panthers located in the same spot for 2 consecutive weeks were at a den and a den search would be triggered. NPS used the first survey date for the calendar week in the 3-year dataset to mimic the proposed change in monitoring methodology.

The results of NPS' analysis indicated no statistical difference in their ability to locate individual panthers when comparing one survey per week with three surveys per week. Likewise, NPS concluded that they would be able to detect mortalities and document positive or negative population trends with one monitoring event per week.

In the NPS comparison of their ability to locate dens with one survey per week versus three surveys per week, NPS' analysis indicated that they would have found 94.4 percent of known dens for the three-year time period used in the analysis. They used information from 21 identified den locations in BICY from 10 individual females. As kittens were not found at three of the potential den sites, they eliminated those three from the analysis. The remaining 18 confirmed dens were included in the remainder of the analysis. Using the full survey dataset, all 18 den sites were detected by three consecutive surveys and the date of entry into the den for marking of kittens averaged 11.22 ± 1.27 days after the date of the third aerial location. Mean age of the kittens at the time of handling was 17.92 ± 0.43 days (range = 12–28 days old). All of these 18 dens were also detected for two consecutive weeks and, NPS states, would have been located during the once-per-week scenario. With one survey event per week, dens would have been detected an average of 3.78 ± 0.51 days later than the actual dates that resulted from multiple surveys per week. Kittens would have been roughly 4 days older at the time of handling under the once-per-week scenario (average of 22 days old instead of 18 days old), and all

accessed kittens would have been in the same age range as kittens actually handled during the years of data used.

Based on the results of NPS' analysis, they are confident the change in monitoring from three events per week to one event per week will not alter their ability to detect changes in panther home ranges, denning activity, and population status in BICY. The Service agrees that the results of NPS' analysis indicate they should be able to comply with the non-discretionary terms and conditions of the ORV Plan BO.

As NPS prepares to sign a record of decision implementing the Final Hunting Management Plan/Environmental Assessment (NPS 2013), an adaptive management framework for decision-making related to hunting on BICY will be developed and instituted. Both the Final Hunting Management Plan and NPS September 19, 2013, letter commit to annual meetings between NPS, the FWC, and the Service to review the analysis of panther and deer data, monitoring protocols, and discuss if changes should be made to the hunting program in BICY.

We look forward to working with you to protect BICY for its conservation and historic value. If you have any questions, please contact Jane Tutton at 772-469-4235.

cc:

NPS/DSC, Denver, Colorado (Tracy Atkins)

NPS/RO, Atlanta, Georgia (Tim Pinion)

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Appendix F

Adaptive Management

ADAPTIVE MANAGEMENT

Adaptive management could be an effective approach to managing hunting in the Preserve because:

- Adaptive management allows stakeholders to confront unresolved issues that can influence management performance. An adaptive approach provides a framework for making good decisions in the face of uncertainties and a formal process for reducing uncertainties so that management performance can be improved over time.
- The adaptive management strategy requires a commitment to developing a collaborative decision framework that includes stakeholders with different perspectives. Developing a collaborative group focused on recreational harvest in the Preserve is dependent upon stakeholder groups committing to a decision process because they agree that it is participatory and fair.
- Agencies whose actions may affect federally listed endangered species (under the *Endangered Species Act*) should design monitoring programs with input from USFWS and/or National Oceanic and Atmospheric Administration-National Marine Fisheries Service. Learning by doing – the critical centerpiece of adaptive management – is particularly important in *Endangered Species Act* situations, where cause and effect can be particularly difficult to ascertain.
- The amount of uncertainty about the effects of water withdrawals, altered fire regime, the rate of game harvest, and exotic plants and animals on game populations is relatively high, and the amount of potential agency control options over these issues is also high.

ADAPTIVE MANAGEMENT OF DEER HARVEST

Both the NPS and the FWC recognize that there is an opportunity to develop a better understanding of how the annual deer population interacts with other environmental influences to determine deer population densities in subsequent years. The adaptive management process builds upon the cooperative relationship for monitoring and managing the Preserve deer hunt that has functioned consistently since at least 1982 (NPS 1983). Over time this relationship has grown from cooperative staffing of deer hunt check stations (Ann. Report 1983), to include cooperative management of all wildlife populations (Adams and Bozzo 2002) and the development of a process for monitoring deer populations from aircraft (Garrison et al. 2009). Three decades of monitoring has revealed a large amount of variability in deer harvest success rates (number of deer harvested per man day of effort) among compartments in a single year and within units across years. These observations have been used to adjust the harvest of deer in different management units.

The Preserve has consistently sustained a deer population since its establishment in 1974, with shifts in abundance of deer potentially affected by droughts, floods, tropical storm events, predation, and disease. The Preserve is an integral part of an expanding group of state and federal preserves which are supporting the recovering population of Florida panthers, as discussed in chapter 3 (“Existing Conditions”). Deer are the main food source for panthers, and are critical forage for reproductive female panthers (Land, 1994; USFWS, 2008). Environmental conditions in and around the Preserve continue to change. Human development continues and is accompanied by increased alteration of the regional watershed. Expansion of protected areas has also occurred. The Southwest Florida Feasibility Study recommends a large number of infrastructure alterations focused on addressing flood protection, water supply, and the ecological health of the Big Cypress

Watershed, and both the scale of human development and the scale of proposed infrastructure alterations are likely to be large enough to impact deer populations in/around the Preserve. This EA outlines the primary management strategy that will be used to support the deer population in the Preserve for the next 15 to 20 years. The elements of the adaptive management strategy in alternative 3 are intended to reduce conflicts among agencies and stakeholders, ensure compliance with the *Endangered Species Act*, and systematically enhance the level of certainty about how regulated deer harvests affect deer populations in the context of a dynamic regional condition.

Double Loop Learning Process

The adaptive management framework is focused on the “double loop” learning process (described in Williams et al. 2009) (figure 1). The first loop occurs annually and is focused on the use of monitoring information to determine whether deer harvest should be increased or decreased in the different management compartments. This learning loop has been a feature of the traditional consultation between the NPS and the FWC. The second learning loop occurs on longer time increments (5 to 10 year basis, or when viewed as necessary by stakeholders) and is focused on clearly describing the existing challenges to managing the deer population (i.e. problem formulation), identification of objectives, and working with stakeholders to develop a participatory decision-making process. This adaptive management strategy identifies how existing cooperative efforts can be enhanced over time to fulfill the goals of increasing stakeholder participation, documenting the decision-making process, ensuring that *Endangered Species Act* requirements are met, and increasing the precision of the management of hunting in the Preserve.

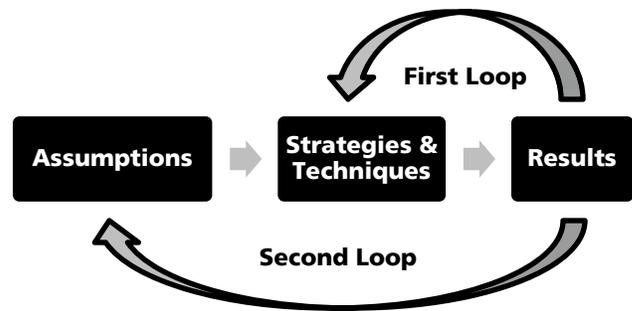


Figure 1 – Double Loop Learning Process

ADAPTIVE MANAGEMENT – DEFINITION, VOCABULARY, AND UTILITY

The operational definition of Adaptive Management is:

Adaptive management [is a decision process that] promotes flexible decision making that can be adjusted in the face of uncertainties as outcomes from management actions and other events become better understood. Careful monitoring of these outcomes both advances scientific understanding and helps adjust policies or operations as part of an iterative learning process. Adaptive management also recognizes the importance of natural variability in contributing to ecological resilience and productivity. It is not a ‘trial and error’ process, but rather emphasizes learning while doing. Adaptive management does not represent an end in itself, but rather a means to more effective decisions and enhanced benefits. Its true measure is in how well it helps meet environmental, social, and economic goals, increases scientific knowledge, and reduces tensions among stakeholders. (Williams et al. 2009)

This definition is important because it sets the expectations for the adaptive management process for all parties who participate. There should be no expectation that management decisions will be perfect, that monitoring processes will be ideal, or that the effects of management decisions will be fully comprehensible. Instead adaptive management is based on the recognition that the best way to reduce risk is to learn, that learning in groups is essential, and that a documented process of sharing information is an effective strategy to facilitate learning while simultaneously reducing conflict. Participating in an adaptive management process is useful for agencies that operate under different regulatory authorities because it offers agencies the opportunity to document the perspective of their agency, stakeholders the opportunity to document their concerns, and management decisions to be made in the context of these deliberations. The requirement for clear communication and documentation of methods and decisions in an adaptive management enterprise is higher than traditional decision-making processes, but this requirement is thought to be essential for diffusing conflicts that might arise in the future.

“The premise of an adaptive management approach is that the behavior of resource systems is uncertain but management is required anyway, and the reduction of uncertainty over time can lead to better management.” (Williams et al. 2009)

Recognizing uncertainty is essential for adaptive management processes to function. In fact, the recognition of different types of uncertainty is the essential aspect of implementing an adaptive management strategy. The challenge is often getting groups with divergent perspectives/authorities to adopt a common perspective and vocabulary for discussing uncertainty. Four types of uncertainty affect hunting management policies in the Preserve: partial control, partial observability, environmental variation, and structural uncertainty (figure 2). Partial control limits the influence of management actions. Environmental variation affects resource system status and dynamics. Partial observability limits the recognition of system

status. Structural uncertainty limits the ability to characterize system change. Regular discussions with key stakeholder groups appear to be the most effective strategy for developing this common perspective and vocabulary.

NPS and FWC scientists and managers who work in the Preserve have long recognized that they have only partial control of the Preserve resource system. While hunting management policies can be clearly designed and communicated, the enforceability of no-hunt policies or harvest limits is subject to budget constraints, chance, and the acceptance of these policies by private individuals who wish to harvest deer. If policies were universally accepted, there would be no need for enforcement. Adaptive management processes are predicated on the idea that private individuals are more likely to accept policies that they understand and that stakeholder discussions are an effective, legal method for systematically enhancing public understanding of management decisions over time. The common theme throughout adaptive management is that focusing on causal drivers is the most effective long-term strategy for improving outcomes of a complex system that is unlikely to be completely understood by all participants. Open communication and facilitated learning are the most direct way to address the challenge of public acceptance of policy changes.

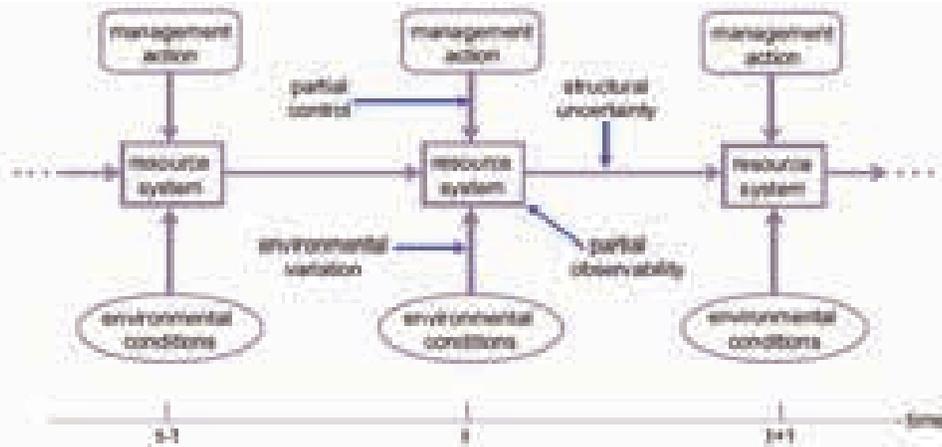


Figure 2 – Uncertainty Sources in Natural Resource Management

Source: Adapted from Williams et al. 2009, figure 5.2.

There is clear documentation of the effect of environmental variation on deer populations. Verme et al. (1969) identified both floods and droughts as affecting deer negatively. MacDonald-Beyers and Labisky (2005) identified tropical storm events in the Preserve as directly killing adult deer (50% of a radio-collared population), and driving flood events that reduced levels of reproduction 10-fold in the following breeding season. McCown et al. (1991) recognized that forage quality reduced deer health, identified the southwestern Preserve as poorer habitat than the northwestern Preserve, and recommended prescribed fire be used to increase the amount, availability, and mineral content of forage. Indicators of reduced habitat quality in the southwestern Preserve included higher parasite loads (indicated by Abomasal Parasite Counts), fewer twin fawns birthed, and a lower mean live weight of 2.5 year old deer than in the northwestern Preserve. The challenge for the adaptive management strategy seems to be helping both agencies and stakeholders recognize the value of environmental variation in supporting the resilience of natural systems, the need for a conservative approach to deer harvest management when the background levels of environmental variation are shifting, and situations when environmental variation is negative for deer but may be necessary for supporting other management goals. Ongoing stakeholder discussions and the second loop of learning (redefining problem statements,

objectives, updating conceptual models) is the appropriate part of the adaptive management process for focusing stakeholder discussions on the variety of factors that can influence deer population health and documenting the different perspectives that stakeholders may have about which factors are more important for determining optimal harvest rates in different areas.

Partial observability will likely be an ongoing challenge to the adaptive management strategy. National Park Service and FWC scientists and managers are quite familiar with this aspect of monitoring deer populations in the Preserve. Continuing to nurture the process of developing better methods for estimating deer population densities (as described by Garrison et al. 2009) seems appropriate, and consistent support for investigations that are focused on issues occurring at different spatial and temporal scales is the recommended path forward for the adaptive management process. Since all forms of monitoring and research are inherently limited, the most efficient strategy is conducting complementary investigations. The highest level of confidence in management actions occurs when different approaches discover similar patterns or provide support for one or more hypothesized causal mechanisms. The discussion presented by McCown et al. (1991) is the most direct example of how scientists use different types of information to form management

recommendations. Often the solutions available for uncertainties caused by partial observability are closely related to the solutions that are implemented for structural uncertainties (i.e. lack of understanding of precisely how the ecological system works to determine deer population levels).

CONCEPTUAL ECOLOGICAL MODEL

The first step in addressing the uncertainties that could affect management decisions is summarizing what is known about a system as a conceptual ecological model. Duever (2005) developed a conceptual ecological model for Big Cypress, and the symbology developed by

Duever has been used to create a conceptual ecological model focused on the deer harvest in the Preserve (figure 3). Ideally, a conceptual ecological model contains all of the possible drivers, stressors, ecological effects and attributes that are considered in a management decision. Attributes are aspects of the deer harvest that are monitored and are likely to change as a consequence of a management decision. Ecological effects are specific non-human events that affect attributes. Stressors are aspects of the system that may alter its properties through their influence on ecological effects, and drivers are large-scale processes that are known to influence system-level properties.

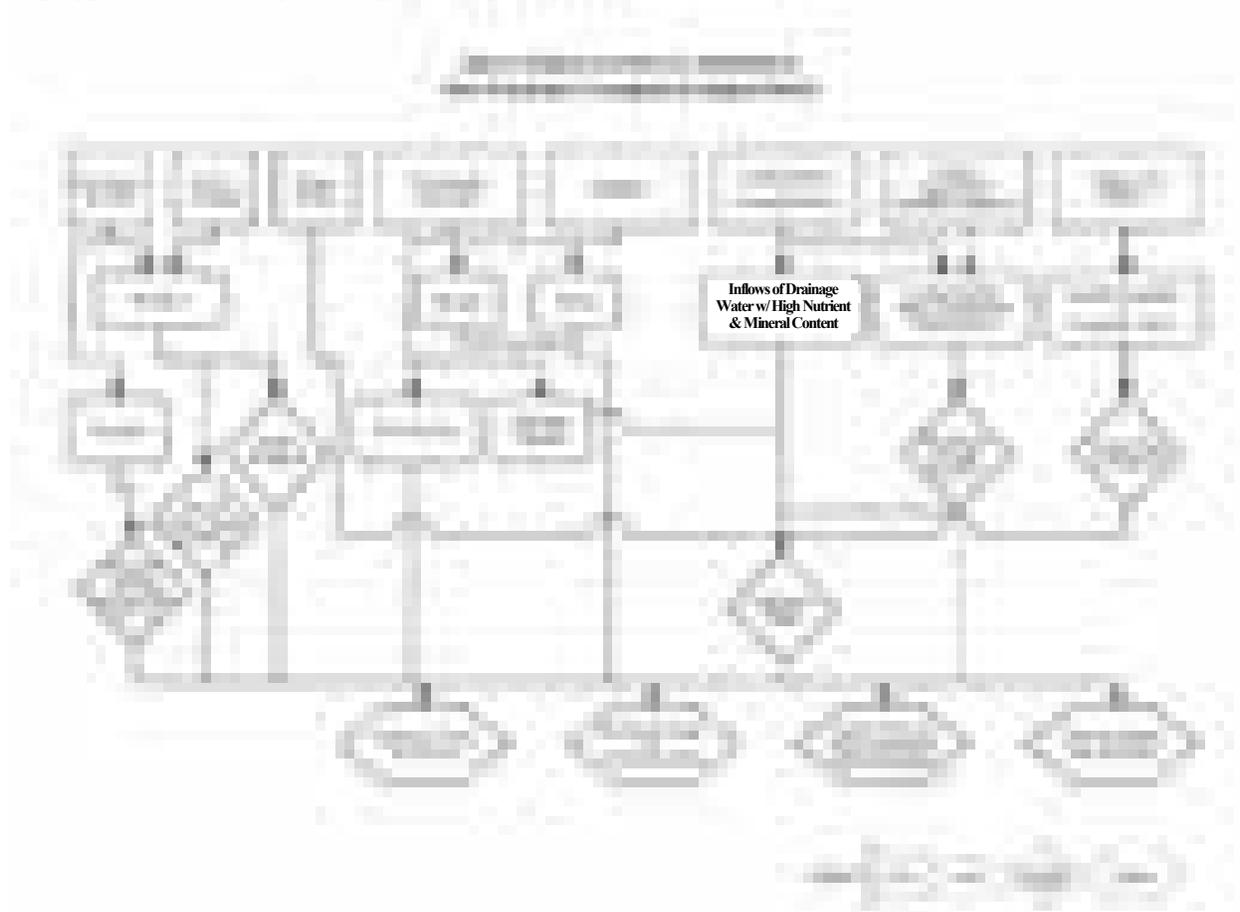


Figure 3 – Big Cypress National Preserve Deer Population Conceptual Ecological Model

CONCLUSION

The bottom line is that choosing to implement an adaptive management process does not mean that all of the challenges associated with complex system management are solved. Instead it means cultivating a group of focused stakeholders, developing a shared vocabulary for identifying and discussing the different types of uncertainty that present challenges to forming management recommendations, and committing to document the resolution of different perspectives over time. Using both the first and second loops of the double loop learning process enable making management decisions in a timely manner and retaining the flexibility to shift decision processes over time as evidence of causal mechanisms becomes clear. Williams et al. (2009) perhaps said it best:

“An adaptive management project is recognized as successful if (1) stakeholders are involved and committed to the process; (2) progress is made toward achieving management objectives; (3) results from monitoring and assessment are used to adjust management decisions; and (4) implementation is consistent with applicable laws.”

