EVERGLADES HEADWATERS CONSERVATION PARTNERSHIP:

Final Environmental Assessment for the Establishment of the Everglades Headwaters National Wildlife Refuge and Conservation Area

Polk, Osceola, Okeechobee, and Highlands Counties, Florida

U.S. Department of the Interior
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I. PURPOSE AND NEED FOR ACTION

A. INTRODUCTION

The Kissimmee River Basin in south-central Florida is a unique and biologically diverse landscape that is home to rare and unique habitats and wildlife found nowhere else, and an agricultural way of life that is slowly disappearing. With Florida's population expected to double to 36 million from 2010 to 2060 (Zwick and Carr 2006) and many major development projects in the works, the time is now to conserve what is left. In 2010, the U.S. Fish and Wildlife Service (Service) helped initiate discussions to form the Greater Everglades Partnership Initiative with a broad array of partners to begin collaborating on the best and most cost-effective ways to achieve conservation across the landscape. This partnership approach is being advanced as a means to collaboratively conserve wildlife and habitats, to protect corridors linking established conservation lands, and to conserve a working cattle-ranching landscape and heritage. The Service will contribute and collaborate with a long list of current agencies and organizations already working to conserve this landscape by establishing a new national wildlife refuge and conservation area.

Widely recognized as a nationally important landscape and area of biological diversity, the Kissimmee River Basin in central Florida contains a network of existing conservation lands that includes state parks, state wildlife management areas, other state lands, agricultural working lands (e.g., with conservation easements), Avon Park Air Force Range, Disney Wilderness Preserve, and other conservation lands. The Everglades Headwaters National Wildlife Refuge (NWR) and Conservation Area will help connect these existing conservation lands, further protecting watersheds and wildlife corridors and enhancing the ecological functioning of the basin. The planning process for the Everglades Headwaters NWR and Conservation Area has helped with coordination and collaboration between the various management entities within the basin to support a more functional conservation landscape into the future, forming the Everglades Headwaters Conservation Partnership. Key conservation partners have a long tradition of working in the basin landscape, including the Natural Resource Conservation Service (NRCS), U.S. Department of Agriculture (USDA); Avon Park Air Force Range, U.S. Air Force; Florida Fish and Wildlife Conservation Commission (FWC); Florida Department of Agriculture and Consumer Services (FDACS); Florida Forest Service (FFS)(formerly Florida Division of Forestry); Florida Department of Environmental Protection (FDEP); Florida Division of State Lands; South Florida Water Management District (SFWMD); and The Nature Conservancy. As the Service endeavors to fill in some of the conservation gaps in the basin landscape, coordination and consultation with these partners will be keys in its development.. The Service also consults with Native American tribes to ensure timely and effective cooperation and collaboration. During the planning process, the Service contacted several tribes with interest in this landscape, including the Seminole Tribe of Florida, Miccosukee Tribe of Indians of Florida, Seminole Nation of Oklahoma, Muscogee (Creek) Nation, and Poarch Band of Creeks. Further, various state and local governmental agencies, organizations, businesses, and the public with interest in this landscape participated in the planning process.

The Service will protect and manage high pine (dry, longleaf pine savanna), Florida scrub, mesic temperate hammock, hydric and mesic pine flatwoods, dry prairie, cutthroat grass communities, wet prairies and freshwater marshes, and freshwater forested wetlands, as well as landscape connectivity in the basin in Polk, Osceola, Okeechobee, and Highlands Counties, Florida, through the establishment of the Everglades Headwaters NWR and Conservation Area. Recognizing the generations of responsible stewardship within this working rural landscape, this project seeks to work with willing landowners to secure a legacy of conservation lands for future generations to enjoy. This project aims to protect and

restore one of the great grassland and savanna landscapes of the Nation's prime areas of biological diversity. Further, the project aims to address threats from habitat fragmentation and urban development, altered ecological processes, and impacts from global climate change. Key species and habitats of concern for this area include Florida grasshopper sparrow, Everglade snail kite, Florida black bear, Audubon's crested caracara, red-cockaded woodpecker, and cutthroat wetlands.

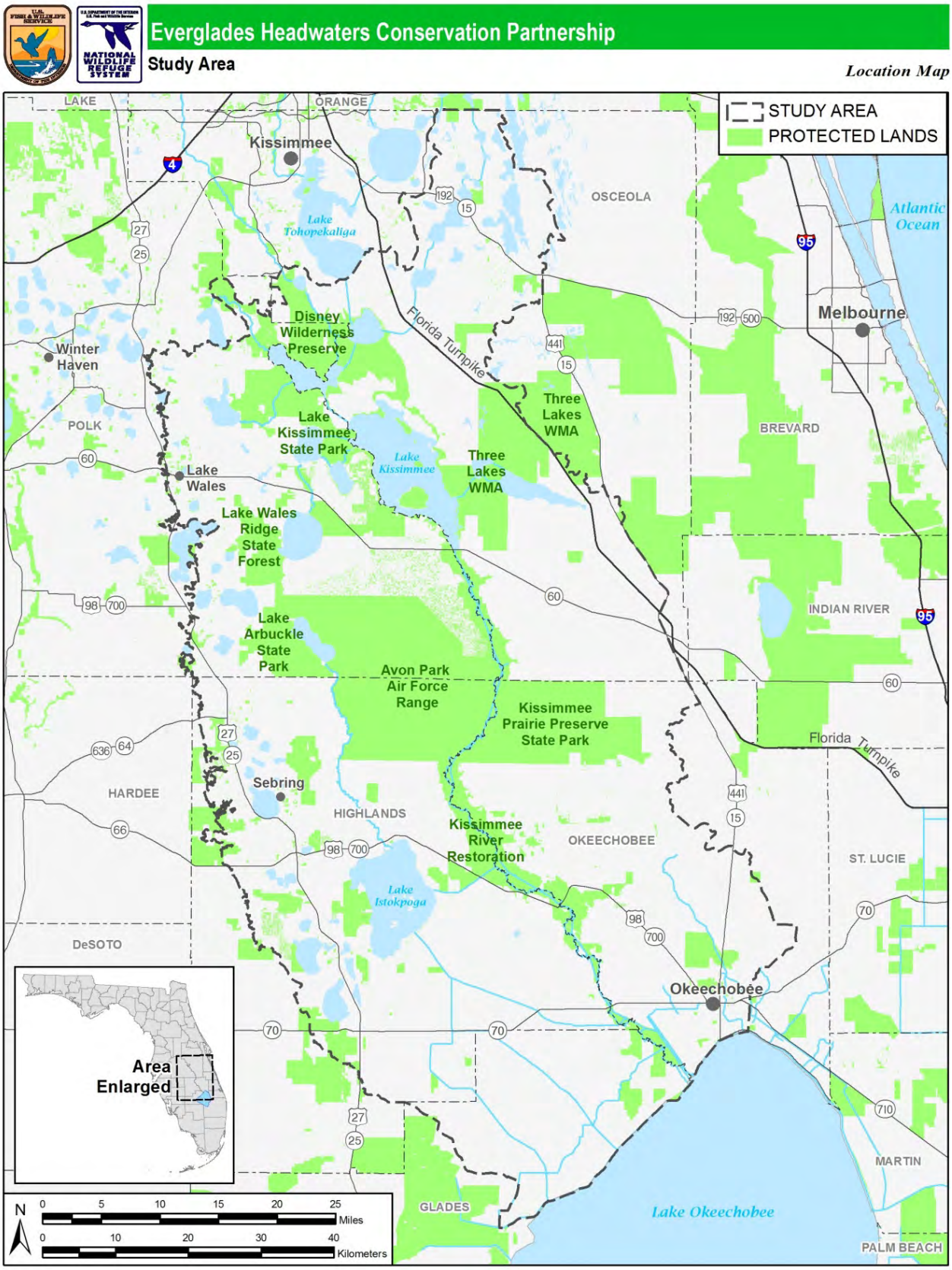
Working with the key partners, as well as with other state and local governments, tribes, businesses, non-governmental organizations, and the public, the Service examined the needs for wildlife habitat protection within the biologically important Kissimmee River Basin of Florida, an approximately 1.8 million-acre general area of interest (Study Area) (Figure 1). During the planning process, the Study Area was further refined to encompass a smaller, approximately 745,000-acre area referred to as a Conservation Partnership Area, wherein the Service would acquire less-than-fee-title interest in up to 100,000 acres and fee-title interest in up to 50,000 acres. It is important to note that the Service's policy is to work with willing landowners.

The Preferred Alternative identified in this Final Environmental Assessment (Final EA) and detailed in the Final Land Protection Plan (Final LPP) to establish the Everglades Headwaters NWR and Conservation Area is the Service's first major contribution in this partnership effort. The Greater Everglades Partnership Initiative, which includes other federal agencies, state agencies, and non-governmental organizations, seeks collaborative and cost-effective ways to conserve the land, water, and wildlife resources in central and south Florida, while honoring the legacy of stewardship handed down through generations of Floridians. To further conservation within the basin, three alternatives were analyzed: Alternative A (No Action Alternative, No Refuge and No Conservation Area), Alternative B (Refuge Only Approach), and Alternative C (Preferred Alternative, Conservation Partnership Approach). The Conservation Partnership Approach Alternative will acquire fee-title interest in up to 50,000 acres and up to 100,000 acres of less-than-fee-title interest to further conservation in this important landscape. This Final EA analyzed the anticipated impacts of the alternatives and found that Alternative C best met the purpose and need, vision, and outlined purposes and goals. The Final LPP presents the methods the Service, conservation partners, and interested landowners could use to accomplish wildlife and habitat goals and objectives for the Everglades Headwaters NWR and Conservation Area.

CONSERVATION PARTNERSHIP AREA OVERVIEW

During the development of this document, the original 1.8 million-acre Study Area was refined and reduced to an approximately 745,000-acre Conservation Partnership Area. It is within this Conservation Partnership Area that the Service will have the ability to work with willing landowners and partners on conservation programs and agreements. Within the approximately 745,000-acre Conservation Partnership Area, the Service is authorized to acquire up to 100,000 acres of less-than-fee-title interest from willing landowners. Once 100,000 acres are acquired for the Conservation Area, any proposal to expand beyond the authorized 100,000 acres would require an additional planning effort by the Service, including public involvement, in accordance with applicable laws and policies. Participation by landowners in the Conservation Area will be voluntary. Landowners within the Conservation Partnership Area will be under no obligation to sell interest in their properties to the Service. The Conservation Partnership Area will provide important opportunities for conservation, while at the same time maintaining the ability of the ranching community to persist. Landowners in the Conservation Partnership Area may voluntarily choose to participate and participating lands will remain in private ownership. Private landowners who elect to participate will continue to control activities on their lands. When lands are acquired, they will become part of a 100,000-acre Conservation Area, which will reflect the vision, purposes, and goals of the overall project, but will be

Figure 1. Location and boundary of the Study Area



subject to the terms and conditions of whatever easement, agreements, and/or other tool(s) that will be used for less-than-fee-title acquisition. Less-than-fee-title acquisitions (e.g., conservation easements) will be acquired in perpetuity.

REFUGE OVERVIEW

The project includes an approximately 130,000-acre Conservation Focal Area within which the Service will be authorized to acquire up to 50,000 acres by working with willing landowners. Landowners within the Conservation Focal Area will be under no obligation to sell their properties to the Service. The preferred method of protection within the Conservation Focal Area will be fee-title acquisitions, however, less-than-fee-title acquisition methods could also be employed. The Conservation Focal Area will allow the Service the flexibility to respond to changing landowner interest and acquisition opportunities within the landscape over time, but will limit the acquisition total to 50,000 acres. Any proposal to expand beyond the authorized 50,000 acres will require an additional planning effort by the Service, including public involvement, in accordance with applicable laws and policies.

Public uses to continue on the Everglades Headwaters NWR will be: hunting, fishing, environmental education and interpretation, wildlife observation and photography, research, camping, hiking, horseback riding, bicycling, and grazing. Potential public uses and activities supporting these uses will also be considered (depending on the specifics of a particular property acquired), such as all-terrain vehicle (ATV) use on designated roads and trails and primitive camping to support hunting and research activities, motorized and non-motorized boating to support fishing activities, and facilities to support any of the approved uses. The Service is committed to working with the FWC to facilitate public use activities, specifically hunting and fishing.

For lands that the Service will own in fee-title, habitat restoration and management will provide threatened, endangered, and resident wildlife with suitable habitat. Wetland drainage ditches may be filled to restore historic water storage capacity and provide breeding grounds for waterfowl. Prescribed fire will be used to remove excess vegetation and restore native plant communities. Invasive species will be controlled through manual, mechanical, and/or chemical means. Cultural and historical resources will be protected and interpretive programs and materials will allow the public to better understand and appreciate these important resources.

VISION

The vision for this project is:

> to conserve, protect, and manage one of the great grassland and savanna landscapes of eastern North America for current and future generations and to protect the important wildlife and habitats of the working rural landscape of central Florida's Kissimmee River Basin that is home to abundant fish and wildlife resources, is vital to restoration and protection of the water quality and quantity for the Everglades ecosystem, is resilient to the effects of global climate change, and offers outdoor recreational opportunities important to the region's economy.

NATIONAL WILDLIFE REFUGE SYSTEM OVERVIEW

The mission of the National Wildlife Refuge System is:

> "... to administer a national network of lands and waters for the conservation, management, and where appropriate, restoration of the fish, wildlife, and plant resources and their habitats within the United States for the benefit of present and future generations of Americans" (National Wildlife Refuge System Improvement Act of 1997).

National wildlife refuges provide important habitat for native plants and many species of mammals, birds, fish, insects, amphibians, and reptiles. They also play a vital role in conserving threatened and endangered species. Refuges offer a wide variety of wildlife-dependent recreational opportunities and many have visitor centers, wildlife trails, and environmental education programs. Nationwide, about 25 million visitors annually hunt, fish, observe, and photograph wildlife, or participate in educational and interpretive activities on refuges.

SCOPE OF THE ENVIRONMENTAL ASSESSMENT

The scope of this Final EA is limited to the acquisition, in fee-title and in less-than-fee-title, of lands for the establishment of the Everglades Headwaters NWR and Conservation Area. Information and analysis are provided for the initial Study Area. This Final EA is not intended to cover the development and/or implementation of detailed, specific programs for the administration and management of those lands. A Conceptual Management Plan (Appendix A, Final LPP) and Interim Compatibility Determinations (Appendix B, Final LPP) are included to provide general outlines on how the lands will be managed. The appendices are provided as general information for the public in its review of the project. The Service will develop a comprehensive conservation plan, a 15-year management plan, and needed step-down management plans (e.g., a step-down plan addressing hunting will likely be developed within 3 years of acquisition of property sufficient to support hunting), for the Everglades Headwaters NWR and Conservation Area. These plans will be developed and reviewed in accordance with Department of Interior requirements of the National Environmental Policy Act.

B. PURPOSE AND NEED

The land, water, and wildlife resources of the Kissimmee River Basin landscape are at risk, especially from development pressures. Florida's population is expected to double from 2010 to 2060 to 36 million, while the 5-county area of the Study Area is expected to more than double in that same time to nearly 2.1 million (Zwick and Carr 2006). Further, many developments of regional impact are planned for the Study Area. Therefore, a conservation effort focused on creating and connecting a matrix of natural lands and critical wildlife corridors is planned. This Final EA presents a plan for protection of additional wildlife habitat in Polk, Osceola, Okeechobee, and Highlands Counties, through the establishment of the Everglades Headwaters NWR and Conservation Area.

The Conservation Partnership Area and Conservation Focal Area are administrative lines delineating areas in which the Service may work with partners and consider negotiations with willing owners for acquisition of an interest in land. Lands within the Conservation Partnership Area do not become part of the Conservation Area and lands within the Conservation Focal Area do not become part of the Everglades Headwaters NWR unless and until a legal interest is acquired through a management agreement, easement, lease, donation, or purchase. Lands within the Conservation Partnership Area and Conservation Focal Area are not subject to any refuge regulations or jurisdiction unless and until an interest is acquired. Land interests are acquired from willing sellers only. Any landowner that is within an approved acquisition boundary, even though the surrounding parcels may have been

purchased by the Service, retains all the rights, privileges, and responsibilities of private land ownership. This includes, but is not limited to, the right to access, hunting, vehicle use, control of trespass; the right to sell the property to any other party; and the responsibility to pay local real estate or property taxes. It is the Service's policy to work with willing sellers to acquire fee-title-interest or less-than-fee-title interest in property in perpetuity. (Additional information regarding the Service's land acquisition policy is provided in the Final LPP)

Within approved acquisition boundaries, the Service will be able to enter into negotiations for the protection of environmentally sensitive lands.

The purpose of the Everglades Headwaters NWR and Conservation Area is to contribute to the mission and goals of the National Wildlife Refuge System (Refuge System) through the listed actions.

- Conducting landscape-scale strategic habitat conservation necessary to conserve the important resources found within the Kissimmee Prairie region through partnerships and responsible stewardship and with the support of the ranching and agricultural interests of this working rural landscape.
- Protecting and enhancing habitats for federal trust species and species of management concern, with special emphasis on species listed under the federal Endangered Species Act (ESA), along with the protection of state-listed species; biological diversity; and prairie, scrub, sandhill, flatwoods, and various wetlands habitats.
- Protecting the headwaters, groundwater recharge, and watershed of the Kissimmee Chain of Lakes, Kissimmee River, and Lake Okeechobee region, which will help improve water quantity and quality in the Everglades watershed.
- Protecting and enhancing habitat corridors and implementing other wildlife adaptation strategies to help buffer the impacts of global climate change.
- Providing opportunities for hunting, fishing, wildlife observation and photography, and environmental education and interpretation, while promoting activities that complement the purposes of the Everglades Headwaters NWR and other protected lands in the region.
- Protecting historic properties; facilitating archaeological and historic investigations regarding human occupation, land use, and paleoecology; and interpreting the region's history and culture.

There is a need for increased resource protection in this part of Florida, as various growing threats are likely to continue to put natural resources at risk. These threats include, but are not limited to the listed items.

- *Habitat Loss and Fragmentation Resulting from Urban Development and Other Land Uses*

  Habitat loss continues to negatively impact Florida's wildlife, including numerous federal- and state-listed species (FWC 2010). Urban and suburban development and other wholesale land clearing are by far the major threats to this area. Existing roadways traverse wildlife corridors and are a leading mortality factor for wide-ranging species such as the Florida panther and Florida black bear. The development and expansion of roadways will create further barriers to wildlife movements. Further, habitat fragmentation and urban development also help to spread invasive species, negatively impacting native wildlife and habitats. The project will protect key habitat and habitat connections in an effort to address the threats associated with habitat fragmentation and urban development.

- *Altered Ecological Processes*

  The alteration of hydrology within the Everglades ecosystem is one of the most devastating and damaging threats facing the Everglades headwaters. Stream channelization (U.S. Army Corps of Engineers 1991, U.S. Army Corps of Engineers and the South Florida Water Management District 1999), wetland modification and drainage (Dahl 2005), increasing water withdrawal (Natural Resources Defense Council 2010), and sediment and nutrient loading all serve to negatively impact water quality, quantity, and delivery throughout the ecosystem. Many of the habitat types found throughout the Study Area are dependent on frequent low-intensity lightning-caused fires. Fire suppression has led to changes in plant communities, creating habitat unsuitable for the threatened and endangered plants and animals that require a frequent fire regime (Pyne 1982, Abrahamson and Abrahamson 1996). Altered ecological processes also support the spread of invasive species, negatively impacting native wildlife and habitats. The project will restore or mimic natural processes to minimize current and historic land-use impacts.

- *Impacts from Global Climate Change*

  This project has been developed in part to address conservation needs of wildlife in southern Florida that may be impacted by the effects of global climate change (Florida Oceans and Coastal Council 2010). As sea levels rise, temperatures increase, and precipitation patterns are altered, lands in the Everglades Headwaters NWR and Conservation Area will assist the survival and management of many of Florida's rare, threatened, and endangered species. Further, impacts from climate change will likely increase the spread of invasive species, negatively impacting native wildlife and habitats. The project will address some of the anticipated impacts associated with climate change, increasing resiliency of the landscape and assisting in wildlife response to climate change and associated stressors.

C. BACKGROUND

The Everglades Headwaters NWR and Conservation Area are located in Polk, Osceola, Okeechobee, and Highlands Counties in central Florida. This area is one of the great grassland and savanna landscapes in eastern North America. Still largely rural, the approximately 1.8 million-acre Study Area is a mosaic of rolling sand hills, lakes and streams, seasonally wet grasslands, longleaf pine savannas, and cattle ranches that sustains one of the most important assemblages of imperiled plant and vertebrate wildlife in the southeast and a large portion of the unprotected natural habitat remaining in peninsular Florida. This project will help conserve a rural working landscape; protect and restore habitat; protect, improve, and restore water quality and wetlands; and connect a matrix of existing conservation lands and important wildlife corridors.

Within this landscape, the Service will focus conservation efforts on protecting important habitats such as sandhill and scrub, cutthroat grass communities, pine flatwoods, dry prairie, and a multitude of freshwater wetlands. Conservation of these habitats will provide increased opportunity for species such as Florida grasshopper sparrow, Everglade snail kite, and Audubon's crested caracara to persist into the future. Overall, agricultural and residential development represents over half of the Study Area or roughly 948,000 acres. Of the remaining lands, the native communities that make up the greatest extent are freshwater marsh (7.4 percent), lakes (7.2 percent), dry prairie (9.5 percent), and wet prairie (4.4 percent). Although Florida scrub is a very important natural community, it is barely represented with only 2 percent of the overall Study Area acreage.

D. ACTION

The Service will acquire, protect, and manage important natural resources of this landscape through fee-title purchases, leases, donations, conservation easements, mitigation and conservation banks, and/or cooperative agreements from willing sellers. All lands and waters acquired will be managed by the Service as the Everglades Headwaters NWR and Conservation Area. The overall objectives of the Everglades Headwaters NWR and Conservation Area will be to provide connectivity of habitat between existing natural areas and opportunities for species to adapt to the impacts from global climate change; restore wetland and upland habitats for a wide range of imperiled species; and provide opportunities for wildlife-dependent outdoor interpretation, education, and recreation.

It is anticipated that funding for this project will be provided primarily through the Land and Water Conservation Fund and the North American Wetlands Conservation Act. The authority for the use of these funds for land acquisition is the National Wildlife Refuge System Administration Act; Endangered Species Act of 1973; Emergency Wetlands Resources Act of 1986; The Migratory Bird Conservation Act of 1929; Fish and Wildlife Act of 1956; and Refuge Recreation Act (16 U.S.C. 460k-460k-4), as amended.

E. COORDINATION AND CONSULTATION

During the planning process, the Service coordinated and consulted with a mix of governmental entities with interest in the greater Everglades landscape. Several federal and state agencies serve as key partners in this landscape, including NRCS, USDA; Avon Park Air Force Range, U.S. Air Force; FWC; FDACS; FFS, FDACS; FDEP; Florida Division of State Lands; and SFWMD. These partners were keys to the development of this project. Native American tribes are also important partners in the greater Everglades landscape. The Service works with the tribes to ensure timely and effective cooperation and collaboration. During the planning for this project, the Service initiated government-to-government consultation with federally recognized tribes that have interest in this landscape: Seminole Tribe of Florida; Miccosukee Tribe of Indians of Florida; Seminole Nation of Oklahoma; Muscogee (Creek) Nation; and Poarch Band of Creeks. The Service met with the Seminole Tribe of Florida during the planning process to develop an understanding of its concerns, including those related to cultural resources and water rights. And, the Muscogee (Creek) Nation and the Miccosukee Tribe of Indians of Florida also expressed interest in the project. The Service is in formal consultation with both the Seminole Tribe of Florida and the Miccosukee Tribe of Indians of Florida on this project.

F. PUBLIC PARTICIPATION

PUBLIC SCOPING

Public scoping helped the Service identify issues and concerns, potential alternatives, and scientific information regarding the Study Area of the project. Preliminary scoping began on August 19, 2010, with a coordination meeting with FWC, which was followed on August 26, 2010, by an America's Great Outdoors event in Kenansville, Florida. This was followed by preliminary informational presentations to the Arthur R. Marshall Foundation, Pelican Island Audubon Society, National Wildlife Refuge Association's Beyond the Boundaries, Trust for Public Land, Summerplace Garden Club, Osceola County Natural Resource Department, FWC, South Florida Water Management District Water Resources Advisory Commission, area ranchers, Osceola County Board of County Commissioners, and Florida Agriculture Commissioner Putnam. A preliminary meeting with the governmental partners was held on November 10, 2010, in Altamonte Springs, Florida, including the Service, NRCS of the USDA, FWC, FDEP, FFS, and SFWMD. The Nature Conservancy and the National Wildlife Refuge Association also attended this November meeting, acting as consultants for the Service.

Secretary of Interior Ken Salazar announced the project at the Everglades Coalition meeting on January 7, 2011. A White House blog appeared the same day to announce the project. The Service created a webpage for the project and posted it on January 10, 2011 (http://www.fws.gov/southeast/greatereverglades). This website has been frequently updated throughout the planning process to help provide information to interested parties.

A notice of intent appeared in the *Federal Register* on January 12, 2011 (76 FR 2132), announcing the intent of the Service to develop a Land Protection Plan and associated NEPA documents for the Everglades Headwaters NWR and Conservation Area in the Kissimmee Valley area and opening the public scoping period for the project. Public scoping comments were requested to be received by February 28, 2011. By mid-February, this deadline was extended to March 31, 2011.

Information about the project was sent to Florida national wildlife refuges' friends groups (1/12/2011); a press release was sent out to local media to announce the public scoping meetings (1/19-20/2011); public notice was e-mailed to over 500 individuals, organizations, and government agency officials on the mailing list for the proposal (1/19-20/2011); a press release was sent to about 2,400 media outlets in Florida to announce the public scoping meetings (1/19-20/2011); over 650 printed flyers were mailed to individuals, organizations, and government agency officials on the mailing list for the project (1/20-21/2011); the Lake Wales Ridge Ecosystem Working Group forwarded a copy of the press release to its members (1/20-21/2011); a follow-up press release was sent to about 2,400 media outlets in Florida to announce the remaining public scoping meetings (2/7/2011); notice of the extension of the public scoping comment period was sent to over 880 e-mail addresses and 500 mailing addresses of interested individuals, organizations, and government agency officials on the mailing list for the project (2/17/2011); and a follow-up press release was sent to about 2,400 media outlets in Florida to announce the public scoping comment period extension (2/17/2011). Informational presentations and discussions about the project also continued, including to the Lake Wales Ridge Ecosystem Working Group (1/10/2011), Archie Carr Working Group (1/13/2011), Osceola County (2/11/2011), Everglades Day (2/12/2011), River Ranch Property Owners Association and local airboat groups (2/18/2011), Okeechobee Economic Council (3/2/2011), South Florida Water Management District Water Resources Advisory Council (3/3/2011), Osceola County Cattleman's Association (3/8/2011), University of Florida/Institute of Food and Agricultural Sciences Working Across Boundaries Workshop (3/23/2011), Association of County Commissioners (3/25/2011), Conservation Blueprint Pilot Project (3/29/2011), Florida Today Editorial Board (4/5/2011), Palm Beach Post Editorial Board (4/7/2011), Archbold Biological Station (4/14/2011), Seminole Tribe of Florida (5/13/2011), Martin County Conservation Alliance (5/18/2011), National Wildlife Refuge Association Board of Directors (5/20/2011), Florida Cattleman's Association (6/1/2011), Environmental Committee of the Florida Cattleman's Association (6/21/2011), Governor's Cabinet (6/22/2011), Florida Department of Environmental Protection and Florida Department of Agriculture and Consumer Services (6/22/2011), Marshall Foundation (7/1/2011), Natural Resources Conservation Service (7/18/2011), Osceola County (7/19/2011), United Waterfowlers (8/25/2011), Ducks Unlimited (8/26/2011), and Environmental Committee of the Florida Cattleman's Association (9/1/2011).

Articles and information about the project appeared in print, online, and radio media, including Osceola News Gazette (1/5/2011, 1/6/2011), Sun Sentinel (1/7/2011), Miami Herald (1/7/2011), Reuters (1/7/2011), Environmental News Service (1/7/2011), SoutheastAgnet.com (1/8/2011), GardenNews.biz (1/9/2011), SustainableBusiness.com (1/10/2011), Habi-Chat (January 2011), Ft. Myers News Press (1/18/2011), National Public Radio (1/19/2011, 3/7/2011, 3/17/2011), WCTV.com Tallahassee Eyewitness News Channel 6 (1/19/2011), Okeechobee News (1/26/2011, 2/20/2011), Highlands Today (1/29/2011, 2/6/2011), Palm Beach Post (1/29/2011, 1/30/2011), Vero Beach Press Journal (2/5/2011, 2/7/2011, 2/10/2011), Sebring News Sun (2/6/2011, 2/20/2011), WPTV.com West Palm Beach News Channel 5

(2/11/2011), St. Petersburg Times (2/19/2011, 3/13/2011), Sebring News Sun (2/20/2011), Florida Today (2/23/2011), Gator Tales (Spring 2011), and TCPalm.com (6/23/2011).

Public scoping comments were submitted verbally and in writing at public scoping meetings and by mail, fax, and email. Four public scoping meetings were conducted in and around the Study Area: January 26, 2011 at the Kissimmee Civic Center, Kissimmee, Florida, with about 200 attendees; February 4, 2011 at the Sebring Civic Center, Sebring, Florida, with about 325 attendees; February 9, 2011 at Okeechobee High School, Okeechobee, Florida, with about 665 attendees; and February 10, 2011 at the Freshman Learning Center of Vero Beach High School, Vero Beach, Florida, with about 580 attendees. Both verbal and written comments were submitted at the public scoping meetings. Further, over 38,000 written comments were submitted to the Service during the public scoping period in person and by mail, fax, and e-mail.