Appendix G

Addition Habitat Comparison Analysis

HABITAT COMPARISON ANALYSIS

As discussed in the description of alternative 3 in chapter 2 (“Alternatives”) of the Hunting Management Plan/Environmental Assessment, rules, regulations, and potential quotas for the Addition would be determined by extrapolating the available NPS and FWC data for areas in the Preserve that are most similar in habitat types to areas in the Addition, based on the habitat map presented in chapter 3 (“Existing Conditions”) and shown in figure 1, below.

In order to determine which management units within the original Preserve boundaries are most similar to the habitats present in the Northeast Addition, a GIS habitat comparison analysis was conducted using the existing habitat map shown in figure 1 and the management units shown in figure 2. The GIS analysis included an examination of the land cover types [as defined by the Florida Land Cover Classification System (FWC 1999)] present in the Bear Island Unit, Corn Dance Unit, Northeast Addition (North of I-75), and Northeast Addition (South of I-75).

The results of the GIS habitat comparison analysis indicate that the land cover types present in the Northeast Addition (North of I-75) are most similar to the Bear Island Unit and the land cover types present in the Northeast Addition (South of I-75) are most similar to the Corn Dance Unit. Using the results of the GIS habitat comparison analysis, both the Bear Island Unit and Corn Dance Unit were used to extrapolate proposed maximum quota limits for deer quota permits; since the maximum quota limits extrapolated from the Bear Island Unit were more conservative than those extrapolated from the Corn Dance Unit, the maximum quota limits extrapolated from the Bear Island Unit were used in the impacts analysis in the Hunting Management Plan/Environmental Assessment.

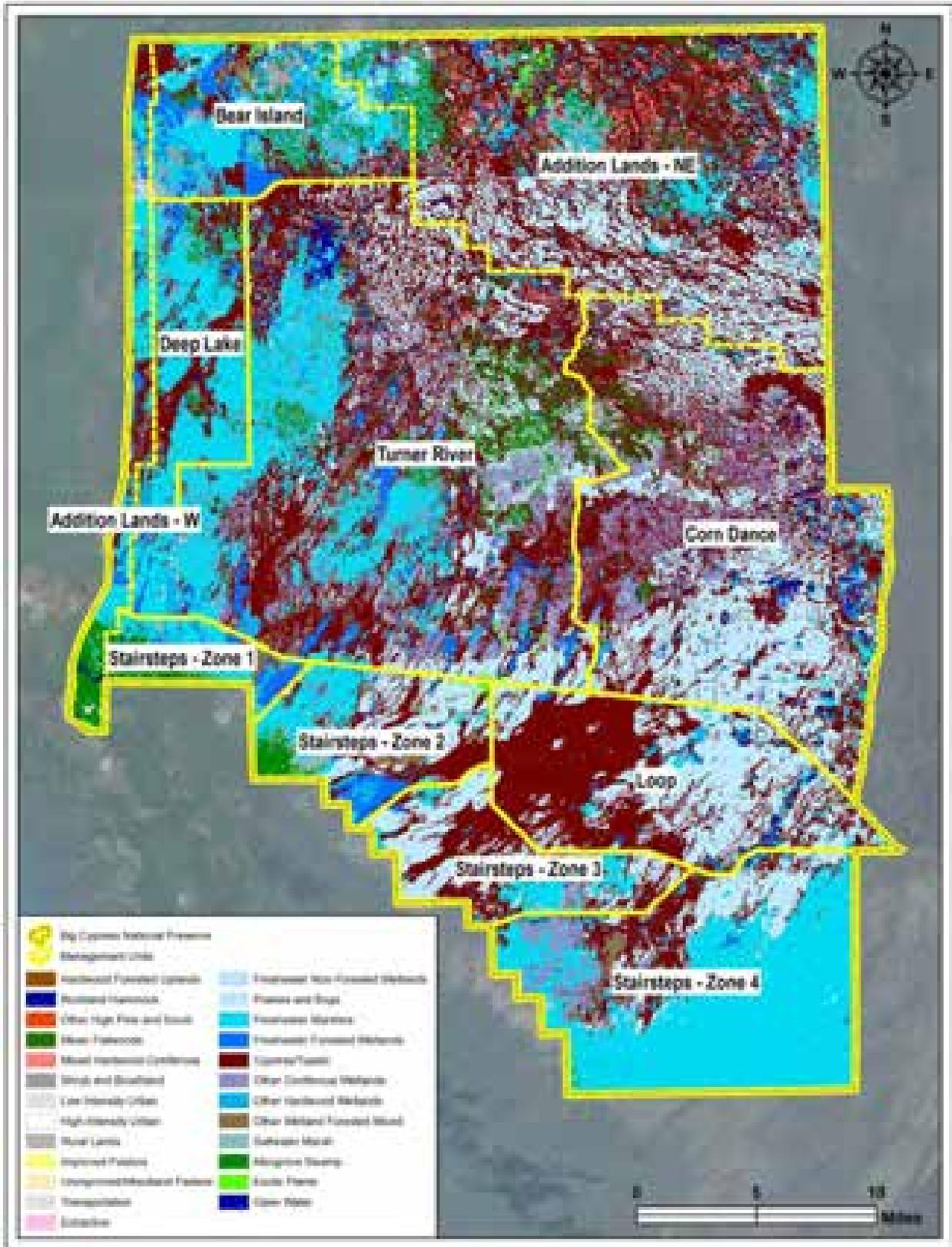


Figure 1 – Big Cypress National Preserve Habitat Map



Figure 2 – Management Units Used for the Habitat Comparison Analysis

Table 1 – Habitat Comparison Analysis

Land Cover Code	Land Cover Description	Bear Island (38,801 Acres)		Corn Dance (120,281 Acres)		Northern NE Addition (70,951 Acres)		Southern NE Addition (56,927 Acres)	
		Size (Acres)	% of Total Unit (Acres)	Size (Acres)	% of Total Unit (Acres)	Size (Acres)	% of Total Unit (Acres)	Size (Acres)	% of Total Unit (Acres)
1110	Upland Hardwood Forest	150.5	0.4	105.9	0.1	199.7	0.3	12.6	0.0
1123	Live Oak	N/A	N/A	N/A	N/A	N/A	N/A	0.6	0.0
1125	Cabbage Palm	70.8	0.2	N/A	N/A	44.4	0.1	11.3	0.0
1130	Rockland Hammock	74.1	0.2	2546.7	2.1	338.8	0.5	75.0	0.1
1230	Upland Coniferous	N/A	N/A	3.4	0.0	N/A	N/A	N/A	N/A
1311	Mesic Flatwoods	3736.0	9.6	3115.3	2.6	6624.6	9.3	234.2	0.4
1400	Mixed Hardwood-Coniferous	451.3	1.2	230.3	0.2	4310.3	6.1	36.2	0.1
1410	Successional Hardwood Forest	N/A	N/A	N/A	N/A	56.9	0.1	N/A	N/A
1500	Shrub and Brushland	947.2	2.4	17.2	0.0	186.3	0.3	3.6	0.0
18212	Low Structure Density	N/A	N/A	N/A	N/A	1.4	0.0	N/A	N/A
1822	High Intensity Urban	24.5	0.1	303.1	0.3	182.4	0.3	38.9	0.1
18222	Residential, High Density > 5 Dwelling Units/AC	N/A	N/A	N/A	N/A	10.3	0.0	N/A	N/A
18223	Commercial & Services	N/A	N/A	2.9	0.0	N/A	N/A	N/A	N/A
1831	Rural Open	250.2	0.6	N/A	N/A	111.2	0.2	4.3	0.0
183111	Oak - Cabbage Palm Forests	43.8	0.1	N/A	N/A	58.2	0.1	5.9	0.0
183213	Improved Pasture	9.1	0.0	N/A	N/A	102.5	0.1	N/A	N/A
183214	Unimproved/Woodland Pasture	N/A	N/A	N/A	N/A	123.7	0.2	N/A	N/A
1840	Transportation	N/A	N/A	121.3	0.1	2.3	0.0	N/A	N/A
1841	Roads	402.4	1.0	220.1	0.2	520.4	0.7	290.8	0.5
1877	Spoil Area	N/A	N/A	113.9	0.1	N/A	N/A	N/A	N/A
2111	Wet Prairie	76.6	0.2	741.3	0.6	271.1	0.4	310.4	0.5
21121	Shrub Bog	2066.8	5.3	N/A	N/A	3170.4	4.5	1539.5	2.7
2113	Marl Prairie	373.4	1.0	N/A	N/A	2416.7	3.4	24239.6	42.6
2120	Freshwater Marshes	4027.0	10.4	942.0	0.8	3363.9	4.7	552.8	1.0
2125	Glades Marsh	6763.5	17.4	2114.3	1.8	3851.5	5.4	2732.3	4.8
2131	Sawgrass	3198.6	8.2	18.4	0.0	1595.0	2.2	468.1	0.8
2140	Floating/Emergent Aquatic Vegetation	1.7	0.0	N/A	N/A	N/A	N/A	N/A	N/A
2200	Freshwater Forested Wetlands	5370.8	13.9	1620.6	1.3	2354.6	3.3	428.7	0.8
2210	Cypress/Tupelo (incl Cy/Tu mixed)	2658.7	6.9	493.3	0.4	11292.2	15.9	1176.4	2.1
2211	Cypress	175.7	0.5	953.1	0.8	562.9	0.8	159.4	0.3
2213	Isolated Freshwater Swamp	98.2	0.3	975.3	0.8	692.7	1.0	93.7	0.2
22131	Dome Swamp	317.1	0.8	25863.4	21.5	13230.4	18.6	16793.4	29.5
2214	Strand Swamp	2987.4	7.7	17578.8	14.6	6302.9	8.9	5538.2	9.7
2221	Wet Flatwoods	48.5	0.1	6300.9	5.2	338.0	0.5	213.6	0.4
22211	Hydric Pine Flatwoods	1444.2	3.7	6820.4	5.7	998.5	1.4	167.7	0.3
22212	Hydric Pine Savanna	24.5	0.1	N/A	N/A	2.8	0.0	353.8	0.6
22312	South Florida Bayhead	N/A	N/A	1635.2	1.4	440.5	0.6	N/A	N/A
2232	Hydric Hammock	1285.5	3.3	546.3	0.5	3639.6	5.1	826.7	1.5
2233	Mixed Wetland Hardwoods	610.4	1.6	79.4	0.1	38.2	0.1	N/A	N/A
2240	Other Wetland Forested Mixed	30.7	0.1	1.8	0.0	102.8	0.1	N/A	N/A

Land Cover Code	Land Cover Description	Bear Island (38,801 Acres)		Corn Dance (120,281 Acres)		Northern NE Addition (70,951 Acres)		Southern NE Addition (56,927 Acres)	
		Size (Acres)	% of Total Unit (Acres)	Size (Acres)	% of Total Unit (Acres)	Size (Acres)	% of Total Unit (Acres)	Size (Acres)	% of Total Unit (Acres)
2242	Cypress/Pine/Cabbage Palm	575.4	1.5	1107.2	0.9	2232.6	3.1	407.3	0.7
3220	Artificial Impoundment/Reservoir	N/A	N/A	62.1	0.1	N/A	N/A	N/A	N/A
4200	Canal/Ditch	55.8	0.1	60.1	0.0	332.3	0.5	193.4	0.3
4210	Canal	30.8	0.1	0.0	0.0	6.7	0.0	15.5	0.0
5240	Saltwater Marsh	N/A	N/A	N/A	N/A	N/A	N/A	1.4	0.0
7000	Exotic Plants	423.5	1.1	127.6	0.1	763.5	1.1	N/A	N/A
7200	Melaleuca	N/A	N/A	N/A	N/A	59.3	0.1	N/A	N/A
7300	Brazilian Pepper	N/A	N/A	N/A	N/A	16.7	0.0	N/A	N/A
7400	Exotic Wetland Hardwoods	N/A	N/A	N/A	N/A	0.6	0.0	N/A	N/A

Appendix H

*Big Cypress National Preserve
Small Game and Wild Turkey
Harvest and Pressure Summary (2011-12)*

BIG CYPRESS NATIONAL PRESERVE

Small Game and Wild Turkey Harvest and Pressure Summary

2011-12

Prepared by: Tad M. Bartareau

Summer 2012

EXECUTIVE SUMMMARY

2011-12

Big Cypress Wildlife Management Area (BCWMA) encompasses 582,030 acres of public hunting land cooperatively managed by Florida Fish and Wildlife Conservation Commission (FWC) and the National Park Service (NPS) and is located within Big Cypress National Preserve (BCNP). BCWMA is located on the Big Cypress Swamp extending east to Miami-Dade County, south to Monroe County, and north and west into Collier County. Additionally, BCWMA includes the 24,320 acre Dade-Collier Transition and Training Airport Area owned by Miami-Dade County, also known as the Jetport.

Public hunting and off-road vehicle (ORV) operation are the principal sources of recreation on BCWMA. Small game hunting is allowed on BCWMA during Archery, Muzzleloading Gun, General Gun, and Small Game seasons. Wild turkey hunting is allowed on BCWMA during Spring Turkey season. Data incorporated in this report summarize trends in small game and wild turkey harvest, hunter pressure, and characteristics of harvested game during the 2011-12 hunting seasons.

From 1985-86 to 2011-12 hunting seasons, the total Small Game harvest was variable ranging from a high of 921 in 1987-88 to low of 67 in 1998-99. The total harvest averaged 333 per year over the past 27 hunting seasons. From 2007-08 to 2011-12 hunting seasons, the total Small Game harvest was variable ranging from a high of 263 in 2009-10 to low of 104 in 2008-09. The total harvest averaged 198 per year over the past 5 hunting seasons. In 2011-12, total harvest (241) was greater than past 5 year average but substantially less than the long-term average.

Snipe, duck, and squirrel were the most harvested small game, with at least 13 animals harvested in each of the past 5 hunting seasons. Quail, raccoon, coot, and rabbit were the least harvested small game, with an average of only 1 or 2 animals harvested per year during the past 5 hunting seasons.

From 2007-08 to 2011-12, the total turkey harvest checked and estimated from BCWMA was variable ranging from a high of 55 in 2008-09 to low of 26 in 2010-11. In 2011-12, the total turkey harvest checked and estimated (36) was slightly higher than the 5 year average (35). The biological data for turkey adults in relation to juveniles remained fairly constant from 1985-86 to 2010-11.

FWC and NPS will continue to monitor hunter pressure and harvest data to ensure optimal small game and spring turkey hunting conditions for hunters and overall favorable wildlife health.

Small game season harvest and hunting pressure in the Big Cypress Wildlife Management Area, 2007-08 to 2011-12.

Season	Duck	Coot	Coyote	Snipe	Quail	Rabbit	Squirrel	Raccoon	Opossum	Armadillo	Man-Days of Hunting Pressure
2007-08	3	0	0	41	3	0	47	1	0	0	232
2008-09	6	0	0	16	3	3	13	0	0	0	231
2009-10	2	0	0	27	0	4	51	3	0	0	225
2010-11	10	0	0	38	0	0	31	0	0	0	109
2011-12	11	0	0	61	0	0	15	0	0	0	192
Average	6	0	0	37	1	1	31	1	0	0	198

Spring Turkey season harvest and hunting pressure in the Big Cypress Wildlife Management Area, 2007-08 to 2011-12.

Season	Number of Adults Harvested ¹	Number of Juveniles Harvested ¹	Checked Harvest	Self-checked Harvest	Man-Days of Hunting Pressure	Hunter Success
2007-08	14	0	14	17	1,624	52.4
2008-09	13	0	14	41	1,827	33.2
2009-10	10	2	12	16	1,681	60.0
2010-11	4	1	5	21	2,004	77.1
2011-12	3	3	6	30	1,771	49.2
Average	9	1	10	25	1,781	54.4

¹Checked harvest

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INTRODUCTION

Description of Big Cypress Wildlife Management Area

Public hunting of white-tailed deer (*Odocoileus virginianus*) and off-road vehicle (ORV) operation are the principal sources of recreation on Big Cypress Wildlife Management Area (BCWMA). Located within the 729,000 acre Big Cypress National Preserve (BCNP), the BCWMA encompasses 582,030 acres of public hunting land cooperatively managed by Florida Fish and Wildlife Conservation Commission (FWC) and the National Park Service (NPS). BCWMA is located on the BCNP extending east to Miami-Dade County, south to Monroe County, and northwest into Collier County. Additionally, BCWMA includes the 24,320 acre Dade-Collier Transition and Training Airport Area owned by Miami-Dade County, also known as the Jetport (Appendix A).

The vegetative cover of BCNP (Fig. 1) is mainly composed of cypress swamp, wet prairies and marshes, pinelands, and hardwood hammock (Duever et al. 1986). Over 50% of BCNP is cypress swamps, and most of this consists of open stands of small cypress growing amongst seasonally flooded grasslands known as cypress prairie. In addition to these cypress-dominated wetlands, another 25% of the BCNP is comprised of various forms of treeless wet prairies and marshes. About 15% of the Preserve supports pine forests, most of which are considered hydric pine flatwoods. Less than 4% of BCNP is elevated enough to support upland hardwood forests and hammocks, and about 1% extend into the mangrove zone along Florida's southwest coast (University of Georgia 1999). Interspersed tree hammocks allow refuge for deer and hog during wet season high water events, primarily May through October (Comiskey et al., 1994; Labisky et al. 1995).

The BCWMA is divided into six different management units: Bear Island, Deep Lake, Turner River, Corn Dance, Loop, and Stairsteps. Small game hunting is allowed on BCWMA during Archery, Muzzleloading Gun, and General Gun and Small Game seasons. Wild turkey hunting is

allowed on BCWMA during Spring Turkey season. Hunting pressure, legal game harvest, and success have been documented on BCWMA for the past 27 hunting seasons (1985-86 to 2011-12). Data incorporated in this report summarize trends in small game and wild turkey harvest, hunter pressure, hunter success, and characteristics of harvested game during the 2011-12 hunting season.

Hunting

Flora and fauna in BCNP are protected from collection and injury. Hunting of game animals and fishing are permitted under Federal and State regulations issued by the NPS and FWC. Special Florida wildlife management area regulations apply in the BCWMA (Appendix A).

BCWMA public hunts consist of five distinct seasons - Archery, Muzzleloading Gun, General Gun, Small Game, and Spring Turkey - spanning varying lengths of time and each constrained to slightly different hunting regulations.

Season Lengths

During 2011-12, Archery, Muzzleloading Gun, General Gun, Small Game, and Spring Turkey seasons were 30, 16, 51, 31, and 37 days in length, respectively (Appendix A).

Regulation Changes

A number of regulation changes were made during the 2011-12 hunting season and the Regulations Summary and Area Map for Bear Island unit was amended to correct error in previous seasons map (Appendix A). First, "hunting during the spring turkey season with firearms other than shotguns or using a shot size larger than #2 is prohibited". Second, by Executive Order EO 11-15 for the 2011-12 hunting season, "taking of white-tailed deer as referenced in sections 68A-

15.064(5); F.A.C. is prohibited within Zone 4 of Stairsteps Unit”, “the bag limit for deer shall be 1 annually within Zone 3 of the Stairsteps Unit”, “(I)in Zone 3 of the Stairsteps Unit, the taking of deer not having at least one forked antler and having one or more antlers at least 5 inches in length visible above the hairline is prohibited”, and (T)the forked antler shall have at least two points one inch or greater in length” (Appendix B). This Executive Order was effective prior to the archery season and will remain in place for one year.

Effective July 22, 2011, the National Park Service announced that ORV use within all units of BCNP will be along designated trail routes only. This move occurred after the NPS selected and marked ORV trails within the Corn Dance Unit, the last unit within the original BCNP where dispersed ORV use was authorized until May of 2011.

Loop Road was closed for repair during the 2011-12 hunting season to all but local vehicle traffic south of the Gator Hook Strand site and west of the Loop Road Education Center.

Check-in / -out Procedures

Six hunter check stations are present at major access points in BCWMA: two locations on I-75 mile marker 70 (north and south), Bear Island check station, Dona Drive check station, Monroe Station check station, and Forty-Mile Bend check station (Appendix A). The FWC attempts to staff these during peak activity periods. Hunters are required to check in and out through BCWMA approved check stations using hunter check-in forms.

During the 2011-12 Small Game season, no check stations were manned but hunters could check in or out using forms and self deposit boxes. Hunter check-in/out forms were used to estimate the number of man-days of pressure on BCWMA for Small Game and Spring Turkey seasons. Hunter pressure was determined by counting the number of days a hunter was in at least

one of the six BCWMA units (including the days that (s)he arrived and departed - unless it was the day before the season began) (Appendix C).

During the 2011-12 Spring Turkey season only Bear Island check station was staffed full time 8 hours a day for 7 days a week for the duration of the season. Bear Island has two legal access points; Alligator Alley North, and at the Bear Island Check Station. Consequently, more effort is placed on check station operations in this unit. Additionally, this unit supports higher densities of most game animals, and therefore generates a significant portion of the small game and spring turkey hunting activity. Bear Island check station has been consistently staffed during Spring Turkey season, from 1985-86 to 2011-12. This check station has been staffed during peak use periods such as Saturdays and Sundays, however it has not always been staffed for the entire season.

Data on hunter pressure and harvest numbers have been collected since the 1985-86 season. Over time, different methods were used to estimate hunter pressure including check-in forms, personal interviews/questionnaires, and vehicle surveys (see Jansen 1986). Consequently, there is no reliable method of comparing annual variation in small game and spring turkey harvest figures or extrapolating estimated harvest figures. Harvest numbers reported in this summary differentiate between estimated harvest (harvest *not* verified by check station operators) and checked harvest (harvest verified by check station operators) (Appendix D). With the data obtained through check station operators, we were able to record physical characteristics of harvested turkey that represent a subset of the BCWMA population (Appendix E).

HARVEST

Data incorporated in this report summarize trends in Small Game and Spring Turkey harvest, and characteristics of harvested game during the 2011-12 hunting seasons.

Small Game

The total Small Game harvest for the 1985-86 to 2010-11 hunting seasons from BCWMA are shown in Table 1 and Fig. 2. Small Game harvest data by season for the past 5 hunting seasons (2007-08 to 2011-12) from BCWMA are shown in Table 2. Small Game harvest for the past 5 hunting seasons (2007-08 to 2011-12) from BCWMA are shown in Table 3. These numbers represent checked and self-checked harvest.

From 1985-86 to 2011-12 hunting seasons, the total Small Game harvest was variable ranging from a high of 921 in 1987-88 to low of 67 in 1998-99 (Table 1). The total Small Game harvest averaged 333 per year over the past 27 hunting seasons. From 2007-08 to 2011-12 hunting seasons, the total Small Game harvest was variable ranging from a high of 263 in 2009-10 to low of 104 in 2008-09 (Table 2). The total Small Game harvest averaged 198 per year over the past 5 hunting seasons (Table 2). In 2011-12, total harvest (241) was greater than past 5 year average but substantially less than the long-term average.

Snipe, duck, and squirrel were the most harvested small game, with at least 13 animals harvested in each of the past 5 hunting seasons (Table 3). Quail, raccoon, coot, and rabbit were the least harvested small game, with an average of only 1 or 2 animals harvested per year during the past 5 hunting seasons (Table 3).

Snipe were the largest number of harvested small game, ranging from a high of 356 in 1988-89 to a low of 1 in 1998-99 (Table 1, Fig. 2). The snipe harvest averaged 107 per year over the 27

year period (Table 1). In 2011-12, snipe harvest (121) was higher than both the long-term (106) and past 5 year average (86) (Table 1 and 2, respectively). The majority of this harvest was collected from Stairsteps and Turner River Units, but snipe were also harvested from Loop, Deep Lake, and Corn Dance Units.

Ducks were the second largest number of harvested small game, ranging from a high of 111 in 2003-04 to low of 0 in 1986-87 and 1994-95 (Table 1, Fig. 2). The duck harvest averaged 47 per year over the 27 year period (Table 1). In 2011-12, duck harvest (89) was greater than both the long-term (47) and past 5 year average (72) (Table 1 and 2, respectively). The majority of this harvest was collected from Stairsteps Unit.

Squirrel were the third largest number of harvested small game, ranging from a high of 336 in 1990-91 to low of 2 in 1999-00 (Table 1, Fig. 2). The squirrel harvest averaged 68 per year over the 27 year period (Table 1). In 2011-12, squirrel harvest (15) was less than both the long-term (68) and past 5 year average (32) (Table 1 and 2, respectively). The majority of this harvest was collected from Bear Island, but squirrel were also harvested from Turner River and Loop Units.

Quail were the fourth most harvested small game, ranging from a high of 568 in 1987-88 to low of 1 in 1997-98 (Table 1, Fig. 2). No quail were harvested in 6 seasons during the period from 2000-01 to 2009-10. The quail harvest averaged 102 per year over the 27 year period (Table 1). In 2011-12, quail harvest (4) was substantially less than the long-term average (102) but greater than during the past 5 years (2) (Table 1 and 2, respectively). The majority of this harvest was collected from Deep Lake, but quail were also harvested from Corn Dance Unit.

The number of coot harvest ranged from a high of 16 in 1995-95 to low of 1 in 1989-90 and 2006-07 (Table 1, Fig. 2). No coot were harvested in 19 of the past 27 seasons. The coot harvest averaged 2 per year over the 27 year period (Table 1). In 2011-12, coot harvest (12) was

substantially greater than both the long-term (2) and past 5 year average (2) (Table 1 and 2, respectively). The majority of this harvest was collected from Stairsteps, but coot were also harvested from Turner River, Deep Lake, and Corn Dance Units.

Armadillo, coyote, dove, opossum, rabbit, raccoon, and coyote were harvested sporadically during the past 27 hunting seasons (Table 1, Fig. 2). One crow was harvested during 2011-12 Archery season. No armadillo, dove, coyote, opossum, raccoon, or rabbit were harvested in 2011-12 (Table 2).

Spring Turkey

Spring Turkey harvest numbers reported in this summary differentiate between estimated harvest (harvest derived from hunter check-out forms at unmanned check stations and *not* verified by check station operators) and checked harvest (harvest verified by check station operators). Spring Turkey harvest data for the period 2007-08 to 2011-12 from BCWMA are shown in Table 4. These numbers represent checked and self-checked harvest. Harvest data for Spring Turkey season for the period 1985-86 to 2010-11 on the Bear Island Unit are shown in Table 5. These harvest figures represent a total checked harvest on the Bear Island Unit of BCWMA.

From 1985-86 to 2011-12, the total turkey harvest checked at Bear Island was variable ranging from a high of 36 in 1995-96 to low of 4 in 2002-03. In 2011-12, the total number of checked turkey harvest at Bear Island (6) was substantially less than the long-term average (17).

From 2007-08 to 2011-12, the total turkey harvest checked and estimated from BCWMA was variable ranging from a high of 55 in 2008-09 to low of 26 in 2010-11 (Table 4). In 2011-12, the total turkey harvest checked and estimated (36) was slightly higher than the 5 year average (35).

The majority of this harvest was collected from Turner River, but turkeys were also harvested from Bear Island, Corn Dance, and Stairsteps Units.

Physical measurements could only be examined for checked harvest in this summary and not estimated harvest. Check station operators recorded physical characteristics of harvested spring turkey that represent a subset of the BCWMA population. Turkey biological data has been collected on the Bear Island Unit since 1985-86 (Table 6). Analyzed morphometric data are based on checked turkeys and are dependent on hunters providing harvest for measurements.

The harvest of turkey adults in relation to juveniles remained fairly constant from 1985-86 to 2010-12 (Table 6). Harvest of adult turkeys checked at Bear Island exceeded that of juveniles in 21 (78%) of the past 27 years. Average harvest rate was 2.4 adults per juvenile.

The biological data of adults in relation to juveniles remained fairly constant from 1985-86 to 2010-11 (Table 6). In 2011-12, average live weight for adults (14.0 lb) was slightly less than the long-term average (14.4 lb) while average spur length was the same (2.2 cm). The average beard length for adults in 2011-12 (25.0 cm) was greater than the long-term average (21.4 cm).

PRESSURE

Data incorporated in this report summarize trends in wild turkey hunter pressure, and hunter success during the 2000-01 to 2011-12 hunting seasons. These numbers represent actual man-days of hunter pressure estimated from mandatory hunter check-in/out forms. Man-days of hunting pressure are estimates for the entire BCWMA.

Hunter success was calculated by dividing number hunter man-days of pressure by number of game harvested. A higher number for hunter success means that it took more man-days for hunters to harvest game. All past data were recalculated in this way for comparison purposes.

From 1985-86 to 2011-12, the total man-days of hunter pressure for BCWMA ranged from a high of 22,020 in 1989-90 to low of 8,785 in 1994-95 (Table 1). The total man-days of hunter pressure for BCWMA during small game season in 2011-12 (192) were slightly less than the 5-year average (198) (Table 3).

From 2007-08 to 2011-12, the total man-days of hunter pressure during Spring Turkey for BCWMA ranged from a high of 2,004 in 2010-11 to low of 1,624 in 2007-08 (Table 4). The total man-days of hunter pressure for BCWMA during turkey season in 2011-12 (1,771) were slightly less than the 5-year average (1,781).

From 1985-86 to 2011-12, the total man-days of hunter pressure during Spring Turkey for Bear Island was variable ranging from a high of 1,403 in 1996-97 to low of 199 in 2004-05 (Fig. 3). The total man-days of hunter pressure during turkey for Bear Island in 2010-11 (397) were substantially less than the long-term average (639) (Table 5).

From 2007-08 to 2011-12, the total hunter success during Spring Turkey for BCWMA ranged from a high of 77.1 in 2010-11 to low of 33.2 in 2008-09. The total hunter success during turkey season in 2011-12 (49.2) was slightly lower than the 5-year average (54.4) (Table 4).

From 1985-86 to 2011-12, the total hunter success during Spring Turkey for Bear Island was variable and ranged from a high of 143 in 2002-03 to low of 18.1 in 2004-05 (Table 5). In 2011-12 hunting season, the hunter-success (66.2) was substantially higher than the long-term average (45.3).

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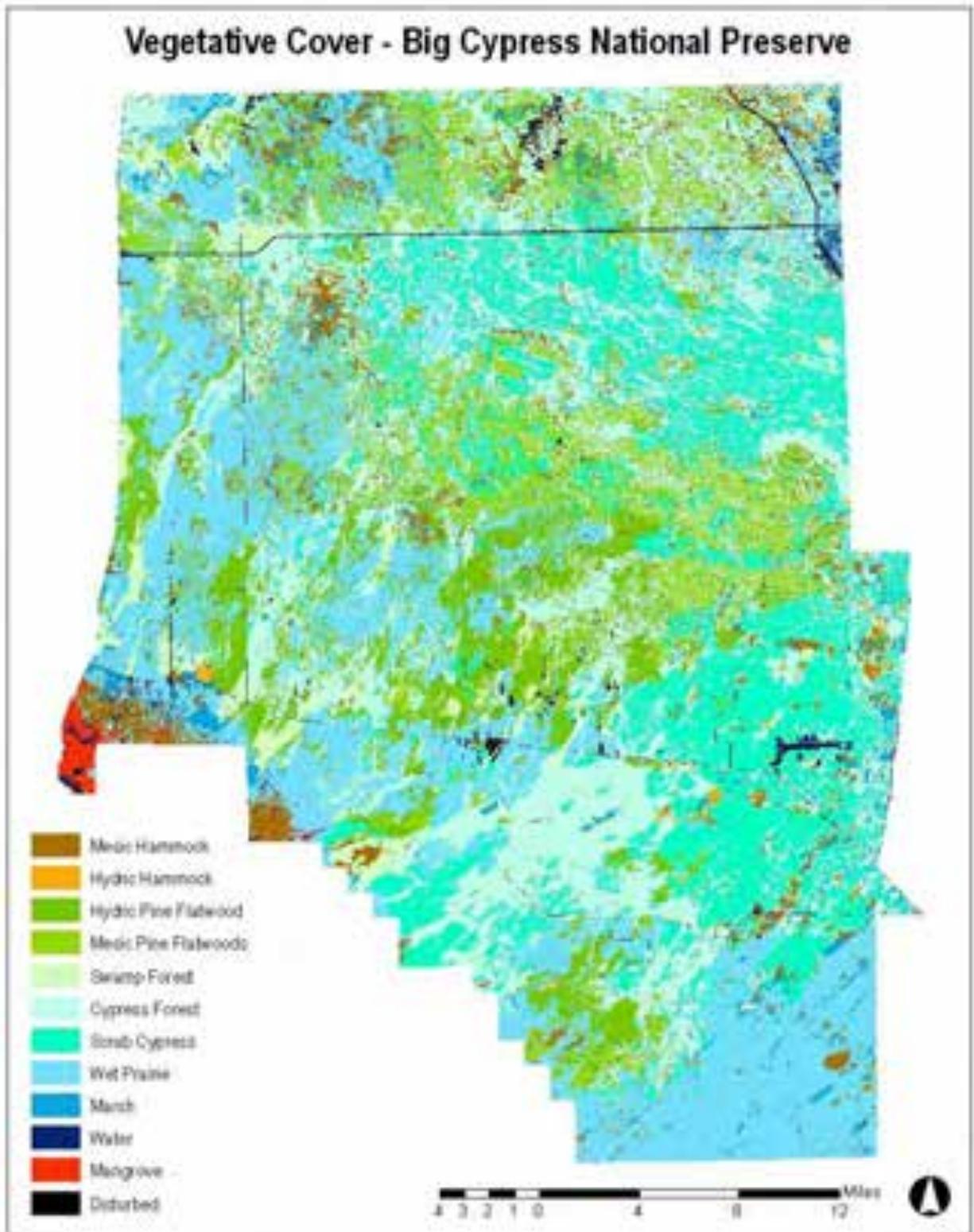


Figure 1. Vegetative cover for Big Cypress National Preserve.

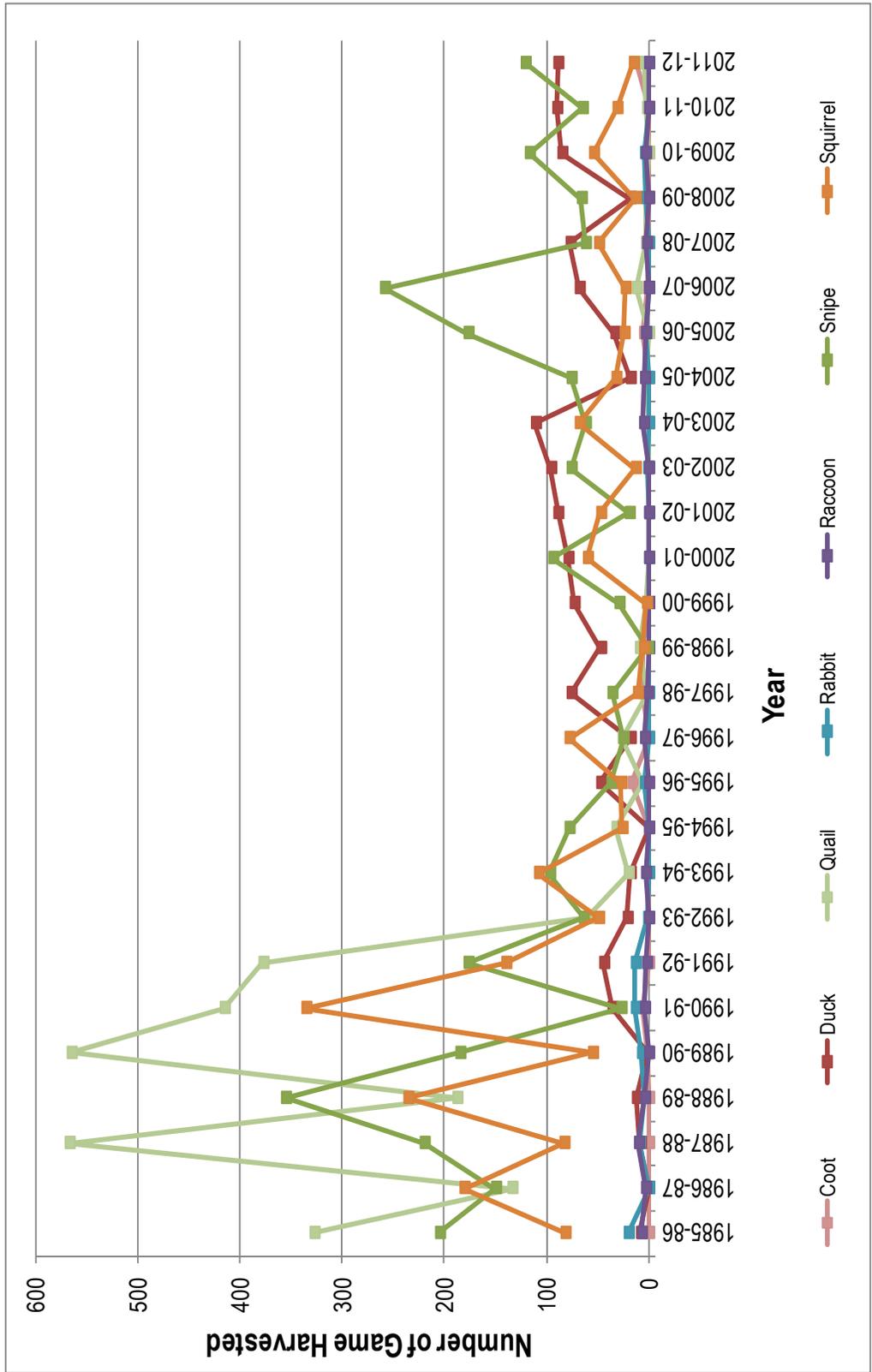


Figure 2. Small Game harvest in Big Cypress Wildlife Management Area during 1985-86 to 2011-12.