The Service met with the Seminole Tribe of Florida during this planning process to develop an understanding of its concerns, including those related to cultural resources. The Seminole Tribe of Florida administers a robust tribal government, operates various tourist and other enterprises, and supports the local economy and employment base. The Study Area for the Everglades Headwaters NWR and Conservation Area encompasses numerous sites of interest to the Seminole Tribe of Florida. Sites that might be encountered within the 50,000-acre refuge include green corn dance sites, villages, camps, cemeteries, and historic landscapes, such as the Okeechobee Battlefield. The Seminole Tribe of Florida also expressed interest in assuring that the project would not impact any preexisting tribal water rights. Further, the Brighton Reservation of the Seminole Tribe of Florida is located in Glades County, adjacent to the Study Area. The Tribal Historic Preservation Officer for the Muscogee (Creek) Nation requested copies of the Draft LPP and the Draft EA when available for review. And, the Miccosukee Tribe expressed interest in the project, especially in relation to burial sites and tribal cattle grazing lands in Highlands County.

Public scoping comments were categorized into five main categories (i.e., Wildlife and Habitat, Resource Protection, Recreation, Administration, and General), with appropriate subcategories, including those listed.

- Wildlife and Habitat
    - General
    - Florida Panther
    - Water Quality and Quantity
    - Wildlife Corridors and Migration
    - Ecosystem Services
- Resource Protection
    - Land Acquisition/Protection in General
    - Eminent Domain
    - River Ranch Concerns
    - Less-than-Fee-title Acquisition
    - Contaminants – Evaluation of Properties for Inclusion
    - Specific Properties/Sites
    - Specific Boundary for the Proposed Refuge and Conservation Area
    - Cultural Resources/History
    - Wilderness
    - Florida Panther NWR
    - Proposed Fisheating Creek NWR

- Recreation
    - General
    - Hunting
    - Fishing
    - Wildlife Observation and Photography
    - Airboat Use
    - ATV/ORV Use
    - Camping
    - Public Use on The Nature Conservancy's Lands
    - Access
- Administration
    - General
    - Funding/Budget
    - Property Taxes/Refuge Revenue Sharing Payment
    - Management Plan
    - Partnerships/Outreach
- General
    - Economy
    - Greater Everglades Partnership Initiative
    - Development Patterns/Pressure
    - Other Examples of Federal Management
    - Planning Process
    - General

PUBLIC REVIEW AND COMMENT

In advance of the release of the Draft LPP and Draft EA, the Service e-mailed and mailed postcards to nearly 1,400 interested parties to announce the upcoming availability of the documents for public review and comment and to allow interested parties to request CD and/or paper copies of the documents. Following release of the Draft LPP and Draft EA, the Service held a public review and comment period during which public comments were requested on the documents. A notice of availability was published in the Reading Room of the *Federal Register* on September 7, 2011 and on September 8, 2011 in the *Federal Register* (76 FR 55699) to help announce the public review and comment period for the proposed Everglades Headwaters NWR and Conservation Area. Information was also posted on the project's website (http://www.fws.gov/southeast/evergladesheadwaters), notices were mailed and e-mailed to the mailing list, and articles were published in various media. Paper and/or CD copies of the Draft LPP and Draft EA were mailed to requesting parties. The documents were also posted on the project's website. A notice of comment extension was posted in the Reading Room of the *Federal Register* at 8:45 a.m. on October 24, 2011 and published in the *Federal Register* (76 FR 66321) on October 26, 2011, to extend the comment period to November 25, 2011. Press releases were sent to over 2,100 media outlets in Florida on 9/7/2011, 9/20/2011, and 10/24/2011.

Beyond *Federal Register* notices and web postings by the Service, public outreach activities included two open house and public hearing events, mailings and e-mailings to the mailing list, ongoing informational presentations, and media coverage. The Service held two public meetings: September 24, 2011 at the Theatre for the Performing Arts at the South Florida Community College in Avon Park, FL (with 68 attendees) and October 1, 2011 at Exhibit Hall A at Osceola Heritage Park in Kissimmee, FL (with 54 attendees). The first hour was an open house event that allowed attendees the opportunity to ask questions and talk with Service staff about the proposal in an informal atmosphere. The open house portion was followed by a public hearing where the

Service presented the proposal and formal public comments were recorded. The Service also mailed notices and requested copies of the documents before September 8, 2011 and e-mailed notices to the mailing list on September 8, 2011 to nearly 1,500 interested parties. On October 24, 2011, the Service also mailed and e-mailed nearly 1,500 notices of the extension of the comment deadline from October 24, 2011 to November 25, 2011. The Service also gave 13 informational presentations to requesting groups during the public review and comment period, including to: Highlands County Board of County Commissioners (9/13/2011), South Florida Water Management District Water Resources Advisory Council (9/19/2011), Polk County Board of County Commissioners (9/27/2011), Sportsman's Association leadership group (10/5/2011), Osceola County Board of County Commissioners (10/10/2011), Peninsular Florida Landscape Conservation Cooperative (10/12/2011), Central Florida Regional Planning Council (10/12/2011), Okeechobee Board of County Commissioners (10/13/2011), Archie Carr Working Group (10/13/2011), Cooperative Alliance for Refuge Enhancement (10/25-26/2011), FWC (11/2/2011) University of Central Florida staff (11/14/2011), and Cooperative Conservation Blueprint (11/15/2011). During the public review and comment period, articles appeared in and on a variety of print, online, and radio media: SoutheastAgNET.com (9/7/2011, 9/20/2011, 9/27/2011), UPI.com (9/7/2011), AudubonofFloridaNews.org (9/7/2011), CFNews13.com (9/7/2011) and on Cable Central Florida News 13 (9/7-8/2011), ABC News Channel 9 (9/7/2011), NBC News Channel 2 (9/7/2011), St. Petersburg Times (9/8/2011), Highlands Today (9/8/2011), Miami Herald (9/8/2011, 11/3/2011, 11/7/2011), Lakeland Ledger (9/8/2011), News Chief (9/8/2011), Orlando Sentinel (9/5/2011, 9/7/2011), Tampa Bay Water Atlas (tampabay.wateratlas.usf.edu) (9/7/2011), National Wildlife Refuge Association (refugeassociation.org, 9/7/2011), National Public Radio (9/12/2011, 10/4/2011, 10/5/2011, 11/8/2011), FLFFC.org (Florida Freshwater Fishing Coalition, 9/9/2011), OrvisNews.com (9/12/2011), Tampa Tribune (9/24/2011), News Sun (9/30/2011, 10/1/2011), Marsh Rider: The Voice of Airboating (October/November edition), News Press Tribune (TCPalm.com, 10/12/2011), Treasure Coast Newspapers (10/25/2011), Politico.com (11/1/2011), NaplesNews.com (11/3/2011), Waterworld.com (11/3/2011), Sarasota.WaterAtlas.org (11/3/2011), Sun-Sentinel.com (11/3/2011, 11/10/2011, 11/19/2011), and SummitCountyVoice.com (11/21/2011).

The Service received over 2,300 comments during the public review and comment period (see Appendix G for a summary of the substantive comments and the Service's responses). During the public review and comment period, the Seminole Tribe expressed concerns regarding: water rights, cultural resources, management plans, grazing rights, and vegetation and fire management/green corn dance. The Miccosukee Tribe expressed concerns regarding future refuge management activities inundating (e.g., through major hydrological projects) cultural resource sites, especially burial sites. The Service continues to consult with both the Seminole Tribe of Florida and the Miccosukee Tribe of Indians of Florida regarding concerns related to the refuge and conservation area.

Comments submitted during the public review and comment period are summarized under five main categories and various subcategories, as listed. (The State Clearinghouse packet and the Letter from the Seminole Tribe of Florida are also included in Appendix G in their entirety.)

- Wildlife and Habitat
    - General
    - Everglades Restoration
    - Water Quality and Quantity
    - Wetlands
    - Florida Panther
    - Wildlife Corridors and Migration
    - Research

    - Monitoring and Enforcement
    - Habitat Loss
    - Climate Change and Sea Level Rise
- Resource Protection
    - Land Stewardship
    - Land Acquisition/Protection in General
    - State Sovereign Lands
    - Eminent Domain
    - Less-than-Fee-title Acquisition
    - Boundary for the Proposed Refuge and Conservation Area
    - Greater Everglades Strategic Habitat Conservation Initiative
    - Cultural Resources/History
    - Wilderness
- Recreation
    - General
    - Hunting
    - Fishing
    - Education
    - Airboat Use
    - Access
- Administration
    - Funding/Budget
    - Property Taxes/Refuge Revenue Sharing Payment
    - Management
    - Management Plans
    - Facilities
    - Partnerships
    - Utilities
- General
    - Water Rights of the Seminole Tribe of Florida
    - Grazing Rights of Seminole Tribe Members
    - Economy and Socio-economic Benefits
    - Ecosystem Services
    - Future Generations
    - Public Health
    - Development Patterns/Pressure
    - Vision and Goals
    - Alternatives
    - Planning Process
    - Florida Panther NWR
    - General
    - Appendices
    - Typographical Corrections

G. SPECIAL CONSIDERATIONS

The Service initially reviewed the designation of Wilderness on May 11, 2011, finding that no areas met the criteria or intent of the Wilderness Act. The Study Area for the Everglades Headwaters NWR and Conservation Area comprises a landscape that is largely rural, with agriculture, forestry, ranching, and outdoor recreation/tourism. Most tracts in the acquisition boundary are impacted by

human use throughout the landscape. The extensive network of roadways, altered landscapes, increasing population and development, and military air traffic area operations will make a wilderness experience improbable.

Lands within the Conservation Focal Area have been reviewed by the Service for inclusion in the National Wilderness Preservation System according to criteria set forth in the Wilderness Act of 1964. Based on the Service's assessment, the Everglades Headwaters NWR was found not to be suitable for wilderness designation since:

- No areas meet the Wilderness minimum size requirement of 5,000 contiguous roadless acres (2,023 ha);
- No areas contain any units of sufficient size for preservation as Wilderness;
- Areas under consideration have been altered by historic and ongoing human activities; and/or
- No areas include outstanding opportunities for solitude or for primitive recreation.

Therefore, wilderness designation for any units of the Everglades Headwaters NWR is not appropriate.

II. AFFECTED ENVIRONMENT

This section describes the environment that will be affected by the implementation of the alternatives. It is organized under the following impact topics, which includes the area's natural vegetation, land use, fish and wildlife resources, related resources, landscape perspective, climate change factors, cultural resources, and socioeconomic and sociocultural conditions.

A. GENERAL

Figure 1 shows the Study Area relative to its major landmarks. It comprises roughly 1.8 million acres of the 1.9 million acres of the Kissimmee River Basin located within south-central Florida. It is bounded by the city of Orlando to the north, Lake Okeechobee to the south, on the east by the St John's River watershed, and on the west by the Lake Wales Ridge. The Study Area boundary was determined based on a number of factors including hydrologic basin, the Lake Okeechobee shoreline, and the western edge of the Lake Wales Ridge. The north end of the Study Area was truncated by Orange County's southern border and County Route 580 north of Lake Hatchineha. Minor adjustments to the Study Area boundary elsewhere incorporated logistical considerations, such as following roadways in close proximity to watershed boundaries. The physiographic provinces within the Study Area are the Lake Wales Ridge, Bombing Range Ridge, and Osceola Plain (which encompasses the Kissimmee River).

WEATHER AND CLIMATE

The climate of central Florida is subtropical with warm, wet summers and mild, dry winters. There are two distinctive seasons. The wet season begins around June 1 and usually ends as the dry season begins in late October. The weather and climate of central Florida are driven by a combination of local, regional, and global events, regimes, and oscillations.

Local Events

Periodic surges of cool, dry continental air move through Florida during the dry season with short duration rain events followed by long periods of dry weather. These rainfall events are usually from strata form clouds with slow, gentle rain. The Atlantic and Caribbean tropical and sub-tropical air masses dominate Florida during the wet season. During this time the majority of rainfall is in the form of convective thunderstorms produced from the daily sea breezes from both the west coast and east coast of Florida. Another significant source of rainfall during the wet season is from tropical weather systems (i.e., tropical waves, tropical depressions, tropical storms, and hurricanes). The most active times of rainfall in central Florida are during the spring and fall (May, June, September, and October).

The El Nino Southern Oscillation

The El Nino Southern Oscillation (ENSO) occurs every 2-7 years (with an average of 4 years) in three phases – El Nino, Neutral, or La Nina. When equatorial waters of the eastern tropical Pacific Ocean are much warmer than normal, this signifies an El Nino event. When these waters are much cooler than normal, a La Nina occurs. The following are weather and hydrology conditions likely for Florida during each of these events:

El Nino:

- Wetter than normal dry season
- Colder winter than during La Nina or when in a neutral ENSO phase
- Decreased Atlantic Ocean hurricanes
- Above average surface water levels
- Fewer wildfires with smaller burn areas

La Nina:

- Drier than normal dry season
- Below average surface water levels
- Increased Atlantic Ocean hurricanes
- More wildfires with larger burn areas

Neutral ENSO Phase:

- More deep freezes even if winter is not consistently as cool (the jet stream is free to meander north and south through the U.S.)

The Atlantic Multi-decadal Oscillation

The Atlantic Multi-decadal Oscillation (AMO) occurs in warm and cool phases generally lasting 20-40 years each. Florida typically experiences wetter conditions during the warm phase as the Inter-tropical Convergence Zone (ITCZ) moves farther north, closer to Florida, from the equator. The ITCZ is a global band of convective thunderstorms occurring 10-20 degrees north and south of the equator. Other than the local weather drivers and ENSO, the AMO highly influences Florida's extended wet and dry trends. Since 1900, there have been two cool phases and two warm phases of the AMO with each of these phases lasting 20-40 years each (Table 1). The exact year of the phase start and finish is an estimate as each phase goes through a "transition period" of a few years. Figure 2 illustrates the AMO cycles dating back to 1856. Figure 3 shows raw yearly data plotted with cycle averages.

Table 1. Timing and duration of cool and warm AMO phases since 1900

Years	Length of Phase	Phase
1906 – 1926	21 years	Cool Phase
1927 – 1965	38 years	Warm Phase
1966 – 1992	27 years	Cool Phase
1993 – Present	19+ years	Warm Phase

With AMO phases lasting typically 20-30 years, the current AMO warm phase is peaking, but could remain wetter than normal for the next 10-20 years. Thus, the generally wetter than normal conditions that Florida has experienced since the early 1990s should begin to slowly decline. After the peak, the warm phase wave will begin its gradual decline where we should see continually cooler anomalies over the next 10-20 years. As we approach the end of the cycle, Florida should experience an increase in drier years than wet years.

Figure 2. Atlantic multi-decadal oscillation - periods where temperatures are above 0 degrees warmer are in a warm phase; periods where temperatures are below 0 degrees cooler are in a cool phase

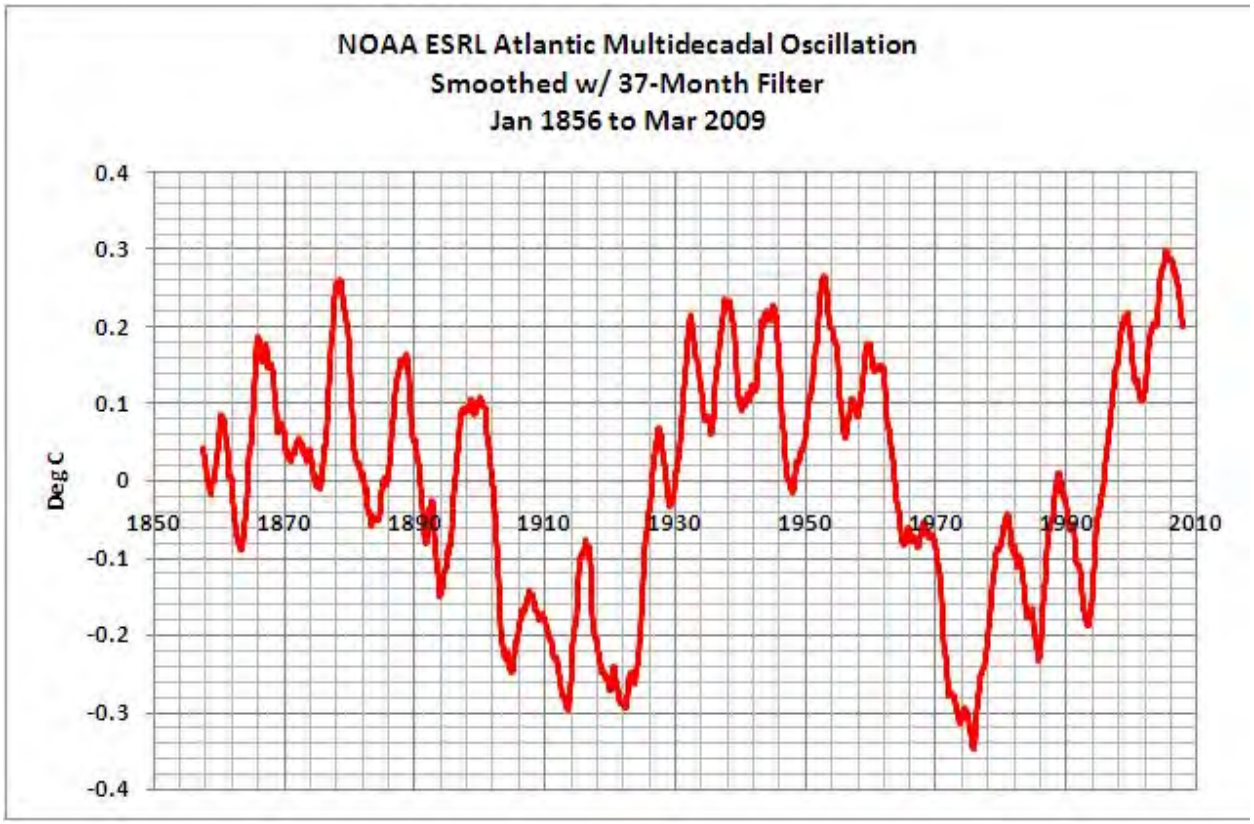


Figure 3. Raw AMO yearly data with the cycle averages (red line)

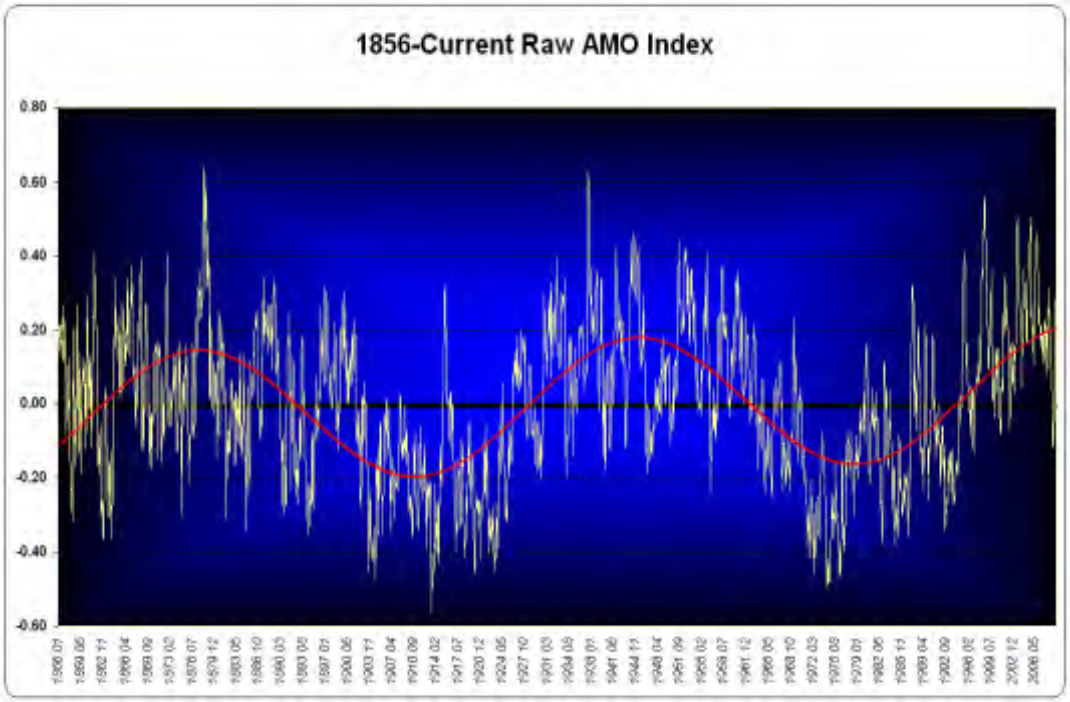
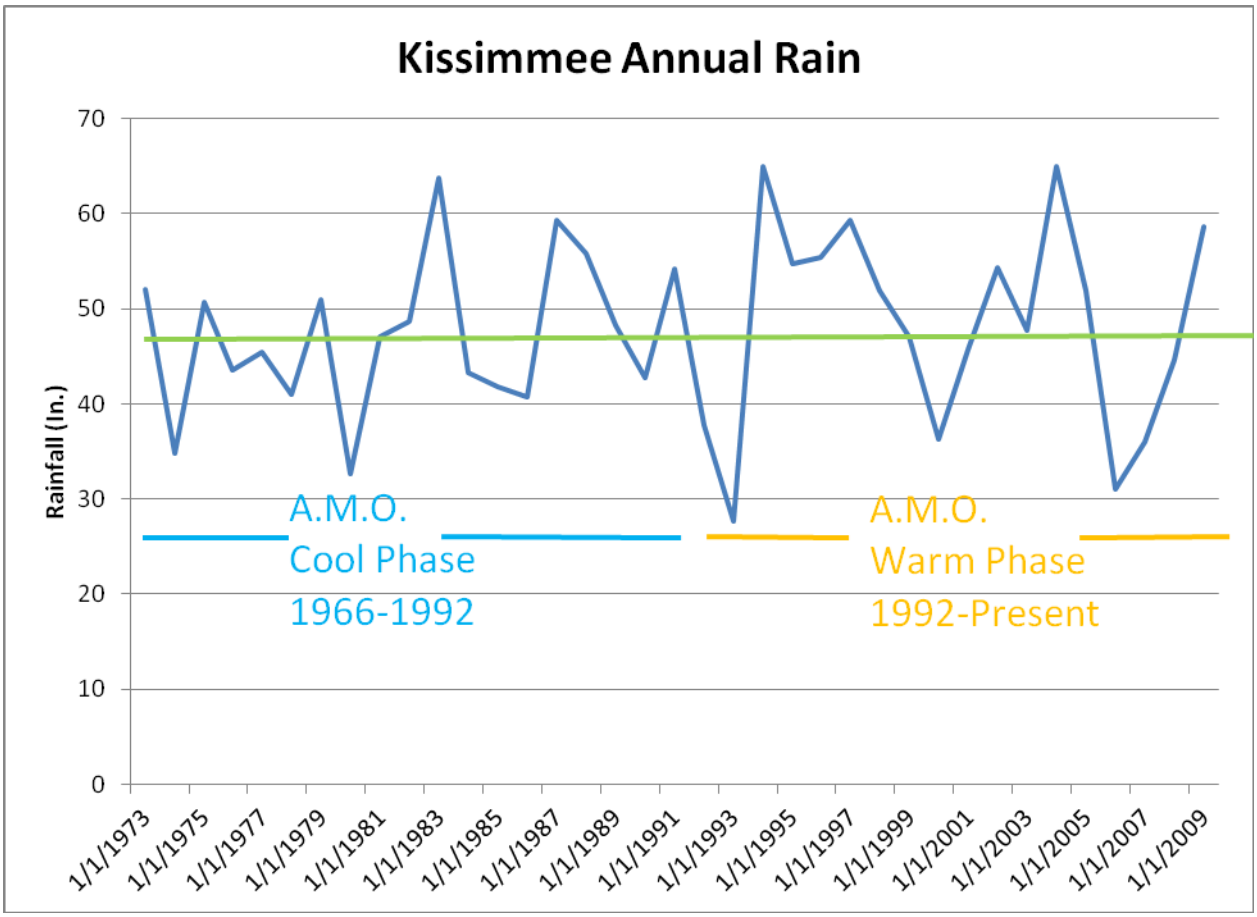


Figure 4 shows the annual rainfall at the SFWMD's Kissimmee Field Station from 1973 to 2010. Conditions were relatively dry during the 1970s, with wetter conditions in the 1980s, and more extreme dry and wet events in the 2000s. For planning purposes, central Florida should remain in a wetter regime for the next 5-10 years. However, low frequency dry years can still occur due to other events such as La Nina.

Figure 4. Kissimmee field station annual rainfall for 1973-2010 plotted on the average annual rainfall of 46 inches per year



AIR QUALITY

The Clean Air Act of 1970 (as amended in 1990 and 1997), required the U.S. Environmental Protection Agency (EPA) to implement air quality standards to protect public health and welfare. National Ambient Air Quality Standards (NAAQS) were established based on protecting health (primary standards) and preventing environmental and property damage (secondary standards). Criteria air pollutants in Florida include carbon monoxide (CO), lead, nitrogen dioxide (NO2), ozone (O3), particulate pollution (2.5 and 10 ug/m3), and sulfur dioxide (SO2) (FDEP 2006a). These pollutants are monitored by a network of monitoring stations throughout Florida and analyzed in order to better understand general air quality trends and to locate exceedances. Primary sources of pollutants in Florida are vehicle emissions, power plants, and industrial activities. In 2006, there were 216 ambient monitors in the statewide air monitoring network and the EPA designated Florida an attainment area for all criteria pollutants, based on data collected in the previous 3 years (FDEP

2006a). Air quality is monitored within the Study Area on a regular basis by six monitors in Polk (5) and Highlands (1) Counties. The Highlands County monitoring station is located at Archbold Biological Station. Table 2 provides air quality data collected for Polk, Osceola, Highlands, nearby counties, and national level standards. Florida's 2006 monitoring results indicate that both Polk and Highlands Counties qualify as attainment areas for all monitored pollutants (FDEP 2006a).

The Air Quality Index (AQI) is a summary index developed by EPA for reporting daily air quality. It indicates how clean or polluted the air is, and what associated health effects might be of concern. The AQI focuses on health effects that may be experienced within a few hours or days after breathing polluted air. EPA calculates the AQI for five major air pollutants regulated by the Clean Air Act: ground-level ozone, particle pollution (also known as particulate matter), carbon monoxide, sulfur dioxide, and nitrogen dioxide. Lead is also considered a major air pollutant under the Clean Air Act. However, because all areas of the United States are currently attaining the NAAQS for lead, the AQI does not specifically address lead. For each of these pollutants, EPA has established national air quality standards to protect public health (AIRNow 2009).

Highlands County AQI is derived from ozone concentrations recorded at one station. From 2002 through 2006, ozone AQI was in the “good” range (0-50 AQI) from 326 (2004) to 355 (2002) days. The county experienced a low of 3 days in the moderate (51-100 AQI) range in 2002 to a high of 19 days in 2006. Data suggest increasing trends of moderate days in Highlands County with no days in the reporting period reported as “unhealthy.” Polk County AQI over the same reporting period is based on Ozone, PM10, and PM2.5 inputs over five reporting stations. Polk County AQI is in the “good” range a minimum of 326 days (2006 levels) from which 38 days are reported in the moderate range during the same year (FDEP 2006a). Polk County AQI trends indicate decreasing air quality based on increasing moderate days and decreasing good days over the reporting period.

TOPOGRAPHY AND GEOLOGY

The 2,940-square-mile (1.9 million acres) Kissimmee River Basin extends from Orlando southward to Lake Okeechobee. This basin, which is the largest source of surface water to Lake Okeechobee, is about 105 miles long and has a maximum width of 35 miles. The northern portion of the basin (often termed the Kissimmee Chain of Lakes) is comprised of many lakes, some of which are interconnected by canals. The Kissimmee Chain of Lakes is bounded on the southern end by State Road (SR) 60, where the largest of the lakes, Lake Kissimmee, empties into the Kissimmee River. The southern portion of the basin includes the Lake Wales Ridge lakes, the Kissimmee River itself, and its tributary watersheds (including flow from the Istokpoga watershed) between Lake Kissimmee and Lake Okeechobee. The Kissimmee River was originally a 103-mile-long shallow, meandering river that was reconfigured in the 1960s into a 56-mile-long canal (renamed C-38) for flood control. Historically, water from the river slowly meandered into Lake Okeechobee and exited unimpeded from the lake southward into the Everglades through small tributaries and broad sheetflow during the rainy season.

The highest elevation is over 300 feet National Geodetic Vertical Datum (NGVD), while the lowest elevation in the region is 40 feet NGVD. Slopes range from nearly level in the bayheads and flatwoods to 12 to 15 percent in the sandhills and sand ridges. Lakes in the region are generally sinkholes, formed by the dissolution and collapse of underlying limestone. Lands in Highlands County are underlain by limestone formations from the Middle Eocene era. These zones are mined in many areas of central Florida; however, there are no phosphate mines within the Study Area. In the prehistoric sand ridge portions of the Study Area, underlying limestone formations are overlain by a composite of sand, clay, and gravel that is generally red to orange in color. The top of this composite is commonly exposed in clay pits. In the southern portion of the project area, sand and peat are found at the surface and can vary in thickness from 1 foot to 100 feet (30.5 m).