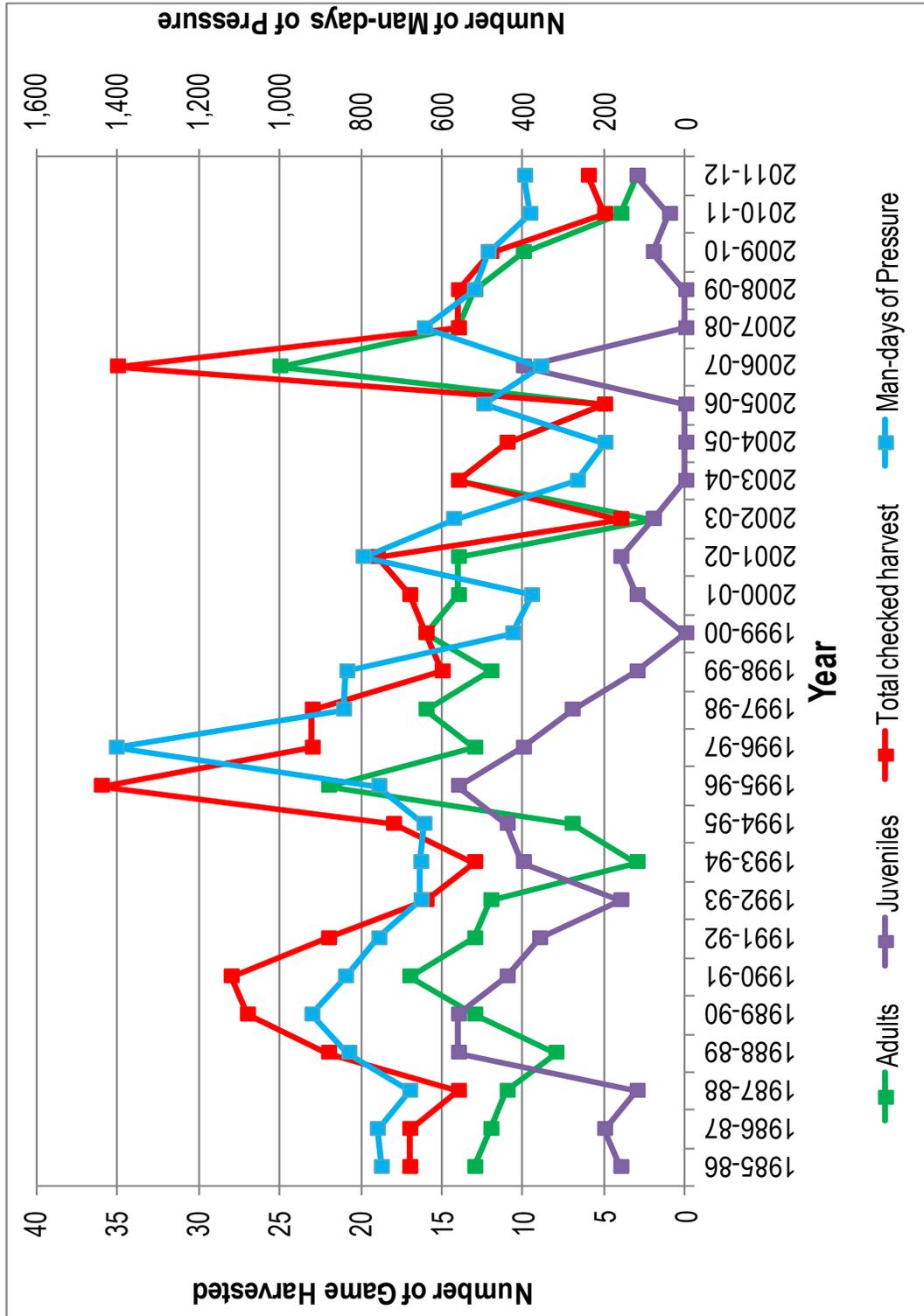


Figure 3. Man-days of pressure and checked Spring Turkey harvest on the Bear Island Unit of the Big Cypress Wildlife Management Area during 1985-86 to 2011-12.

Table 1. Small game harvest and hunting pressure by season for the Big Cypress Wildlife Management Area, 1985-86 to 2011-12^{*}.

Season	Duck	Coot	Dove	Snipe	Quail	Rabbit	Squirrel	Raccoon	Opossum	Armadillo	Coyote	Man-Days of Hunting Pressure
1985-86	8	0	0	205	328	20	82	7	0	0	0	17,355
1986-87	0	0	0	150	134	0	181	3	0	0	0	18,255
1987-88	8	0	18	220	568	9	83	10	4	1	0	17,864
1988-89	12	0	0	356	188	4	236	4	0	0	0	22,020
1989-90	1	1	0	185	566	7	55	0	0	3	0	22,015
1990-91	36	6	2	27	416	13	336	4	0	0	0	14,737
1991-92	44	0	1	177	378	13	140	2	0	4	0	17,657
1992-93	21	0	0	64	60	1	49	0	0	1	0	16,857
1993-94	18	0	0	97	20	0	108	3	0	6	0	16,145
1994-95 ¹	0	0	0	78	32	0	26	0	0	0	0	8,785
1995-96	47	16	0	37	5	4	27	0	0	4	0	11,495
1996-97	18	0	0	25	26	0	78	4	0	0	0	15,471
1997-98	76	5	0	36	1	0	11	1	0	0	0	14,405
1998-99 ²	47	5	0	1	9	0	5	0	0	0	0	17,767
1999-00 ³	73	0	0	29	2	0	2	0	0	0	0	11,554
2000-01	79	0	0	94	0	0	60	0	0	0	0	14,886
2001-02	89	0	0	19	0	0	47	0	0	0	0	15,747
2002-03	96	0	0	76	0	1	13	0	0	1	0	16,282
2003-04	111	0	0	62	0	0	68	5	0	0	0	14,160
2004-05 ⁴	18	0	0	76	3	0	32	4	0	0	0	12,419
2005-06 ⁵	33	5	0	177	0	3	24	3	0	0	0	11,390
2006-07	68	1	0	259	12	0	23	0	0	0	0	12,858
2007-08	77	0	0	62	3	0	49	2	0	0	0	14,859
2008-09	18	0	0	66	3	3	13	0	0	0	1	16,357
2009-10	85	0	0	117	0	4	54	3	0	0	0	15,830
2010-11	90	0	0	65	2	0	31	0	0	0	0	13,749
2011-12	89	12	0	121	4	0	15	0	0	0	0	12,343
Average	47	2	1	107	102	3	68	2	0	1	0	15,306

^{*}Totals represent checked and self-checked harvest.

¹General Gun season was 9 days long in Turner River and Corn Dance Units and closed in Stairsteps and Loop Units.

²Archery season closed for 2 days due to hurricane.

³Closures affected all units during Muzzleloading Gun season, as well as Corn Dance, Stairsteps, and Loop Units during General Gun seasons.

⁴Closure due to hurricane Francis and Ivan affected all units during Archery season.

⁵Closure in Corn Dance and Loop Units, parts of Bear Island, and Zones 3 and 4 of Stairsteps due to high water and hurricane Wilma affected Muzzleloading Gun season.

Table 2. Small game harvest and hunting pressure by season for the Big Cypress Wildlife Management Area, 2007-08 to 2011-12.

Muzzleloader											Man-Days of Hunting Pressure
Season	Duck	Coot	Coyote	Snipe	Quail	Rabbit	Squirrel	Raccoon	Opossum	Armadillo	
2007-08	0	0	0	0	0	0	0	1	0	0	3,197
2008-09	0	0	0	0	0	0	0	0	0	0	2,922
2009-10	0	0	0	0	0	0	0	0	0	0	3,099
2010-11	0	0	0	0	0	0	0	0	0	0	2,639
2011-12	0	0	0	0	0	0	0	0	0	0	2,640
General Gun											Man-Days of Hunting Pressure
Season	Duck	Coot	Coyote	Snipe	Quail	Rabbit	Squirrel	Raccoon	Opossum	Armadillo	
2007-08	74	0	0	21	0	0	2	0	0	0	8,727
2008-09	12	0	1	50	0	0	0	0	0	0	10,658
2009-10	83	0	0	90	0	0	3	0	0	0	9,388
2010-11	80	0	0	27	2	0	0	0	0	0	8,271
2011-12	73	12	0	60	3	0	0	0	0	0	7,155
Small Game											Man-Days of Hunting Pressure
Season	Duck	Coot	Coyote	Snipe	Quail	Rabbit	Squirrel	Raccoon	Opossum	Armadillo	
2007-08	3	0	0	41	3	0	47	1	0	0	232
2008-09	6	0	0	16	3	3	13	0	0	0	231
2009-10	2	0	0	27	0	4	51	3	0	0	225
2010-11	10	0	0	38	0	0	31	0	0	0	109
2011-12	11	0	0	61	0	0	15	0	0	0	192
Total (Includes Archery)											Man-Days of Hunting Pressure
Season	Duck	Coot	Coyote	Snipe	Quail	Rabbit	Squirrel	Raccoon	Opossum	Armadillo	
2007-08	77	0	0	62	3	0	49	2	0	0	14,859
2008-09	18	0	1	66	3	3	13	0	0	0	16,357
2009-10	85	0	0	117	0	4	54	3	0	0	15,830
2010-11	90	0	0	65	2	0	31	0	0	0	13,749
2011-12	89	12	0	121	4	0	15	0	0	0	12,343
Average	72	2	0	86	2	1	32	1	0	0	14,628

Table 3. Small game season harvest and hunting pressure for the Big Cypress Wildlife Management Area, 2007-08 to 2011-12.

Season	Duck	Coot	Coyote	Snipe	Quail	Rabbit	Squirrel	Raccoon	Opossum	Armadillo	Man-Days of Hunting Pressure
2007-08	3	0	0	41	3	0	47	1	0	0	232
2008-09	6	0	0	16	3	3	13	0	0	0	231
2009-10	2	0	0	27	0	4	51	3	0	0	225
2010-11	10	0	0	38	0	0	31	0	0	0	109
2011-12	11	0	0	61	0	0	15	0	0	0	192
Average	6	0	0	37	1	1	31	1	0	0	198

Table 4. Harvest data for Spring Turkey season for the Big Cypress Wildlife Management Area, 2007-08 to 2011-12.

Season	Number of Adults Harvested¹	Number of Juveniles Harvested¹	Checked Harvest	Self-checked Harvest	Man-Days of Hunting Pressure	Hunter Success
2007-08	14	0	14	17	1,624	52.4
2008-09	13	0	14	41	1,827	33.2
2009-10	10	2	12	16	1,681	60.0
2010-11	4	1	5	21	2,004	77.1
2011-12	3	3	6	30	1,771	49.2
Average	9	1	10	25	1,781	54.4

¹Checked harvest

Table 5. Harvest data for Spring Turkey season on the Bear Island Unit of the Big Cypress Wildlife Management Area, 1985-86 to 2011-12.

Season	Number of Adults Harvested¹	Number of Juveniles Harvested¹	Checked Harvest	Season Length	Man-Days of Hunting Pressure	Hunter Success
1985-86	13	4	17	37	750	44.1
1986-87	12	5	17	37	760	44.7
1987-88	11	3	14	37	680	48.6
1988-89	8	14	22	37	830	37.7
1989-90	13	14	27	37	921	34.1
1990-91	17	11	28	37	838	29.9
1991-92	13	9	22	37	756	34.4
1992-93	12	4	16	37	652	40.8
1993-94	3	10	13	37	653	50.2
1994-95	7	11	18	37	645	35.8
1995-96	22	14	36	37	756	21.0
1996-97	13	10	23	37	1403	61.0
1997-98	16	7	23	37	843	36.7
1998-99	12	3	15	37	835	55.7
1999-00	16	0	16	37	426	26.6
2000-01	14	3	17	37	380	22.4
2001-02	14	4	19	37	795	41.8
2002-03	2	2	4	37	572	143.0
2003-04	14	0	14	37	267	19.1
2004-05	11	0	11	37	199	18.1
2005-06	5	0	5	37	498	99.6
2006-07	25	10	35	37	357	10.2
2007-08	14	0	14	37	644	46.0
2008-09	13	0	14	37	521	37.2
2009-10	10	2	12	37	487	40.6
2010-11	4	1	5	37	384	76.8
2011-12	3	3	6	37	397	66.2
Average	12	5	17	37	639	45.3

¹Checked harvest

Table 6. Spring Turkey harvest and biological data for the Bear Island Unit on the Big Cypress Wildlife Management Area, 1985-86 to 2011-12.

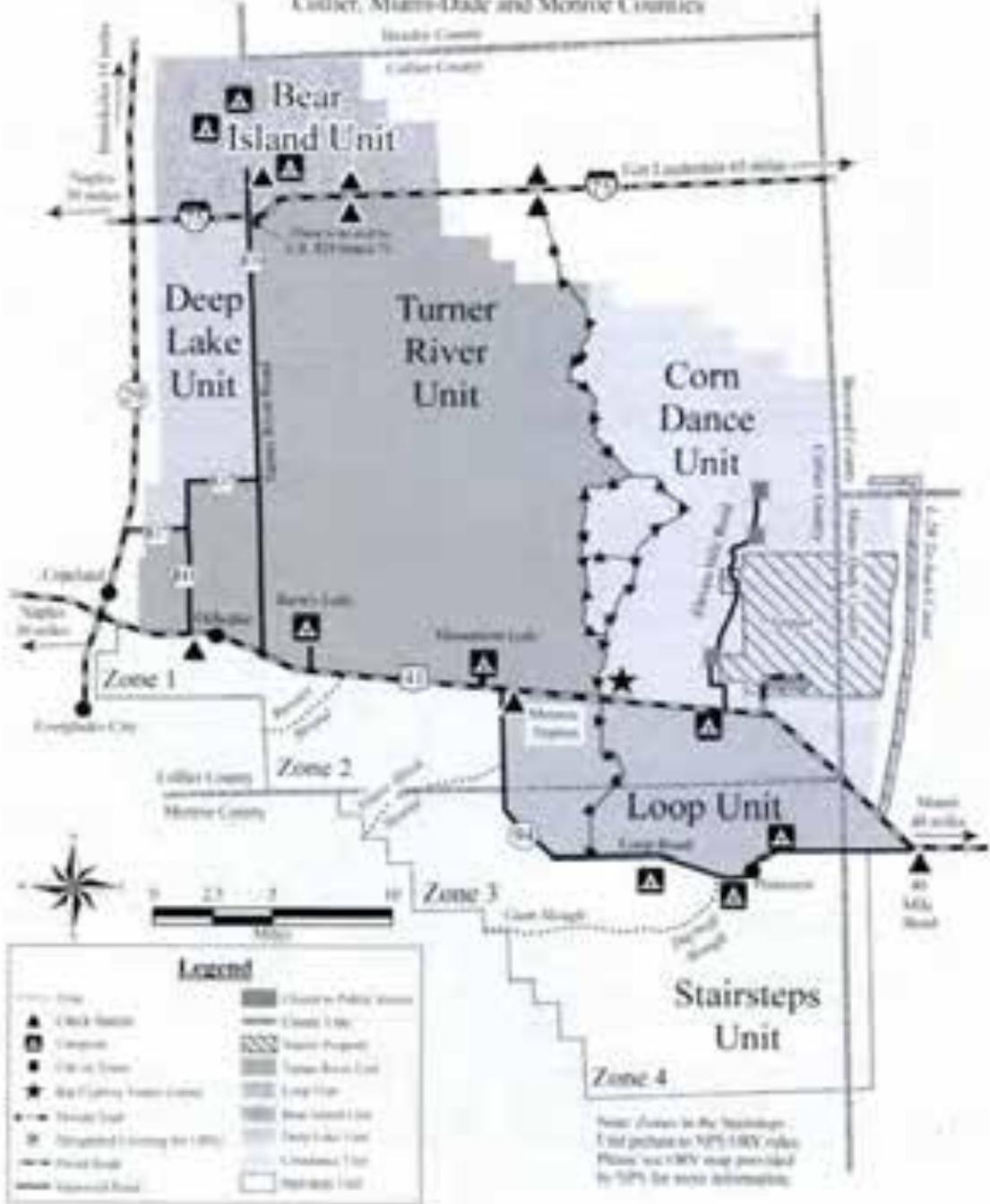
Season	Age	Number Harvested ¹	Average Live Weight (lbs)	Average Beard Length (cm)	Average Spur Length (cm)
1985-86	Adult	13	14.1	18.9	1.9
	Juvenile	4	9.8	7.3	0.2
1986-87	Adult	12	15.0	16.9	1.8
	Juvenile	5	10.8	7.5	0.8
1987-88	Adult	11	13.6	20.4	2.0
	Juvenile	3	9.0	5.5	0.5
1988-89	Adult	8	14.6	21.2	2.2
	Juvenile	14	10.9	6.2	0.9
1989-90	Adult	13	14.0	19.7	2.4
	Juvenile	14	10.1	9.9	1.3
1990-91	Adult	17	15.0	21.7	2.5
	Juvenile	11	10.7	8.4	0.8
1991-92	Adult	13	13.3	20.0	2.1
	Juvenile	9	10.0	7.7	0.7
1992-93	Adult	12	13.8	18.8	1.8
	Juvenile	4	9.3	6.9	0.5
1993-94	Adult	3	15.9	24.1	2.3
	Juvenile	10	10.8	8.7	0.6
1994-95	Adult	7	14.3	20.5	2.3
	Juvenile	11	9.5	9.4	0.7
1995-96	Adult	22	15.3	21.2	2.2
	Juvenile	14	11.6	7.0	0.5
1996-97	Adult	13	14.3	23.3	2.4
	Juvenile	10	11.0	8.3	0.9
1997-98	Adult	16	15.2	22.2	2.1
	Juvenile	7	10.1	3.6	0.7
1998-99	Adult	12	14.4	22.9	2.6
	Juvenile	3	12.5	9.8	0.7
1999-00	Adult	16	14.2	21.4	2.1
	Juvenile	0	-	-	-
2000-01	Adult	14	15.4	21.9	2.4
	Juvenile	3	8.6	13.4	1.0
2001-02	Adult	14	15.4	21.9	2.4
	Juvenile	3	10.8	8.6	0.7
2002-03	Adult	2	15.0	21.8	2.3
	Juvenile	2	9.5	9.8	-
2003-04	Adult	14	14.8	22.6	2.3
	Juvenile	0	-	-	-
2004-05	Adult	11	11.4	22.5	2.3
	Juvenile	0	9.3	6.2	0.5
2005-06	Adult	5	12.8	20.0	2.1
	Juvenile	0	-	-	-
2006-07	Adult	25	14.6	20.0	2.4
	Juvenile	10	10.6	3.5	0.8
2007-08	Adult	14	15.0	21.0	2.0
	Juvenile	0	-	-	-
2008-09	Adult	13	14.8	23.6	2.2
	Juvenile	0	-	-	-
2009-10	Adult	10	16.0	22.2	2.2
	Juvenile	2	8.8	7.8	0.3
2010-11	Adult	4	13.4	21.4	1.6
	Juvenile	1	10.5	8.0	0.5
2011-12	Adult	3	14.0	25.0	2.2
	Juvenile	3	10.3	8.0	1.5
Average	Adult	12	14.4	21.4	2.2
	Juvenile	5	10.2	7.8	0.7

¹Checked harvest

APPENDIX A. Big Cypress Wildlife Management Area
2011-12 Regulations Summary and Area Map.