Table 2. Selected air quality data for the Study Area and surrounding monitoring stations

County	2000 Population	CO 8-hr (ppm)	Pb Qmax (µg/m3)	NO_2 AM (ppm)	O_3 1-hr (ppm)	O_3 8-hr (ppm)	PM_{10} Wtd AM (µg/m3)	PM_{10} 24-hr (µg/m3)	$PM_{2.5}$ Wtd AM (µg/m3)	$PM_{2.5}$ 24-hr (µg/m3)	SO_2 AM (ppm)	SO_2 24-hr (ppm)
Area Counties												
Polk County	483,924	ND	ND	ND	ND	0.077	66	9.3	19	ND	ND	ND
Highlands County	87,366	ND	ND	ND	0.079	0.071	ND	ND	ND	ND	ND	ND
Osceola County	172,493	ND	ND	ND	ND	0.073	ND	ND	ND	ND	ND	ND
Hillsborough County	998,948	2	1.65	0.007	ND	0.083	ND	86	10.1	27	0.004	0.031
Lake County	210,528	ND	ND	ND	ND	O.O78	ND	ND	ND	ND	ND	ND
United States												
National Ambient Air Quality Standards		9	1.5	0.053	0.125	0.085	50	150	15	65	0.03	0.14

CO - Highest second maximum non-overlapping 8-hour concentration (applicable NAAQS is 9 ppm)
Pb - Highest quarterly maximum concentration (applicable NAAQS is 1.5 µg/m3)
NO2 - Highest arithmetic mean concentration (applicable NAAQS is 0.053 ppm)
O3 (1-hour) - Highest second daily maximum 1-hour concentration (applicable NAAQS is 0.125 ppm)
O3 (8-hour) - Highest fourth daily maximum 8-hour concentration (applicable NAAQS is 0.085 ppm)
PM10 - Highest weighted annual mean concentration (applicable NAAQS is 50 µg/m3)
- Highest second maximum 24-hour concentration (applicable NAAQS is 150 µg/m3)
PM2.5 - Highest weighted annual mean concentration (applicable NAAQS is 15 µg/m3)
- Highest 98th percentile 24-hour concentration (applicable NAAQS is 65 µg/m3)
SO2 - Highest annual mean concentration (applicable NAAQS is 0.03 ppm)
- Highest second maximum 24-hour concentration (applicable NAAQS is 0.14 ppm)
ND - Indicates data not available IN – indicates insufficient data to calculate summary statistic
AM - Annual mean
µg/m3 - units are micrograms per cubic meter
Qmax - Quarterly maximum
Ppm - units are parts per million

Notes: Data from exceptional events are not included. The monitoring data represent the quality of air in the vicinity of the monitoring site and, for some pollutants, may not necessarily represent urban-wide or parish/county-wide air quality.
Source: U.S. EPA 2009

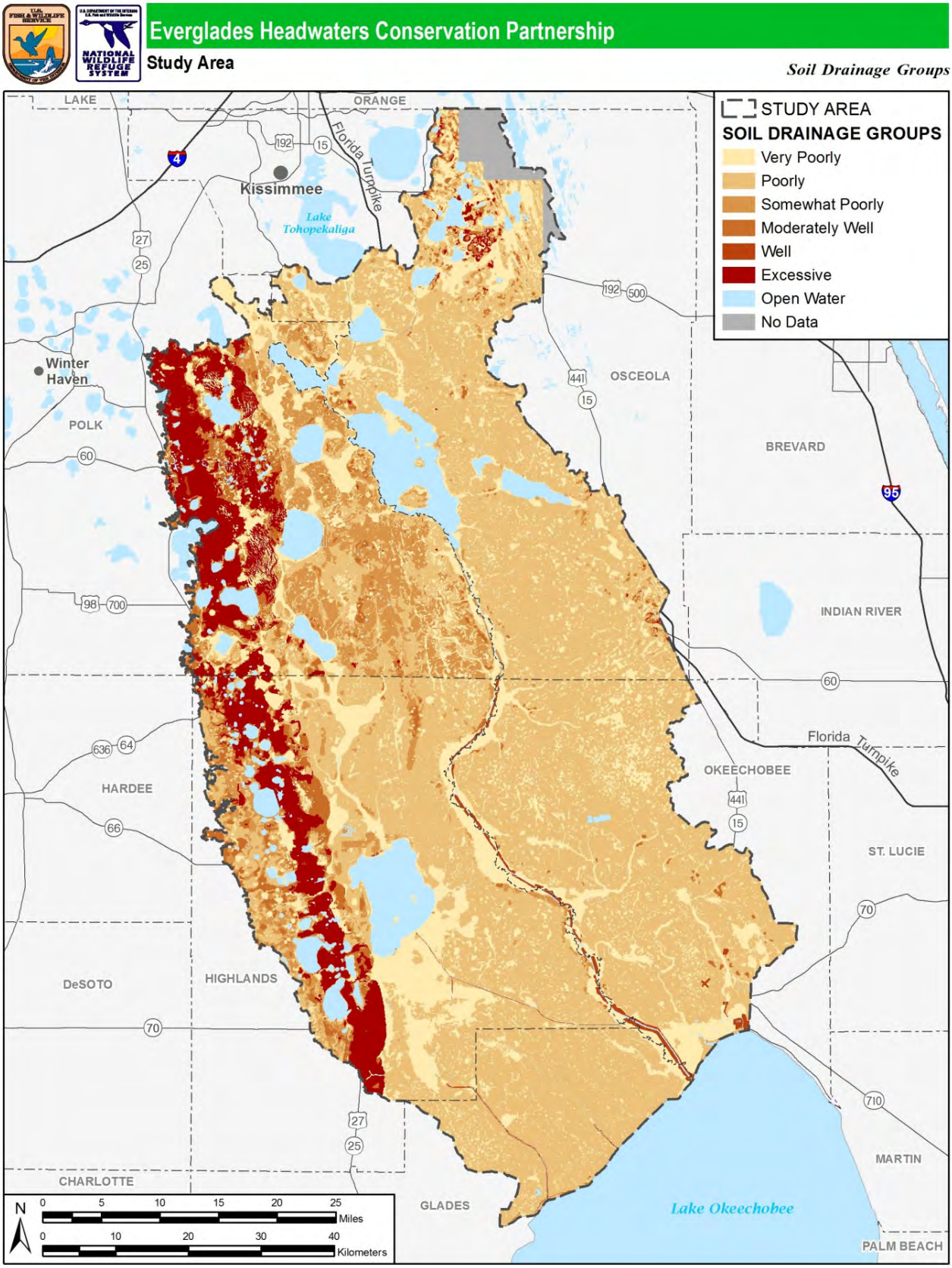
The hill and swale landforms in the prehistoric sand ridges (Lake Wales Ridge, Lakeland Ridge, Winter Haven Ridge, Mt. Dora Ridge, Lake Henry Ridge, Orlando Ridge, Gordonville Ridge, and Bombing Range Ridge) are relict dunes and bays, formed during pre-Pleistocene sea level rises 2 million years ago, when sea level was about 200 feet above its current elevation. When the ancient ocean levels rose, they covered nearly the entire present-day Florida peninsula, leaving the ridges as island archipelagos whose plants and animals continued to evolve in isolation. This isolation contributed to the evolution of numerous endemic species, and today these ridges may have the highest concentration of rare and endangered plants and animals in the continental U.S., with 24 plants and 19 animals currently having federal or state status as threatened or endangered. However, more than 70 percent of this unique community has been lost to citrus cultivation and residential development.

These relict dune and bay ridges also contain many sinkhole depressions and lakes, formed by the collapse of limestone caverns deep beneath the overlying sands and clays. Due to the resulting topography, lowland plant communities are sometimes in close proximity to upland communities, where scrub and sandhill habitats grade down to seasonal ponds, bayheads, and lake shores. The principle prehistoric sand ridges located between Orlando and Lake Okeechobee are the Lake Wales, Winter Haven, and Lake Henry Ridges. The Lake Wales Ridge is by far the largest and longest of the three. McCartan (1992) dates the beach and dune complex of the Lake Wales Ridge at 2.5 million years old. Over this period, there have been several warm wet periods and cool dry periods where the vegetation communities underwent some change. Nonetheless, Florida scrub has been present for tens of thousands of years with flora and fauna possibly going back millions of years. Scrub habitats on the Lake Wales and other central Florida ridges are ancient compared with vegetation elsewhere in eastern North America. The ebb and flow of scrub, resulting from the changing climate, may have created the opportunity for speciation in isolated patches of scrub, resulting in the patterns of endemism seen today, particularly among short-lived plants and those related to disturbance (Menges et al. 2006).

SOILS

The soils within the Study Area grade from excessively drained to well drained to poorly drained to very poorly drained soils that include a composite of upland and hydric soil classifications (Figure 5, Table 3). Upland soils typically include entisols and spodosols, whereas hydric soils generally include histosols and mollisols. The more xeric entisols are soils with little profile development and are characteristically classified as excessively well drained to well drained. These soils typically support sandhill and scrub vegetation. The water table is 4 to 6 feet below the surface. These soils are very rarely flooded. Scrubby flatwoods are a type of scrub found on less xeric soils than sandhill or other types of scrub, but have drier soils than flatwoods soils. More mesic flatwood soils are generally composed of spodosols. Spodosols have a well-defined internal profile with a spodic horizon (a zone of accumulated organic matter, clay, and aluminum - a hardpan). The water table is within a foot of the surface during the rainy season, and can be as deep as 40 inches (101.6 cm) during dry periods. Since the spodic horizon is relatively impermeable, perched water tables can occur. The native vegetation is slash pine (*Pinus elliottii* var. *densa*), and longleaf pine (*Pinus palustris*) with gallberry, palmetto, and *Lyonia* spp. in the understory. Hydric soils are found around lake edges, in bayheads, and in the depression marshes. Most of these soils have either a mollic epipedon (mollisols) or are organic soils (histosols). These soils remain flooded for most of the year. Native vegetation varies. In the bayheads, one can find bay trees (*Persea* spp.), maples (*Acer* spp.), and other hydric trees, while in the depression marshes the primary vegetation is grasses and forbs.

Figure 5. Soils within the Study Area color-coded based on drainage class



Minerals

Sand mining is an important sector of Florida's economy. Florida ranks approximately 15th in the country in sand and gravel used or produced. Sand and gravel are subdivided into construction and industrial sand, the bulk of which, in Florida, is construction grade. Within the Study Area, the sand is generally 20 to 50 feet thick. The deposits do not necessarily follow the surface sand ridges and at times occur under large strands of hardwood, cypress, and freshwater swamps. There are six permitted sand mines in the Study Area, three of which are located in the central portion adjacent to SR 60 near the city of Lake Wales. Three additional sand mines are located in the southern portion of the Study Area southwest of the city of Okeechobee, a few miles east of the Kissimmee river and within 3 miles of Lake Okeechobee.

Table 3. Soil series within the Study Area

Soil Series	Order	Vegetation	Acreage	Percent
ADAMSVILLE SAND	Entisol	Sandhills	4,765	<1
ANCLOTE SAND	Mollisol	Lake shore swamp	1,827	<1
ANKONA SAND	Spodosol	Flatwoods	463	<1
APOPKA SAND	Ultisols	Scrubby flatwoods	495	<1
ARCHBOLD SAND	Entisol	Scrubby flatwoods	17,771	1.0
ARENTS SAND	Anthropogenic soils -disturbed		8,089	<1
ASTATULA SAND	Entisol	Sandhills and scrub land	78,538	4.4
ASTOR SAND	Mollisol	Lake shore swamp	2,070	<1
BASINGER SAND	Entisol	Depression marsh	200,318	11.3
BOCA SAND	Spodosol	Flatwoods and scrubby flatwoods	9,424	<1
BRADENTON SAND	Histosol	Bayheads	4,763	<1
BRIGHTON SAND	Histosol	Bayheads	7,622	<1
CANDLER SAND	Entisol	Sandhills and scrub land	34,959	2.0
CASSIA SAND	Spodosol		2,256	<1
CHANLER SAND	Inceptisol	Pine Flatwoods	203	<1
CHOBEE SAND	Mollisol	Swamp	4,160	<1
DAYTONA SAND	Spodosol	Flatwoods and scrubby flatwoods	2,280	<1

Soil Series	Order	Vegetation	Acreage	Percent
DELRAY SAND	Mollisol	Swamp	6,504	<1
DUETTE SAND	Spodosol	Flatwoods and scrubby flatwoods	5,357	<1
EATON SAND	Alfisol	Flatwoods	255	<1
EAU GALLIE SAND	Spodosol	Flatwoods	38,243	2.2
ELECTRA SAND	Spodosol	Flatwoods and scrubby flatwoods	276	<1
FELDA SAND	Alfisol	Sloughs	49,716	2.8
FLORIDANA SAND	Mollisol	Swamp	52,688	3.0
FORT MEADE SAND	Inceptisol	Pine flatwoods	111	<1
FT. DRUM FINE SAND	Inceptisol	Flatwoods	2,854	<1
GATOR MUCK	Histosol	Bayheads	8,441	<1
GENTRY FINE SAND	Mollisol	Swamp	2,196	<1
HALLANDALE & Hallandale POPLE COMPLEX	Entisol & Alfisol	Bayheads, flatwoods	10,516	<1
HICORIA MUCKY SAND	Alfisol	Bayheads	4,132	<1
HOLOPAW FINE SAND	Alfisol	Slough	4,677	<1
HONTOON MUCK	Histosol	Bayheads	29,976	1.7
IMMOKALEE FINE SAND	Spodosol	Flatwoods	167,269	9.4
KALIGA MUCK	Histosol	Bayheads	30,933	1.7
KENDRICK FINE SAND	Ultisols	Pine flatwoods	56	<1
LAUDERHILL MUCK	Histosol	Bayheads	95	<1
LOCHLOOSA FINE SAND	Ultisols	Pine flatwoods	13	<1
LOKOSEE FINE SAND	Alfisol	Flatwoods	8,385	<1
LYNNE SAND	Spodosol	Flatwoods	521	<1
MALABAR SAND	Alfisol	Flatwoods	52,771	3.0
MANATEE, FLORIDANA AND TEQUESTA SOILS,	Mollisol	Swamp	20,423	1.0

Soil Series	Order	Vegetation	Acreage	Percent
MILLHOPPER FINE SAND	Ultisols	Pine flatwoods	348	<1
MYAKKA FINE SAND	Spodosol	Flatwoods	193,448	10.9
NARCOOSSEE FINE SAND	Spodosol	Flatwoods and scrubby flatwoods	8,213	<1
NEILHURST SAND	Entisol	Sandhills and scrub land	528	<1
NITTAW SAND	Mollisol	Swamp	5,183	<1
OKEELANTA MUCK	Histosol	Bayheads	4,121	<1
OLDSMAR FINE SAND	Spodosol	Flatwoods	16,258	<1
ONA FINE SAND	Spodosol	Flatwoods	3,234	<1
ORSINO FINE SAND	Entisol	Sandhills and scrub land	1,766	<1
PAISLEY FINE SAND	Alfisol	Flatwoods	477	<1
PAOLA SAND,	Entisol	Scrub land	13,040	<1
PARKWOOD FIND SAND	Alfisol	Flatwoods	3,741	<1
PINEDA SAND	Alfisol	Flatwoods	21,982	1.2
PITS	Quarries, gravel, water, till		484	<1
PLACID VARIANT FINE SAND	Inceptisol	Swamp	23,356	1.3
PLANTATION MUCK	Inceptisol	Swamp	10	<1
POMELLO FINE SAND	Spodosol	Flatwoods and scrubby flatwoods	18,980	1.1
POMONA FINE SAND	Spodosol	Flatwoods	6,241	<1
POMPANO	Entisol	Flatwoods	12,186	<1
POPLE FINE SAND	Alfisol	Flatwoods	5,434	<1
RIVIERA FINE SAND	Alfisol	Flatwoods	10,811	<1
SAMSULA MUCK	Histosol	Bayheads	45,635	2.6
SANIBEL MUCK	Inceptisol	Swamp	7,145	<1
SATELLITE SAND	Entisol	Flatwoods and depression marsh	32,318	1.8

Soil Series	Order	Vegetation	Acreage	Percent
SLICKENS	Mine tailings		10	<1
SMYRNA SAND	Spodosol	Flatwoods	159,266	9.0
SPARR SAND	Ultisol	Flatwoods	73	<1
ST. AUGUSTINE SAND	Entisol	Filled tidal uplands	784	<1
ST. JOHNS SAND	Spodosol	Flatwoods	2,149	<1
ST. LUCIE SAND	Entisol	Scrub land	4,055	<1
TAVARES - URBAN	Entisol	Sandhills	29,524	1.7
TEQUESTA MUCK	Alfisol	Depression marsh	19,455	1.1
TERRA CEIA MUCK	Histosol	Bayheads	794	<1
UDORTHENTS	Spoil deposition sites		5,123	<1
VALKARIA SAND	Entisol	Flatwoods	66,719	3.8
VERO FINE SAND	Spodosol	Flatwoods	645	<1
WABASSO FINE SAND	Spodosol	Flatwoods	4,314	<1
WAUCHULA FINE SAND	Spodosol	Flatwoods	357	<1
WINDER FINE SAND	Alfisol	Depression marsh	6,124	<1
ZOLFO FINE SAND	Spodosol	Flatwoods and scrubby flatwoods	594	<1
Urban			1,290	<
Open Water			145111	8.2
No Data			19,221	1.1
Unknown Code			5.5	<1

HYDROLOGY

Hydrologic Cycle

The water budget and hydrologic cycle in central Florida consist of rainfall, runoff, evaporation from water surfaces, transpiration from vegetation, infiltration, aquifer recharge, and condensation. The hydrology and hydraulics is a water distribution, timing, and duration process in area lakes, rivers, canals, and marshes. See Table 4 below for a partial list of natural water resources within the Study Area.

Table 4. Acres of natural water resources within the Study Area

Land Use	Acres in Study Area	Percent of Study Area
Wet Prairie	79,663	4.37
Freshwater Marsh	167,520	9.19
Forested Wetlands	129,518	7.10
Open Water	140,531	7.71

Rainfall is a critical driver of "natural" water levels and the hydrology of central Florida. The annual rainfall for the Kissimmee Field Station averaged 47.77 inches/year for the 37-year period of record of 1973-2010 (Figure 4). Thus, rainfall can greatly influence water levels in the vast number of central Florida lakes, wetlands, and flowing waters.

The combination of evaporation from water surfaces and transpiration from vegetation (evapotranspiration) is responsible for a large portion of water losses in central Florida. Evapotranspiration rates vary throughout the year and are affected by temperature, humidity, and wind speed. Rates are highest in the spring when temperatures and wind speeds are higher and humidity is lower. Rates are lowest during the winter months when temperatures and wind speeds are lower. Water losses due to evapotranspiration are similar to input of water from rainfall during an average year.

The groundwater system is another critical hydrologic and hydraulic component and is contained in aquifers in central Florida. The aquifer nearest the land surface is the Surficial aquifer. Beneath the Surficial aquifer system lays the Intermediate Confining Unit (ICU). In turn, the Floridan aquifer system underlies the ICU and is the primary source of nearly all the drinking water in central Florida. The depth of the water table can range from 50 feet or more below land surface (4-7 feet below surface is more common) to above land surface in wetlands and lakes. The hydraulic gradient (water flow direction and volume) between lakes and groundwater creates the paths of water movement below ground.

One common misconception about lakes in central Florida is that they are spring-fed from the deep Floridan aquifer. Some lakes are spring-fed, but the spring's origin of the water is simply specific locations in the lake bottom where water is entering from the adjacent Surficial aquifer. However, central Florida is filled with major springs from the Floridan aquifer and some lakes are directly connected through fractures in the underlying rock.

Rainfall and runoff also create variations in water clarity among lakes and flowing waters. Water clarity ranges from clear lakes like Lake Butler to the green colored waters of Lake Apopka. But, water clarity is not necessarily an indication of water quality.

Management of lake and river levels using operational structures (e.g., weirs, culverts, flood control gates) can, and often supersedes the natural hydrologic cycle and water budget. Natural drainage systems have also been altered through the addition of canals or by the dredging or straightening of existing outflow channels, rivers, and tributaries, especially within the Kissimmee Chain of Lakes area. Many of the canals connecting lakes in central Florida were constructed during the 1800s and were dug to lower the water levels and provide more valuable land for farming and citrus cultivation. The effect of this type of modification of natural drainage lowers natural lake levels, surface area, and the range of lake level fluctuations, particularly for natural seepage lakes. These canals and

structures are operated through a joint effort between the SFWMD and the U.S. Army Corps of Engineers (USACE). As a result, lake levels can vary by 10 feet or more in some lakes, whereas in other lakes, the water level may vary by only 1 or 2 feet.

Other human activities that affect the fluctuation in water levels include urbanization and water supply. Water is stored and used by residents, agriculture, and businesses for drinking and irrigation. The increased extent of impervious surfaces from urbanization can also cause water levels to rise higher than they did historically due to storm water runoff. This can result in an increase in the rate at which water flows downstream and may cause a greater volume of water to reach lakes and other downstream water bodies.

Surface Water Resources

The Kissimmee basin lies at the northern end of an interconnected Everglades ecosystem. Historically, water from the Kissimmee River and adjacent creeks and sloughs slowly meandered into Lake Okeechobee and exited unimpeded from the lake southward into the Everglades through small tributaries and broad sheetflow during the rainy season. Prior to the twentieth century, long periods of flooding and hurricanes made most of south Florida inhospitable to development. In an effort to make the land developable for human uses, Hamilton Disston led an effort in 1882 to dredge canals between the Kissimmee Chain of Lakes, and between Lake Okeechobee and the Caloosahatchee River. The latter provided Lake Okeechobee's first outlet to salt water (the Gulf of Mexico) via the Caloosahatchee River. Then the Kissimmee River Navigation Project, authorized by Congress in 1902, resulted in a navigation channel being dredged from the town of Kissimmee downstream to Fort Basinger. The project, with a required depth of 3 feet and a width of 30 feet, included a side channel through Istokpoga Creek. In the early 1900s, the Everglades Drainage District dug the St. Lucie, West Palm Beach, Hillsboro, North New River, and Miami Canals from Lake Okeechobee to the Atlantic Ocean. Together, these projects provided a means to drain the northern Everglades for agricultural and residential uses, forever altering or severing the natural hydrologic connections among the different parts of the Everglades ecosystem. Despite this drainage, today the Study Area still supports significant surface water resources as depicted in Figure 1.

The Study Area overlaps much of the Lake Okeechobee Watershed, which includes sub-watersheds to the north of America's second largest lake, such as the Upper and Lower Kissimmee, Lake Istokpoga, and Taylor Creek. Once a natural lake and wetland system, Lake Okeechobee now functions primarily as a multipurpose regional reservoir, storing water during the wet season for use during the dry season (FDEP 1999). The lake is a critical component of south Florida's water supply and flood control and provides a backup water source for urban areas, irrigation water for agricultural land, recharges water for aquifers, and is a major source of water for the Everglades. It provides habitat for migratory waterfowl and several threatened and endangered species and supports a multimillion-dollar recreational and commercial fishery (SFWMD 2011).

Surface Water Quality Classifications

Florida's water quality standards, the foundation of the state's program of water quality management, designate the "present and future most beneficial uses" of the waters of the state [Subsection 403.061(10), Florida Statutes (F.S.)]. Water quality criteria for surface water and groundwater expressed either as numeric or narrative limits for specific parameters describe the water quality necessary to maintain these uses. Florida's surface water is classified using the following five designated use categories (Table 5).

Table 5. Surface water quality classifications in Florida

Class	Description
Class I	Potable water supplies
Class II	Shellfish propagation or harvesting
Class III	Recreation, propagation, and maintenance of a healthy, well-balanced population of fish and wildlife
Class IV	Agricultural water supplies
Class V	Navigation, utility, and industrial use (there are no state waters currently in this class)

Within the Study Area, all state water bodies are either Class III or Class IV waters. Class IV waters consist of all secondary and tertiary canals or ditches wholly within agricultural areas behind a water control structure permitted by the water management district under Sections 373.103, 373.413, or 373.416, F.S. All other state water bodies within the Study Area are Class III waters. Lake Okeechobee, just south (and downstream) of the Study Area, is a Class I water.

Outstanding Florida Waters

A number of waterbodies in the basin have been given additional protection through designation as Outstanding Florida Waters (OFWs) (Table 6). OFWs are designated for "special protection due to their natural attributes" (Section 403.061, F.S.). The intent of an OFW designation is to maintain ambient water quality, even if these designations are more protective than those required under the waterbody's surface water classification. Most OFWs are associated with managed areas in the state park system or federal conservation land system, such as aquatic preserves, national seashores, or national wildlife refuges. Other OFWs may also be designated as "Special Waters" based on a finding that the waters are of exceptional recreational or ecological significance, and are identified as such in Rule 62-302, F.A.C.

Table 6. Outstanding Florida waters within the Study Area

County	Location	Outstanding Florida Water
Polk		
	Lake Arbuckle State Park	Lake Arbuckle
	Lake Arbuckle State Park	Livingstone Creek
	Lake Arbuckle State Park	Morgan Hole Creek
	Lake Arbuckle State Park	Blue Jordan Swamp (small part)
	Saddle Blanket Scrub	Lake Livingston drain
	Crooked Lake	Crooked Lake
	Lake Kissimmee State Park	Tiger Creek

County	Location	Outstanding Florida Water
	Lake Kissimmee State Park	Tiger Lake, Tiger Lake Outlet
	Lake Kissimmee State Park	Lake Kissimmee, Lake Kissimmee north drain
	Lake Kissimmee State Park	Rosalie Canal
	Lake Kissimmee State Park	Lake Rosalie, Lake Rosalie Outlet
	Catfish Creek Preserve State Park	Catfish Creek
	Catfish Creek Preserve State Park	Lake Pierce
Osceola		
	Prairie Lakes State Preserve	Jackson Canal
	Prairie Lakes State Preserve	Lake Jackson
	Prairie Lakes State Preserve and Three Lakes Prairie Lakes	Three Lakes– Prairie Lakes
		Lake Marian, Lake Marian Outlet
		Lake Kissimmee South
		Lake Kissimmee (mid drain)
Highlands		
	Placid Lakes	Placid Lakes
		Fisheating Creek
		Lake Placid Outlet
		Placid June Canal
Okeechobee		
		None
Glades		
		None

Surface Water Quality

The following information regarding surface and groundwater quality was largely excerpted from FDEP's Division of Water Resource Management, Water Quality Assessment Report, Kissimmee River and Fisheating Creek (FDEP 2006b). The Study Area is within the Kissimmee basin and contains four water quality planning units: Upper Kissimmee, Lower Kissimmee, Lake Istokpoga, and Lake Placid.

Upper Kissimmee

The major water quality problems in the Upper Kissimmee Planning Unit are elevated nutrients, low dissolved oxygen (DO), and mercury in fish. In addition, there were several detections of the metals iron, lead, silver, and cadmium at various locations, and pesticides in the Reedy Creek drainage area. Elevated nutrient, metal, and pesticide concentrations can be attributed to urban and/or agricultural land uses. Mercury contamination is thought to result from atmospheric deposition and mediated by anthropogenic sulfate conditions (which result from fertilizer use).

Point Sources: The Upper Kissimmee Planning Unit has 179 permitted wastewater treatment facilities, of which 174 discharge to groundwater and 5 to surface waters. The planning unit also has 24 permitted landfills and 42 delineated groundwater contamination areas for ethylene dibromide and bromacil (EDB).

Nonpoint Sources: The city of Orlando and Orange, Polk, and Osceola Counties currently have regulated municipal separate storm sewer systems (MS4s) operating in the planning unit. The predominant land uses in the Upper Kissimmee Planning Unit are agriculture (28.5 percent) and wetlands (23.8 percent). Other significant land uses include upland forest (9.5 percent), residential (15.0 percent), and open water (13.7 percent). Of these land uses, the categories most likely associated with nonpoint discharges of pollutants and eroded sediments are agriculture and residential, which together cover more than 43.5 percent of the planning unit.

Lower Kissimmee

The major water quality problems in the Lower Kissimmee Planning Unit are low DO and elevated nutrients, which may be attributable to agricultural nutrient loading. Low DO may also be in part attributable to natural conditions in the area (i.e., swamp drainage). It is important to note that several segments of the channelized Kissimmee River (the C-38 Canal) have either been recently backfilled, or are scheduled to be backfilled in the future, as part of the Kissimmee River Restoration Project.

Point Sources: The Lower Kissimmee Planning Unit has 11 permitted groundwater discharges, no permitted surface water discharges, no delineated groundwater contamination areas for ethylene dibromide (EDB), and no permitted landfills.

Nonpoint Sources: Although the Lower Kissimmee Planning Unit includes a small portion of Polk and Osceola Counties, both of which currently have regulated MS4s, there are no urban areas with such permitted sewer systems operating in the planning unit. The predominant land uses in the planning unit are agriculture (51.2 percent) and wetlands (22.8 percent). Other significant land uses include rangeland (15.8 percent) and upland forest (6.5 percent). Of these land uses, the category most likely associated with the nonpoint discharges of pollutants and eroded sediments is agriculture.

Lake Istokpoga

The major water quality problems in the Lake Istokpoga Planning Unit are low DO, elevated nutrients, and mercury in fish. Elevated nutrients and low DO may be attributable to agricultural or urban nutrient loading. Low DO may also be in part attributable to natural conditions in the area (swamp drainage). Mercury contamination is thought to result from atmospheric deposition.

Point Sources: The Lake Istokpoga Planning Unit has 86 permitted wastewater treatment facilities, with 85 discharging to groundwater and one discharging to surface water. The planning unit also has 25 delineated groundwater contamination areas for EDB and 12 permitted landfills.

Nonpoint Sources: There are no regulated MS4s operating in the planning unit. The predominant land uses in the Lake Istokpoga Planning Unit are agriculture (33.9 percent) and residential (12.9 percent). Other significant land uses include open water (14.3 percent), wetlands (15.3 percent), and upland forests (14.7 percent). Of these land uses, the categories most likely associated with the nonpoint discharges of pollutants and eroded sediments are agriculture and residential, which together comprise more than 46.8 percent of the planning unit.

Lake Placid

The major water quality problems in the Lake Placid Planning Unit are elevated nutrients and mercury in fish.

Point Sources: The Lake Placid Planning Unit has 16 permitted wastewater treatment facilities, all of which discharge to groundwater. The planning unit also has 6 delineated groundwater contamination areas for EDB in citrus areas and no permitted landfills.

Nonpoint Sources: There are no regulated MS4s operating in the planning unit. The predominant land uses in the Lake Placid Planning Unit are agriculture (28.4 percent) and residential (23.5 percent). Other significant land uses include open water (23.1 percent), upland forests (7.3 percent), and wetlands (6.1 percent). Of these land uses, the categories most likely associated with the nonpoint discharges of pollutants and eroded sediments are agriculture and residential, which together comprise more than 51.9 percent of the planning unit.

Lake Okeechobee

The water quality of Lake Okeechobee has been compromised by various sources, with phosphorus-induced eutrophication, a process where water bodies receive excess nutrients that stimulate excessive plant growth, being among the major environmental stressors. Despite various regulatory and voluntary incentive-based programs to limit phosphorus inputs into Lake Okeechobee, phosphorus loads entering the lake did not decline during the 1990s. As a result, the lake continues to become more eutrophic with blooms of noxious blue-green algae (cyanobacteria), loss of benthic invertebrate diversity, and spread of cattail (*Typha* spp.) in shoreline areas (SFWMD 2011). In 2000, the Florida Legislature passed the Lake Okeechobee Protection Act, which requires state water quality standards to be achieved no later than January 1, 2015 (Section 373.4595, F.S.). Total phosphorus (TP) load to the lake from all drainage basins and atmospheric deposition was 478 metric tons (mt) in Water Year (May 1 through April 30) 2010. Major TP contributors included the Kissimmee River Basin. The most recent 5-year average (water years 2006–2010) was 496 mt, which exceeds the Total Maximum Daily Load (TMDL, 140 mt) by 356 mt (SFWMD 2011).

Groundwater Resources

The groundwater resources of the Study Area include a sequence of aquifers and confining units. The uppermost of these is the Surficial aquifer system. This system is unconfined. Most of the water contained in this aquifer comes from precipitation although there is some leakage from underlying aquifers in places (Bishop 1956). Most of the water in the Surficial aquifer flows downward to recharge the Upper Floridan Aquifer. However, some groundwater flows laterally and is directed by the topography. The thickness of this aquifer varies with the base of the system being defined by the first persistent beds of Miocene or Pliocene age sediments that contain a substantial amount of clay and silt (Spechler and Kroening 2007). The upper limit of the surficial aquifer varies from one physiographic region to another. In low poorly drained areas, such as the bayheads, the top of the water table is at or near the surface for much of the year. On the other

hand, in some of the higher sand hills and scrub areas the water table may be as much as 100 feet below the surface. An intermediate aquifer can occasionally be found between the surficial aquifer and the Upper Floridan Aquifer. This aquifer is present in much of the northern and eastern parts of Polk County (Spechler and Kroening 2007).

The Floridan Aquifer is the principle groundwater source for both Polk and Highlands Counties. It can be divided into two sub-systems—the Upper Floridan and Lower Floridan Aquifers. In between these two is a less permeable area. The Upper Floridan Aquifer is the primary source of drinking water in many places including Polk and Highlands Counties. The Lower Floridan Aquifer is more mineralized and is rarely used as a water source.

Groundwater Quality

The Surficial aquifer system is primarily insoluble quartz sand and the water generally has low mineral content and hardness. However the Surficial aquifer is open to the surface and contaminants can easily enter the system. Even if no contaminants enter from directly above, there could be lateral movement of contaminants within the aquifer. Iron is a commonly present element in this aquifer. Other chemicals that could be present in high concentrations include chlorides, sulfur, and nitrates. These all could occur in some amount even if there were no urbanization or agriculture in the area. The presence of human activity will increase the chances of these appearing in higher concentrations. Human activity also increases the risk of pesticide contamination. The Upper Floridan Aquifer is primarily freshwater (Spechler and Kroening 2007). The water here is hard due to the presence of calcium and magnesium. There are some nitrates in the Upper Floridan Aquifer. These enter the system through breaches in the intermediate confining layer caused by sinkholes and other gaps in the confining unit. Sampling from wells has also detected small amounts of chlorides and sulfur. There are few wells that reach into the Lower Floridan Aquifer. Consequently, there are not much sampling data to indicate spatial variation in quality. However, there are a few years of on-going sampling data associated with the Comprehensive Everglades Restoration Plan's Aquifer Storage and Recovery Project wells recently installed along the lower Kissimmee River, about one mile upstream of Lake Okeechobee.

Groundwater Contamination

Upper Kissimmee

Overall, median dissolved phosphorus and orthophosphate values for the surficial aquifer in the planning unit are similar to the TP medians in a number of lakes, and there are several examples where phosphorus "spikes" in groundwater coincide with high phosphorus in lakes. Phosphorus concentrations are elevated (above 0.1 mg/L) in shallow groundwater in the vicinity of several of the larger lakes that are listed for nutrients and include Lakes Cypress, Lake Kissimmee, and Lake Marian Outlet. Nitrate and ammonia distribution maps also show evidence of impacts to groundwater in the vicinity of all of these lakes. In the ridge area along the western margin of the Upper Kissimmee Planning Unit, nitrate levels in several surficial aquifer monitoring wells, plus a significant portion of the 1,000 private drinking water wells on the Lake Wales Ridge overall, exceed the drinking water MCL of 10 mg/L. Elsewhere in the planning unit, ammonia levels range between 0.1 and 1 mg/L in most surficial aquifer depth wells. Wells with elevated ammonia (>1 mg/L) are located near Lakes Cypress and Marian Outlet. Available groundwater data show above-background concentrations in many areas of the Kissimmee River Basin for copper and lead. Above-background levels of copper were found in monitoring wells near Reedy Creek North, so groundwater may provide a conveyance for copper in this area if there are sources. There are no wells with lead data in the vicinity of the surface waterbodies listed for lead. Groundwater seepage to the lakes of the

Upper Kissimmee Planning Unit has not been quantified, although Lakes Tohopekaliga and Kissimmee have been extensively modeled. Based on a groundwater–surface water comparison of the median concentrations of several conservative ions, groundwater seepage may account for approximately 30 percent of the water in the two lakes.

Lower Kissimmee

In the Lower Kissimmee Planning Unit, phosphorus detections in groundwater are scattered and less prevalent than in the Upper Kissimmee Planning Unit. However, ammonia detections in several cases are greater than 1 mg/L. The predominant land use is agriculture, mostly cattle farming. Livestock wastes generate significant amounts of phosphorus and ammonia. The cattle operations in the Lower Kissimmee Planning Unit could be significant sources of elevated nutrients in shallow groundwater and surface water. No published material was obtained to document the extent of groundwater seepage into the Kissimmee River. However, a groundwater–surface water comparison of median concentrations of alkalinity, chloride, conductivity, and sodium concentrations suggests that groundwater seepage may account for approximately 30 percent of the water in the river. Because the river is a controlled system, hydrograph data could not be used to estimate base flow.

Lake Istokpoga

Most of the Lake Istokpoga Planning Unit includes the Lake Wales Ridge, a major citrus-growing region of the state. Fertilizer application on the sandy ridge has resulted in high levels of nitrate in the Surficial aquifer and may have also caused elevated phosphorus in groundwater. Based on the radon survey, there are high levels of radon in an extensive area on the eastern flank of the ridge covering the central part of the Lake Istokpoga Planning Unit. This area may have a natural abundance of phosphate in the soil. Livingston Creek lies in this area and is on the Verified List (for nutrients and low DO), but is also adjacent to a dairy farm. Relatively high concentrations of phosphorus are present in wells near several of the other listed waters in the southern part of the Lake Istokpoga Planning Unit (outside of the high-radon area) and are most likely related to agriculture. Arbuckle Creek is located near wells with elevated phosphorus. The USGS (Sacks, Swancar, and Lee 1998; Sacks 2002) used an isotope mass-balance method to estimate the groundwater contribution to several lakes in the Istokpoga Planning Unit. Lakes Clinch and Angelo both had estimated groundwater contributions of 39 to 44 percent and Lake Josephine, listed for nutrients, had an estimated groundwater input of 80 to 83 percent, according to the USGS study. Comparisons between groundwater and surface water medians for several conservative chemical tracers for lakes in the Lake Istokpoga Planning Unit suggest that 25 to 50 percent of the inflows into the lakes are from groundwater.

Lake Placid

The small Lake Placid Planning Unit consists of a lake area south of the Lake Wales Ridge in which the predominant land uses are urban/residential and citrus groves. Groundwater in the Surficial aquifer in the vicinity of Lake Placid, which is listed for nutrients, contains somewhat elevated levels of nitrate and phosphorus. Sacks (2002) provided a groundwater seepage estimate for one lake in the Lake Placid Planning Unit. The chemical mass balance method was used by Sacks to estimate that approximately 12 percent of the total inflows into Grassy Lake were from groundwater.

Lake Wales Ridge

The Lake Wales Ridge area of the Kissimmee River Basin is a well known area of groundwater contamination because the highly vulnerable groundwater setting coincides with the intensive agricultural practices that occur there. Citrus farming in this area has historically required heavy

applications of fertilizers and agrichemicals because of sandy soils and other challenges posed by the setting. As a result, nitrate concentrations in groundwater are uniformly elevated and several highly mobile pesticides, most notably EDB and bromacil, have contaminated potable groundwater supplies in many wells within the Lake Wales Ridge citrus area. According to the FDEP's Water Supply Restoration Program (WSRP) database, approximately 1,000 private potable supply wells have been contaminated by nitrate (exceeding the maximum contaminant level [MCL] of 10 milligrams per liter [mg/L]), approximately 800 exceeded the MCL of 0.02 micrograms per liter (µg/L) for EDB, and approximately 60 exceeded the groundwater guidance concentration of 90 µg/L for bromacil. The WSRP, in cooperation with the Florida Department of Health, monitors water quality in private wells and provides treatment systems or alternative water sources for affected well owners. In the past several years, agricultural best management practices have promoted more careful application of fertilizers, EDB has been entirely banned from use, and bromacil has essentially been restricted from citrus applications in this area.

Copper is also a contaminant of concern from citrus groves. It is applied as a fungicide and over time slowly builds up in the soils at the tree's drip line. Once in the soil, copper is not very mobile; however, if that soil becomes inundated, the copper can partition into the water and become bioavailable to aquatic or semi-aquatic organisms. The ability of molluscs to uptake copper is well documented in the literature (Betzer and Pilson 1975; Berger and Dallinger 1989; Eisler 1998) and is of potential concern for molluscan predators, such as the federally endangered Everglade snail kite (Winger et al. 1984). A 2003 ecological risk assessment on the proposed conversion of a citrus grove into a water reservoir as part of an Everglades restoration project predicted that copper-impacted soils might adversely impact the Everglade snail kite (URS Corporation 2003). The predicted risk was a reduction in the body weight of the Everglade snail kite nestlings through the bioaccumulation of copper in their diet, which is almost exclusively the Florida apple snail (*Pomacea paludosa*). These findings resulted in a recommended interim soil screening level of 85 milligrams per kilogram (mg/kg) copper for protection of the Everglade snail kite at all sites to be inundated for Everglades restoration projects.

Another potential contaminant concern is from former row crop areas. Sites that had row crops prior to 1985 could be contaminated with residual organochlorine pesticides especially on muck (i.e., highly organic) soils where these chemicals tend to accumulate. Common pesticides on these areas could include toxaphene, chlordane, DDT, endrin, dieldrin, and others. It will be important to closely evaluate the chemical contaminant loads on any parcels for acquisition or easement, especially if they would be inundated with water (i.e., wetlands restoration).

In an interagency groundwater monitoring study (U.S. Geological Survey [USGS], Florida Department of Agriculture and Consumer Services [FDACS], and Southwest Florida Water Management District) on the Lake Wales Ridge, data from 1999 to 2003 showed detections of several other pesticides in groundwater samples. These included norflurazon and desmethyl norflurazon (84 percent of wells), simazine (61 percent), diuron (52 percent), deisopropylatrazine (CEAT) (39 percent), aldicarb sulfoxide (32 percent), aldicarb sulfone (32 percent), metalaxyl (10 percent), aldicarb (6 percent), imidacloprid (6 percent), and thiazopyr monoacid (6 percent). The occurrence and potential adverse effects of these pesticides are being monitored by FDACS.

Urban Setting

Most urban development in the Study Area occurs primarily in the upper Kissimmee River Basin, which comprises the fast-growing southern half of the metropolitan Orlando area. Within the Study Area there are a number of groundwater contamination sites of limited extent, mostly associated with small-scale industries and leaking underground fuel storage tanks. However, this area also contains

a number of drainage wells and galleries that divert stormwater into the Upper Floridan Aquifer to compensate for aquifer withdrawals in the urban area, increase recharge, control lake levels, and suppress the upward migration of sub-Floridan mineralized waters. The city of Orlando's water supply wells tap the same aquifer zone in the same geographic areas, without significant degradation of water quality (Schiner and German 1983).

Cattle Dip Vats

Cattle dip vats are ubiquitous to most of Florida, and hundreds of them have been identified in the Kissimmee River and Fisheating Creek Basins. Approximately 3,400 cattle-dipping vats were constructed throughout Florida from 1906 through 1962. These vats were used to eradicate ticks from cattle and other livestock. The vats were constructed of concrete and were typically 30 feet long, 3 feet wide, and 7 feet deep. The vats were generally filled with an arsenic solution that killed the ticks. It is now known that the solutions used are harmful to humans, and areas with the vats may have contaminated groundwater in their vicinity. Other possible dip vat contaminants are benzene hexachloride (BHC), dichlorodiphenyltrichloroethane (DDT), dichlorodiphenyl dichloroethylene (DDE), and toxaphene (Florida Department of Health 2003). Most of the potential aquifer contamination resulting from cattle-dipping vats is extremely localized, and these facilities are not considered to be hazardous on a regional scale.

Superfund Sites

According to EPA 2003, there are no National Priority List (Superfund) contaminated sites within the Kissimmee River or Fisheating Creek Basins.

B. HABITAT AND LAND COVER

According to the Myers and Ewel (1990), the historic landscape of the Kissimmee Valley was comprised of a freshwater marsh, which encompassed the Kissimmee River with more expansive wet and dry prairies that occupied slightly higher elevations east and west of the Kissimmee marsh. There is also evidence that pine flatwoods existed interspersed and upslope from the prairies (Davis 1943, Myers and Ewel 1990). Cypress strands or domes also dotted the valley landscape and were probably more concentrated at the northern end of the Study Area. The ridges were dominated by pinelands and scrub, with lesser amounts of hardwoods and open water. Today, these natural areas have been largely displaced by residential and agricultural development, which occupies approximately 943,000 acres (52 percent) of the Study Area. Today, the native communities of greatest areal extent within the Study Area are lakes and ponds (7.0 percent), mesic flatwoods (6.0 percent), freshwater marsh (6.0 percent), dry prairie (4.5 percent), and wet prairie (4.4 percent). Table 7 outlines the land cover types within the Study Area.

Two of the most ecologically damaging impacts of residential and agricultural development within the Study Area are from the loss of scrub habitat (now at only 2 percent of the Study Area), and their associated cutthroat grass communities, and the loss of isolated and depressional wetlands on the Kissimmee Prairie (1 percent of the Study Area). There are 112 different land covers [based on the Florida Natural Areas Inventory (FNAI) 2010 Florida Land Covers Map] within the 1.8 million-acre Study Area. These have been combined into 12 land cover categories for the purpose of analysis in this document (Table 7). Figure 6 shows similarly grouped land uses within the Study Area based on FNAI land cover codes. Although there are many land covers, approximately 79 percent of the Study Area is comprised of only 16 land uses (Table 8).

Table 7. Land cover types within the Study Area

Land Cover	Currently Protected Acres (estimate)	Unprotected Acres (estimate)	Total Acres (estimate)
Cutthroat Grass Communities	11,025.15	35.29	11,060.44
Dry Prairie	48,150.97	34,451.69	82,602.66
Freshwater Forested Wetlands	47,893.80	81,623.26	129,517.06
High Pine, Florida Scrub, Sandhill	23,548.83	26,073.73	49,622.56
Improved, Unimproved, and Woodland Pasture	47,991.70	536,487.85	584,479.55
Intensive Agriculture	2,952.52	199,254.18	202,206.7
Scrubby Mesic and Hydric Pine Flatwoods	103,715.75	76,837.08	180,552.83
Mesic Temperate Hammock	11,910.91	18,441.77	30,352.68
Open Water	4,302.10	136,224.39	140,526.49
Shrub and Brushland	1,315.61	8,168.01	9,483.62
Urban	20,172.66	135,357.35	155,530.01
Wet Prairie and Freshwater Marshes	98,252.21	148,938.70	247,190.91
TOTAL	**421,232.21**	**1,401,893.3**	**1,823,125.51**

Table 8. Top 16 land cover types that comprise 79 percent of the Study Area

Land Cover Type	Acres in Study Area	Percent of Study Area
183213 - Improved Pasture	445,605.90	24.44
3100 - Natural Lakes and Ponds	126,784.78	6.95
1311 - Mesic Flatwoods	109,888.90	6.03
2120 - Freshwater Marshes	109,727.27	6.02
183214 - Unimproved/Woodland Pasture	102,757.49	5.64
1330 - Dry Prairie	82,602.99	4.53
18322 - Orchards/Groves	82,477.10	4.52
2111 - Wet Prairie	79,662.87	4.37

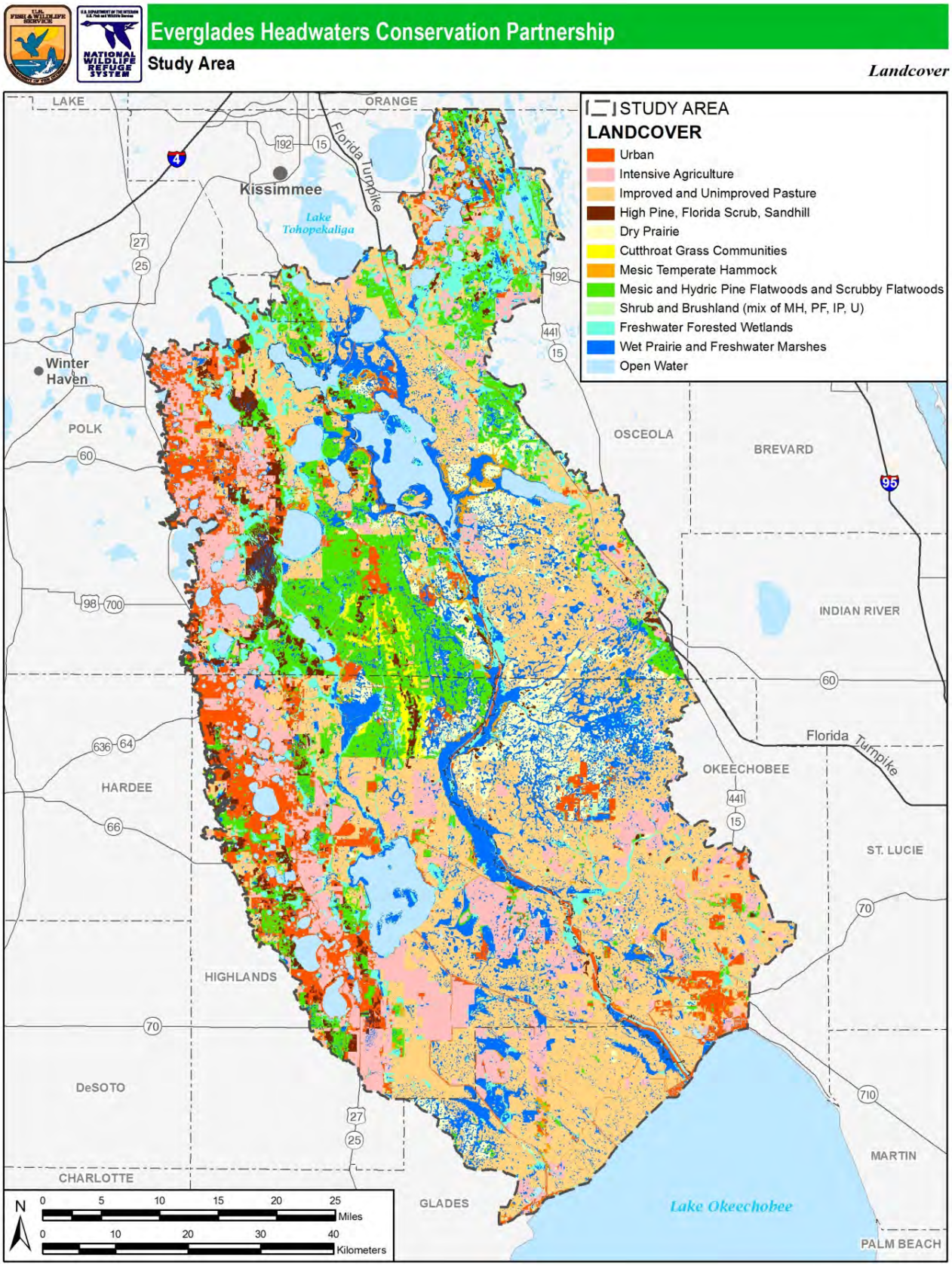
Land Cover Type	Acres in Study Area	Percent of Study Area
183221 - Citrus	57,103.09	3.13
1831 - Rural Open	41,886.47	2.30
18212 - Low Structure Density	39,487.81	2.17
1210 - Scrub	37,467.86	2.06
2233 - Mixed Wetland Hardwoods	32,405.36	1.78
18321 - Cropland/Pasture	31,485.50	1.73
21121 - Shrub Bog	28,183.55	1.55
18221 - Residential, Med. Density - 2-5 Dwelling Units/AC	27,527.60	1.51

The habitats of the south Florida region support an extremely diverse array of flora and fauna. Over 600 species are considered either rare or imperiled in south Florida; 68 of those species are federally listed as threatened or endangered (for which the Service is the lead responsible agency). The Service also has sufficient information on biological vulnerability and threats to support a proposal to list 20 candidate species as threatened or endangered, but for which preparation and publication of a proposal are precluded by higher priority listing actions. Twenty-three of the ecological communities found within this region are inhabited by federally listed species, and are the subject of the ecosystem restoration goals in the Service's recovery plan (1999). These south Florida communities that are within the Study Area include high pine (dry, longleaf pine savanna); Florida scrub, including scrubby flatwoods and scrubby high pine; mesic temperate hammock; tropical hardwood hammock; mesic and hydric pine flatwoods; dry prairie; cutthroat grass communities; freshwater marshes and wet prairies; and forested wetlands including flowing water, pond, and seepage swamps (Service 1999). We have included an additional category for shrub and brushland to facilitate the alternatives' analysis. Additionally, we recognize that there are disturbed or developed land uses that may also provide habitat for plants, fish, and wildlife. The following is a description of each community or land use type.

HIGH PINE (DRY, LONGLEAF PINE SAVANNA)

High pine or dry, longleaf pine savannas, characterized by a nearly continuous ground cover of wiregrass (*Aristida stricta* var. *beyrichiana*) and widely spaced longleaf pines, once covered most of the pre-settlement uplands of the southeastern United States from Virginia to Texas, and south to central Florida. These savannas included both high pine and pine flatwoods, similar plant communities at opposite ends of the moisture gradient. Today, the longleaf pine savanna is almost extinct, the result of harvesting all original-growth longleaf pines and decades of fire suppression. In south Florida, the high pine community is virtually extinct except for a few small, isolated fragmentary remnants that are not large enough to be self-sustaining or to support the full complement of native species. Remaining high pine sites are small and have been degraded by fire suppression. They now are dominated by invasive species such as sand pine (*Pinus clausa*), or by species formerly restricted to the shrub layer such as turkey oak (*Quercus laevis*). In the Study Area, long-leaf pine (which is lumped with xeric oak land use/land cover type) is sparsely present on the Lake Wales Ridge west of Lakes Istokpoga and Weohyakapka.

Figure 6. Similarly grouped land uses within the Study Area



FLORIDA SCRUB

Florida scrub soils are well-drained, nutrient-poor, and sandy. Depending on elevation, scrub has a fire return frequency of 1 to 80 years. Florida scrub can be identified by the dominance of several species of woody shrubs, especially myrtle oak or scrub oak (*Quercus myrtifolia* or *Q. inopina*), sand live oak (*Q. geminata*), Chapman's oak (*Q. chapmanii*), crookedwood (*Lyonia ferruginea*), saw palmetto (*Serenoa repens*) and Florida rosemary (*Ceratiola ericoides*); the absence of a tree canopy; the absence of a continuous vegetative ground cover; and the absence of longleaf pine (*Pinus palustris*), wiregrass, and turkey oak (*Q. laevis*). When sand pines (*Pinus clausa*) are present in scrub, they do not form a continuous canopy, but occur as scattered individuals or clumps of individuals. Scrub occurs on white and yellow sand soils and contains patches of bare sand with or without scattered clumps of ground lichens (Service 1999). The highest elevations of Florida scrub within the Study Area occur on the Lake Wales Ridge. The Lake Wales Ridge is home to many endemic xeric plant species or communities that require burning at intervals of 1 to 8 years (sandhill) and 5 to 12 years (oak-hickory scrub).

MESIC TEMPERATE HAMMOCK

Mesic temperate hammock is a closed canopy forest, dominated by temperate evergreen tree species, primarily live oak and cabbage palm that is naturally protected from fire by its position on the landscape (Service 1999). Tropical species are common in the shrub layer and become increasingly important in the canopy at the southern end of its range. Soils in mesic temperate hammock are moist due to a dense litter layer and the humid conditions that prevail under the closed canopy, but are rarely inundated. Mesic temperate hammocks are important habitat for wildlife and provide secondary habitat for a number of rare, threatened, and endangered plant and animal species. This community has been heavily impacted by human activity, primarily clearing for agriculture and urbanization. Soils and understory vegetation in mesic hammocks, often the only shaded habitat in a landscape of prairie, pasture, pineland, or marsh, are trampled and compacted by cattle. Mesic temperate hammocks have also been adversely affected by nonnative plant and animal species, especially feral hogs (*Sus scrofa*), and by fire suppression and hydrological alterations in adjacent and surrounding communities. Protection measures for mesic temperate hammocks include conservation land acquisition; ecosystem management practices, particularly restoration of natural fire and hydrological regimes; control and eradication of nonnative species; and limits on grazing, development, and recreational uses.

Mesic temperate hammock occurs in a broad zone of peninsular Florida, where it is transitional between the southern mixed hardwood forest of north peninsular and panhandle Florida and the tropical forest of southern Florida (Greller 1980). The southern mixed hardwood forest of north Florida comprises a diverse mix of deciduous hardwoods, such as beech (*Fagus grandifolia*), hickory (*Carya* spp.) and oaks (*Quercus falcata*, *Q. alba*, etc.); broad-leaved evergreens, such as southern magnolia (*Magnolia grandiflora*) and live oak (*Quercus virginiana*); and needle-leaved evergreens (conifers), such as spruce pine (*Pinus glabra*) and loblolly pine (*P. taeda*). Within the Study Area, examples of mesic temperate hammock can be found at Tiger Creek Preserve, Polk County; Upper Lakes Basin Watershed, Polk and Osceola Counties; Avon Park Air Force Range, Polk and Highlands Counties, Highlands Hammock State Park, Highlands County; Kissimmee Prairie Preserve State Park, Okeechobee County; Kissimmee River Valley, Polk, Osceola, Highlands, Okeechobee Counties, and Three Lakes WMA, Osceola County (Service 1999).

HYDRIC, MESIC, AND SCRUBBY PINE FLATWOODS

Pine flatwoods are characterized by level topography and poorly drained sands. They range from open forests of scattered pines with little understory to dense pine stands with a rather dense undergrowth of grasses (particularly wiregrass), saw palmetto (*Serenoa repens*), and other low shrubs. Hydric flatwoods occur in seasonally inundated flatlands with sand substrates and have canopies of slash pine, pond pine (*Pinus serotina*), and/or cabbage palm (*Sabal palmetto*). They have an understory of mixed hydrophytic shrubs, such as wax myrtle (*Myrica cerifera*) and gallberry (*Ilex glabra*), grasses, and forbs that varies with fire frequency. In contrast, mesic flatwoods occupy sandy, seldom inundated flatlands and typically have canopies of slash pine or longleaf pine (*Pinus palustris*) with a dense understory of saw palmetto. Gallberry, rusty lyonia (*Lyonia ferruginea*), wax myrtle, and wiregrass are also usually abundant (Abrahamson and Hartnett 1990). There are approximately 66,000 acres of pine flatwoods scattered throughout the central portion of the Study Area from the ridge west of Lake Istokpoga through Avon Park AFR and north to the eastern side of East Lake Toho.

Hydric and mesic pine flatwoods of south Florida are of critical, regional importance to its biota. They provide essential forested habitat for a variety of wildlife including wide-ranging, large carnivores such as the Florida panther (*Felis concolor coryi*) and the Florida black bear (*Ursus americanus floridanus*); mid-sized carnivores; fox squirrels (*Sciurus niger* spp.); red-cockaded woodpecker (*Picoides borealis*) and white-tailed deer (*Odocoileus virginianus*). They provide tree canopy for canopy-dependent species including neotropical migratory birds, tree-cavity dependent species, and tree-nesting species (Service 1999). In hydric flatwoods, the same habitat seasonally functions as both a wetland and upland. The relatively predictable nature of this hydrologic transformation allows for an abundant diversity of plant life, including both wetland and upland annuals, and supports a diverse invertebrate fauna and, as a result, a diverse vertebrate fauna. Pine flatwoods are also an important habitat for a number of common flatwoods vertebrate species, including the pine woods tree frog (*Hyla femoralis*), oak toad (*Bufo quercicus*), box turtle (*Terrapene carolina*), eastern diamondback rattlesnake (*Crotalus adamanteus*), black racer (*Coluber constrictor*), brown-headed nuthatch (*Sitta pusilla*), pine warbler (*Dendroica pinus*), great horned owl (*Bubo virginianus*), least shrew (*Cryptotis parva*), cotton mouse (*Peromyscus gossypinus*), cotton rat (*Sigmodon hispidus*), and gray fox (*Urocyon cinereoargenteus*) (Layne 1974, Layne et al. 1977).