BIG CYPRESS WILDLIFE MANAGEMENT AREA

711,848 acres
Collier, Miami-Dade and Monroe Counties



APPENDIX B. Executive Order (EO 11-15): Special Regulations for the Stairsteps Unit
of Big Cypress Wildlife Management Area.

Order Number: ED 11-15

Special regulations for the Stairstep Unit
of Big Cypress WMA

The Fish and Wildlife Conservation Commission of the State of Florida, acting under the authority of Article IV, Section 9 of the Florida Constitution and as approved at the public meeting held on Wednesday June 8, 2011, hereby establishes special hunting regulations for the Stairstep Unit of Big Cypress Wildlife Management Area for the 2011-2012 hunting season as follows:

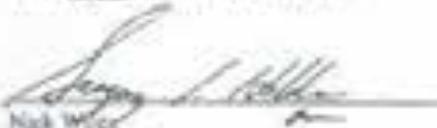
- (1) The taking of white-tailed deer as referenced in sections 68A-15.064 (1), F.A.C. is prohibited within Zone 4 of the Stairstep Unit.
- (2) The bag limit for deer shall be 1 annually within Zone 3 of the Stairstep Unit.
- (3) In Zone 3 of the Stairstep Unit, the taking of deer not having at least one forked antler and having one or more antlers at least 5 inches in length visible above the hairline is prohibited. The forked antler shall have at least two points one inch or greater in length.
- (2) Any provisions of Rules 68A-15.064 (5), F.A.C., which are inconsistent herewith, are hereby superseded.

This order shall take effect upon signing and shall remain in effect until 11:59 p.m. on 30 June 2012 or until superseded by subsequent order or rule.

Specific Authority: Article IV, Section 9, Florida Constitution

Law Implemented: Article IV, Section 9, Florida Constitution

GIVEN UNDER MY HAND AND SEAL OF
THE FISH AND WILDLIFE CONSERVATION
COMMISSION OF THE STATE OF FLORIDA,
THIS 20th DAY OF JUNE, 2011.



Nick Wiles
Executive Director

Attest: 
Nancy Clark
Agency Clerk



APPENDIX C. Big Cypress Wildlife Management Area man-days pressure worksheet.

Big Cypress WMA Weekly Pressure and Harvest Summary

Check Station _____ week covered _____

Number of Hunters checked in for each unit

	Bear Island	Corn Dance	Turner River	Loop Road	Deep Lake	Stairsteps
Mon						
Tue						
Wed						
Thu						
Fri						
Sat						
Sun						
Tot						

Put a mark in the box for each day the hunter is checked in, including the day of arrival, the day of departure, and all days in between. If the hunter marks down more than one unit, split the days equally between units and mark the number of days attributed to each unit on the check-in/out forms. Total the week's pressure for each unit and enter it in the bottom row.

APPENDIX D. Big Cypress Wildlife Management Area weekly harvest summary worksheet.

BIG CYPRESS WMA WEEKLY HARVEST REPORT

UNIT	ARCHERY	MUZZLELOADER	GENERAL GUN	SMALL GAME	SPRING GOBLER	HUNT DATE REPORTED	HARVEST	DEER		HOG		TURKEY		*DUCK	DOVE	SNIPE	QUAIL	RABBIT	SQUIRREL	RACCOON	WOODCOCK	REMARKS
								M	F	M	F	M	F									
BEAR ISLAND							CHECKED															
							EST															
							TOTAL															
DEEP LAKE							CHECKED															
							EST															
							TOTAL															
CORN DANCE							CHECKED															
							EST															
							TOTAL															
TURNER RIVER							CHECKED															
							EST															
							TOTAL															
LOOP ROAD							CHECKED															
							EST															
							TOTAL															
STAIRSTEPS							CHECKED															
							EST															
							TOTAL															
TOTAL BIG CYPRESS							CHECKED															
							EST															
							TOTAL															

*Please indicate the species and sex of waterfowl in remarks column.

APPENDIX E. Big Cypress Wildlife Management Area turkey biological data worksheet.

Appendix I

Endangered Species Act
Section 7 Consultation Memorandums
between the National Park Service
and the U.S. Fish and Wildlife Service
(March 7, 2012, February 10, 2014,
and April 23, 2014)



United States Department of the Interior



NATIONAL PARK SERVICE
Big Cypress National Preserve
33100 Turnagain Trail E.
Capeoper, Florida 33141-3100

IN REPLY REFER TO:
12617 (BICY-5)

March 7, 2012

Memorandum

To: U.S. Fish and Wildlife Service, South Florida Ecological Services Office
Attention: Mr. Larry Williams, Field Supervisor

From: Superintendent, Big Cypress National Preserve 

Subject: Hunting Management Plan EA, Request for Informal Consultation

The National Park Service (NPS), in cooperation with the Florida Fish and Wildlife Conservation Commission (FWC) and the U.S. Fish and Wildlife Service (FWS), has drafted a Hunting Management Plan/Environmental Assessment (EA) for Big Cypress National Preserve in accordance with NPS policies. The purpose of the plan is to allow the Preserve superintendent to provide for hunting opportunities in a manner that is in the best interest of the Preserve's resources and the public, while meeting the requirements set forth by the NPS, the Preserve's enabling legislation, the NPS/FWC Cooperative Partnership Agreement, and all federal, state, and local laws and regulations.

Hunting in the Preserve is authorized by Public Law (P.L.) 93-440, which established the Preserve in 1974. The original 1974 Preserve is a State Wildlife Management Area, and hunting is managed through regulations published each year by FWC. P.L. 93-440 was amended in 1988 by P.L. 100-301, which expanded the Preserve by 147,000 acres. These new lands, known as the Addition, were largely acquired by the federal government by 1986 and have not been open to hunting pending completion of an Addition General Management Plan. That plan was completed in 2010 and states that the NPS will develop a Hunting Management Plan and work with FWC to provide hunting access, define hunting seasons, and develop hunting regulations that are consistent with both agencies' policies and goals for the Addition.

Alternatives included in this plan are as follows:

Alternative 1 – No Action – Apply Current Management to the Addition

Under alternative 1 (no action), management of hunting in the entire Preserve would occur in accordance with the NPS/FWC Cooperative Partnership Agreement.

Alternative 2 – Minimum Management – No Hunting in the Addition

Under alternative 2, current hunting management would continue within the original Preserve boundaries, using the guidance outlined in the NPS/FWC Cooperative Partnership Agreement. In the Addition, public hunting would be prohibited.

Alternative 3 (Preferred Alternative) – New Adaptive Management Strategy

Under alternative 3, the NPS and FWC, in consultation with FWS, would cooperate to implement an adaptive management strategy to manage hunting in the Preserve in accordance with the NPS/FWC Cooperative Partnership Agreement.

To review the draft plan, visit <http://parkplanning.nps.gov/bicy> and follow the appropriate link to *Hunting Management Plan/EA*.

On page 125 the EA concludes that no impacts would occur to the West Indian manatee, and long-term, negligible, adverse impacts to the Cape Sable seaside sparrow, Everglade snail kite, red-cockaded woodpecker, wood stork, American crocodile, eastern indigo snake, and American alligator would result from implementation of the preferred alternative. As explained on page 107, this impact intensity would equate to a determination of "no effect" under Section 7 of the Endangered Species Act of 1973, as amended. Impacts of the preferred alternative on the Florida panther would be long-term, negligible to minor, and adverse, equating to a "not likely to adversely affect" determination.

This constitutes the NPS' request for informal consultation in accordance with Section 7 of the Endangered Species Act. We request your concurrence with the above determinations and any other comments you may have. Please provide your comments by April 6, 2012. Should you have any questions, please contact me



United States Department of the Interior



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

February 10, 2014

Memorandum

To: Pedro Ramos, Superintendent, Big Cypress National Preserve

From:  Cary Williams, Field Supervisor, South Florida Ecological Services Office

Subject: Big Cypress National Preserve Final Draft Hunting Management Plan/Environmental Assessment Comments and Consultation, Service Consultation Code: 2012-4-0159

This memorandum responds to the National Park Service's (NPS) Big Cypress National Preserve Final Draft Hunting Management Plan/Environmental Assessment (Hunting Management Plan) dated November 2012 and the NPS' March 7, 2012, request for informal consultation regarding the Hunting Management Plan. The Hunting Management Plan presents three alternatives for implementing hunting in both the original Big Cypress National Preserve (BICY) and the Addition Lands (Addition). This memorandum provides the U.S. Fish and Wildlife Service's (Service) comments, in accordance with the National Environmental Policy Act of 1969 (42 U.S.C. 4321 *et seq.*) (NEPA), on the Hunting Management Plan and provides our informal section 7 consultation, in accordance with section 7 of the Endangered Species Act of 1973, as amended (16 U.S.C. 1531 *et seq.*) (Act), with the NPS on the preferred alternative for the Hunting Management Plan.

PROJECT DESCRIPTION AND BACKGROUND

The General Management Plan and Final Environmental Impact Statement (GMP) (NPS 1991) for the original BICY directed the development of a hunting management plan. The Big Cypress National Preserve – Addition Draft GMP/Wilderness Study/Off-Road Vehicle Management Plan/Environmental Impact Statement (EIS) (NPS 2010) also stated a hunting management plan would be developed. The Hunting Management Plan represents the NPS' effort to comply with those directives.

The purpose of the Hunting Management Plan is to direct decision making efforts regarding hunting activities, seasons, bag limits, etc., for both the original BICY and the Addition. The Hunting Management Plan presents three alternatives for consideration and review. The alternatives, as described in the Hunting Management Plan, include:

- **Alternative 1 – No-Action – Apply Current Management to the Addition.** The NPS would continue to allow hunting in the original BICY and apply that same management program to the Addition. Existing regulations using the current communications,

coordination, and regulation modification process between NPS and FWC would be implemented throughout the Preserve. Changes in hunting management in BICY would be subject to NEPA whenever changes are proposed. There would be no obligation to use the best science available in making those decisions, and the timeframes necessary to complete NEPA would not necessarily be compatible with the Florida Fish and Wildlife Conservation Commission (FWC's) process for approval of seasons, permits, and bag limits.

- **Alternative 2 – No Hunting in the Addition.** This alternative would allow hunting to continue in the original BICY with no public hunting in the Addition. Under this alternative, harvest data on deer and hog populations in the Addition would not be collected. In addition, decisions on hunting seasons, permits, and bag limits would be made in a manner similar to the current process, using the existing regulations and employing the current communications, coordination, and regulation modification process between NPS and FWC. There would be no adaptive management feedback loop to dictate changes in hunting and wildlife management in BICY. This Alternative represents the baseline condition for the purpose of section 7 consultation under the Act.
- **Alternative 3 – New Adaptive Management Strategy.** This alternative would incorporate the best, and most current, science into decision-making regarding hunting in BICY. It includes a requirement for an annual feedback loop to assess the data obtained from prior seasons and make changes to seasons, bag limits, etc. based on those data. The framework would be implemented in a cooperative manner with the NPS, FWC, and the Service working together to incorporate the variables necessary to ensure that hunting activities undertaken in BICY are compatible with the endangered Florida panther (*Puma = [Felis] concolor coryi*). Under this alternative, an adaptive management strategy would be utilized. Wildlife Management Area regulations would be reviewed at least annually through the decision-making framework established in the NPS/FWC Cooperative Partnership Agreement that would provide a: 1) process by which the elements of the hunting regulations could be modified, and 2) communications protocol to change regulations.

The NPS has selected Alternative 3 as the Environmentally Preferred Alternative (PA). Additional details on each alternative are included in the Hunting Management Plan (NPS 2013).

The Adaptive Management objectives for the PA were developed based on policies outlined in Section 4.4.3 of the NPS *Management Policies* (2006), which states:

"Where harvesting is allowed and subject to NPS control, the [NPS] will allow harvesting only when (1) the monitoring requirement contained in section 4.4.2 and the criteria in section 4.4.2.1 ... have been met, and (2) the [NPS] has determined that the harvesting will not unacceptably impact park resources or natural processes, including the natural distributions, densities, age-class distributions, and behavior of

- *harvested species*
- *native species that the harvested species use for any purpose, or*
- *native species that use the harvested species for any purpose"*

The adaptive management objectives for this Hunting Management Plan are:

The [NPS] will successfully maintain native plants and animals by:

- *Preserving and restoring the natural abundances, diversities, dynamics, distributions, habitats, and behaviors of native plant and animal populations and the communities and ecosystems in which they occur;*
- *Restoring native plant and animal populations in parks when they have been extirpated by past human-caused actions; and*
- *Minimizing human impacts on native plants, animals, populations, communities, and ecosystems, and the processes that sustain them.*

Based on these policies, under alternative 3, the NPS would conduct ecosystem management actions in the preserve to achieve the following objectives through the adaptive management process:

- A sustainable deer population in the Preserve, which ensures the effects of hunting in the Preserve are beneficial, discountable, or insignificant to the Florida panther population¹
- A feral hog population in the Preserve that balances the feral hog as an invasive species and ensures that the effects of hunting in the Preserve are beneficial, discountable, or insignificant to the Florida panther.
- A sustainable population for all other game species in the Preserve including wild turkey and small game species

The life of the PA is 15 to 20 years.

BACKGROUND

At NPS' request, the Service played a significant role in the development of this Hunting Management Plan. Service staff attended workshops and meetings designed to assist in NPS' choice of alternatives, including the selected PA. NPS employed the "choosing by advantage" process to identify variables and metrics that were essential in developing alternatives that met the criteria for a hunting management plan and to involve stakeholder agencies, including the FWC and the Service. Meetings were attended by NPS, FWC, and Service representatives in an effort to ensure the position of all stakeholders was adequately considered in the development of the alternatives. NPS also held many public meetings to gather comments and suggestions from the general public and other stakeholders. Service staff attended some of these public meetings.

The Service provided specific comments on the draft Hunting Management Plan throughout its development. We, therefore, include few specific comments in this memorandum.

¹ Deer are the Florida panthers' most consistent prey item (Lund 1994, USFWS 2008). Janis and Clark (2002) determined a predation success rate of one kill per 5.24 days for female panthers and one kill per 7.7 days for male panthers, with an average of one kill per animal per 6.45 days for the general panther population. Other literature (Anderson and Lindzey 2003, Cooley et al. 2008, Murphy et al. 2011) shows similar predation success rates of one deer-sized prey per panther approximately every 6.7 to 7.6 days or on average one deer-sized prey per week (Ruth and Murphy 2010).

COMMENTS

The Service is pleased to see a holistic approach to hunting management in BICY. The Service is also pleased by the spirit of cooperation displayed in the development of the PA for the Hunting Management Plan. The PA attempts to include all stakeholder groups and experts in the adaptive management process which will be overseen by the NPS and FWC, in consultation with the Service. Finally, we believe the NPS used the best available science, and the FWC provided much-needed support through the use of its deer population experts. As a result, we believe the PA has taken a "hard look" at the potential impacts of implementation of the PA.

THREATENED AND ENDANGERED SPECIES

The BICY consists of approximately 729,000 acres, including the original BICY and Addition, and is located in Collier and Monroe counties, Florida. Nine federally threatened or endangered species are present within, or use BICY. Species present include the Florida panther, endangered West Indian manatee (*Trichechus manatus*), endangered wood stork (*Mycteria americana*), endangered Everglade snail kite (*Rostrhamus sociabilis plumbeus*), endangered red-cockaded woodpecker (*Picoides borealis*), endangered Cape Sable seaside sparrow (*Ammodramus maritimus mirabilis*), threatened American crocodile (*Crocodylus acutus*), and threatened eastern indigo snake (*Drymarchon corais couperi*). Critical habitat for the West Indian manatee is present within BICY boundaries and the Florida bonneted bat (*Etonops floridanus*), which was recently listed as endangered and is present within the BICY boundaries (FR Vol 77, No. 193, October 4, 2012).

In a March 7, 2012, memorandum from NPS to the Service, the NPS stated the Hunting Management Plan would serve as their biological assessment for the PA, and determined the selection of the PA would have no effect on the West Indian manatee, Cape Sable seaside sparrow, Everglade snail kite, red-cockaded woodpecker, wood stork, American crocodile, and eastern indigo snake. The NPS also determined the selection of the PA was not likely to adversely affect the Florida panther. Subsequent to the final rule listing the Florida bonneted bat as endangered, the NPS contacted the Service on January 15, 2014, and provided a determination that implementation of the Hunting Management Plan was not likely to adversely affect the Florida bonneted bat.

ANALYSIS

The Service consulted on the EIS for the Addition GMP (NPS 2010). In that consultation, we analyzed ORV and other recreational uses in the Addition. The Service also consulted on the Final Recreational Off-road Vehicle Management Plan and Supplemental Environmental Impact Statement (ORV Plan) (NPS 2001) which addressed recreational uses of ORVs in the original BICY. The Hunting Management Plan proposes three alternatives for regulating hunting activities in BICY. The PA includes a provision for introducing public hunting in the Addition. Since ORV activities were addressed in prior consultations, the discussion and analysis of the PA will only address the potential effects of hunting activities, not the use of ORVs.

Each of the above-referenced documents provides conservation measures if manatees, wood storks, Everglade snail kites, Cape Sable seaside sparrows, red-cockaded woodpeckers, crocodiles, or eastern indigo snakes are located in proximity to trails or in areas to be burned or receive other management actions. Taken together, the conservation measures in the Hunting Management Plan, the Addition GMP, and the ORV Plan are sufficient to conserve those species and to ensure that activities undertaken pursuant to the Hunting Management Plan are not likely to adversely affect the manatee, wood stork, Everglade snail kite, Cape Sable seaside sparrow, red-cockaded woodpecker, American crocodile, or eastern indigo snake. With respect to the eastern indigo snake, public use of ORV trails and human occupation in the backcountry could alter eastern indigo snake behavior, but not to an extent that those effects would be measurable or result in death or injury of an individual. Effects that are not measurable are considered insignificant and discountable in the context of the Act. The development of an educational plan under the GMP/EIS is consistent with the standardized protection measures developed by the FWS' South Florida Field Office to minimize potential adverse effects to the eastern indigo snake resulting from land development projects as explained in the 1999 Multi-Species Recovery Plan (Service 1999). The most recent iteration of the Service's standardized protection measures for the eastern indigo snake is published on Service's website (<http://www.fws.gov/ygnobeach/Reptiles/PDFs/EasternIndigoSnakeConservationGuidelines.pdf>) These measures include the creation and distribution of educational materials regarding eastern indigo snake identification, biology and habitat requirements. Based on this information, the NPS has determined the implementation of the PA is not likely to adversely affect the above-listed species. The Service concurs and will not consider these species further in this document.

The Service listed the Florida bonneted bat (*Eumops floridanus*) as an endangered species during the final stages of development of this Hunting Management Plan. The Service is developing guidelines for consultations regarding this species. The Florida bonneted bat does occur on BICY, however, current locations for the bonneted bat are unknown. Historic records indicate bonneted bats were at least foraging near the Deep Lake Unit of BICY. Due to the limited range of acoustic sampling methods, this information does not mean the bonneted bat is not present in other areas of BICY.

After reviewing location information and potential activities that may take place during implementation of the Hunting Management Plan, the NPS believes "the Florida bonneted bat could be impacted by flushing and short-term displacement; however, their daytime roosting locations in tree cavities and nocturnal feeding behavior would limit their exposure to hunters. Additionally, since no construction or other permanent ground disturbing activities are associated with this project, impacts to the Florida bonneted bat would be negligible." The NPS has stated, in a teleconference on January 22, 2014, they plan on implementing protection measures for either manmade or natural roost sites that they currently implement for RCWs (e.g., buffer zones around known roost sites). Hunters are required to vacate BICY between 10 pm and 5 am, the times where bonneted bats would be most active. Hunters camping overnight in BICY will not be hunting between 10 pm and 5 am, thereby minimizing the potential for bat/hunter interactions. Those types of activities would also have to comply with guidance provided in the GMP. In

addition, the NPS plans on incorporating educational materials and efforts to further minimize the potential for hunters to interact with bonneted bats. Based on these conservation measures and other information presented, the NPS has determined the implementation of the Hunting Management Plan is not likely to affect the Florida bonneted bat. The Service concurs.

The remainder of this analysis is focused on the Florida panther, as that is the species most likely to be affected by the introduction of public hunting in the Addition. Public hunting is part of the baseline condition for the original BICY boundaries, so this analysis will focus on the Addition.

For the purposes of this consultation, the Service used the status of the Florida panther as described in the 2008 Recovery Plan (Service 2008) and updated in the August 13, 2012, Biological Opinion for the Off Road Vehicle (ORV) Trail Heads and U.S. Highway 41 Turn Lanes Project, Service Consultation Code 2012-1-0139. The Service's goal for Florida panther conservation in south Florida is to locate, preserve, and restore lands containing sufficient area and appropriate land cover types to ensure the long-term survival of a population of 80 to 100 individuals (adults and subadults) south of the Caloosahatchee River. As of July 2012, 49 known radio-collared panthers (alive or status unknown) were documented within a 25-mile radius of the ORV Trailheads project from 6,664 telemetry observations. It is not known if all these animals are currently alive. In 2009, Rancher's Supply (a consultant to the FWC) found evidence of 80 individual panthers during their annual count of both radio-collared and uncollared panthers in south Florida (FWC 2010). The area surveyed included BICY.

As stated earlier, the environmental baseline for this Hunting Management Plan is represented by Alternative 2. Hunting occurs in the original BICY but is prohibited in the Addition. The PA would maintain hunting in the original BICY, and expand hunting opportunities to the Addition. According to the schedule presented in the Hunting Management Plan (NPS 2013), hunting would occur on a maximum of 165 days per year for all included seasons and ORV use is prohibited between 10 pm and 5 am. Therefore, this analysis is focused on those hunting opportunities that may introduce an additional variable potentially affecting the Florida panther population in BICY. Hunting seasons, bag limits, and other elements would be evaluated under the adaptive management strategy framework established through the Hunting Management Plan (NPS 2013).

The PA calls for the development of a "clear decision-making and communications framework between the NPS and FWC, in consultation with the [Service], to manage hunting in the entire Preserve. Wildlife Management Area regulations would be reviewed at least annually through the decision-making framework established in the NPS/FWC Cooperative Partnership Agreement" (NPS 2013). Furthermore, "decisions regarding modifications to the Hunting Management Plan, hunting regulations, law enforcement needs, threatened and endangered species, nonnative / exotic species, research and monitoring, and public access would be made by the NPS and FWC, in consultation with the [Service], through the adaptive management process" (NPS 2013).

The PA includes a provision for population monitoring of major game species (*i.e.*, deer and hog), as well as the Florida panther population. These data will be used under the science-based adaptive management framework in conjunction with traditional and innovative hunting management tools (*e.g.*, quotas, season dates, bag limits, season limits) to provide for a sustainable prey base for the Florida panther. The adaptive management framework identifies the use of a 5-year average for both deer survey and hunter check-in data to determine if changes are needed to the hunting program to ensure that the level of deer harvest does not result in a reduction of available prey for the Florida panther.

Essentially, the PA directs the NPS and FWC, in consultation with the Service, to develop an adaptive management strategy to guide decisions regarding hunting management in BICY and incorporate a feedback loop for validation of assumptions and facilitation of science-based decisions regarding changes to the hunting program in BICY. More specific information about the components incorporated into an adaptive management framework may be viewed in the description of the PA in the Hunting Management Plan (NPS 2013).

The development of the adaptive management strategy, itself, does not enable hunters to enter BICY to harvest game species. Development of a plan or strategy is similar to a change in land ownership in that it does not change the land use or baseline conditions of the land in question. Implementation of the adaptive management strategy, however, may facilitate hunting activities in BICY, in particular the Addition. Therefore, it is the implementation of the adaptive management strategy that requires a more detailed analysis of hunting's effects on panther prey and panthers in BICY.

In performing the analysis of the development and implementation of the PA, the Service considered the introduction of public hunting in the Addition as the potential introduction of a competing predator for the Florida panther. Public hunting has never occurred on the Addition and hunting of any kind has been prohibited in the Addition for more than 20 years. The Big Cypress National Preserve Harvest and Pressure Summary for 2010 to 2011 (FWC 2011) reported hunter effort in the form of man days per deer harvested from the 2006-2007 season to the 2010-2011 season. For all forms of hunting, including archery, muzzle-loading, and general gun, the lowest level of effort required to harvest a buck was 36 hunter days. The greatest level of effort was 93 hunter days. The means of harvest for these levels of effort figures were muzzle-loading and archery, respectively. For the purpose of this analysis, the FWC provided an analysis of hunter pressure and deer harvest for BICY from 1980 to 2012 (Figure 1). This figure, while showing some trends between hunter pressure and harvest, does not show a significant relationship. It is likely hydrology and rainfall may play a role in this relationship that may clarify the relationship of hunter-days to harvest success; however, those data are not available at this time (Fletcher and McCarthy 2011).

Ackerman et al. (1982) predicted the deer kill rate for a resident male cougar was one deer every 8 to 11 days. Resident female kill rates were predicted to be one deer every 14 to 17 days. A female with three, 13-month old kittens had a predicted kill rate of one deer every 3.3 days. Janis

and Clark (2002) determined a predation success rate of one kill per 5.24 days for female panthers and one kill per 7.7 days for male panthers, with an average of one kill per animal per 6.45 days for the general panther population. Other literature (Anderson and Lindzey 2003, Cooley et al. 2008, Murphy et al. 2011) shows similar predation success rates of one deer-sized prey per panther approximately every 6.7 to 7.6 days or on average one deer-sized prey per week (Ruth and Murphy 2010). These studies provide guidance regarding the energy needs of Florida panthers.

Land (1991) noted deer survival rates averaged 81.3 percent over a 4-year period between 1987 and 1991 in the Bear Island Unit of BICY. In this study, Land also found bobcats predated more deer than panthers. Bobcats alone, and bobcats and panthers together also killed more deer than were harvested by hunters. Land found the Bear Island population to be stable with female deer replacing themselves before death. Land concluded hunting in Bear Island did not appear to have adverse impacts on the deer population as a whole. It should be noted, an antlerless season existed at the time of this report. Antlerless harvest is now prohibited throughout BICY in areas that are open to hunting.

The NPS states that under the PA "adverse impacts to the Florida panther would be very similar to those of Alternative 1, with the exception of the impacts on the panther prey base." To investigate the interactions of predators and their prey, the Service reviewed literature related specifically to deer and large predators including mountain lions (*Puma concolor*), wolves (*Canis lupus*), and coyotes (*Canis latrans*). We found one particular reference, Ballard et al. (2001), which reviewed studies of deer population and predator relationships conducted throughout North America including mule deer and black-tailed deer (*Odocoileus hemionus*), as well as white-tailed deer. They found widely differing relationships between predators and their prey, mainly based on the relationship of the deer population to carrying capacity. While these studies were not performed in the same type of habitat present in BICY, we do believe they represent the best scientific and commercial data available.

Bleich and Taylor (1998) observed deer mortality for individually monitored deer in the Western Great Basin of California. For females, the primary cause of mortality was predation, comprising 83 percent of mortality. Human induced mortality and malnutrition comprised 4.8 and 12.2 percent, respectively. For the 11 male deer where cause of death was determinable, 36.4 percent were predated and 63.6 percent of mortalities were attributed to hunter harvest. The authors speculated mountain lion predation may regulate deer populations in ecosystems where severe drought or winters occur unpredictably. Drought and unusual weather conditions occur in South Florida in an unpredictable fashion, similar to the conditions of this study.

Compensatory mortality is a theory that states a total population's mortality remains unchanged at low to intermediate exploitation rates because natural mortality decreases in compensation for reduced density. Conversely, additive mortality represents an increase in mortality due to exploitation that results in an increase in total mortality (Allen et al. 1998). Bartmann et al. (1992) reviewed compensatory mortality in the Piceance Basin of Colorado and determined

coyote predation was compensatory to starvation mortality in deer populations that were at carrying capacity. Coyote predation was not compensatory to starvation when deer populations were not at carrying capacity. In BICY, it is unlikely the deer population is at carrying capacity. Therefore, it is unlikely, if the same relationship exists, that panther-caused mortality is compensatory to starvation in our system.

Mackie et al. (1998) summarized research in Montana on mule and white-tailed deer. They found hunting to be the largest source of female deer mortality, with natural mortality representing 0 to 25 percent of mortalities observed. They did not believe hunter harvest or other sources of mortality were compensatory in this population. In BICY, NPS and the FWC are proposing to allow harvest of antlered individuals only; therefore, hunter harvest effects will be focused on the male portion of the population. White-tailed deer are polygynous, so one buck services several does, making loss of male deer less important to the population as a whole.

Both Hamlin and Mackie (1989) and Mackie et al. (1998) noted there is a potential for predation to influence deer populations, particularly in areas where there may be multiple predators. Hamlin and Mackie (1989) indicated that predation combined with other sources of mortality, including hunting, could influence low density deer populations and potentially keep them from increasing. This observation indicates introduction of hunter harvest should be undertaken in a precautionary manner to observe the potential effects on the deer populations in BICY, particularly the Addition. The adaptive management framework and communication structure will allow NPS and the FWC, in consultation with the Service, to monitor and respond to this type of scenario should it arise.

In a study conducted on Vancouver Island, British Columbia, Hatter (1988) noted wolf predation was the primary limiting factor in fawn recruitment in that population of black-tailed deer. Atkinson and Janz (1994) noted reduced wolf densities yielded increased fawn survival during the first 3 months of life, likely resulting in an increase in fawn recruitment. The increase in fawn survival was reversed when wolf control efforts ceased. In these studies, the predator appeared to be controlling fawn recruitment into the population. BICY is not a closed system as Vancouver Island is, making a similar type of study problematic. However, the potential exists that the panther population does have a significant effect on the deer population in BICY.

Nelson and Mech (1986a) observed wolf predation was responsible for twice the mortality attributed to hunting in white-tailed deer in Minnesota. Of 85 deer mortalities, 44 were attributed to wolf predation, 22 to hunting, 12 to probable wolf predation, and 7 to miscellaneous causes. Their study also indicated wolf predation was limiting yearling deer recruitment into the population in this area.

In a study in Montana, Dusek et al. (1992) determined mortality rates for 154 adult, female radio-collared deer in three different habitat types. Hunting was the largest source of mortality in all areas. Their study concluded hunting regulations in that area had little effect on natural mortality rates and was, therefore, additive to other forms of mortality. This study focused on female deer

and the relationship of hunting to natural mortality levels. Antlerless deer harvest is not permitted in BICY. Therefore, hunter harvest, while being an additive source of mortality for bucks, will not be an additive source of mortality for does in BICY.

During a predator removal experiment in Texas, Beasome (1974) noted fawn mortality was 61 to 74 percent higher in areas without predator removal. Deer densities in the treatment areas increased from 15.6 to 19.6 deer per kilometer squared (km^2) while those in the untreated area declined from 8.0 to 7.8 deer per km^2 . This study also indicated predator densities had an effect on recruitment of deer into the breeding population. In this case, the removal of a large predator from the study area resulted in an increase in the prey population. A relationship that likely exists between panthers and their prey, in particular deer, as bog are almost non-existent in BICY.

Using these and other case studies of predator/prey relationships, Ballard et al. (2001) concluded the deer population's relationship to carrying capacity was critical to the impacts of predation. Where deer populations appeared limited by predation, such populations were below forage carrying capacity. Conversely, deer populations at or near carrying capacity did not respond to predator removal experiments, indicating the effects of predation were compensatory in nature.

Other factors also influence fitness and fawn survival. Kunkel and Mech (1994) noted fawns from white-tailed does greater than 4 years of age in Minnesota were heavier and had better survival rates than fawns from younger does. A buck only harvest strategy ensures older does are retained in the population. If this dynamic also occurs in BICY, an unhunted or buck only harvest would allow does to reach a more advanced age with a potential for greater fawn survival.

Collectively, these studies appear to support the idea that panther population in south Florida, and in particular in BICY, may be driving the deer population - rather than the availability of deer as prey driving the panther population. Since the deer population in BICY occurs at low densities, most likely related to resource availability and hydrology, and predator mortality is additive in deer populations at low densities, panther predation could be having an effect on recruitment of fawns or yearlings into the population. Most of the published literature indicated hunter harvest did not appear to have an effect on fawn or yearling recruitment (Ballard 2008). This may be due to the fact panthers, and other large predators, are more efficient at finding and killing prey than humans. Assuming hunter harvest is not affecting recruitment of fawns or yearlings into the breeding population, then the proposed introduction of hunting into the Addition should not have a measurable effect on the deer population in this management unit. The adaptive management approach included in the PA will allow NPS to assess this assumption and validate it, by requiring continued monitoring of deer populations, hunter harvest, and panthers. These data will be incorporated into the feedback loop for assessing the effects of implementation of the PA on panther and deer populations in BICY.

The adaptive management process requires an action to be taken so data can be collected on the effects of the action and input into a feedback loop to assess if changes to the action are necessary to achieve the stated goals. For the Addition, 5 years of consistently collected deer

survey data and hunter harvest data do not exist. Three years of consistently collected deer survey data do exist, so the 5 years of data desired should be reached in two seasons. Since the 5-year average cannot be used for the first two seasons, the NPS and FWC, in consultation with the Service, will be reviewing data at least annually to determine whether changes in quotas, bag limits, or seasons should be implemented.

Predator cycles follow prey cycles with a lag (Laundre et al. 2007). Laundre et al. (2007) also noted that a puma population in southern Idaho and northwestern Utah increased during an increase in mule deer abundance and declined four years after mule deer abundance declined. Therefore, annual review of deer data will allow the NPS and FWC, in consultation with the Service, to identify any change in prey cycles before that change results in a change in the predator population. This frequency of review of the data should ensure potential adverse effects to the panther prey base are identified and addressed before those effects could result in effects on the Florida panther.

The NPS and FWC have committed to following the protocols established in the Hunting Management Plan to ensure hunters harvest a reasonable number of bucks while the deer population is sustainable and the panther population is not affected. There will be no increase in the quotas for the Addition until sufficient data exist to support a change in the number of quota permits. As currently planned, this would not occur until a 5-year average for hunter check-in data can be established and additional access or ORV trails were available in the Addition (NPS 2013).

Because the relationship between panthers, hunters, and prey will be complex and difficult to predict, two elements must be in place to ensure adverse effects to panthers do not occur. The first element is an initial hunting program that is conservative and prevents adverse effects to panthers. The PA provides that through limiting hunting quota permits to 30 per season, in the Addition, for the initial years of implementation of the Hunting Management Plan. The second element includes trigger points and feedback loops sufficient to conserve the panther population. The PA provides that through its inclusion of annual data reviews and the types and levels of change or unforeseen events that could result in changes to seasons or quota permits for the Addition.

The goal of the adaptive management framework is to ensure hunting activities do not alter the existing predator/prey relationship in BICY and, therefore, do not have a measurable effect on the Florida panther. Based on this information, the NPS has determined effects to the Florida panther population would be expected to be minimized with the PA and result in long-term, negligible to minor, adverse, regional effects to the Florida panther (NPS 2013). As stated in the Hunting Management Plan, this level of effects equates to a determination that implementation of the PA "may affect, but is not likely to adversely affect" the Florida panther. Based on this information, the Service concurs.

CONCLUSION

The Service supports selection of Alternative 3, of the PA, due to its inclusion of an adaptive management strategy in making decisions regarding hunting activities within BICY. We believe the PA offers the best use of science in decision-making and creates a cooperative atmosphere between NPS, the FWC, and the Service. Adaptive management focuses on learning and adapting, through partnerships of managers, scientists, and other stakeholders who learn together how to create and maintain sustainable resource systems (Williams et al., 2009). The adaptive management strategy and decision-making framework will ensure the best science is used to formulate decisions regarding hunting in BICY and the needs of threatened or endangered species like the Florida panther are adequately considered in those decisions.