Scrubby flatwoods is an intermediate habitat between mesic pine flatwoods and scrub, and sometimes occurs as an ecotone between them (Abrahamson and Hartnett 1990). “Scrubby flatwoods are more hydric than scrub, have a higher water table, more dense vegetation, and almost never have standing water” (Abrahamson et al. 1984). It also differs from scrub by the presence of scattered wiregrass and a preponderance of flatwoods species such as fetterbush (*Lyonia lucida*), wax myrtle, and gallberry. Shrubby oaks, including sand live oak, Chapman’s oak, and myrtle oak or scrub oak, are often dominant and slash pine, sand pine, or longleaf pine may be present. Plant species typical of scrubby flatwoods that may be considered indicators of the community include tarflower (*Befaria racemosa*), scrub St. John’s wort (*Hypericum reductum*), and pennyroyal (*Piloblephis rigida*) (Service 1999). Scrub habitats in south Florida are important for a number of xeric-adapted species including: Florida gopher frog (*Rana capito*), Florida mouse (*Podomys floridana*), short-tailed snake (*Stilosoma extenuatum*), scrub lizard (*Sceloporus woodi*), rufous-sided towhee (*Pipilo erythrophthalmus*), gopher tortoise (*Gopherus polyphemus*), Florida worm lizard (*Rhineura floridana*), other subspecies of mole skink (*Eumeces egregius* sspp.), and the crowned snakes (*Tantilla* spp). Federally listed scrub inhabitants include 23 species of plants, Florida panther, Florida scrub-jay (*Aphelocoma coerulescens*), eastern indigo snake, blue-tailed mole skink (*Eumeces egregious lividus*), and sand skink (*Neoseps reynoldsi*) (Service 1999).

DRY PRAIRIE

Florida dry prairie is a natural landscape that is endemic to the state, with no similar communities found in adjacent states. It is geographically restricted to the interior of central, south-central, and west-central peninsular Florida. Dry prairie is often (but not exclusively) found on the same soil series, topographic positions, and moisture regimes as mesic flatwoods, with dry prairie being the essentially treeless endpoint of a continuum of variation in canopy cover across pine flatwoods landscapes in central Florida. Dry prairie occurs on nearly level, poorly to somewhat poorly drained, interdrainage flatlands above major river/stream floodplain valleys. Typically, the flatlands characteristic of the Osceola Plain are dotted with numerous small shallow depressions (with ephemeral ponds and marshes), but have very few surface drainage features. Developed on flat plains, the dry prairies at Avon Park AFR are generally below the 19.6 m (65 ft) contour (Bridges 1998). It is unclear why the dry prairie landscape at Avon Park AFR is lower in elevation than the other landscape associations on the Osceola Plain at this site, but it seems to be correlated with the proximity of major drainages such as Arbuckle Creek, Arbuckle Marsh, and the Kissimmee River (Bridges 1998). Dry prairie is a pyrogenic landscape with a ground cover diverse in regionally endemic plant taxa and dominated by wiregrass, scattered, low, stunted saw palmetto, and low-growing runner oak. The typical dry prairie has a mixture of upland and wetland plants, with the most conspicuous indicator of this mixture being the co-occurrence of running oak (*Quercus minima*) and yellow-eyed grass (*Xyris elliottii*). Unlike most other grasslands in the southeastern United States, Florida dry prairie harbors numerous endemic vertebrates. Interior dry prairie is considered to be one of four geographic and/or ecological communities in Florida with a concentration of high-ranked vertebrate taxa. Several of the high-ranked avian taxa are near-endemic to the dry prairie region of south-central Florida. Of these, some are not found exclusively in native prairie habitat, but are capable of persisting in anthropogenic altered landscapes (e.g., semi-improved pastures, improved nonnative pastures, disturbed rangelands, and others). The Florida grasshopper sparrow (*Ammodramus savannarum floridanus*) is a federal and state endangered subspecies which is endemic to the prairie region of south-central peninsular Florida. Frequently burned dry prairie is the preferred natural habitat for this non-migratory subspecies, although it is also documented from degraded prairie and other rangeland sites (Service 1999). The largest concentration of dry prairie within the Study Area is at the Kissimmee Prairie Preserve State Park, Avon Park AFR, and Three Lakes Wildlife Management Area.

CUTTHROAT GRASS COMMUNITIES

Cutthroat grass (*Panicum abscissum*) is a central peninsular Florida endemic species, found in scattered locations from Orange County south to Palm Beach County. However, it seems to dominate natural communities almost exclusively within Polk and Highlands Counties, in association with the side slopes of the central Florida ridges. Cutthroat grass-dominated communities fall within four distinct natural community classes. Since the landscape position, hydrology, soil types, and community composition differ significantly between each of these types, they are best discussed as distinct sets of natural communities. Cutthroat grass communities are mostly associated with areas of slight to strong groundwater seepage; however, not all cutthroat grass communities are well-developed seepage slopes. Cutthroat grass communities also occur within the community classes of wet flatwoods and wet prairies (FNAI 2010b). It is important to recognize these communities to make it clear that not every occurrence of cutthroat grass is by definition, a cutthroat seepage slope. Cutthroat grass communities require frequent fire for maintenance of the open, graminoid-dominated character of these areas. The greatest threats to the integrity of cutthroat grass communities are continued fire-suppression and drainage effects. Even on protected lands, many cutthroat grass communities are not fire-managed aggressively enough to conserve the biodiversity of these community types. Cutthroat grass communities cover more than 5,800 ha (14,326 acres) at Avon

Park Air Force Range, the largest areal extent remaining for these communities. Diverse, fire-maintained cutthroat grass vegetation continuums with intact species-rich ecotones are now found only in association with the Bombing Range Ridge in Polk and Highlands Counties. These communities support large populations of the endemic Florida hartwrightia (*Hartwrightia floridana*), and disjunct populations of species which are more common in seepage slopes of the Florida Panhandle, such as swamp bayberry (*Myrica heterophylla*) and featherbristle beaksedge (*Rhynchospora oligantha*).

WET PRAIRIES AND FRESHWATER MARSHES

Wet prairies and freshwater marshes were once a prominent feature of the central portion of the Study Area. The differences between the two are based on hydroperiod. Wet prairies are flooded less than 6 months per year (short hydroperiod). Freshwater marshes can be flooded 6 to 9 months per year (intermediate hydroperiod) or more than 9 months per year (long hydroperiod). As a result, wet prairies are more susceptible to fire, and burn more frequently than marshes. The loss of short-hydroperiod wetlands on the Kissimmee Prairie is a significant ecological consequence of agricultural ditching and residential development in that area. Those wetlands, many times isolated from other surface water bodies, are critical for maintaining amphibian diversity on the prairie, because the occurrence of predators (e.g., fish and alligators) is less than in longer hydroperiod wetlands. These differences in hydroperiod and fire regime are also reflected in the vegetative communities. The common plants of wet prairies are sawgrass (*Cladium jamaicense*), muhly grass (*Muhlenbergia capillaris*), beakrush (*Rhynchospora* spp.), black sedge (*Schoenus nigricans*), wiregrass, and dwarf cypress (*Taxodium* spp.; Service 1999). Freshwater marshes are frequently categorized based on their dominant vegetation [e.g., sawgrass marsh; cattail marsh; flag marsh (*Pontederia lanceolat*a and one or more *Sagittaria* spp.); mixed emergent grass/sedge marsh; maidencane (*Panicum hemitomon*) marsh; beakrush and spike rush (*Eleocharis* spp.) marsh; or floating vegetation marsh (the water lilies *Nymphaea odorata* and *Nuphar luteum* and floating hearts, *Nymphoides aquatica*)]. Marshes can also be categorized based on physiognomy. Flatwoods marshes, also called depressional marshes, are small, elliptical wetlands that occupy the low areas within pine flatwoods. They have moderate to long hydroperiods with depths less than a meter, and are generally disconnected (Kushlan 1990). Conversely, sloughs are larger, linear, connected marshes with deeper water and long hydroperiods (Service 1999). Regardless of their category, marshes and wet prairies are another vital component for the biodiversity of south Florida (Service 1999). Federally listed birds, such as the Everglade snail kite (*Rostrhamus sociabilis plumbeus*), wood stork (*Mycteria americana*), whooping crane (*Grus americana*), and Audubon's crested caracara [*Polyborus* (=*Caracara*) *plancus audubonii*], and state listed birds, such as Florida sandhill crane (*Grus canadensis pratensis*), roseate spoonbill (*Ajaia ajaja*), little blue heron (*Egretta caerulea*), reddish egret (*Egretta rufescens*), snowy egret (*Egretta thula*), tricolored heron (*Egretta tricolor*), and white ibis (*Eudocimus albus*), all use these habitats for nesting and/or foraging. The growth, maintenance, and/or reproduction of many other species of birds, amphibians, reptiles, fish, invertebrates, and mammals are directly linked to the quality and quantity of these wetland habitats.

FRESHWATER FORESTED WETLANDS

Freshwater forested wetlands are present in the Study Area primarily in the form of pond swamps, but also as seepage and flowing water swamps. In the Study Area, there are approximately 150,000 acres of forested swamps. Pond swamps are seasonally inundated forested wetlands located around or within landscape depressions. They include the lake-border swamps and major wetlands within large landscape basins, as well as smaller cypress domes and gum ponds. Although many small and/or shallow pond swamps have been cleared and converted to agricultural or residential uses, most of the larger systems still exist. Most of the remaining systems have been

degraded to some extent by logging, drainage, impoundment, nonnative plant invasion, and/or pollution. Increased hydroperiods, nutrient enrichment, and contamination from agricultural runoff are major problems, since pond swamps are often surrounded by farmlands and water is typically diverted from these lands into the wetlands. Appropriate timber management and nonnative species control are also significant management concerns.

Seepage swamps are forested wetlands characterized by saturated soils rather than periodic inundation. They include baygalls at the base of seepage slopes, bayheads in peat-filled depressions, and hydric hammocks on low sand or limestone rises within periodically inundated wetland systems. Baygalls and bayheads are dense evergreen forests or shrub thickets with a spongy understory of sphagnum moss and ferns. The canopy is composed of tall, densely packed, generally straight-boled evergreen hardwoods dominated by sweetbay (Magnolia virginiana), swamp bay (*Persea palustris*), red bay (*Persea borbonia*), dahoon holly (*Ilex cassine*), and loblolly bay (*Gordonia lasianthus*). There is typically a more or less open understory of shrubs and ferns and a ground surface of sphagnum mats interlaced with convoluted tree roots. Hydric hammocks are open forests dominated by cabbage palms and laurel oaks (*Quercus laurifolia*) mixed with other hardwoods. They often have minimal understory and a floor carpeted by fallen palm fronds (Service 1999). Many animal species utilize these forested wetlands in south Florida including the following federally listed species: Florida panther, wood stork, and eastern indigo snake (*Drymarchon corais couperi*) (Service 1999).

Flowing water swamps can be classified further as floodplain wetlands - those along clearly defined river channels; and strand swamps - those of shallower and more diffuse flow-ways. The vegetative community of flowing water swamps is frequently dominated by bald cypress (*Taxodium distichum*). Pop ash (*Fraxinus caroliniana*) and pond apple (*Annona glabra*) may also be present. Other typical plant species include red maple (*Acer rubrum*), cabbage palm (*Sabal palmetto*), strangler fig (*Ficus aurea*), swamp bay (*Persea palustris*), sweetbay (*Magnolia virginiana*), royal palm (*Roystonea regia*), coastal plain willow (*Salix caroliniana*), wax myrtle, myrsine (*Rapanea* spp.), poison ivy (*Toxicodendron usneoides*), swamp lily (*Crinum* spp.), leather fern (*Acrostichum* spp.), and royal fern (*Osmunda regalis*). The canopy plants are mainly temperate, while the understory and epiphytic plants are generally tropical (Service 1999).

SHRUB AND BRUSHLAND

Shrub and brushland is an unusual category that is not in the MRSP (Service 1999), but was used by FNAI when they created their new land cover layer for Florida. We have examined the aerial photographs for where this land cover occurs within the Study Area and it appears to serve as a “catch-all” category of non-descript areas with land signatures that are similar to pastures, prairies, pine flatwoods, or mesic hammocks. It represents less than 1 percent of the spatial extent of the Study Area.

INTENSIVE AGRICULTURAL AREAS

Intensive agriculture in the Study Area occurs mainly as citrus (90,000 acres) and tree crops (57,000 acres). These nonnative areas are generally less desirable habitats for fish and wildlife. They exhibit habitat uniformity and are subject to disturbance from humans, machinery, and pesticide usage. Still, some wildlife species are usually present in these areas as either residents or transients from native habitats. Mazzotti et al. (1992) reported on wildlife usage in citrus groves southwest of Lake Okeechobee. They found 203 vertebrate species out of a possible total of 380 that were regionally present, however, 78 percent of those were observed not in the production areas, but in associated agricultural reservoirs or wet detention areas. During a 5-day wildlife survey of the Ten Mile Creek citrus grove, Carroll and Associates (1999) found 36 wildlife species including great egret, great blue heron, red-

tailed hawk, merlin, wild turkey, blue jay, downy and hairy woodpeckers, ovenbird, European starling, bobcat, white-tailed deer, butterflies, Cuban anole, and the federally threatened eastern indigo snake. Thirty-three understory plant species were also identified from between the citrus rows.

IMPROVED, UNIMPROVED, AND WOODLAND PASTURES

Approximately 585,000 acres (32 percent) of the Study Area is pasture. Improved pasture is recognizable by the presence of numerous drainage ditches and an almost complete monoculture of planted pasture grasses. Unimproved and woodland pastures usually provide better wildlife habitat than improved pastures, but all ecosystems are generally of higher value than the more intensive agricultural areas mentioned previously and can support a number of federally listed species including the wood stork, Audubon's crested caracara, eastern indigo snake, and Everglade snail kite (if sufficient wetlands are present). State-listed pasture inhabitants may include bald eagle, roseate spoonbill, limpkin (*Aramus guarauna*), burrowing owl (*Speotyto cunicularia*), little blue and tricolored herons, snowy and reddish egrets, white ibis, southeastern American kestrel (*Falco sparverius paulus*), Florida sandhill crane, and gopher tortoise (*Gopherus polyphemus*).

Cattle ranches by far dominate the landscape within the Study Area. Florida itself is known as one of the top leading cattle producing states in the United States. Livestock grazing was historically the primary economic benefit derived from the dry prairie and flatwoods landscapes of central and south-central Florida. Between 1940 and 1960, many pastures of Bahia grass (*Paspalum notatum*), digit grass (*Digitaria* sp.), and Bermuda grass (*Cynodon dactylon*) were established, as a result of land clearing and drainage alterations of native rangeland. By 1985, Florida had 4 million acres of pasture, an extensive area of which had formerly been dry prairie or flatwoods. Today, grazing occurs on both pasture and rangeland in the Study Area.

While grazing densities and types of cattle operations vary by ranch, several generalizations can be made regarding these operations. Native central and south Florida rangelands are typically burned by ranchers annually or biennially during the winter or early spring months to stimulate forage growth, nutrition, and palatability during the lean winter months. Ranchers also burn to maintain openness, reduce shrub cover, reduce fuel accumulations, and improve wildlife habitat. On average, nutrient runoff of both phosphorous and nitrogen is greater from improved pasture than from semi-native pastures (Archbold Biological Station 2002). It is also recognized that agricultural wetlands are sources of nutrient accretion. Nutrient content of both water column and vegetation is elevated in improved pasture (Swain and Bohlen 2001, 2003). However, it appears that this nutrient loading may be the result of past fertilization and cattle hoof action re-suspending nutrients, rather than stocking rates.

C. VEGETATION

FEDERALLY LISTED PLANT SPECIES

There are approximately 25 federally listed plant species present in the Study Area (Appendix E). The federally listed plant species occur mostly in scrub, though some also occur in high pine (dry, longleaf pine savanna) and flatwoods, or in areas that formerly supported these vegetation types but that have been converted to pasture. Most of the scrub plants are gap specialists whose populations expand after fire and then decline as clonal oaks and palmettos reclaim dominance. Nearly all of the plant species are adapted to the fires that were once frequent in these habitats. The Okeechobee gourd (*Cucurbita okeechobeensis* ssp. *okeechobeensis*) is the only listed plant species associated with water bodies. The following is a brief discussion of each species. For more in-depth information, we refer the reader to the Service's South Florida Multi-species Recovery Plan (1999), species five-year status reviews, and the Service's website: *http://www.fws.gov/verobeach/*.

Okeechobee Gourd

The endangered Okeechobee gourd is a vine that was locally common in the extensive pond apple (*Annona glabra*) forest that once grew south of Lake Okeechobee and in hammocks along the rim and islands of the lake (Small 1922). The Okeechobee gourd is now restricted in the wild to two small disjunct populations - one along the St. Johns River which separates Volusia, Seminole, and Lake Counties in north Florida, and a second around the shoreline of Lake Okeechobee. Population trend and abundance of this subspecies are difficult to assess because the gourd is ephemeral by nature, often only growing when habitat conditions are favorable. This subspecies employs a strategy of growing on open organic soils exposed by low water levels with little to no competition, producing numerous seeds with somewhat long viability, and experiencing vegetative decline when competition increases or water levels rise (Moyroud 2009). Currently, the survival of the Okeechobee gourd in south Florida is threatened by the water-regulation practices in Lake Okeechobee, the continued expansion of nonnative vegetation in the lake, aggressive weeds [especially moonflower (*Ipomoea alba*)], habitat degradation, improper use of herbicides, predation of seeds by animals (e.g., rabbits and feral pigs), and, potentially, disease and insect infestation. The Okeechobee gourd could grow in any given year along any suitable shoreline inside the Herbert Hoover Dike or along the rim canal; therefore, it would be present only in the extreme southern portion of the Study Area.

Beautiful Pawpaw

The endangered beautiful pawpaw (*Deeringothamnus pulchellus*) is a low-growing, diminutive shrub rarely exceeding 1.6 feet in height. The current range of the pawpaw is limited to Lee, Charlotte, and Orange (immediately adjacent to the Study Area) Counties, Florida. The occurrences are fragmented and isolated within the range. Historically, beautiful pawpaw occurred on poorly drained sands of slash (*Pinus elliottii*) and longleaf pine (*P. palustris*)-saw palmetto (*Serenoa repens*) flatwoods in southwestern Florida and in Orange County east of Orlando (Kral 1960). However, much of the suitable habitat in the historic range has been destroyed or converted for residential housing, commercial activities, and agriculture, and numbers and distribution of plants have decreased as a result (Service 1999). Habitat loss, fragmentation, degradation, changes in land use, and competition from invasive plants continue to threaten the species. Where habitat remains intact, beautiful pawpaw depends on active management to persist. Land management practices, especially prescribed fire used for the reduction of tall grasses and larger shrubs, are extremely important for maintaining the health of the pine flatwoods ecosystem in which this species occurs. The species limited distribution and its limited reproductive capacity also renders it vulnerable to random natural events, such as hurricanes and drought (Service 2009c).

Scrub Lupine

The endangered scrub lupine (*Lupinus westianus var. aridorum*) is an herb endemic to Orange and Polk Counties. This species is known from two distinct areas. In western Orange County (Orlando area), it is found on the southern Mount Dora Ridge from the Apopka-Plymouth area south, past Lake Buena Vista. It is also found in north-central Polk County on the Winter Haven Ridge near Audurndale and Winter Haven (Service 1999). The species is an unusual central Florida scrub plant, because it is absent from the Lake Wales Ridge. Like many other scrub species, however, it is threatened by loss of habitat due to land conversion for agriculture and for residential construction. Scrub lupine is found in open disturbed areas in sand pine and rosemary scrub communities of central Florida. It grows primarily on well-drained sandy soils of the Lakewood or St. Lucie series (Wunderlin 1984). These soils are very dry and have very little organic accumulation (Lowe et al.

1990). The sands are white or occasionally yellow and generally support sand pine (Wunderlin 1984). They are also quite acidic with a pH from 4.0 to 4.5 (Stout 1996).

Avon Park Harebells

The endangered Avon Park harebells (*Crotalaria avonensis*) is a spreading, perennial herb with one to three moderately hairy, flowering stems that may grow 2 to 10 cm above the surface. It is known from only three locations – Avon Park Lakes Subdivision, The Nature Conservancy's Saddle Blanket Scrub Preserve, and FWC's Lake Wales Ridge Wildlife Management Area (Carter Creek). The Avon Park Lakes Subdivision population continues to be threatened by residential development. This species occupies sparsely vegetated, xeric, white-sand scrub habitat.

Britton's Beargrass

The endangered Britton's beargrass (*Nolina brittoniana*) is a long-lived species of Agavaceae (e.g., agave and yucca) and is found from the south end of the Lake Wales Ridge in Highlands County north to Orange County and northern Lake County, Florida. It is a relatively widespread species with highest concentrations in Polk and Highlands Counties. The species is threatened by habitat loss or modification due to land conversions for agriculture and development (Service 1999). It occurs in a wide range of habitat types, from relatively open scrub to hammocks with closed canopies. It has been reported in scrub, high pine (dry, longleaf pine savanna), and occasionally in hammocks (Christman 1988). The wide range of habitat types that *Nolina brittoniana* occupies are very different in appearance, physiognomy, species composition, fire dynamics, and land use history, but are closely linked ecologically and historically (Myers 1990). In all habitats where *Nolina brittoniana* occurs, soil is droughty and infertile, and all are considered upland sites (Myers 1990, C. Weekly 1996). These habitats are also fire-maintained and fire-dependent ecosystems that are presumably replaced by hardwoods in the absence of fire (Myers 1990, Service 1999).

Carter's Mustard

The endangered Carter's mustard (*Warea carteri*) is a fire-dependent annual herb occurring in xeric, shrub dominated habitats on the Lake Wales Ridge of central Florida. The primary threats to this species are habitat loss to citrus grove operations and residential developments and long-term fire suppression, both of which cause local extirpations (Service 1999). From what is known of the historic distribution of *Warea carteri*, it occurred in scrubby flatwoods and sandhills of the Lake Wales Ridge in Highlands, Polk, and Lake Counties, in south Florida slash pine forests in the Miami area, and in coastal scrub in Brevard County (Service 1999). *Warea carteri* has occurred throughout the entire length of the Lake Wales Ridge, as well as the Winter Haven Ridge (Schultz et al. 1999, Turner et al. 2006). Several populations of *Warea carteri* at Archbold Biological Station are adjacent to roads, firelanes, or in areas with historic human disturbance. At Tiger Creek Preserve, *Warea carteri* is found in degraded sandhill habitat where turkey oak is abundant, in scrubby flatwoods, and in xeric hammocks (Menges 1995). *Warea carteri* is found almost exclusively in upland areas and is a soil generalist, being found in yellow, gray, or white sands (Menges et al. 2007). It is found primarily in sandhills and scrubby flatwoods, and often at the ecotone between these two vegetation types. In the northern part of its range, most sites are on sandhill. This is also true for sites at Tiger Creek Preserve, a site in the central part of its range, which supports the greatest number of plants. At this site, the species is found in both high-quality, frequently burned sandhill, as well as in overgrown sandhill that could also be termed xeric hammock (Menges 2008b). Near the end of its range (e.g., ABS), *Warea carteri* is found primarily in scrubby flatwoods, often just downhill from a ridge of yellow sand (Menges 2008c, Service 2008a).

Wide-leaf Warea

The endangered wide-leaf warea (*Warea amplexifolia*) is a summer annual herb endemic to central Florida where it is known from Lake, Polk, and Osceola Counties and historically from Orange County. Less than 30 populations have been documented, but many have been extirpated. Wide-leaf warea is found on the Lake Wales Ridge and is restricted to longleaf pine and scrubby oak forests. Loss of habitat is the primary threat to this species. There are very few remaining areas of upland, dry, open longleaf pine woods in the area of well-drained white sandy soil from the city of Leesburg to Haines City. This area is now covered with citrus groves, with the few remaining wooded areas occupying mainly lowland sites. Many populations of wide-leaf warea are surrounded by citrus groves and/or urban developments, such as Orlando, Tavares, and Leesburg, and are vulnerable to development pressures. The plant's attractive flowers dispose it to picking by vandals and curiosity seekers, and to taking for use as a cultivated ornamental. Additionally, because this species is an annual and extremely restricted in both range and numbers, it is vulnerable to disturbance and natural disasters. The failure of any one of the remaining populations to set seed in the fall could result in the extirpation of that population and a further reduction in the already small genetic variability of the species.

American Chaffseed

The endangered American chaffseed (*Schwalbea americana*) is a hemiparasitic plant that photosynthesizes in addition to acquiring food from a host plant species through haustoria (modified roots that bridge the vascular systems of the host and parasite). It is present in 174 locations in New Jersey, North Carolina, South Carolina, Georgia, Florida, Alabama, and Louisiana (Service 2008b). Out of the 10 occurrences of this plant in Florida, 8 had been extirpated by 1995, including a site in Highlands County. By 2008, the Gadsen County site was extirpated; only the Leon County site is known to support this species in Florida. American chaffseed is an early successional species that requires periodic fire or other disturbance for long-term maintenance of its habitat. Destruction of habitat, fire suppression, and incompatible agricultural and silviculture practices are the major threats to this species. Surveys in South Carolina found American chaffseed in areas being managed for red-cockaded woodpeckers. Controlled burning as habitat maintenance for red-cockaded woodpeckers would also support conditions for American chaffseed. While we expect that this species has been extirpated from the study area, there is potential for reintroduction in suitable habitat.

Highlands Scrub Hypericum

The endangered Highlands scrub hypericum (*Hypericum cumulicola*) is a small, short-lived perennial herb reaching 20 to 70 centimeters in height. It is a rare species that is endemic to the Lake Wales Ridge in central Florida and only known from Polk and Highlands Counties. The scrub hypericum is threatened by habitat loss, isolation of populations, and fire suppression. It is limited to upland areas with well-drained, sterile, white sands (Judd 1980). It is almost exclusively found in the sunny openings in rosemary balds. Rosemary balds are unique vegetative communities that occur as patches within the more expansive scrub ecosystems. These habitat patches provide suitable habitat for a number of rare scrub endemics (Christman and Judd 1990). *Hypericum cumulicola* occurs occasionally in openings in well-drained scrubby flatwoods or among turkey/oak scrubs in yellow sands (Quintana- Ascencio 1995).

Florida Bonamia

The threatened Florida bonamia (*Bonamia grandiflora*) is a member of the morning glory family (*Convolvulaceae*), and is the only species of its genus in the continental United States. This endemic scrub is found only on scrub areas of central and south Florida. Destruction of Florida's scrub habitat for residential housing and agricultural expansion has dramatically reduced the size and number of this population. This species formerly occurred in central Florida from Volusia and Marion Counties south to Highlands and Charlotte Counties (Wunderlin et al. 1980). It is a scrub endemic of central Florida where all of its known populations occur within or near scrub or on the edge of scrub habitat in the white sands associated with the ancient Pleistocene dune systems of the central ridge system (Ward 1979). The substrate is associated with a sand pine scrub vegetation consisting of evergreen scrub oak (*Quercus myrtifolia* and *Q. germinata*) and sand pine (*Pinus clausa*), with openings between trees and shrubs occupied by lichens and herbs. The openings are cleared by infrequent fires or by mechanical disturbance. *Bonamia grandiflora* is also known to live in disturbed areas near roadways and clearings caused by logging operations.

Florida Perforate Cladonia

The endangered Florida perforate cladonia (*Cladonia perforata*), commonly called reindeer lichen, is restricted to high, well-drained sands of Florida scrub, primarily rosemary balds. Florida scrub, which is characterized in part by persistent, open patches of sand, supports a relatively rich assemblage of these terrestrial lichens. Up to eight species of reindeer lichens commonly occur in Florida scrub. *Cladonia perforata* is a habitat-specialist, usually restricted to openings in very xeric sites. It can occur in monospecific mats or in mixed-species mats with other *Cladonia* species (Service 1999). The loss of habitat is the primary reason *Cladonia perforata* was listed. Land conversion to citrus and residential development continues to diminish scrub habitat (Service 1999). Typical habitat for *Cladonia perforata* is found on the high sand dune ridges of Florida's peninsula, including the Atlantic Coastal and Lake Wales Ridges. In these areas, *Cladonia perforata* is restricted to the highest, xeric white sands in sand pine scrub, typically in the rosemary phase (Abrahamson et al. 1984). *Cladonia perforata* typically occurs in open patches of sand between shrubs in areas with sparse or no herbaceous cover (Service 1999). In Highlands and Polk Counties on the Lake Wales Ridge, *Cladonia perforata* occurs at relatively higher elevations than surrounding areas, on excessively well-drained, nutrient-poor, white sands of the St. Lucie series (Buckley and Hendrickson 1988, Yahr 1995).