This consultation applies to the development of the Hunting Management Plan and implementation of the PA. Any additional proposals or modifications to the adaptive management framework may require additional consultation in accordance with section 7 of the Act.

This letter fulfills the requirements of section 7 of the Act and further action is not required. If modifications are made to the project, if additional information involving potential effects to listed species becomes available, or if a new species is listed, reinitiation of consultation may be necessary. In this case, development and implementation of the adaptive management framework will require additional section 7 consultation as the implementation is the action that actually results in hunters entering the Addition.

We look forward to working with you to protect BICY for its conservation and historic value. If you have any questions, please contact Jane Tutton at 772-469-4235.

cc: electronic only

NPS/DSC, Denver, Colorado (Tracy Atkins)

NPS/RO, Atlanta, Georgia (Tim Pinion)

FWC, Tallahassee, Florida (Nick Wiley)

FWC, Gainesville, Florida (Don Coyner)

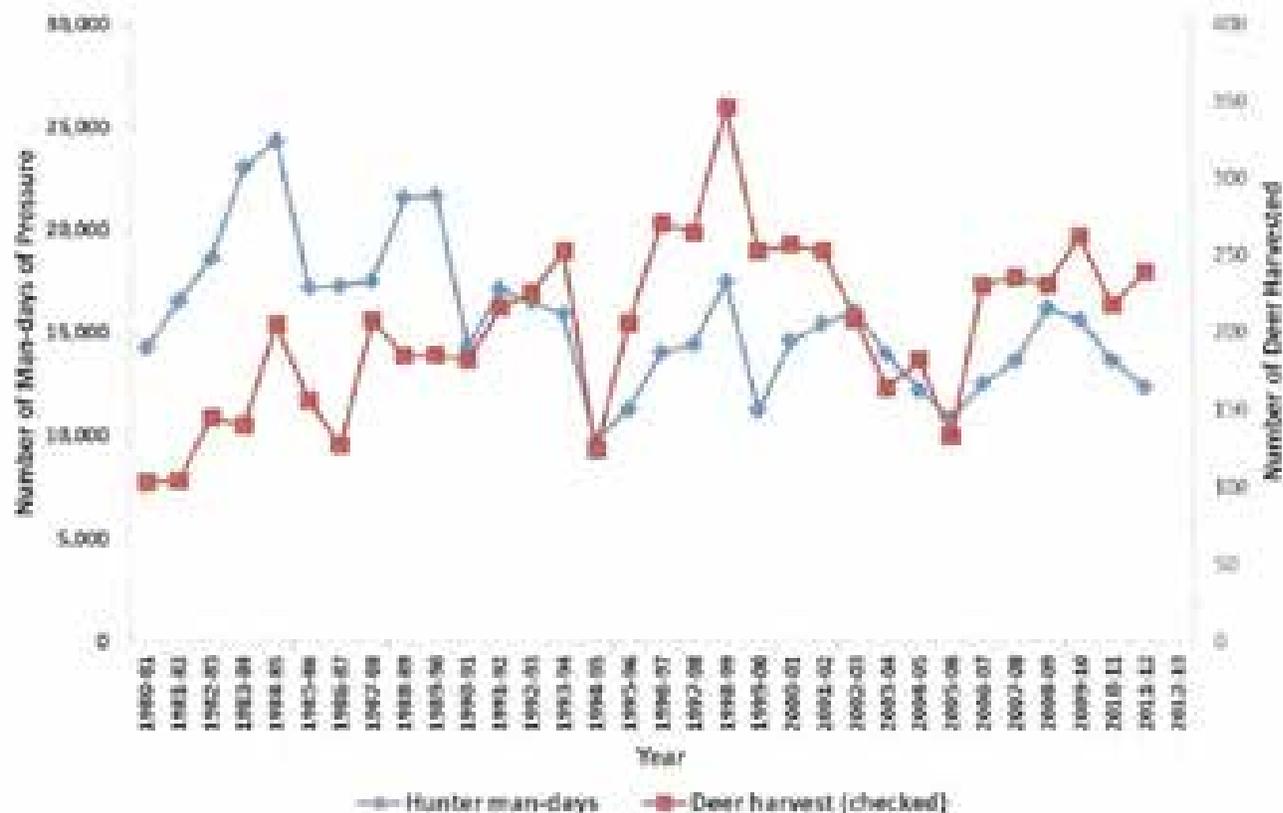
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Figure 1. Hunter pressure and deer harvest from Big Cypress Wildlife Management Area (Big Cypress National Preserve), 1980-2012.





United States Department of the Interior

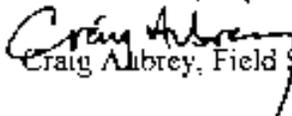


FISH AND WILDLIFE SERVICE
South Florida Ecological Services Office
1339 20th Street
Vero Beach, Florida 32960

April 23, 2014

Memorandum

To: Pedro Ramos, Superintendent, Big Cypress National Preserve

From:  Craig Aubrey, Field Supervisor, South Florida Ecological Services Office

Subject: Big Cypress National Preserve Final Draft Hunting Management Plan/Environmental Assessment Comments and Consultation, Service Consultation Code: 2012-I-0159

This memorandum supersedes the U.S. Fish and Wildlife Service's (Service) February 10, 2014, memorandum responding to the National Park Service's (NPS) November 2012 Big Cypress National Preserve Final Draft Hunting Management Plan/Environmental Assessment (Hunting Management Plan) and the NPS' March 7, 2012, request for informal consultation regarding the Hunting Management Plan. The Hunting Management Plan presents three alternatives for implementing hunting in both the original Big Cypress National Preserve (BICY) and the Addition Lands (Addition). This memorandum provides the Service's comments, in accordance with the National Environmental Policy Act of 1969 (42 U.S.C. 4321 *et seq.*) (NEPA), on the Hunting Management Plan and provides our informal section 7 consultation, in accordance with section 7 of the Endangered Species Act of 1973, as amended (16 U.S.C. 1531 *et seq.*) (Act), with the NPS on the preferred alternative for the Hunting Management Plan.

PROJECT DESCRIPTION

The General Management Plan and Final Environmental Impact Statement (GMP) (NPS 1991) for the original BICY directed the development of a hunting management plan. The Big Cypress National Preserve – Addition Draft GMP/Wilderness Study/Off-Road Vehicle Management Plan/Environmental Impact Statement (EIS) (NPS 2010) also stated a hunting management plan would be developed. The Hunting Management Plan represents the NPS' effort to comply with those directives.

The purpose of the Hunting Management Plan is to provide for hunting opportunities in the best interest of BICY resources and the public, meet NPS requirements, and comply with the enabling legislation, the NPS/FWC Cooperative Partnership Agreement and all other applicable requirements. The Hunting Management Plan will also direct decision making efforts regarding hunting activities, seasons, bag limits, etc., for both the original BICY and the Addition. The Hunting Management Plan presents three alternatives for consideration and review. The alternatives include:

- **Alternative 1 – No-Action – Apply Current Management to the Addition:** The NPS would continue to allow hunting in the original BICY and apply that same management program to the Addition. Existing regulations using the current communications, coordination, and regulation modification process between NPS and FWC would be implemented throughout the Preserve. Changes in hunting management in BICY would be subject to NEPA whenever changes are proposed. There would be no obligation to use the best science available in making those decisions, and the timeframes necessary to complete NEPA would not necessarily be compatible with the Florida Fish and Wildlife Conservation Commission (FWC's) process for approval of seasons, permits, and bag limits.
- **Alternative 2 – No Hunting in the Addition:** This alternative would allow hunting to continue in the original BICY with no public hunting in the Addition. Under this alternative, harvest data on deer and hog populations in the Addition would not be collected. In addition, decisions on hunting seasons, permits, and bag limits would be made in a manner similar to the current process, using the existing regulations and employing the current communications, coordination, and regulation modification process between NPS and FWC. There would be no adaptive management feedback loop to dictate changes in hunting and wildlife management in BICY. This Alternative represents the baseline condition for the purpose of section 7 consultation under the Act.
- **Alternative 3 – New Adaptive Management Strategy:** This alternative would incorporate the best, and most current, science into decision-making regarding hunting in BICY. It includes a requirement for an annual feedback loop to assess the data obtained from prior seasons and make changes to seasons, bag limits, etc. based on those data. The framework would be implemented in a cooperative manner with the NPS, FWC, and the Service working together to incorporate the variables necessary to ensure that hunting activities undertaken in BICY are compatible with the endangered Florida panther (*Puma = [Felis] concolor caryi*). Under this alternative, an adaptive management strategy would be utilized. Wildlife Management Area regulations would be reviewed at least annually through the decision-making framework established in the NPS/FWC Cooperative Partnership Agreement that would provide a: 1) process by which the elements of the hunting regulations could be modified, and 2) communications protocol to change regulations.

The NPS has selected Alternative 3 as the Environmentally Preferred Alternative (PA). Additional details on each alternative are included in the Hunting Management Plan (NPS 2013).

The Adaptive Management objectives for the PA were developed based on policies outlined in Section 4.4.3 of the NPS *Management Policies* (2006), which states:

"Where harvesting is allowed and subject to NPS control, the [NPS] will allow harvesting only when (1) the monitoring requirement contained in section 4.4.2 and the criteria in section 4.4.2.1 ... have been met, and (2) the [NPS] has determined that the harvesting will not unacceptably impact park resources or natural processes, including the natural distributions, densities, age-class distributions, and behavior of

- *harvested species*
- *native species that the harvested species use for any purpose, or*
- *native species that use the harvested species for any purpose”*

The adaptive management objectives for this Hunting Management Plan are:

The [NPS] will successfully maintain native plants and animals by:

- *Preserving and restoring the natural abundances, diversities, dynamics, distributions, habitats, and behaviors of native plant and animal populations and the communities and ecosystems in which they occur;*
- *Restoring native plant and animal populations in parks when they have been extirpated by past human-caused actions; and*
- *Minimizing human impacts on native plants, animals, populations, communities, and ecosystems, and the processes that sustain them.*

Based on these policies, under alternative 3, the NPS would conduct ecosystem management actions in the preserve to achieve the following objectives through the adaptive management process:

- A sustainable deer population in the Preserve, which ensures the effects of hunting in the Preserve are beneficial, discountable, or insignificant to the Florida panther population¹
- A feral hog population in the Preserve that balances the feral hog as an invasive species and ensures that the effects of hunting in the Preserve are beneficial, discountable, or insignificant to the Florida panther.
- A sustainable population for all other game species in the Preserve including wild turkey and small game species

The life of the PA is 15 to 20 years.

BACKGROUND

At NPS' request, the Service played a significant role in the development of this Hunting Management Plan. Service staff attended workshops and meetings designed to assist in NPS' choice of alternatives, including the selected PA. NPS employed the "choosing by advantage" process to identify variables and metrics that were essential in developing alternatives that met the criteria for a hunting management plan and to involve stakeholder agencies, including the FWC and the Service. NPS also held many public meetings to gather comments and suggestions from the general public and other stakeholders. Service staff attended some of these public meetings.

¹ Deer are the Florida panthers' most consistent prey item (Lund 1994, USFWS 2008). Janis and Clark (2002) determined a predation success rate of one kill per 5.24 days for female panthers and one kill per 7.7 days for male panthers, with an average of one kill per animal per 6.45 days for the general panther population. Other literature (Anderson and Lindzey 2003, Cooley et al. 2008, Murphy et al. 2011) shows similar predation success rates of one deer-sized prey per panther approximately every 6.7 to 7.6 days or on average one deer-sized prey per week (Roth and Murphy 2010).

The Service provided specific comments on the draft Hunting Management Plan throughout its development. We, therefore, include few specific comments in this memorandum.

THREATENED AND ENDANGERED SPECIES

The BICY consists of approximately 729,000 acres, including the original BICY and Addition, and is located in Collier and Monroe counties, Florida. Nine federally threatened or endangered species are present within, or use BICY. Species present include the Florida panther, endangered West Indian manatee (*Trichechus manatus*), endangered wood stork (*Mycteria americana*), endangered Everglade snail kite (*Rostrhamus sociabilis plumbeus*), endangered red-cockaded woodpecker (*Picoides borealis*), endangered Cape Sable seaside sparrow (*Ammodramus maritimus mirabilis*), threatened American crocodile (*Crocodylus acutus*), and threatened eastern indigo snake (*Drymarchon corais couperi*). Critical habitat for the West Indian manatee is present within BICY boundaries and the Florida bonneted bat (*Eumops floridanus*), which was recently listed as endangered, is present within the BICY boundaries (FR Vol 77, No. 193, October 4, 2012).

In a March 7, 2012, memorandum from NPS to the Service, the NPS stated the Hunting Management Plan would serve as its biological assessment for the PA, and determined the selection of the PA would have no effect on the West Indian manatee, Cape Sable seaside sparrow, Everglade snail kite, red-cockaded woodpecker, wood stork, American crocodile, and eastern indigo snake. The NPS also determined the selection of the PA was not likely to adversely affect the Florida panther. Subsequent to the final rule listing the Florida bonneted bat as endangered, the NPS contacted the Service on January 15, 2014, and provided a determination that implementation of the Hunting Management Plan was not likely to adversely affect the Florida bonneted bat.

ANALYSIS

The Service consulted on the EIS for the Addition GMP (NPS 2010). In that consultation, we analyzed ORV and other recreational uses in the Addition. The Service also consulted on the Final Recreational Off-road Vehicle Management Plan and Supplemental Environmental Impact Statement (ORV Plan) (NPS 2001) which addressed recreational uses of ORVs in the original BICY. The Hunting Management Plan proposes three alternatives for regulating hunting activities in BICY. The PA includes a provision for introducing public hunting in the Addition. Since ORV activities were addressed in prior consultations, the discussion and analysis of the PA will only address the potential effects of hunting activities, not the use of ORVs.

Each of the above-referenced documents provides conservation measures if manatees, wood storks, Everglade snail kites, Cape Sable seaside sparrows, red-cockaded woodpeckers, crocodiles, or eastern indigo snakes are located in proximity to trails or in areas to be burned or receive other management actions. Taken together, the conservation measures in the Hunting Management Plan, the Addition GMP, and the ORV Plan are sufficient to conserve those species and to ensure that activities undertaken pursuant to the Hunting Management Plan are not likely

to adversely affect the manatee, wood stork, Everglade snail kite, Cape Sable seaside sparrow, red-cockaded woodpecker, American crocodile, or eastern indigo snake. With respect to the eastern indigo snake, public pedestrian or non-motorized use of ORV trails and human occupation in the backcountry could alter eastern indigo snake behavior, but not to an extent that those effects would be measurable or result in death or injury of an individual. Effects that are not measurable are considered insignificant and discountable in the context of the Act. The development of an educational plan under the GMP/EIS is consistent with the standardized protection measures developed by the FWS' South Florida Field Office to minimize potential adverse effects to the eastern indigo snake resulting from land development projects as explained in the 1999 Multi-Species Recovery Plan (Service 1999). The most recent iteration of the Service's standardized protection measures for the eastern indigo snake is published on Service's website (<http://www.fws.gov/verobeach/Reptiles/PDFs/EasternIndigoSnakeConservationGuidelines.pdf>) These measures include the creation and distribution of educational materials regarding eastern indigo snake identification, biology and habitat requirements. Based on this information, the NPS has determined the implementation of the PA is not likely to adversely affect the above-listed species. The Service concurs and will not consider these species further in this document.

The Service listed the Florida bonneted bat (*Eumops floridanus*) as an endangered species during the final stages of development of this Hunting Management Plan. The Service is developing guidelines for consultations regarding this species. The Florida bonneted bat does occur on BICY, however, current locations for the bonneted bat are unknown. Historic records indicate bonneted bats were at least foraging near the Deep Lake Unit of BICY. Due to the limited range of acoustic sampling methods, this information does not mean the bonneted bat is absent in other areas of BICY.

After reviewing location information and potential activities that may take place during implementation of the Hunting Management Plan, the NPS believes "the Florida bonneted bat could be impacted by flushing and short-term displacement; however, their daytime roosting locations in tree cavities and nocturnal feeding behavior would limit their exposure to hunters. Additionally, since no construction or other permanent ground disturbing activities are associated with this project, impacts to the Florida bonneted bat would be negligible." The NPS stated, in a teleconference on January 22, 2014, that it plans on implementing protection measures for either manmade or natural roost sites that they currently implement for RCWs (e.g., buffer zones around known roost sites). Hunters are required to vacate BICY between 10 pm and 5 am, the times where bonneted bats would be most active. Hunters camping overnight in BICY will not be hunting between 10 pm and 5 am, thereby minimizing the potential for bat/hunter interactions. Those types of activities would also have to comply with guidance provided in the GMP. In addition, the NPS plans on incorporating educational materials and efforts to further minimize the potential for hunters to interact with bonneted bats. Based on these conservation measures and other information presented, the NPS has determined the implementation of the Hunting Management Plan is not likely to adversely affect the Florida bonneted bat. The Service concurs,

The remainder of this analysis is focused on the Florida panther, as that is the species most likely to be affected by the introduction of public hunting in the Addition. Public hunting is part of the baseline condition for the original BICY boundaries, so this analysis will focus on the Addition.

For the purposes of this consultation, the Service used the status of the Florida panther as described in the 2008 Recovery Plan (Service 2008) and updated in the August 13, 2012, Biological Opinion for the Off Road Vehicle (ORV) Trail Heads and U.S. Highway 41 Turn Lanes Project, Service Consultation Code 2012-I-0139. The final report for 2013 for the Florida panther has not been received, therefore, the 2012 data are the most recent available. The Service's goal for Florida panther conservation in south Florida is to locate, preserve, and restore lands containing sufficient area and appropriate land cover types to ensure the long-term survival of a population of 80 to 100 individuals (adults and subadults) south of the Caloosahatchee River. As of July 2012, 49 known radio-collared panthers (alive or status unknown) were documented within a 25-mile radius of the ORV Trailheads project from 6,664 telemetry observations. It is not known if all of these animals are currently alive. With the panther population in south Florida at or near carrying capacity, any territory vacated through death or removal of an individual from the wild, is likely to be filled by a dispersing subadult panther in a relatively short period of time. In 2010, Rancher's Supply (a consultant to the FWC) found evidence of 91 adult and juvenile panthers during their annual count of both radio-collared and uncollared panthers in south Florida south of the Caloosahatchee River (FWC 2011). In 2011, the same survey detected 90 panthers for the area surveyed (Rancher's Supply 2012). The area surveyed included BICY. For the purposes of the survey, only resident adults and juveniles accompanying their mother are included; kittens in a den and dispersing subadults are not included in the counts. The Rancher's Supply methodology leads to a conservative estimate of population numbers as it includes only adults and juveniles and does not capture dispersing subadults and kittens.