Florida Ziziphus

The endangered Florida ziziphus (*Ziziphus celata*) is a thorny shrub in the Buckthorn family (Rhamnaceae), endemic to the Lake Wales Ridge in Polk and Highlands Counties. All *Ziziphus celata* populations occupy yellow sand sites that historically supported longleaf pine (*Pinus palustris*) wiregrass sandhills or oak (*Quercus myrtifolia*) hickory (*Carya floridana*) scrub, but most have been converted to pastures or other uses (Weekley and Menges 2006). Threats to this species include habitat loss, genetic limitations, and nonnative species. The species was believed to be extinct when it was described in 1984 from a 36-year old herbarium specimen. Between 1987 and 2007, 14 remnant populations were discovered. Ten of the fourteen extant populations are located on private land (Service 2009b). In the most recent survey (2008), a total of 1,088 plants were counted in the 14 wild populations. Two introduced populations totaled 396 plants. Habitat fragmentation has likely played a large role in the current abundance and distribution of *Ziziphus celata*. The loss and fragmentation of habitat, which has taken place over the last few decades, have resulted in scattered remnant, genetically depauperate, and largely sterile populations persisting on degraded sites (Service 2009b).

Garrett's Mint

The endangered Garrett's mint (*Dicerandra christmanii*) is a partially woody, short-lived (less than 10 years) perennial shrub growing to 50 centimeters (cm) (Huck et al. 1989). Small white flowers with purple splotches are produced July through October. The leaves of this species produce a strong odor of eucalyptus oil when crushed (Huck et al. 1989). *Dicerandra christmanii* is endemic to the Lake Wales Ridge and occurs only in Highlands County, approximately 5 to 8 kilometers (km) southeast of the town of Sebring. It is distinguished from scrub mint by anther color, odor, leaf length, and chemistry of the compounds found in leaves (Huck et al. 1989). Loss of habitat to residential and commercial development, compounded by an extremely small distribution, as well as fire suppression in tracts of remaining habitat, are the principal threats to this species (Service 1999). There are only four locations recorded for *Dicerandra christmanii*. Three of the four known occurrences are located on private land. Habitat for *Dicerandra christmanii* is yellow sand xeric oak-hickory scrub. All populations are found in areas with moderately well-drained Tavares yellow sands (Menges et al. 1999). These soils support scrub and sandhill vegetation, but have largely been converted to citrus cultivation (Menges 1992). Within the habitats where it occurs, *Dicerandra christmanii* is a gap specialist, growing almost exclusively in openings in between shrubs. Occupied microhabitats typically have shallow leaf litter (less than 2 cm) and partial to no canopy cover (Menges et al. 1999).

Lewton's Polygala

The endangered Lewton's polygala (*Polygala lewtonii*) is a short-lived (5- to 10-year) perennial herb that occurs in high pine (dry, longleaf pine savanna) and occasionally in oak scrub or the transitional areas between these two community types (Service 1999). In the Lake Wales Ridge, the south portion of Carter Creek, including the refuge-managed unit and the unprotected unit to the south, have the largest known population of *Polygala lewtonii* (Service 1999). Each plant produces one to several annual stems. This species is closely related to the widespread *P. polygama*. *Polygala lewtonii* occurs in scrub and high pine (dry, longleaf pine savanna) communities of Highlands, Polk, Osceola, Orange, Lake, and Marion Counties within the Lake Wales and Mount Dora Ridges of central Florida (Service 1999). *Polygala lewtonii* is not strictly a scrub species and is found in widely scattered populations that frequently occur in transitional habitats between high pine (dry, longleaf pine savanna) and turkey oak barrens. *Polygala lewtonii* also occurs in both habitats (Wunderlin et al. 1981, Christman 1988). It depends on fire to maintain its habitat. It is found in sunny openings and often colonizes disturbed sites, such as roadsides and fire lanes.

Papery Whitlow-wort

The endangered papery whitlow-wort (*Paronychia chartacea*) is a short-lived dioecious herb, forming small mats. There are two geographically isolated subspecies of this small herb: *P. chartacea* ssp. *chartacea* in central Florida and *P. chartacea* ssp. *minima* in northwestern Florida. *Paronychia chartacea* is currently protected on 26 managed areas on the Lake Wales Ridge, including the Carter Creek and Flamingo Villas Units of the Lake Wales Ridge NWR. *Paronychia chartacea* is also known to exist on conserved lands of the Winter Haven Ridge including the Lake Wales Ridge NWR. *Paronychia chartacea* is endemic to the scrub community of the Lake Wales Ridge (Kral 1983), in Highlands, Polk, Osceola, Orange, and Lake Counties (Anderson 1991). The natural habitat for the papery whitlow-wort is rosemary scrub (Abrahamson et al. 1984, Christman 1988, Menges and Kohfeldt 1995). Although soil preferences for *Paronychia chartacea* elsewhere on the Lake Wales Ridge have not been qualified, it is well known from white, gray, and yellow sands throughout its range, but is most abundant on white sands (Service 2008c).

Pigeon Wing

The threatened pigeon wing (*Clitoria fragrans*) is an erect perennial herb belonging to the pea family (Fabaceae). The distribution of the species is limited mainly to the rapidly disappearing scrub habitats of the Lake Wales Ridge in Highlands and Polk Counties (Fantz 1977, Wunderlin et al. 1980, Christman 1988). The total number of *Clitoria fragrans* has been estimated to be less than 3,000 in Orange, Polk, and Highlands Counties (Muller et al. 1989). Christman (1988) indicates that the species is found primarily within habitats intermediate with high pine (dry, longleaf pine savanna) and scrub. Christman and Judd (1990) reported the species from scrub, turkey oak barrens, and the edges of high pines (dry, longleaf pine savannas). Others report *Clitoria fragrans* from scrubby high pine, more typical of hickory-dominated scrub (hickory phase of high pineland) (Menges 1997). *Clitoria fragrans* occupies several xeric upland habitats on white, yellow, and gray sands (Menges et al. 2007, Stout and Lewis 2006), and requires the appropriate use of fire to manage and maintain its habitat.

Pygmy Fringetree

The threatened pygmy fringetree (*Chionanthus pygmaeus*) is a large shrub that occurs primarily in scrub, as well as in high pineland, dry hammocks, and transitional habitats in central Florida. Much of this species habitat has been lost because of land clearing for citrus production and residential development. *Chionanthus pygmaeus* is known from west of Lake Apopka in Lake County, northwestern Osceola County, and the Lake Wales Ridge in Polk and Highlands Counties. One of the largest populations is in the Carter Creek scrubs in Highlands County, where is occurs with turkey oak (*Quercus laevis*), a species more typical of high pine community (Service 1996a). *Chionanthus pygmaeus* inhabits excessively drained sandy soils on the Lake Wales Ridge (and historically on the Mount Dora Ridge which is part of its historic range, but where it is no longer found). This species is found on the low-nutrient St. Lucie fine sand, which is subject to rapid drying (Wunderlin et al. 1981, Service 1999).

Sandlace

The endangered sandlace (*Polygonella myrophylla*) is found in open scrub sites. It is a sprawling shrub that forms many branches that zigzag along the ground and root at the nodes, forming low mats. The species occurs in scrub habitats along the Lake Wales Ridge in the Davenport-Poinciana area in Polk County and in Highlands County south to Archbold Biological Station. *Polygonella myriophylla* has also been found in Orange and Osceola Counties (Service 1999). This species thrives in areas of bare white or yellow sand created by moderate disturbance. *Polygonella myriophylla* is an allelopathic species (Richardson 1985).

Scrub Blazing Star

The endangered scrub blazing star (*Liatris ohlingerae*) belongs to the aster family (Asteracea) within the genus of perennial, long-lived herbs that live in open, usually fire-maintained habitats. This species is endemic to the Lake Wales Ridge in Highlands and Polk Counties. The species' range extends from Lake Blue in Polk County (Service 1996a), south along the Lake Wales Ridge to Archbold Biological Station at the south end of the ridge in Highlands County (Service 1999). *Liatris ohlingerae* is one of the endemic plants found in rosemary balds. It is also found along the ecotone between these bald and surrounding scrub habitats on white or rarely on yellow sands (Christman and Judd 1990). It can also be found scattered in surrounding scrub. Herndon (1996) found that *Liatris ohlingerae* has important microhabitat requirements, particularly its preference for shade. Unlike most other scrub endemics, it appears to thrive in lightly shaded areas.

Scrub Buckwheat

The threatened scrub buckwheat (*Eriogonum longifolium* var. *gnaphalifolium*) occurs in high pine (dry, longleaf pine savanna) and in turkey oak barrens in Marion, Pasco, Hillsborough, Lake, and Orange Counties in central Florida (Christman 1988). In Polk and Highlands Counties, it is found on the Lake Wales Ridge as far south as Archbold Biological Station, south of Lake Placid (Service 1999). The northern range limits for scrub buckwheat are in Ocala National Forest and in areas of mixed scrub and high pine (dry, longleaf pine savanna) south of Ocala in Marion County. Suitable habitat and possibly the plant extends south into northern Sumter County. Scrub buckwheat historically occurred near Eustis in Lake County (where it was collected around the turn of the century) and it still occurs near Clermont in remnants of high pine (dry, longleaf pine savanna) with *Polygala lewtonii* and several other endangered plant species (Service 1999).

Scrub Plum

The endangered scrub plum (*Prunus geniculata*) is a small shrub endemic to the oak scrub and high pine (dry, longleaf pine savanna) communities of the Lake Wales Ridge. It has declined with the destruction and fragmentation of its scrub habitat for agriculture and residential housing. *Prunus geniculata* is a scrub endemic known to occur on the ridges of central Florida in Lake, Orange, Osceola, Polk, and Highlands Counties. In these areas, *Prunus geniculata* occurs in both high pine (dry, longleaf pine savanna) and in oak scrub communities (Stout 1982). *Prunus geniculata* prefers dry, sunny, nutrient-poor sites (Harper 1911). It has been found on soils of the St. Lucie series and on other fine sands or fine sand Entisols that are excessively drained. These soils are acidic; are subject to rapid drying; and have little silt, clay, or organic matter (Service 1999). *Prunus geniculata* is native to the high pine (dry, longleaf pine savanna) and oak scrub community types.

Scrub Mint

The endangered scrub mint (*Dicerandra frutescens*) is a partially woody, short-lived (less than 10 years) perennial shrub growing to 50 centimeters (cm) in height. The species does not spread clonally. Scrub mint populations are dependent on fire for long-term persistence. White flowers with vivid purple spots are produced from August through October. The leaves of this species produce a strong mint odor when crushed (Huck 1987). The species is endemic to the Lake Wales Ridge and occurs only in Highlands County, Florida (Huck 2008). Five of fourteen occurrences of scrub mint are within two protected areas – Archbold Biological Station and Lake Wales Ridge Wildlife and Environmental Area Highland Park Estates tract. Nine of fourteen occurrences are located on unprotected private land and their present status is unknown. Based on analysis of 2008 aerial images, it appears that four are likely destroyed or heavily disturbed and another five may still be extant based on remaining habitat in the area where they were previously recorded.

Short-leaved Rosemary

Very little is known about the biology or ecology of the endangered short-leaved rosemary (*Conradina brevifolia*). Observations of longevity have been made only in cultivation; plants at Bok Tower Gardens (BTG) live 5 - 10 years (Peterson 2008). The FNAI database contains 35 Element Occurrence Records for short-leaved rosemary. The majority of short-leaved rosemary sites have not been surveyed since 1998 or before (FNAI 2008). Only two new occurrences have been discovered since 1999. Of the 35 recorded sites, 17 occur on 5 conservation areas and are presumed or known to be extant. These areas are: Lake Wales Ridge State Forest; Lake Wales Ridge Wildlife and Environmental Area; Hickory Lake Scrub; Polk County Natural Resources Division; and The Nature Conservancy's Saddle Blanket Lakes Preserve and Sunray Preserve.

Eighteen recorded observations occur on privately owned, non-conservation lands. Recent aerial photographs show that 10 of these 18 sites have been destroyed or are likely to be destroyed due to their small size and proximity to development.

Snakeroot

The endangered snakeroot (*Eryngium cuneifolium*), a member of the Apiaceae (carrot family), is a short-lived (less than 10 years) perennial herb with a very long taproot and flowering stems growing to 0.5 m in height. The species does not spread clonally. Greenish flowers occur for about a month during August to October. Seeds germinate in winter and spring. The species is endemic to the Lake Wales Ridge and occurs only in Highlands County, Florida (Turner et al. 2006, FNAI 2009). Habitat for snakeroot is open sand gaps in white sand scrub, primarily Florida rosemary scrub "balds" characterized by xeric conditions, relatively sparse vegetation, persistent gaps, and longer fire-return intervals than oak (*Quercus* spp.) and sand pine (*Pinus clausa*) dominated scrubs. Eight of nineteen occurrences of snakeroot are within seven protected areas – Archbold Biological Station, Lake Wales Ridge Wildlife and Environmental Area Lands at McJunkin Tract, Gould Road Scrub, Holmes Avenue Scrub, Lake Apthorpe, and Lake Placid Scrub. Eleven of nineteen occurrences are located on unprotected, private land and their present status is unknown. Based on analysis of 2008 aerial images, it appears that two are likely destroyed or heavily disturbed, two have been destroyed by development, and another seven may still be extant based on remaining habitat in the area where they were previously recorded.

Wireweed

The endangered wireweed (*Polygonella basiramia*) is an herbaceous perennial endemic to the central ridges of the Florida peninsula and is one of a suite of herbs found primarily in the rosemary phase of sand pine scrub. It is restricted in distribution with a small number of remaining sires and is faced with continued and dramatic habitat loss. The Lake Wales Ridge in central Florida is the center of diversity for the genus *Polygonella*, whose species have remarkably diverse growth habits ranging from tall and leafy, to upright and virtually leafless (wireweeds), to prostrate (Horton 1960). Wireweed is endemic to Lake Wales Ridge and Winter Haven Ridge of central peninsular Florida. It ranges from Lake Pierce in Polk County southward to Venus near the southern tip of the Lake Wales Ridge in Highlands County. *Polygonella basiramia* is most commonly found in rosemary scrub (Abrahamson et al. 1984, Menges and Kohfeldt 1995). *Polygonella basiramia* occupies open spaces or gaps between shrubs and can be found in abundance along sandy fire lanes.

STATE LISTED PLANT SPECIES

There are potentially 126 state listed plant species in the Study Area (77 are classified as endangered, and 49 as threatened) (Appendix E). There are an additional 7 plant species that are considered commercially exploited. Forty-three of the plant species in the Study Area are considered endemic. The majority of these are high pine (dry, longleaf pine savanna) and scrub inhabitants (e.g. Florida ziziphus, Garrett's mint), but there is a moderate number of wetland-dependent plants (e.g. pine-pink orchid, Chapman's sedge), and a few grassland species (e.g. wild coco, Florida beargrass).

NONNATIVE AND INVASIVE PLANTS

There are more than 4,000 plant species in Florida of which nearly 25 percent are nonnative (University of Florida 2005). Nonnative plants are defined as "those that have become part of the Florida flora following the occupation by European man" (Source: Richard P. Wunderlin © 2006 Institute for Systematic Botany in University of Florida 2005). Many are benign, but numerous

species become invasive in native habitats, outcompeting native plants and degrading the habitat for wildlife. Numerous nonnative and invasive plants are known to occur in the Study Area, including more problematic and frequently occurring species such as Brazilian pepper, Caesar weed, cogon grass, guava species, hydrilla, limpograss, Japanese climbing fern and Old World climbing fern, natal grass, paragrass, Peruvian primrose willow, smutgrass species, torpedo grass, tropical soda apple, water hyacinth and water lettuce, and Wright's nut-rush.

Brazilian Pepper

Brazilian pepper (*Schinus terebinthifolius*) is a woody species that grows quickly and forms a dense canopy, shading out native plant species. It occurs throughout the Study Area primarily in disturbed land covers (i.e., spoil areas left by canal dredging). It also invades upland inclusions and wetlands within the Kissimmee River floodplain.

Caesar Weed

Caesar weed (Urena lobata) is an erect shrub that grows up to 10 feet in height. The plant is single stalked, with free-branching stems that comprise a bushy appearance. It grows as an annual species in many areas of Florida but may perennate in south Florida. Caesar weed invades disturbed areas, pastures, eroded areas, and perennial crop plantations. The species does not compete well in tall grass and brush lands and does not grow under forest canopies. Caesar weed tolerates salt spray but does not grow in saturated soils. Caesar weed grows rapidly and can reach 2 to 7 feet by the end of the first year.

Cogon Grass

Cogon grass (*Imperata cylindrica*) was introduced into Florida in the 1930s and 1940s as potential forage and for soil stabilization purposes. It is an aggressive perennial grass now found throughout Florida. It does not survive in cultivated areas but becomes established along roadways, in forests, parks, and mining areas. It also occurs primarily in disturbed uplands in areas of the channelized Kissimmee River floodplain currently not being restored. It is a problematic species in Kissimmee Prairie Preserve State Park

Guava Species

Both guava (*Psidium guajava*) and strawberry guava (*P. cattleianum*) are frequently found growing in the hammocks and disturbed sites of central and southern Florida. These species are native to Asia and Australia but escaped cultivation. They may form thickets and have a serious impact on native forests and open woodlands. Along with the Surinam cherry, they also serve as a major host for the naturalized Caribbean fruit fly, which occasionally spreads to commercial citrus crops.

Hydrilla

Hydrilla (*Hydrilla verticillata*) is a prolific submergent species that forms dense mats at the water surface. It is an ongoing problem in Florida water bodies. In addition to its far-reaching ecological impacts, the species causes problems with water quality, recreation, and navigation. Hydrilla occurs in many lakes within the Study Area and the Kissimmee River, becoming most evident under conditions of stabilized water levels and extended periods of inundation. During long periods of inundation of the floodplain, hydrilla colonized large areas (e.g., the Oak Creek area on the east-central side of the floodplain). In the Upper Kissimmee Basin headwaters lakes, hydrilla populations have developed a

resistance to the systemic herbicide fluridone, formerly used extensively for whole-lake treatments. This development has reduced treatment options. However, treatments were conducted in 2008 with a new systemic herbicide, followed by application of a contact herbicide, with good success.

Limpograss

Limpograss (*Hemarthria altissima*) is a nonnative grass introduced to the Kissimmee River Basin as cattle forage. It forms dense, almost monospecific stands. The herbicides imazapyr and glyphosate are effective control agents.

Japanese Climbing Fern and Old World Climbing Fern

Japanese climbing fern (*Lygodium japonicum*) and Old World climbing fern (*L. microphyllum*) are present in the Study Area. These nonnative wetland ferns climb to the canopies of wetland trees and large shrubs, eventually killing host plants. Approximately 4,000 acres along the Kissimmee River, primarily wetland forest, are impacted by *Lygodium* spp. (SFMWD 2010). While treatment can reduce density and slow rates of infestation, maintenance control of this species with herbicides alone is not likely. New, small populations of *Lygodium* are discovered on the floodplain each year. Larvae of the *Lygodium*-eating moth *Neomusotima conspurcatalis* were released in early 2009 in Pool D in a cooperative program between the SFWMD and the USDA's Agricultural Research Service. A 900-acre area surrounding the release site will not be treated with herbicide in 2011 so the area can be used as a nursery for the moths.

Natal Grass

Natal grass (*Rhynchelytrum repens*) is an annual grass native to South Africa and is found throughout many counties in Florida. It was introduced as a forage species, but lacks the nutritional qualities of other species. Natal grass prefers dry conditions and is found in waste lands and perennial crop fields. Natal grass displaces native vegetation and prevents those species from regenerating. It is a primary invader of abandoned crop fields, unimproved pastures, and disturbed scrub sites and prevents the natural succession of native species such as *Andropogon* sp. and desirable forbs.

Paragrass

Paragrass (*Urochloa mutica*) is sparsely distributed in patches on the restored Kissimmee River floodplain and the backfilled canal, but populations are not believed to be significantly expanding. This species occupies a floodplain niche similar to the native dominant floodplain species, maidencane (*Panicum hemitomon*), and is difficult to distinguish from that species in aerial photography, making broad-scale monitoring difficult.

Peruvian Primrose Willow

Peruvian primrose willow (*Ludwigia peruviana*) is an invasive wetland shrub that tends to be concentrated in the lower portions of Kissimmee River pools above tieback levees, where water levels have remained relatively stable since channelization in 1971. It currently occurs in a large area of otherwise native floodplain marsh in the Phase I restoration area as well as along river channel edges. Primrose willow populations experience temporary frost impacts in very cold weather (e.g., winter 2009), but can quickly reestablish dense cover. Extended periods of deep inundation also cause dieback, but with rapid vegetative regrowth when water levels recede. This species may pose a threat to restoration of moderate-to-long hydroperiod native wetland marsh and shrub communities.

Smutgrass Species

Small smutgrass (*Sporobolus indicus*) and giant smutgrass (*Sporobolus indicus* var. *pyramidalis*) are invasive bunch grasses native to tropical Asia. It is a serious weed of improved pastures, roadsides, natural areas, and waste areas in Florida. Results of a survey conducted by The South Florida Beef Forage Program in 2003 indicated that smutgrass ranks as the second-most-problematic weed species in Florida pastures, behind tropical soda apple, which is the most problematic weed. However, because practices to control tropical soda apple have been widely adopted in Florida since that survey was conducted, it is likely that smutgrass has by now become the most problematic weed species in Florida pastures.

Torpedo Grass

Torpedo grass (*Panicum repens*) is one of the most serious weeds in Florida. It grows in or near shallow waters forming monocultures where it can quickly displace native vegetation. It is also found in disturbed areas (i.e., degraded spoil areas and the backfilled C-38 canal). Native to Africa and/or Asia, it was introduced to the United States before 1876, primarily through seed used for forage crops. In the early 1900s, the USDA imported and distributed torpedo grass seed for planting in pasturelands, providing forage for cattle. By 1992, torpedo grass had taken over 70 percent of Florida's public waters. The largest infestations can be found in Lake Okeechobee where it displaces close to 7,000 acres of native marsh. Torpedo grass management costs approximately $2 million a year in flood control systems. In Florida, torpedo grass is also a major problem for the citrus and golf course industries. The denseness of the mats may impede water flow in ditches and canals and restrict recreational use of shoreline areas of lakes and ponds.

Tropical Soda Apple

Tropical soda apple (TSA) (*Solanum viarum*) is a native to Brazil and Argentina. Since its discovery in the United States, it has been found in many southern states including Florida, North Carolina, and Mississippi. It was first collected in Glades County, Florida, in 1988. It is estimated that approximately one million acres of pasture, sod farms, forests, ditches, natural areas, etc., are covered with TSA in Florida. Tropical soda apple is extremely prolific, producing roughly 40,000 to 50,000 seeds per plant. Seed is spread primarily via livestock and wildlife, such as raccoons, deer, and birds that consume the fruit. If TSA is not controlled in pastures, it can lead to reduced yields in terms of lower stocking rates, lower forage quality, and lower profitability. Dispersal is also accomplished through contaminated equipment, hay, seed, sod, and composted manure. Cattle, sod, as well as other transported goods carry the potential of spreading this invasive weed to other parts of the state and country. This concern and its rapid spread throughout Florida caused TSA to be placed on the Florida Noxious Weed List in 1994 and the Federal Noxious list in 1995. Specifically, it occurs in uplands along the channelized Kissimmee River floodplain. TSA tortoise beetles (*Gratiana boliviana*) were released throughout the Kissimmee River area in 2007 from FDACS stocks. Some areas have exhibited good control.

Water Hyacinth and Water Lettuce

Water hyacinth (*Eichhornia crassipes*) and water lettuce (*Pistia stratiotes*) are floating nonnative species that are widespread throughout aquatic habitats in the Study Area. They occur within the Kissimmee River restoration area in remnant (non-flowing) river channels and channels with reestablished flow, as well as on the floodplain. Areas of open water that lack emergent vegetation are especially vulnerable for establishment and propagation of these species at the water surface, inhibiting development of native emergent communities. Water hyacinth has become a chronic problem on the Kissimmee floodplain in

the restoration area. Large beds can establish on open water portions of the floodplain with sparse or immature emergent vegetation, and can expand with increasing stage and depths before native emergent species can become established. If uncontrolled, water hyacinth and water lettuce would have the potential to severely disrupt reestablishment of native patterns of vegetation, both in the Kissimmee River channel and the floodplain.

Wright's Nut-rush

Wright's nut-rush (*Scleria lacustris*), an introduced sedge, is of increasing ecological concern in Florida. First collected in 1988, its distribution now extends to more than twenty natural areas in four major drainage regions. Freshwater marshes and lake shorelines characterized by seasonal water level fluctuations appear most vulnerable to invasion by *Scleria lacustris*. Seedlings are believed to emerge and establish during spring when marshes are dry. Juvenile plants adapt readily to the influx of water during the rainy summer months. As late summer surface water levels rise, emergent plants flower and grow to heights of 200 cm. In autumn, mature plants sprawl across the water as their nutlets ripen and disperse. *Scleria lacustris* is native to scattered regions of Africa and the Neotropics. Its source of introduction to Florida is unknown. Birds and airboats are suspected to aid in dispersal of the shiny nutlets, although transport by water through drainage systems could be most important, leaving vast conservation marshes of southern Florida at risk.

D. LAND USE

PLANS/POLICIES/CONTROLS

Land use plans and policies are largely under the control of the various federal, state, and local government agencies. The Central Florida Regional Planning Council (CFRPC) is a planning and public policy agency that works with public and private leadership in the central Florida region to achieve a healthy and sustainable future. Working with the CFRPC, the Florida Division of Emergency Management, Division of Community Planning, and Department of Transportation developed the Statewide Regional Evacuation Study for the Central Florida Region (2010). This study updated the region's evacuation population estimates, evacuation clearance times, and public shelter demand. The CFRPC also maintains a local emergency planning committee.

Heartland 2060 is a multi-year effort started by the CFRPC in September 2007. The intent is to create a vision for the future that enables growth while simultaneously: (1) Conserving natural areas; (2) protecting wildlife; (3) protecting agricultural production; (4) supporting healthy communities; and (5) ensuring a vibrant economic and social life. It encompasses seven counties in central Florida, including, Polk, Hardee, Highlands, DeSoto, Okeechobee, Glades, and Hendry. The Nature Conservancy convened a Technical Advisory Group and contractors to develop the ecological foundation for this initiative (The Nature Conservancy 2010).

AGRICULTURAL AND NATURAL AREAS

As indicated earlier in this document, the Study Area is largely agricultural in nature. Approximately, 36 percent of the Study Area is pasture (644,858 acres). Adding rangelands (163,638 acres) to that percentage increases it to roughly 46 percent. Citrus groves occupy an additional 88,800 acres (5 percent) and tree crops, 56,961 acres (3.2 percent). Lakes, rivers, canals, and wetlands also occupy a large portion (almost 30 percent) of the Study Area. Conversely, upland forests comprise only about 140,000 acres (or 8 percent) of the Study Area.

The combined residential or urban land uses equal 86,697 acres, which is only about 5.5 percent of the Study Area. Nearly 400,000 acres within the Study Area are publicly owned (Appendix B) and many of those lands and waters are managed for conservation.

TRANSPORTATION FACILITIES

Transportation facilities within the Study Area include numerous roadways and highways, airports, railroad lines, and utility lines.

Roads and Highways

The most noticeable transportation facility within the Study Area is the network of roads and highways. The Florida Turnpike, which extends from Miami to central Florida, crosses through the middle of Osceola County and bisects the Three Lakes Wildlife Management Area. Numerous highways (e.g., SR 60, US 98, and SR 70) cut east-west across the Study Area, and US 27 runs atop the Lake Wales Ridge. All these roads serve to fragment natural and native habitats and the high rates of traffic on these roads cause animal mortality.

Airports

There are 14 airports within the Study Area; however, six of these are small grass airports (less than 14 acres), and two are private airports (less than 50 acres). Of the six remaining airports, Sebring and Okeechobee are the largest two available to the public. The U.S. Air Force operates the Macdill Air Force Base (auxiliary field) at Avon Park Air Force Range. Identifying the locations of airports within the Study Area is important due to Federal Aviation Association guidelines that limit wetland restoration (or other bird attractants) within 2,000 feet of runways.

Railroad Lines

CSX Transportation operates a Class 1 freight railway that runs from West Palm Beach through Okeechobee, to Winter Haven, Orlando, and north. The South Central Florida Express is a Class 3 freight rail that extends from Sebring south along the Lake Wales Ridge to the western side of Lake Okeechobee.

Utility Lines

Florida Gas Transmission Company operates a natural gas pipeline along SR 70 in the lower portion of the Study Area and on the Lake Wales Ridge in Polk and Highlands Counties. The Gulfstream Natural Gas Systems, LLC, also operates a natural gas pipeline that roughly parallels US 98 through Okeechobee and Highlands Counties. The pipeline rights-of-way are maintained as low-cut herbaceous ground cover and vary from 50 to 200 feet wide.

E. WILDLIFE RESOURCES

LISTED AND CANDIDATE WILDLIFE SPECIES UNDER THE ENDANGERED SPECIES ACT

There are 15 federally listed wildlife species and three candidate species present in the Study Area (Appendix E). A candidate species is one for which we have on file sufficient information on biological vulnerability and threats to support a proposal to list as threatened or endangered, but for which preparation and publication of a proposal is precluded by higher priority listing actions. The

following is a short discussion of each species. For more in depth information, we refer the reader to the Service's South Florida Multi-species Recovery Plan (1999), species five-year status reviews, and the Service's website: http://www.fws.gov/verobeach/.

Birds

Federally listed birds known to be present in the Study Area include Audubon's crested caracara, Everglade snail kite, Florida grasshopper sparrow, Florida scrub-jay, red-cockaded woodpecker, whooping crane, and wood stork.

Audubon's Crested Caracara

Historically, the threatened Audubon's crested caracara [*Polyborus plancus audubonii;* now more commonly referred to as crested caracara (*Caracara cheriway*)] was a common resident in Florida from northern Brevard County, south to Fort Pierce, Lake Okeechobee, and Hendry County. Today, the region of greatest abundance for this large raptor is the area north and west of Lake Okeechobee including much of the Study Area. The preferred habitat is dry or wet prairies, and pastures with wetlands and scattered cabbage palms (Service 1999). The species is an opportunistic feeder, eating primarily wetland-dependant organisms, but also insects and road kills. Critical habitat has not been designated for this species.

Everglade Snail Kite

The endangered Everglade snail kite (*Rostrhamus sociabilis plumbeus*), a medium-sized raptor, is a food specialist that feeds almost entirely on apple snails (*Pomacea spp*.). These snails are found in palustrine emergent, long-hydroperiod wetlands, lakes, streams, canals, and ditches. Although the snail kite may forage in a variety of surface water types throughout the Study Area, some lakes are of particular importance to this species' nesting and survival. Lakes Tohopekaliga (Toho), Kissimmee, and East Lake Toho are primary nesting locations within the Study Area. Lakes Istokpoga, Hatchineha, and Jackson have recently become moderately used nesting sites. Over time, these lakes have become critical to continued snail kite nesting due to droughts and water management practices that have limited snail kite nesting in the species historic nesting areas (e.g., Lake Okeechobee and the Water Conservation Areas). Critical habitat for the snail kite (designated in 1977) occurs adjacent to the Study Area within the western Lake Okeechobee littoral zone. The principal threat to this species is the loss or degradation of wetlands in central and south Florida. Degradation of water quality, particularly runoff of phosphorous from agricultural and urban sources, and regulation of water stages in lakes and the water conservation areas are additional threats to this species.

Florida Grasshopper Sparrow

The endangered Florida grasshopper sparrow (*Ammodramus savannarum floridanus*) occurs in the prairie region of south-central Florida. This subspecies was listed as endangered due to habitat loss, limited distribution, and a declining population. Florida grasshopper sparrows are strongly habitat-specific, occupying only native fire-maintained dry prairie, which occur almost exclusively on a few parcels of public land. Five primary Florida grasshopper sparrow populations occur on public lands in Florida: three at Avon Park Air Force Range (APAFR), one at Kissimmee Prairie Preserve State Park (KPPSP), and one at Three Lakes Wildlife Management Area (TLWMA). Besides these public lands, there is little potential habitat remaining for this species in Florida. There is one population known from a privately owned ranch in Okeechobee County, but it has not been thoroughly assessed since 2001. The unexplained decline of the three populations at APAFR is cause for concern (Delany et al.

2005), and more recently, the populations at KPPSP and TLWMA have also exhibited declining trends. Critical habitat has not been designated for this species.

Florida Scrub-jay

The threatened Florida scrub-jay (*Aphelocoma coerulescens*) is similar in size and shape to the blue jay (*Cyanocitta cristata*), but differs significantly in coloration having a pale blue head, nape, wings, and tail and a pale gray back and belly (Woolfenden and Fitzpatrick 1996). Unlike the blue jay, the scrub-jay lacks a crest. The Florida scrub-jay occupies fire-dominated oak (*Quercus* spp.) scrub habitat on well-drained sandy soils in peninsular Florida and has a social structure that involves cooperative breeding requiring a minimum of 5 hectares of habitat per pair (Service 1999). Scrub-jays are extremely habitat-specific, sedentary, and territorial and may be present in any oak scrub habitat within the Study Area. The greatest threats to the continued existence of scrub-jays are habitat destruction, fragmentation, and modification and lack of effective management. Disease or predation will likely have a greater effect on this species in the future. The recovery of the scrub-jay depends mostly on acquiring (or otherwise protecting) and restoring and/or managing scrub habitat in areas that are important for the species, monitoring the effects of the restoration and/or management activity, and implementing adaptive management, where necessary, to achieve population stability. Critical habitat has not been designated for this species.

Red-cockaded Woodpecker

The endangered red-cockaded woodpecker (*Picoides borealis*) is a non-migratory woodpecker of the southeastern United States that is distinguished by its large, conspicuous white cheek patches, black cap and neck, and black-and-white barred back and wings (Jackson 1994). Red-cockaded woodpeckers are territorial and live in cooperative breeding social units called groups. Such groups are typically comprised of a breeding pair and up to three helpers, which are usually males and most often offspring of the mated pair from previous years (Jackson 1994). South Florida contains significant support populations for recovery of the endangered red-cockaded woodpecker. This species occurs within the Study Area at Avon Park Air Force Range and Three Lakes Wildlife Management Area. We expect it may also occur in other remnant pine flatwoods in the Study Area, but private properties have been infrequently surveyed for its presence. Pine stands, or pine-dominated pine/hardwood stands, with a low or sparse understory and ample old-growth pines constitute primary nesting and roosting habitat (Service 1999). Threats to this species include: (1) Insufficient numbers of natural cavities and continuing net loss of cavity trees; (2) habitat fragmentation and its effects on genetic variation, dispersal, and demography; (3) lack of foraging habitat and adequate quality; (4) range-wide and within population isolation; and (5) tenuous viability of small populations (Service 2006a). Critical habitat has not been designated for this species.

Whooping Crane

The endangered whooping crane (*Grus americana*) is among the most endangered species on the planet, with about 570 birds remaining globally, with approximately 420 in the wild and 150 in a captive breeding population. Whooping cranes currently exist in four wild populations. The only self-sustaining natural wild population nests in the Northwest Territories and adjacent areas of Alberta, Canada, primarily within the boundaries of Wood Buffalo National Park. These birds winter along the central Texas Gulf of Mexico coast at Aransas National Wildlife Refuge and adjacent areas. Two hundred and eighty-one whooping cranes (46 chicks) were reported from the wintering grounds in February 2011. The flock is recovering from a population low of 15 or 16 birds in 1941. The other three populations are designated Nonessential Experimental Populations (NEP) and have been established through reintroductions. The Eastern Migratory Population currently numbers 106. The

core breeding area for this population is in central Wisconsin and they winter in the southeast United States from Tennessee to central Florida. A new reintroduction effort is referred to as the Louisiana Nonmigratory Population. This reintroduction project released the first 10 whooping cranes in southwestern Louisiana in February 2011. The third NEP is the Florida Nonmigratory Population and is located in the Kissimmee Prairie area of central Florida. Between 1993 and 2004, 289 captive-born, isolation-reared whooping cranes were released into Osceola, Lake, and Polk Counties in an effort to establish this nonmigratory flock. As of January 2011, only 21 individuals are being monitored. Since the first nest attempt in 1999, there have been a total of 72 nest attempts, 33 chicks hatched and only 10 chicks successfully fledged. Releases have ceased due to problems with survival and reproduction, both of which have been complicated by drought. The last releases took place in the winter of 2004-2005. The whooping cranes occupy habitats similar to that of sandhill cranes (*Grus canadensis pratensis*; i.e., large freshwater marshes, pastures, and wet and dry prairies). There is some potential for the population to occupy the Study Area in the future assuming the population increases and the habitat is still present. The Florida NEP designation provides protection under the authority of the Endangered Species Act as a threatened species on national wildlife refuges and national parks and protection under the Migratory Bird Treaty Act otherwise. Critical habitat has not been designated in Florida for this species.

Wood Stork

The endangered wood stork (*Mycteria americana*) is one of two species of storks that breed in North America. This large, long-legged inhabitant of marshes, cypress (*Taxodium* spp.) swamps, and mangrove swamps reaches the northern limit of its breeding range in the southeastern United States where it shares breeding colonies with great egrets (*Ardea alba*), snowy egrets (*Egretta thula*), white ibises (*Eudocimus albus*), and many other species. The unique feeding method of the wood stork gives it specialized habitat requirements; these habitats have been disrupted by changes in the distribution, timing, and quantity of water flows in south Florida. From the 1960s to the mid-1980s, the wood stork nesting population declined in south Florida and increased in north Florida (Ogden et al. 1987). Prior to 1970, 70 percent of the population nested south of Lake Okeechobee and declined from 8,500 pairs in 1961 to fewer than 500 pairs in the late 1980s. However, by 2005, the annual nest count had increased in south Florida to 2,684 pairs (Brooks and Dean, in press). Annual nest counts in central and north Florida have not significantly changed over the last 20 years and fluctuate around 3,100 pairs (Brooks and Dean, in press). There are only two active wood stork breeding colonies within the Study Area. There are an additional five locations of abandoned nesting colonies going back the mid 1980s. There are three active wood stork nesting colonies within approximately 20 miles of the Study Area; therefore, the surface water resources within could support these birds and their offspring. Typical foraging sites include freshwater marshes and stock ponds, shallow, seasonally flooded roadside or agricultural ditches, narrow tidal creeks or shallow tidal pools, managed impoundments, and depressions in cypress heads and swamp sloughs (Service 1999). Critical habitat has not been designated for this species.

Mammals

One candidate for federal listing and two federally listed mammals are known to occur in the Study Area: Florida bonneted bat, Florida panther, and West Indian manatee.

Florida Bonneted Bat

The Florida bonneted bat (*Eumops floridanus*) is a candidate species endemic to Florida. It is also the largest bat in Florida (5-6.6” in length). Although relatively little is known of its ecology, in general, Florida bonneted bats will forage over ponds, streams, and wetlands, and drink when

flying over open water (Marks and Marks 2008). During dry seasons, Florida bonneted bats become more dependent on remaining ponds, streams, and wetland areas for foraging purposes (Marks and Marks 2008). Florida bonneted bats roost primarily in trees and manmade structures (Marks and Marks 2008). Species occurrence data are scant, but the bat has been documented at 12 locations in Florida and a study in 2008 documented the bat at 2 locations within the Study Area, one at an oxbow along the Kissimmee River in the Kicco Wildlife Management Area and another near Platt's Bluff boat ramp on the Kissimmee River.

Florida Panther

The Florida panther (*Puma concolor coryi*) is one of the most endangered large mammals in the world. They use all habitats contained within their home ranges by selecting for forested habitat types and using all others in proportion to availability (Land et al. 2008, Service 2008d). The more open habitats are used more at night (Onorato et al. 2010). Reproduction is known only in the Big Cypress Swamp and Everglades physiographic region in Collier, Lee, Hendry, Miami-Dade, and Monroe Counties, south of the Caloosahatchee River (Belden et al. 1991). Transient male panthers are often documented north of the Caloosahatchee River (and within the Study Area); however, no physical evidence of a female or kittens has been documented north of the Caloosahatchee River since 1973 (Nowak and McBride 1974; Belden et al. 1991; Land and Taylor 1998; Land et al. 1999; Shindle et al. 2000; McBride 2002; Onorato et al. 2010). Habitat loss combined with small population size is the primary threat to this species. Critical habitat has not been designated for this species.

West Indian Manatee

The endangered West Indian manatee (*Trichechus manatus*) is one of the largest coastal mammals in North America. It migrates through fresh, brackish, and marine waters, maintaining a seasonal distribution based on water temperatures. It is occasionally found in Lake Okeechobee and more rarely the lower Kissimmee River. Distribution is also controlled by aquatic vegetation availability, proximity to channels of at least 2 m in depth, and location of freshwater sources (Service 1999). Boat-caused mortality is one of the principal threats to the manatee. Critical habitat was originally designated for the Florida manatee in 1976 in areas of Citrus, Hillsborough, Manatee, Sarasota, Charlotte, De Soto, Lee, Collier, Monroe, Dade, Palm Beach, Martin, Volusia, Brevard, Nassau, and Duval Counties. That critical habitat designation was made before critical habitat regulations and guidance were developed. Therefore, it does not identify those essential features needed for the species conservation. Instead, it describes specific waterways that were known to be important concentration areas for manatees at that time. There is no designated critical habitat for manatees in the Study Area.

Reptiles

Federally listed reptiles known to occur in the Study Area include the bluetail mole skink, sand skink, and eastern indigo snake. The gopher tortoise is also present in this landscape and became a candidate for listing under the Endangered Species Act on July 27, 2011 (eastern portion of its range).

Bluetail Mole Skink

The threatened mole skink (*Eumeces egregius*) is a small, fossorial lizard that occupies xeric upland habitats of Florida, Alabama, and Georgia (Mount 1963). Five subspecies have been described (Mount 1965), but only the bluetail mole skink (*Eumeces egregius lividus*; more recently *Plestiodon egregius lividus*) is federally listed as threatened. The bluetail mole skink reaches a maximum length of about 5 inches. The legs are somewhat reduced in size and are used only during surface

locomotion, not when the animal “swims” through the sand (Christman 1992). This subspecies only occurs at elevations 80 feet above mean sea level or higher on the southern Lake Wales Ridge in Polk and Highlands Counties, and also Osceola County (based on the collection of a single bluetail juvenile just north of the Polk County line). The habitat for this species is comprised of a variety of xeric upland communities, including rosemary and oak-dominated scrub, turkey oak barrens, high pine (dry, longleaf pine savanna), and xeric hammocks. Habitat loss, fragmentation, and changes in land use continue to be concerns for the subspecies, and active management is necessary to maintain suitable habitat. Fire suppression, improper stand management, competition by invasive plant species, and loss of genetic diversity continue to threaten the existence of the bluetail mole skink. Critical habitat has not been designated for the bluetail mole skink.

Sand Skink

The threatened sand skink (*Neoseps reynoldsi*) is a small, fossorial lizard that reaches a maximum length of about 5 inches. This species occurs on the sandy ridges of interior central Florida from Marion County south to Highlands County. The sand skink is widespread in native xeric uplands with excessively well-drained soils, principally on the ridges at elevations greater than 80 feet above mean sea level. Commonly occupied native habitats include Florida scrub and scrubby flatwoods, as well as high pine (dry, longleaf pine savanna) communities that include sandhill, longleaf pine/turkey oak, turkey oak barrens and xeric hammock. Habitat loss, fragmentation, and changes in land use continue to be concerns for the species, and active management is necessary to maintain suitable habitat. Fire suppression, improper stand management, competition by invasive plant species, and loss of genetic diversity continue to threaten the existence of the sand skink. Critical habitat has not been designated for the sand skink.

Eastern Indigo Snake

The threatened eastern indigo snake (*Drymarchon corais couperi*) is the longest non-venomous snake in North America, obtaining lengths of up to 8.5 feet. Its color is uniformly lustrous-black, dorsally and ventrally, except for a red or cream-colored suffusion of the chin, throat, and sometimes the cheeks (Service 1999). The range of this snake has been reduced to portions of southern Georgia and Florida. It may be present throughout the state, but its abundance is reduced to a point where it is uncommon. Habitat includes pine flatwoods, scrubby flatwoods, high pine (dry, longleaf pine savanna), dry prairie, tropical hardwood hammock, edges of freshwater marshes, agricultural fields, coastal dunes, and human-altered habitats. Threats to this species include primarily loss, degradation, and fragmentation of habitat and vehicle mortality. Critical habitat has not been designated for the indigo snake.

Gopher Tortoise

The candidate (federal) and state listed (threatened) gopher tortoise (*Gopherus polyphemus*), belongs to a group of land tortoises that originated in North America 60 million years ago, thus making it one of the oldest living species. It can be found throughout the State of Florida and southern areas of Georgia, South Carolina, Mississippi, Alabama, and the tip of eastern Louisiana. The gopher tortoise grows on average to 12 inches in length (up to 16 inches) and weighs up to 29 pounds. Gopher tortoises are primarily herbivores and feed on many species of low-growing plants. The largest part of their diet consists of grasses and legumes. They also eat gopher apple, pawpaw, blackberries, saw palmetto berries, and other fruits. Gopher tortoises will also scavenge and are opportunistic feeders, occasionally feeding on dead animals or excrement. Gopher tortoises require well-drained, sandy soils for burrowing and nest construction (Landers 1980; Auffenberg and Franz 1982). Longleaf pine and oak uplands, xeric hammock, sand pine and oak ridges (beach scrub), and

ruderal (disturbed) habitat most often provide the conditions necessary to support gopher tortoises (Auffenberg and Franz 1982). The gopher tortoise is important because their burrows also provide homes for other animals, such as indigo snakes, gopher frogs, mice, foxes, skunks, opossums, rabbits, quail, armadillos, burrowing owls, snakes, lizards, frogs, toads, and other invertebrates (up to about 250 other species of animals). This species is expected to exist within natural upland habitats throughout the Study Area.

Invertebrates

One federal candidate invertebrate species is known to occur in the Study Area: the Highland's tiger beetle.

Highland's Tiger Beetle

The Highlands tiger beetle (Cicindela highlandensis) is a candidate species found only in Polk and Highland Counties, Florida. It is medium-sized (10.5-12 millimeters long), elongate, and mostly black. The Highlands tiger beetle is often associated with evergreen scrub oaks, as well as high pineland with deciduous turkey oak (Quercus laevis) and longleaf pines (Pinus palustris). Knisley and Hill (1996) view high-quality habitat as primarily scrub or pine woodland, with a high percent of open sand (greater than 50 percent) and with many natural openings which are continuous or connected to adjacent open patches, or connected by lightly disturbed trails or paths. Results from surveys conducted during 2004-2005 (Knisley 2005) supported previous conclusions that the Highlands tiger beetle occurs in a diversity of habitats and that there are no key plant or other specific indicators of habitat, other than open sandy areas within or adjacent to scrub or sandhill. The amount of open area was usually the primary indicator of suitable habitat (Knisley 2005). The Highlands tiger beetle has been documented at 40 sites, with the largest counts (> 40 individuals) at the listed locations (Knisley 2005).

- Allen David Broussard Catfish Creek State Park Preserve
- Snell Creek Unit (Lake Wales Ridge NWR)
- Flaming Arrow Boy Scout Ranch
- Tiger Creek Preserve (The Nature Conservancy)
- Carter Creek Unit (Lake Wales Ridge NWR)
- Flamingo Villas Unit (Lake Wales Ridge NWR)
- Horse Creek Scrub
- Walk-in-the-Water Tract (Florida Forest Service, formerly Florida Division of Forestry)

STATE LISTED ANIMAL SPECIES

There are 68 state listed animal species that use the resources within the Study Area (Appendix E). Table 9 shows the number of species per guild. Of these, 17 are of particular interest. They are the Florida black bear (*Ursus americanus floridanus*), Sherman's fox squirrel (*Sciurus niger shermani*), bald eagle (*Haliaeetus leucocephalus*), sandhill crane (*Grus canadensis pratensis*), and 13 species of "long-legged" wading birds (two of which are not state-listed species). The following is a brief discussion of several of these species.

Table 9. State-listed species found within the Study Area, listed by guild

Guild	Species of Special Concern	Endangered	Threatened	Florida Endemic
Amphibians	1	0	1	0
Birds	23	6	11	3
Fish	40	0	0	0
Mammals	2	2	1	2
Reptiles	2	1	5	4
Invertebrates	6	1	7	8

Florida Black Bear

The Florida black bear is a unique subspecies of the American black bear that historically ranged throughout Florida and the southern portions of adjoining states (Hall 1981). Today, black bears occupy 18 percent of their historic range in Florida and the state has listed the black bear as threatened. Historically, black bears ranged throughout the southeast with the Florida subspecies inhabiting all of Florida (except the lower Keys) and southern portions of Georgia and Alabama (Hall 1981). However, the distribution of the subspecies has been significantly reduced and fragmented in Florida to six large (Eglin, Apalachicola, Osceola, Ocala, St. Johns and Big Cypress) and two small, remnant populations (Chassahowitzka, Glades/Highlands). Black bears are adaptable and inhabit a variety of forested habitats. Habitat selection by bears is a function of nutritional needs and spatially fluctuating food sources. The Florida black bear thrives in habitats that provide an annual supply of seasonally available foods, secluded areas for denning, and some degree of protection from humans. Harlow (1961) described optimal bear habitat in Florida as “a mixture of flatwoods, swamps, scrub oak ridges, bayhead and hammock habitats, thoroughly interspersed.”

Sherman’s Fox Squirrel

There are three subspecies of fox squirrel (*Sciurus niger*) in Florida - two are state listed as protected species. The Sherman's fox squirrel (species of special concern) is found in the open piney woods of central and northeastern Florida. The Big Cypress fox squirrel (*Sciurus niger avicennia*; threatened) is found from the Everglades region, in Lee County, to the southern part of Dade County. Fox squirrels in the western Florida panhandle belong to a less vulnerable, more widespread subspecies. These large squirrels exhibit color variations which range from a buff color to gray, and in some instances black. The under parts are usually lighter, and typical specimens have white noses and ears with black faces and feet. They are noted for their long, bushy tails and for their strong hind legs, which allows them to leap easily. The diet of the fox squirrel consists primarily of plant material such as nuts, seeds, fungi, fruit, and buds. Longleaf pine cones and seeds are important foods. They have also been known to occasionally eat animal material such as insects and bird eggs. Primary habitats include sandhills (high pine), pine flatwoods, pastures, and other open, ruderal habitats with scattered pines and oaks. Oak trees are important for seasonal food and nest material.

Bald Eagle

Pre-colonial era population estimates of the state threatened bald eagle (*Haliaeetus leucocephalus*) are in the hundreds of thousands. Due to hunting, organopesticide use, and habitat destruction, the numbers of these large raptors fell to threatened levels in the continental United States of less than 10,000 nesting pairs by the 1950s, and to endangered levels of less than 500 pairs by the early 1960s. Bald eagles were protected by the Endangered Species Act of 1973 and designated as a threatened species in the lower 48 states. Due to a successful recovery effort, the species was de-listed in August 2007. The bald eagle continues to be protected by the Bald and Golden Eagle Protection and Migratory Bird Treaty Acts. Bald eagles may nest throughout the Study Area where nest trees and open water are available; however, the Kissimmee Chain of Lakes, central Polk County, and Lake Istokpoga are particularly important nesting areas. These areas are part of a larger inland “core nesting area” that extends from Lake Okeechobee north to the lower St. Johns River.

Sandhill Crane

The state threatened sandhill crane (*Grus canadensis*) is a long-legged, long-necked, gray, heron-like bird with a patch of bald red skin on top of its head. Two subspecies of the sandhill crane occur in Florida. The Florida sandhill crane (*G. c. pratensis*), numbering 4,000 to 5,000, is a non-migratory year-round breeding resident. They are joined every winter by 25,000 migratory greater sandhill cranes (*G. c. tabida*), the larger of the two subspecies. The greater sandhill crane winters in Florida but nests in the Great Lakes region. Cranes are quite omnivorous, feeding on seeds, grain, berries, insects, earthworms, mice, small birds, snakes, lizards, frogs, crayfish, but do not "fish" like herons. Sandhill cranes occur in pastures, prairies, and freshwater wetlands in peninsular Florida from the Everglades to the Okefenokee Swamp.

Long-legged Wading Birds

There are 13 species of “long-legged” wading birds that may occupy the Study Area. These include the American bittern (*Botaurus lentiginosus*), least bittern (*Ixobrychus exilis*), glossy ibis (*Plegadis falcinellus*), white ibis (*Eudocimus albus*), great egret (*Ardea alba*), snowy egret (*Egretta thula*), great blue heron (*Ardea herodias*), green heron (*Butorides virescens*), little blue heron (*Egretta caerulea*), tricolor (=Louisiana) heron (*Egretta tricolor*), black-crowned night-heron (*Nycticorax nycticorax*), yellow-crowned night-heron (*Nyctanassa violacea*), and roseate spoonbill (*Ajaia ajaja*). These species are indicators of the overall health of ecosystems, because they require shallow water with abundant prey for foraging and shrubs or trees for nesting. Within the Study Area, the number of active wading bird nesting rookeries has decreased over the last 40 years. In the 1970s and 1980s, there were 14 and 17 active wading bird nesting rookeries, respectively. By the 1990s, there were only seven nesting rookeries. In 1999, there were two rookeries in Lake Kissimmee, each with over 100 wading birds comprised by 6 different species. West of Lake Rosalie there is a wood stork rookery. West of Lake Arbuckle there is a rookery that is largely cattle egrets (*Bubulcus ibis*) (a nonnative species). In Lake Istokpoga, there is a great egret and anhinga rookery. Along the lower Kissimmee River there is another cattle egret rookery and on the northern shoreline of Lake Okeechobee there is a large (100+ individuals) rookery made up of great egrets, little blue herons, great blue herons, and white ibises.

In 2009, the largest colony on Rabbit Island in Lake Kissimmee was comprised of 740 cattle egret, 150 great egret, 87 tricolored heron, 75 white ibis, 50 great blue heron, 42 little blue heron, 10 snowy egret, 10 glossy ibis, and 3 black-crowned night heron nests. The largest colony along the Kissimmee River included 240 cattle egret, 11 little blue heron, and 3 tricolored heron nests in the

southern reach of MacArthur Run near the Pool C boat ramp. Two other colonies formed southwest of the Pool D floodplain on private property (Lykes Brothers, Inc.), comprising 126 great egret and 27 great blue heron nests (SFWMD 2010).

GENERAL WILDLIFE DIVERSITY AND ABUNDANCE

A variety of other wildlife species use the diverse habitats within the Study Area. More than 400 amphibian, reptile, bird, and mammal species have been identified.

The Study Area provides habitat for a variety of resident and migratory birds. More than 300 avian species are known to occur within the Study Area. Over 200 of these birds are considered migrant, either utilizing habitat in the project area as stopover sites as they migrate or residing locally for a portion of the year.

Waterfowl surveys by the SFWMD on the Kissimmee River have indicated that densities fluctuate from year-to-year from 0.4 to 7.6 birds/km². Blue-winged teal (*Anas discors*) and mottled duck (*A. fulvigula*) are the two most commonly observed species, accounting for over 95 percent of observations. Other regularly observed duck species include green-winged teal (*Anas crecca*), hooded merganser (*Lophodytes cullulatus*), and wood duck (*Aix sponsa*). The American wigeon (*Anas americana*), northern pintail (*A. acuta*), northern shoveler (*A. clypeata*), ring-necked duck (*Aythya collaris*), and black-bellied whistling duck (*Dendrocygna autumnalis*) are present but are not regularly observed (SFWMD 2010).

There are approximately 40 mammal, 50 reptilian, and 26 amphibian species known to occur within the Study Area. Arthropods are also abundant in the Study Area. There are over 60 species of ants, 70 species of bees, 45 species of spiders, and 120 species of beetles occurring on the Lake Wales Ridge and adjacent lands. There is a large number of endemic insects including the emerald moth (*Nemouria outina*) which feeds solely on rosemary, the bee fly (*Bombyliidae* sp.) which is the primary pollinator for the scrub balm, and the scrub millipede (*Floridobolus penneri*). The scarab beetle (*Scarabaeidae* sp.) and gopher cricket (*Gryllus* sp.) are both obligate commensals that are only found in gopher tortoise burrows.

Aquatic invertebrates are an integral component of the food web within the Study Area linking different trophic levels. Riverine water bodies support mayflies and caddisflies, while more lacustrine water bodies are dominated by crustaceans, midges, beetles, and dragonflies. Grazing invertebrates such as the grass shrimp (*Palaemonetes paludosus*) comprise a large portion of the aquatic invertebrate biomass. The Florida apple snail (*Pomacea paludosa*) is also important because it is eaten by many animal species including the endangered Everglade snail kite.

GAME SPECIES

The FWC licenses hunters for the following species in Florida: resident game birds (quail and wild turkeys), resident game mammals (white-tailed deer, gray squirrels, and rabbits), furbearers (bobcats, otters, raccoons, opossums, coyotes, beavers, skunks, and nutrias), and migratory game birds (ducks, geese, common moorhens, coots, snipe, rails, woodcocks, crows, mourning doves, and white-winged doves). With landowners' permission, wild hogs may be taken year-round with no bag limits, size limits, or licenses required. Wild hogs can be taken on wildlife management areas only during specified seasons, where bag and size limits may apply.

NONNATIVE AND INVASIVE ANIMALS

The following are some of the more problematic non-indigenous, invasive animals that occur in the Study Area (excluding fish, which are addressed with other fish species), including feral hogs, coyotes, cane toads, Cuban treefrogs, island apple snails, and Asian clams. These species can disrupt ecosystems by changing the structure of plant and animal communities or displacing native species.

Feral Hog

Feral hogs impact native habitats through soil and vegetation disturbance by rooting, interspecific competition for resources, and predation of native flora and fauna. This species is present throughout the Study Area, but avoids deepwater conditions on the Kissimmee floodplain. Feral hog populations are managed through hunts and removal programs to help minimize the impacts to native wildlife and habitat.

Coyote

The coyote (*Canis latrans*) is an exotic species becoming more common in Florida. Coyotes can use most upland or wetland habitats, and have a wide-ranging diet (feeding on rodents, rabbits, lizards, snakes, insects, grasses, watermelon, persimmons, wild berries, grains, fish, turtle eggs, and carrion). They can be a major predator on deer fawns and turkey poults. Little is known about coyote ecology in Florida; it is not known if predation on deer could adversely affect the food source for the Florida panther. Coyotes will kill or injure calves, poultry, hogs, goats, and domestic dogs and cats. With the increase of occurrence of this species, loss of livestock could be problematic and ranchers may have to allocate some resources towards coyote control.

Cane Toad (marine toad, giant toad)

Breeding populations of the cane toad (*Rhinella marina*) have been established in the Kissimmee River Basin since the early 1970s; however, the cane toad is mainly associated with disturbed agricultural and residential areas. This species is a threat to native fauna. Its large size and aggressive nature allow the cane toad to out-compete and prey on native species. The toxicity of the cane toad makes it unpalatable to most potential predators; consequently, there is little predator control of the species.

Cuban Treefrog

The Cuban treefrog (*Osteopilus septentrionallis*) is established in all counties in the Kissimmee River Basin. The species has been recorded recently in aural and/or drift fence sampling along the Kissimmee River. It has been observed to prey on native frogs and toads. The species has the potential to disrupt and displace native species in natural habitats, and therefore, is viewed as a potential problem for restoration of native herpetofaunal communities in the Kissimmee River and floodplain.

Island Apple Snail (channeled apple snail)

This nonnative apple snail (*Pomacea insularum*) is present in both the Upper and Lower Kissimmee River Basins and Lake Okeechobee. This species has potential to reduce abundance of the native Florida apple snail (*P. paludosa*), the primary food source of the endangered Everglade snail kite. Snail kite foraging on this larger nonnative snail was thought to be a problem a few years ago, but evidence now seems to indicate that all size classes of this snail are available to the kites.