As stated earlier, the environmental baseline for this Hunting Management Plan is represented by Alternative 2. Hunting occurs in the original BICY but is prohibited in the Addition. The PA would maintain hunting in the original BICY, and expand hunting opportunities to the Addition. According to the schedule presented in the Hunting Management Plan (NPS 2013), hunting would occur on a maximum of 165 days per year for all included seasons. This analysis is focused on those hunting opportunities that may introduce an additional variable potentially affecting the Florida panther population in BICY. Future changes to the hunting seasons, bag limits, and other elements would be evaluated under the adaptive management strategy framework established through the Hunting Management Plan (NPS 2013).

The PA calls for the development of a "clear decision-making and communications framework between the NPS and FWC, in consultation with the [Service], to manage hunting in the entire Preserve. Wildlife Management Area regulations would be reviewed at least annually through the decision-making framework established in the NPS/FWC Cooperative Partnership Agreement" (NPS 2013). Furthermore, "decisions regarding modifications to the Hunting Management Plan, hunting regulations, law enforcement needs, threatened and endangered species, nonnative/exotic species, research and monitoring, and public access would be made by the NPS and FWC, in consultation with the [Service], through the adaptive management process"

(NPS 2013). The adaptive management process includes a feedback loop for validation of assumptions and facilitation of science-based decisions regarding changes to the hunting program in BICY. More specific information about the components incorporated into an adaptive management framework may be viewed in the description of the PA in the Hunting Management Plan (NPS 2013).

The PA includes a provision for population monitoring of major game species (i.e., deer and hog), as well as the Florida panther population. These data will be used under the science-based adaptive management framework in conjunction with traditional and innovative hunting management tools (e.g., quotas, season dates, bag limits, season limits) to provide for a sustainable prey base for the Florida panther. The adaptive management framework identifies the use of a 5-year average for both deer survey and hunter check-in data to determine if changes are needed to the hunting program to ensure the level of deer harvest does not result in a reduction of available prey for the Florida panther.

In performing the analysis of the development and implementation of the PA, the Service considered the introduction of public hunting in the Addition as the potential introduction of a competing predator for the Florida panther. Public hunting has never occurred on the Addition and hunting of any kind has been prohibited in the Addition for more than 20 years. The Big Cypress National Preserve Harvest and Pressure Summary for 2010 to 2011 (FWC 2011) reported hunter effort in the form of man days per deer harvested from the 2006-2007 season to the 2010-2011 season. For all forms of hunting, including archery, muzzle-loading, and general gun, the lowest level of effort required to harvest a buck was 36 hunter days. The greatest level of effort was 93 hunter days. The means of harvest for these levels of effort figures were muzzle-loading and archery, respectively. For the purpose of this analysis, the FWC provided an analysis of hunter pressure and deer harvest for BICY from 1980 to 2012 (Figure 1). This figure, while showing some trends between hunter pressure and harvest, does not show a significant relationship. It is likely hydrology and rainfall may play a role in this relationship that may clarify the relationship of hunter-days to harvest success; however, those data are not available at this time (Fletcher and McCarthy 2011).

Ackerman et al. (1982) predicted the deer kill rate for a resident male cougar was one deer every 8 to 11 days. Resident female kill rates were predicted to be one deer every 14 to 17 days. A female with three, 13-month old kittens had a predicted kill rate of one deer every 3.3 days. Janis and Clark (2002) determined a predation success rate of one kill per 5.24 days for female panthers and one kill per 7.7 days for male panthers, with an average of one kill per animal per 6.45 days for the general panther population. Other literature (Anderson and Lindzey 2003, Cooley et al. 2008, Murphy et al. 2011) shows similar predation success rates of one deer-sized prey per panther approximately every 6.7 to 7.6 days or on average one deer-sized prey per week (Ruth and Murphy 2010). These studies provide guidance regarding the energy needs of Florida panthers.

Land (1991) noted deer survival rates averaged 81.3 percent over a 4-year period between 1987 and 1991 in the Bear Island Unit of BICY. In this study, Land also found bobcats predated more deer than panthers. Bobcats alone, and bobcats and panthers together also killed more deer than were harvested by hunters. Land found the Bear Island population to be stable with female deer

replacing themselves before death. Land concluded hunting in Bear Island did not appear to have adverse impacts on the deer population as a whole. It should be noted an antlerless season existed at the time of this report. Antlerless harvest is now prohibited throughout BICY in areas that are open to hunting.

The NPS states that under the PA "adverse impacts to the Florida panther would be very similar to those of Alternative 1, with the exception of the impacts on the panther prey base." To investigate the interactions of predators and their prey, the Service reviewed literature related specifically to deer and large predators including mountain lions (*Puma concolor*), wolves (*Canis lupus*), and coyotes (*Canis latrans*). We found one particular reference, Ballard et al. (2001), which reviewed studies of deer population and predator relationships conducted throughout North America including mule deer and black-tailed deer (*Odocoileus hemionus*), as well as white-tailed deer. They found widely differing relationships between predators and their prey, mainly based on the relationship of the deer population to carrying capacity. While these studies were not performed in the same type of habitat present in BICY, we do believe they represent the best scientific and commercial data available.

Bleich and Taylor (1998) observed deer mortality for individually monitored deer in the Western Great Basin of California. For females, the primary cause of mortality was predation, comprising 83 percent of mortality. Human induced mortality and malnutrition comprised 4.8 and 12.2 percent, respectively. For the 11 male deer where cause of death was determinable, 36.4 percent were predated and 63.6 percent of mortalities were attributed to hunter harvest. The authors speculated mountain lion predation may regulate deer populations in ecosystems where severe drought or winters occur unpredictably. Drought and unusual weather conditions occur in South Florida in an unpredictable fashion, similar to the conditions of this study.

Compensatory mortality is a theory that states a total population's mortality remains unchanged at low to intermediate exploitation rates because natural mortality decreases in compensation for reduced density. Conversely, additive mortality represents an increase in mortality due to exploitation that results in an increase in total mortality (Allen et al. 1998). Bartmann et al. (1992) reviewed compensatory mortality in the Piceance Basin of Colorado and determined coyote predation was compensatory to starvation mortality in deer populations that were at carrying capacity. Coyote predation was not compensatory to starvation when deer populations were not at carrying capacity. In BICY, it is unlikely the deer population is at carrying capacity. Therefore, it is unlikely, if the same relationship exists, that panther-caused mortality is compensatory to starvation in our system.

Mackie et al. (1998) summarized research in Montana on mule and white-tailed deer. They found hunting to be the largest source of female deer mortality, with natural mortality representing 0 to 25 percent of mortalities observed. They did not believe hunter harvest or other sources of mortality were compensatory in this population. In BICY, NPS and the FWC are proposing to allow harvest of antlered individuals only; therefore, hunter harvest effects will be focused on the male portion of the population. White-tailed deer are polygynous, so one buck services several does, making loss of male deer less important to the population as a whole.

Both Hamlin and Mackie (1989) and Mackie et al. (1998) noted there is a potential for predation to influence deer populations, particularly in areas where there may be multiple predators. Hamlin and Mackie (1989) indicated that predation combined with other sources of mortality, including hunting, could influence low density deer populations and potentially keep them from increasing. This observation indicates introduction of hunter harvest should be undertaken in a precautionary manner to observe the potential effects on the deer populations in BICY, particularly the Addition. The adaptive management framework and communication structure will allow NPS and the FWC, in consultation with the Service, to monitor and respond to this type of scenario should it arise.

In a study conducted on Vancouver Island, British Columbia, Hatter (1988) noted wolf predation was the primary limiting factor in fawn recruitment in that population of black-tailed deer. Atkinson and Janz (1994) noted reduced wolf densities yielded increased fawn survival during the first 3 months of life, likely resulting in an increase in fawn recruitment. The increase in fawn survival was reversed when wolf control efforts ceased. In these studies, the predator appeared to be controlling fawn recruitment into the population. BICY is not a closed system as Vancouver Island is, making a similar type of study problematic. However, the potential exists that the panther population does have a significant effect on the deer population in BICY.

Nelson and Mech (1986a) observed wolf predation was responsible for twice the mortality attributed to hunting in white-tailed deer in Minnesota. Of 85 deer mortalities, 44 were attributed to wolf predation, 22 to hunting, 12 to probable wolf predation, and 7 to miscellaneous causes. Their study also indicated wolf predation was limiting yearling deer recruitment into the population in this area.

In a study in Montana, Dusek et al. (1992) determined mortality rates for 154 adult, female radio-collared deer in three different habitat types. Hunting was the largest source of mortality in all areas. Their study concluded hunting regulations in that area had little effect on natural mortality rates and was, therefore, additive to other forms of mortality. This study focused on female deer and the relationship of hunting to natural mortality levels. Antlerless deer harvest is not permitted in BICY. Therefore, hunter harvest, while being an additive source of mortality for bucks, will not be an additive source of mortality for does in BICY.

During a predator removal experiment in Texas, Beasome (1974) noted fawn mortality was 61 to 74 percent higher in areas without predator removal. Deer densities in the treatment areas increased from 15.6 to 19.6 deer per kilometer squared (km^2) while those in the untreated area declined from 8.0 to 7.8 deer per km^2 . This study also indicated predator densities had an effect on recruitment of deer into the breeding population. In this case, the removal of a large predator from the study area resulted in an increase in the prey population.

Using these and other case studies of predator/prey relationships, Ballard et al. (2001) concluded the deer population's relationship to carrying capacity was critical to the impacts of predation. Where deer populations appeared limited by predation, such populations were below forage carrying capacity. Conversely, deer populations at or near carrying capacity did not respond to predator removal experiments, indicating the effects of predation were compensatory in nature.

Other factors also influence fitness and fawn survival. Kunkel and Mech (1994) noted fawns from white-tailed does greater than 4 years of age in Minnesota were heavier and had better survival rates than fawns from younger does. A buck-only harvest strategy ensures older does are retained in the population. If this dynamic also occurs in BICY, an unbunted or buck-only harvest would allow does to reach a more advanced age with a potential for greater fawn survival.

Collectively, these studies appear to support the idea that panther population in south Florida, and in particular in BICY, may be driving the deer population - rather than the availability of deer as prey driving the panther population. Since the deer population in BICY occurs at low densities, most likely related to resource availability and hydrology, and predator mortality is additive in deer populations at low densities, panther predation could be having an effect on recruitment of fawns or yearlings into the population. Most of the published literature indicated hunter harvest did not appear to have an effect on fawn or yearling recruitment (Ballard 2008). This may be due to the fact panthers, and other large predators, are more efficient at finding and killing prey than humans. Assuming hunter harvest is not affecting recruitment of fawns or yearlings into the breeding population, then the proposed introduction of hunting into the Addition should not have a measurable effect on the deer population in this management unit. The adaptive management approach included in the PA will allow NPS to assess this assumption and validate it, by requiring continued monitoring of deer populations, hunter harvest, and panthers. These data will be incorporated into the feedback loop for assessing the effects of implementation of the PA on panther and deer populations in BICY.

The adaptive management process requires an action to be taken so data can be collected on the effects of the action and input into a feedback loop to assess if changes to the action are necessary to achieve the stated goals. For the Addition, 5 years of consistently collected deer survey data and hunter harvest data do not exist. Three years of consistently collected deer survey data do exist, so the 5 years of data desired should be reached in two additional seasons. Since the 5-year average cannot be used for the first two seasons, the NPS and FWC, in consultation with the Service, will be reviewing data at least annually to determine whether changes in quotas, bag limits, or seasons should be implemented.

Predator cycles follow prey cycles with a lag (Laundre et al. 2007). Laundre et al. (2007) noted a puma population in southern Idaho and northwestern Utah increased during an increase in mule deer abundance and declined four years after mule deer abundance declined. Therefore, annual review of deer data will allow the NPS and FWC, in consultation with the Service, to identify any change in prey population cycles before that change results in a change in the predator population. This frequency of review of the data should ensure potential adverse effects to the panther prey base are identified and addressed before those effects could result in measurable effects on the Florida panther.

The NPS and FWC have committed to following the protocols established in the Hunting Management Plan to ensure hunters harvest a reasonable number of bucks while the deer population is sustainable and the panther population is not affected. There will be no increase in the quotas for the Addition until sufficient data exist and analyses of those data support such a

change. As currently planned, this would not occur until a 5-year average for hunter check-in data can be established and additional access points or sustainable ORV trails were available in the Addition (NPS 2013).

Because the relationship between panthers, hunters, and prey will be complex and difficult to predict, two elements must be in place to ensure adverse effects to panthers do not occur. The first element is an initial hunting program that is conservative and prevents adverse effects to panthers. The PA provides that through limiting hunting quota permits to 30 per season, in the Addition, for the initial years of implementation of the Hunting Management Plan. The second element includes trigger points and feedback loops sufficient to conserve the panther population. The PA provides that through its inclusion of annual data reviews and the types and levels of change or unforeseen events that could result in changes to seasons or quota permits for the Addition.

CONCLUSION

The goal of the adaptive management framework is to ensure hunting activities do not alter the existing predator/prey relationship in BICY and, therefore, do not have a measurable effect on the Florida panther. As actions that result in harm or harassment of panthers would be measurable, and the analysis indicates these types of effects are not likely to occur, we anticipate harm or harassment of panthers would not occur with implementation of the PA. As stated earlier, the potential harassment effects of ORV use have been addressed in prior, formal consultations and, as such, are not included in this consultation. Based on this information, the NPS has determined effects to the Florida panther population would be expected to be minimized with the PA and result in long-term, negligible to minor, adverse, regional effects to the Florida panther (NPS 2013). As the NPS stated in the Hunting Management Plan, this level of effects equates to a determination that implementation of the PA "may affect, but is not likely to adversely affect" the Florida panther. Based on this information, the Service concurs.

This consultation applies to the development of the Hunting Management Plan and implementation of the PA. Any additional proposals or modifications to the adaptive management framework may require additional consultation in accordance with section 7 of the Act.

The Service supports selection of Alternative 3, of the PA, due to its inclusion of an adaptive management strategy in making decisions regarding hunting activities within BICY. We believe the PA offers the best use of science in decision-making and creates a cooperative atmosphere between NPS, the FWC, and the Service. Adaptive management focuses on learning and adapting, through partnerships of managers, scientists, and other stakeholders who learn together how to create and maintain sustainable resource systems (Williams et al., 2009). The adaptive management strategy and decision-making framework will ensure the best science is used to formulate decisions regarding hunting in BICY and the needs of threatened or endangered species like the Florida panther are adequately considered in those decisions.

This letter fulfills the requirements of section 7 of the Act and further action is not required. If modifications are made to the project, if additional information involving potential effects to listed species becomes available, or if a new species is listed, reinitiation of consultation may be necessary.

We look forward to working with you to protect BICY for its conservation and historic value. If you have any questions, please contact Jane Tutton at 772-469-4235.

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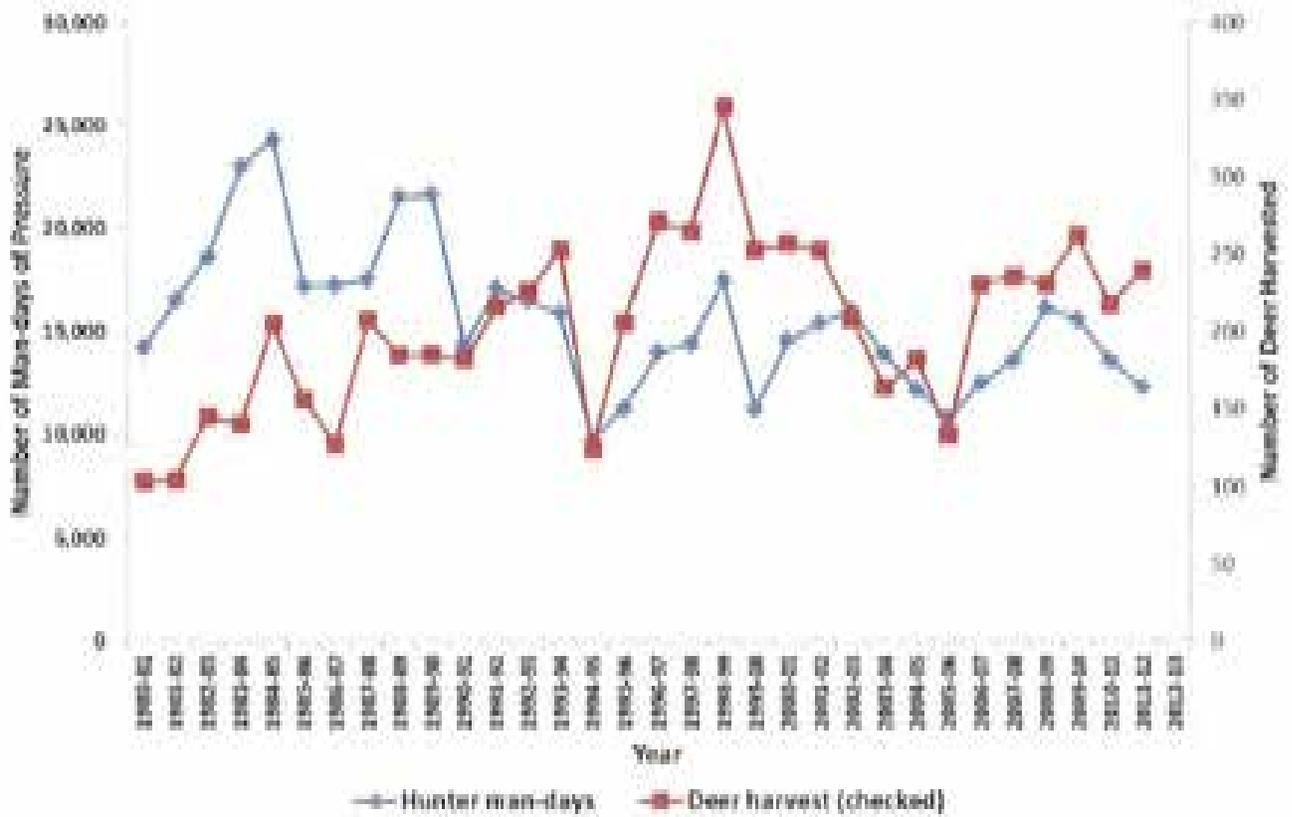
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Figure 1. Hunter pressure and deer harvest from Big Cypress Wildlife Management Area (Big Cypress National Preserve), 1980-2012.





As the nation's principal conservation agency, the Department of the Interior has responsibility for most of our nationally owned public lands and natural resources. This includes fostering sound use of our land and water resources; protecting our fish, wildlife, and biological diversity; preserving the environmental and cultural values of our national parks and historical places; and providing for the enjoyment of life through outdoor recreation. The department assesses our energy and mineral resources and works to ensure that their development is in the best interests of all our people by encouraging stewardship and citizen participation in their care. The department also has a major responsibility for American Indian reservation communities and for people who live in island territories under U.S. administration.