Asian Clam

The Asian clam (*Corbicula fluminea*) is common in the Kissimmee River with mid-river channel densities averaging 1,585/m2. It has not been determined to what extent, if any, this species is depressing native bivalve populations.

F. FISHERY RESOURCES

SPECIES OF SPECIAL CONCERN

American Eel

The American eel (*Anguilla rostrata*) is a species of concern and the Service is reviewing new information to determine if it should become a candidate for listing under the Endangered Species Act. American eels hatch in the Sargasso Sea, a 2 million-square-mile, warm-water lens in the North Atlantic between the West Indies and the Azores. They take years to reach freshwater streams where they mature, and then they return to the Sargasso Sea to spawn and die. They are the only species of freshwater eels in the Western Hemisphere. American eels are likely present in the Kissimmee River portion of the Study Area. The threats to this species include dams and other obstructions in rivers, hydropower plants, and overfishing.

Pirate Perch

The pirate perch (*Aphredoderus sayanus*) is a small (few inches) freshwater fish native to the eastern half of North America. It is dark brown, sometimes with a darker band near the base tail. Its preferred habitat is backwaters of warm water and little current. This species commonly inhabits coastal waters along the east coast of the United States, but is also found in the Study Area within the Kissimmee River. It eats mosquito larva, amphipods, glass shrimp, smaller fish, dragon fly larva, and earthworms. While the pirate perch is not an endangered species, it is uncommon due to the habitats it occupies. Urban development does affect this species with dredging and draining of backwater areas for urbanization purposes.

Recreational, Non-Recreational, and Subsistence Fisheries

The fishery resources within the Study Area can be generally divided into recreational (or sport) fisheries, non-recreational fisheries, subsistence fisheries, and nonnative species. Table 10 lists the fish species in the Study Area. The water resources that support these fisheries are primarily the Kissimmee Chain of Lakes, Kissimmee River, Lake Istokpoga Basin (including Lake Arbuckle and Arbuckle Creek), wetlands, and canals. Many of the fisheries in the Study Area have probably changed over the decades due to water management practices. The installation of water control structures on the Kissimmee River, stabilization of lake levels, drainage of wetlands, increased nutrient inputs, and the influx of nonnative species have resulted in a different ecological setting for aquatic communities. Despite these changes, the area still supports significant and valuable fisheries. According to Mann (2011), Lakes Tohopekaliga, Cypress, Hatchineha, and Kissimmee all have excellent largemouth bass (*Micropterus salmoides*), black crappie (*Pomoxis nigromaculatus*), and bream (*Lepomis* spp.) fisheries. East Lake Toho has a secondary largemouth bass and black crappie fishery. There is commercial fishing for golden shiners and other nongame fish on all lakes in the Kissimmee Chain of Lakes (Mann 2011). Lake Istokpoga supports a strong recreational fishery for largemouth bass and black crappie. The Lower Kissimmee River is known for its springtime black crappie fishery and as spawning grounds for many important fish species in Lake Okeechobee.

Table 10. Fish species list for Lake Okeechobee and the Kissimmee River Basin Updated May 2010; Nonnative species are noted with an asterisk

CODE	COMMON NAME	SCIENTIFIC NAME
AMEE	American eel	*Anguilla rostrata*
ATNE	Atlantic needlefish	*Strongylura marina*
BETI	Blue tilapia*	*Tilapia aureus*
BLCR	Black crappie	*Pomoxis nigromaculatus*
BLKI	Bluefin killifish	*Lucania goodei*
BLUE	Bluegill	*Lepomis macrochirus*
BOW	Bowfin	*Amia calva*
BRBU	Brown bullhead	*Ameiurus nebulosus*
BRHO	Brown hoplo*	*Hoplosternum littorale*
BRSI	Brook silverside	*Labidesthes sicculus*
BSSU	Bluespotted sunfish	*Enneacanthus gloriosus*
CPIK	Chain pickerel	*Esox niger*
CHCA	Channel catfish	*Ictalurus punctatus*
DOSU	Dollar sunfish	*Lepomis marginatus*
EPS	Everglades pygmy sunfish	*Elassoma evergladei*
FGAR	Florida gar	*Lepisosteus platyrhincus*
FLAG	Flagfish	*Jordanella floridae*
GISH	Gizzard shad	*Dorosoma cepedianum*
GOSH	Golden shiner	*Notemigonus crysoleucas*
GOTO	Golden topminnow	*Fundulus chrysotus*
GRCA	Grass carp*	*Ctenopharyngodon idella*
INSI	Inland silverside	*Menidia beryllina*
LACH	Lake chubsucker	*Erimyzon sucetta*
LEKI	Least killifish	*Heterandria formosa*
LGAR	Longnose gar	*Lepisosteus osseus*
LITO	Lined topminnow	*Fundulus lineolatus*

CODE	COMMON NAME	SCIENTIFIC NAME
LMB	Largemouth bass	*Micropterus salmoides*
MACI	Mayan Cichlid	*Cichlasoma urophthalmus*
MBTI	Mozambique/blue tilapia*	Tilapia hybrid
MOSQ	Eastern mosquitofish	*Gambusia holbrooki*
OPS	Okeefenokee pygmy sunfish	*Elassoma okefenokee*
PIPE	Pirate perch	*Aphredoderus sayanus*
RBD	Redbreast sunfish	*Lepomis auritus*
RED	Redear sunfish	*Lepomis microlophus*
RPIK	Redfin pickerel	*Esox americanus*
SAMO	Sailfin molly	*Poecilia latipinna*
SEKI	Seminole killifish	*Fundulus seminolis*
SHMI	Sheepshead minnow	*Cyprinodon variegatus*
SPSU	Spotted sunfish	*Lepomis punctatus*
SPTI	Spotted tilapia*	*Tilapia mariae*
SUCA	Suckermouth catfish*	*Hypostomus plecostomus*
SWDA	Swamp darter	*Etheostoma fusiforme*
TAMA	Tadpole madtom	*Noturus gyrinus*
TASH	Taillight shiner	*Notropis maculatus*
THSH	Threadfin shad	*Dorosoma petenense*
VSCA	Vermiculated sailfin catfish*	*Pterygoplichthys disjunctivus*
WACA	Walking catfish*	*Clarias batrachus*
WAR	Warmouth	*Lepomis gulosus*
WHCA	White catfish	*Ameiurus catus*
YEBU	Yellow bullhead	*Ameiurus natalis*

Non-recreational fish species add to the diversity in the Study Area. Some of these smaller species are important as forage for larger fish, wading birds, alligators, otters, and other predators. They are represented by the following families: sunfish (*Centrarchidae*), shad (*Clupeidae*), minnow (*Cyprinidae*), and killifish (*Cyprinodontidae*). Anywhere the public has access, there is also likely to be some subsistence fishing (including for nonnative species such as *Tilapia* spp. and other cichlids).

NONNATIVE AND INVASIVE ANIMALS

Nonnative fishes are not as abundant in the Study Area as they are in areas of south Florida; however, there are still approximately eight species of nonnative fish (included in Table 10) in the Kissimmee Chain of Lakes and the Kissimmee River Basin.

Brown Hoplo and Vermiculated Sailfin Catfish

Both the brown hoplo (*Hoplosternum littorale*) and vermiculated sailfin catfish (*Pterygoplichthys disjunctivus*) have increased in abundance since their introduction in the late 1990s and can be considered naturalized in the Kissimmee River ecosystem. Both species have potential to interfere with centrarchid (sunfish) breeding success through predation of pit nests (based on feeding habits, Hoover et al. 2004) although this has not been documented in this region. Because vermiculated sailfin catfish construct nesting burrows, spawning colonies can degrade shoreline stability, increase erosion rates, and increase suspended sediment loads (Nico 2000).

G. RELATED RESOURCES

Sections B and C of Chapter II in the Final LPP provide an overview of related resources in this landscape, including landscape conservation goals and objectives and partner efforts. The Everglades Headwaters NWR and Conservation Area will contribute to many of these, including the Peninsular Florida Landscape Conservation Cooperative, conservation and mitigation banks, national and international conservation plans and initiatives (including Partners-in-Flight Peninsular Florida Bird Conservation Plan, Wetlands Reserve Program of the NRCS of the USDA, and America's Great Outdoors Initiative), and regional conservation plans and initiatives (including federal recovery plans, the State Wildlife Action Plan, Florida's Endangered and Threatened Species Management and Conservation Plan, Florida Forever Program, Critical Lands and Waters Identification Project, Avon Park Air Force Range Joint Land Use Study, Kissimmee River Restoration Project, SFWMD General Management Plan, Northern Everglades and Estuaries Protection Program, State of the Scrub, Highlands County Comprehensive Plan, Polk County Environmental Lands Program, Osceola County Environmental Lands Conservation Program, and Green Horizon Land Trust). Several federal and state agencies serve as key partners in this landscape, including NRCS, USDA) Avon Park Air Force Range, U.S. Air Force; FWC; FDACS; FFS, FDACS; FDEP; Florida Division of State Lands, FDEP; and South Florida (SFWMD) and Southwest Florida (SWFWMD) water management districts. During the planning process for this project, the Service contacted several Native American tribes with interest in this landscape: Seminole Tribe of Florida; Miccosukee Tribe of Indians of Florida; Seminole Nation of Oklahoma; Muscogee (Creek) Nation; and Poarch Band of Creeks. The Service met with the Seminole Tribe of Florida during the planning process to develop an understanding of its concerns, including those related to cultural resources. The Tribal Historic Preservation Officer for the Muscogee (Creek) Nation requested copies of the Draft LPP and Draft EA when available for review. And, the Miccosukee Tribe of Indians of Florida expressed interest in the project, especially in relation to burial sites and tribal cattle grazing lands in Highlands County.

Figure 1 depicts current conservation lands and waters within the Study Area. Many of our partners already own or have future plans to protect lands in the project area through conservation or agricultural easements. Still others have completed on-the-ground habitat restoration projects throughout the area and the Kissimmee River. These partners use their individual mission statements to focus protection and restoration efforts. Taken together, those mission statements cover the protection of state and federal threatened and endangered species, rare habitats, prairie

and flatwoods habitats, ranchlands, and recreational areas that have been identified through the scoping process as being important to the long-term ecological health, economy, and way of life of the region. (Please see the Final LPP for more information about related resources.)

H. CLIMATE CHANGE

According to the 2007 Report from the Intergovernmental Panel on Climate Change, (IPCC), there is overwhelming scientific consensus that climate change is real, that it is being caused by human actions, and that there will be potentially significant impacts for people around the globe. The IPCC Report (2007) furthered described changes in natural ecosystems with potential wide-spread effects on many organisms, including fish and migratory birds and their habitats. Present day Florida has experienced 8-16 inches of sea level rise over the last 70 years (Wanless et al. 1994) and climate change will eventually affect all of the species occurring in central Florida. Central Florida will likely become a major migratory corridor for species in south Florida.

Historically, sea levels have risen 27 feet over the last 4,500 years. Wanless et al. (1994) found that, over the past 2,500 years, south Florida has experienced an average rate of sea level rise of 1.5 inches per century. Wanless (2008) also observed that Florida has experienced a 9-inch rise in sea level since 1932. This is eight times the average rate over the past 2,500 years. Much of this accelerated rise is likely the result of warming and expansion of water in the western North Atlantic Ocean. The 2007 IPCC report identified a 90 percent probability of an additional 7 to 23 inches of sea level rise by 2100.

Scientific evidence that has emerged since the publication of the IPCC Report (2007) indicates an acceleration in global climate change. Important aspects of climate change seem to have been underestimated previously and the resulting impacts are being felt sooner. For example, early signs of change suggest that the 1°C of global warming the world has experienced to date may have already triggered the first tipping point of the Earth's climate system – the disappearance of summer Arctic sea ice. This process could lead to rapid and abrupt climate change, rather than the gradual changes that were originally forecasted.

Other processes to be affected by this projected warming include temperature changes, rainfall (amount, seasonal timing, and distribution), storms (frequency and intensity), and sea level rise. Temperatures are predicted to rise from 2°C to 5°C for North America by the end of this century (IPCC 2007). The latest data indicate that with current climate change, hurricanes have increased by 1 percent in wind intensity. That equates to a 1-2 mph wind increase in a Katrina class hurricane of 170 mph (Knutson et al 2008). By 2100, there should be a 10-30 percent decrease in hurricane frequency with a 5-10 percent wind increase. This is due to more hurricane energy available for intense hurricanes. However, hurricane frequency is expected to drop due to more wind shear impeding initial hurricane development. Along with climate change, weather variables are influenced by other natural cycles, such as ENSO, with a frequency of every 4-7 years, solar cycle (every 11 years), and the AMO. All of these cycles influence changes in Floridian weather. The exact magnitude, direction, and distribution of all of these changes at the regional level are not easy to predict. Current climate change models offer a wide range of predicted changes and outcomes.

Climatic changes in central Florida could amplify current land management challenges involving habitat fragmentation, urbanization, invasive species, disease, parasites, and water management (Pearlstine 2008). Global warming may be a particular challenge for endangered, threatened, and other "at risk" species due to small population sizes and/or restricted ranges. It is difficult to precisely estimate which species will be affected by climate change or exactly how they will be affected. The

Service will implement Strategic Habitat Conservation Planning, an adaptive science-driven process that begins with explicit trust resource population objectives, as the framework for adjusting our management strategies in response to climate change (Service 2006b).

The potential for rapid climate change poses a significant challenge for fish and wildlife conservation. Species abundance and distribution are dynamic, relative to a variety of factors, including climate. As climate changes, the abundance and distribution of fish and wildlife will also change. Highly specialized or endemic species are likely to be most susceptible to the stresses of a changing climate. Based on these findings and other similar studies, the Department of the Interior requires agencies under its direction to consider potential climate change effects as part of their long-range planning activities (Service 2009a).

I. SOCIOECONOMIC AND SOCIOCULTURAL CONDITIONS

This section summarizes population, employment, income, tourism, and wildlife-associated recreation data and trends for counties in the Study Area and, where applicable, state and national levels.

REGIONAL ECONOMIC SETTING

The Study Area comprises a landscape that is largely rural, with agriculture, forestry, ranching, and outdoor recreation/tourism being among the more important economic drivers of the area of interest. Of the 18.8 million residents of the State of Florida, approximately 13 million are located in the 24 south Florida counties that either receive their water supply or are located within a 1- to 2-hour drive of the Study Area (U.S. Census Bureau 2011). For the purposes of this EA, selected demographic and economic data for the following counties were summarized: Brevard, Glades, Highlands, Indian River, Okeechobee, Osceola, and Polk.

Recreational use on national wildlife refuges generated almost $1.7 billion in total economic activity during Fiscal Year 2006, according to the Service's *Banking on Nature 2006: The Economic Benefits to Local Communities of National Wildlife Refuge Visitation* report (Carver and Caudill 2007). According to the Banking on Nature study, nearly 35 million people visited national wildlife refuges in 2006, supporting almost 27,000 private sector jobs and producing about $543 million in employment income (Carver and Caudill 2007). In addition, recreational spending on refuges generated nearly $185.3 million in tax revenue at the local, county, state, and federal levels (Carver and Caudill 2007). An estimated 87 percent of refuge visitors travel from outside the local area (Carver and Caudill 2007).

POPULATION

Recent Population Trends: 2000-2010

Human population characteristics for the Study Area are shown in Table 11. Data from 2000 are compared to 2010, and the general trend is that population has continued to rise in all the counties of the Study Area, as well as the state. The population of Florida grew by over 17 percent during the past 10 years. Although there has been a relative decline in the rate of population growth, the state continues to add people (Dr. S. Smith, University of Florida's Bureau of Economic and Business Research, pers. comm., 14 March 2011). In fact, the rate of population growth has been greater than projected. In 1995, the U.S. Census (1995) estimated that Florida would have approximately 18,497,000 people by 2015; this number has been reached 5 years earlier than anticipated. Furthermore, Florida is likely to overtake New York as the third most populous state in the nation during the next 10 years (America Online News 2011). Each county in the Study Area had positive

population growth during the past 10 years (Table 12). Glades County had the lowest population growth rate of counties compared, at +2.4 percent; Osceola County experienced the highest population growth at +59.5 percent.

Population densities (persons per-square-mile) increased for all counties (and the state), except for Glades County (Table 11), which only added a relatively small number of people during the past 10 years and remained the least densely populated county in the Study Area. The median age ranged between 34.9 (Osceola County) and 49.7 (Highlands County) in 2010 (Table 11). Between 2000 and 2010, the median age increased in most counties, except for Highlands County, where it declined slightly by 0.3 year.

Table 11. Local and regional population estimates, characteristics, and trends (2000 - 2010)

Demographic Unit	Population Characteristics in 2000			Population Characteristics in 2010			Populatio n Change (2000 to 2010)
	Residents	Persons per Square Mile	Median Age	Residents	Persons per Square Mile	Median Age	
Florida	15,982,378	296	38.7	18,801,310	346	40	+17.6%
Glades County	10,576	14	40.2	10,827	14	42.2	+2.4%
Highlands County	87,366	85	50	98,211	97	49.7	+12.4%
Okeechobee County	35,910	46	36.7	40,472	52	37.3	+12.7%
Osceola County	172,493	130	34.6	275,064	204	34.9	+59.5%
Polk County	483,924	258	38.6	585,128	324	38.7	+20.9%

Source: U.S. Census Bureau 2011

Table 12. State and county population trends (2000 - 2060)

Demographic Unit	2000	2020	2040	2060	Percent Population Change (2000 to 2060)
Florida	15,982,378	22,894,140	29,203,842	35,814,574	+124%
Glades County	10,576	12,991	15,371	17,768	+68%
Highlands County	87,366	115,772	142,481	170,038	+95%
Okeechobee County	35,910	44,770	52,831	61,292	+71%
Osceola County	172,493	384,294	577,044	779,319	+352%
Polk County	483,924	675,627	847,712	1,029,606	+113%

Source: Zwick and Carr 2006

Projected Population Trends: 2000-2060

As was discussed above, Florida's population rose during the past 10 years and is expected to do so for the next 50 years. A study conducted by the University of Florida (Zwick and Carr 2006) estimated that Florida's population would more than double by 2060 (Table 12). Included in the study were population projections at the county level. Of the five counties included in the area of interest, Osceola County is expected to experience the fastest growth, with its population expected to more than triple in 50 years to over 750,000 people. According to the study, Glades County's population would grow at the slowest pace, increasing to about 18,000 between 2000 and 2060 or 68 percent (Table 12).

EMPLOYMENT AND INCOME

Employment data for all the industry categories are summarized for 2000 and 2009 in Tables 13 and 14. For the purposes of this EA, the discussion of these data will focus largely on the land- and water-based industries (agriculture, forestry, fishing and hunting, and mining), with the assumption that most of the other industry categories are associated with the more urbanized areas of the counties.

Employment and income data was summarized for the counties that are part of the Study Area, as well as the State of Florida (Tables 15 and 16). Data from both 2000 and 2009 are shown as a means of comparison, and both were derived from U.S. Census Bureau (USCB) online sources (USCB 2011). For the purposes of this EA, the most recent data available was 2009 (2010 Census data was not available at the time of preparation of this document).

Following the statewide trend, the percentage of land-based industries declined in all counties of the Study Area between 2000 and 2010, with the exception of Glades and Osceola Counties. The percentage of people employed in land-based industries almost doubled in Glades County, from 12.5 percent in 2000 to 24.7 percent in 2010. The largest percentage decline was seen in Okeechobee County, where the percentage of people employed in land-based industries declined from 17.5 percent in 2000 to 11.2 percent in 2010. Relatively fewer people were employed in land-based industries for counties that include larger urban centers, such as Osceola. For Osceola County, land-based jobs accounted for less than one percent (0.6) of the total jobs.

National, state, and county income, unemployment and poverty estimates for 2000 and more recent data are shown in Table 15. Median incomes rose in all seven counties included in the area of interest, following patterns seen at state and national levels. The effects of the economic downturn in recent years can be seen in the comparison between 2000 and 2010 unemployment and poverty data. In all seven counties, unemployment levels approximately tripled between 2000 and 2010. Overall, county unemployment levels were higher than the national average of 9.0 percent. County poverty rates also increased by one to three percentage points during the 2000-2010 period, albeit not to the degree seen in unemployment numbers for that timeframe.

TOURISM AND RECREATION

Tourism is an important part of Florida's economy, contributing $65.2 billion in revenue in 2008, which comprised approximately 11 percent of the state's gross domestic product (Visit Florida 2009). It is estimated that over 84.2 million out-of-state and international visitors visited Florida in 2008 (Visit Florida 2009). That year there were an estimated 17.1 million in-state travelers (Visit Florida 2009). In 2009 the Florida Department of Transportation estimated 81 million annual visitors (FDOT 2010).

Table 13. Percent full and part-time employment in 2000 for counties in the Study Area and the State of Florida

Industry	Glades	Highlands	Okeechobee	Osceola	Polk	Florida
Agriculture, forestry, fishing and hunting, and mining	12.5	10.3	17.5	0.6	3.4	1.3
Construction	10.0	7.1	9.5	8.8	8.4	8.0
Manufacturing	5.4	4.6	4.7	5.4	9.3	7.3
Wholesale trade	2.4	3.3	2.9	3.2	4.6	4.0
Retail trade	9.6	15.0	11.9	13.3	15.2	13.5
Transportation and warehousing, and utilities	6.6	3.6	5.1	5.9	6.1	5.3
Information	1.0	2.5	1.2	1.5	1.5	3.1
Finance and insurance, and real estate and rental and leasing	3.9	5.0	3.2	5.5	6.2	8.1
Professional, scientific, and management, and administrative and waste management services	3.7	6.8	7.1	6.9	7.3	10.6
Educational services, and health care and social assistance	18.5	20.6	17.7	12.3	17.1	18.1
Arts, entertainment, and recreation, and accommodation and food services	9.5	9.0	7.4	29.7	11.3	10.5
Other services, except public administration	5.9	5.5	4.3	3.9	4.8	5.1
Public administration	10.9	6.6	7.4	3.1	4.8	5.2
Totals	**100%**	**100%**	**100%**	**100%**	**100%**	**100%**

Source: U.S. Census Bureau 2011

Table 14. Percent full and part-time employment for 2009 for counties in the Study Area and the State of Florida

Industry	Glades	Highlands	Okeechobee	Osceola	Polk	Florida
Agriculture, forestry, fishing and hunting, and mining	24.7	7.2	11.2	0.9	2.7	1.1
Construction	9.9	11.9	11.7	9.2	10.2	9.3
Manufacturing	3.7	4.0	2.7	4.2	7.2	5.9
Wholesale trade	3.4	1.9	3.2	2.5	3.2	3.3
Retail trade	10.2	15.1	11.7	13.1	14.1	12.9
Transportation and warehousing, and utilities	2.9	3.8	4.8	6.7	5.9	5.1
Information	0.2	1.5	0.3	1.4	1.7	2.4
Finance and insurance, and real estate and rental and leasing	2.0	4.9	3.4	6.4	6.5	8.4
Professional, scientific, and management, and administrative and waste management services	2.5	9.1	8.1	10.4	9.0	11.8
Educational services, and health care and social assistance	14.0	20.9	17.8	13.8	19.2	19.2
Arts, entertainment, and recreation, and accommodation and food services	5.6	9.9	10.0	23.6	11.9	10.7
Other services, except public administration	5.2	4.4	6.4	4.0	4.5	5.2
Public administration	15.7	5.3	8.6	3.7	3.9	4.8
Totals	**100%**	**100%**	**100%**	**100%**	**100%**	**100%**

Source: U.S. Census Bureau 2011

Table 15. Income, unemployment, and poverty estimates

Demographic Unit	Median Household Income (US Dollars)		Percent Unemployment		Percent of Persons below Poverty Line	
	2000[a]	2009[a]	2000[a]	2010[b]	2000[a]	2010[a]
United States	$41,994	$51,425	3.7	9.0[c]	12.4	13.5
Florida	$38,819	$47,450	3.2	11.9 [c]	12.5	13.2
Glades County	$30,774	$39,260	4.2	11.5	15.2	17.5
Highlands County	$30,160	$33,902	1.9	12.0	15.2	16.4
Okeechobee County	$30,456	$38,643	2.5	13.4	16.0	18.6
Osceola County	$38,214	$46,315	3.2	12.4	11.5	13.3
Polk County	$36,036	$44,043	3.3	12.5	12.9	14.4

[a]*U.S. Census Bureau 2011*
[b]*U.S. Bureau of Labor Statistics 2010*
[c]*U.S. Bureau of Labor Statistics 2011*

WILDLIFE-DEPENDENT RECREATION

Nationwide, wildlife-dependent recreational opportunities support hundreds of thousands of jobs in industries and businesses. According to the most recent “National Survey of Fishing, Hunting, and Wildlife-Associated Recreation”, 87.5 million Americans spent more than $122 billion in 2006 on wildlife-related recreation (USFWS and U.S. Census Bureau 2007).

In Florida, there were over seven million participants engaged in one or more of three wildlife-dependent recreation activities (fishing, hunting, wildlife watching) during 2006, as shown Table 16 (USFWS and U.S. Census Bureau 2006). Most participants, over four million, engaged in wildlife watching, followed by fishing (about 2.8 million), and hunting (approximately 236,000). In the survey results, wildlife-associated expenditures were segregated into trip-related expenses and money spent on equipment and supplies. Total expenditures (trip-related and equipment/supplies) were the highest for fishing, followed by wildlife watching and hunting. The average expenditures per participant for fishing and hunting were almost double (about $1,500) that of wildlife watching ($720).

Table 16. Economics of wildlife-dependent recreation in Florida during 2006

Activity	Number of Participants	Expenditures			
		Trip-related	Equipment & Supplies	Total	Average Per Participant
Fishing	2,767,000	$1,973,985,000	$2,334,598,000	$4,308,583,000	$1,536
Hunting	236,000	$155,116,000	$222,278,000	$377,394,000	$1,442
Wildlife Watching	4,240,000	$887,942,000	$2,193,554,000	$3,081,496,000	$720
Total	**7,243,000**	**$3,017,043,000**	**$4,750,430,000**	**$7,767,473,000**	

Source: USFWS and U.S. Census Bureau 2006

A 2003 assessment by FDEP on the economic impact of Florida's state parks showed that the park system had an overall direct state-wide economic impact of over $573 million on local economies (FDEP 2003). Direct economic impact was defined as the amount of new dollars spent in the local economy by non-local park visitors (e.g., lodging, purchasing fuel and food, and related activities) and by park operations (e.g., construction and maintenance contracts, etc.). It was estimated that for every 1,000 persons attending a state park, the total direct economic effects on the local community was over $27,400 or roughly $274 per person. Locally, Lake Kissimmee State Park recorded 46,342 visitors in FY 2002-2003, which was a 10 percent increase over 1993-1994. It was estimated that these visitors contributed $1,632,814 in direct economic impact and the equivalent of nearly 33 jobs to the area's economy (FDEP 2003).

In 2003, FWC conducted a survey to determine the economic impacts of 17 FWC wildlife management areas (WMAs) across the state (Harding et al. 2003). According to the report, there were over 1.1 million visits to 17 WMAs in 2003. It was estimated that visitors to the 17 WMAs spent over $100 million annually on goods and services while making their trips. Out of the 17 WMAs, five were selected for additional detailed economic analysis, including J.W. Corbett and Babcock/Webb, which are in the vicinity of the Study Area. Average expenditures (per trip) for consumptive uses (e.g., hunting and fishing) were approximately $425/trip and $154/trip for Corbett and Babcock/Webb, respectively. Expenditures per trip were generally lower for non-consumptive uses (e.g., wildlife watching, photography). Visitors to Corbett and Babcock/Webb spent approximately $163/trip and $127/trip, respectively.

Data on recreational opportunities and use on private lands in Florida are relatively scarce. For the purposes of this EA, we used information derived from a study conducted by FWC and The University of Florida Department of Wildlife Ecology and Conservation that aimed to get a better understanding of land use and habitat/wildlife characteristics on private lands (Willcox and Giuliano 2009). The report analyzed and summarized survey responses from over 1,000 private landowners across the state. According to the report, approximately 9 percent of respondents indicated that recreation was the primary land use on their properties, compared to 70 percent indicating that agriculture was the primary land use. Development was the primary land use according to 20 percent of respondents.

Forty-four percent of landowner respondents or their families hunted. Statewide, 6 percent of landowners leased their land to hunters. Only 3 percent of landowners conducted guided hunts and 4 percent conducted ecotourism, bird watching, or wildlife viewing tours.

Recreational Activities and Trends

Still largely rural, the Study Area includes a variety of opportunities for outdoor recreation, including hunting, fishing, wildlife viewing, hiking, biking, camping, boating, airboating, and off-roading. For the purposes of this EA, the focus of our discussion on recreational opportunities will be on those that are wildlife-dependent. Wildlife-dependent uses are those uses for which the wildlife experience is a key part of the activity, including priority public uses for refuges (i.e., hunting, fishing, wildlife observation, wildlife photography, and environmental education and interpretation), as well as those uses that support the priority public uses [e.g., camping, hiking, horseback riding, ORV use (on designated roads and trails in support of hunting and fishing), and bicycling].

In the Study Area, various lands and waters are accessible to the public for a variety of recreational activities (e.g., boating, fishing, hunting, camping, biking, hiking, horseback riding, and wildlife watching) include federal-, state-, and county-managed lands. These public lands include, but are not limited to, those listed.

- County-managed lands (recreational and conservation) and facilities, including parks, campgrounds, nature centers, trails, boat access sites, environmental lands, etc.
- FDACS Lands: Lake Wales Ridge State Forest
- FDEP Lands: Kissimmee Prairie Preserve State Park and Allen David Broussard Catfish Creek Preserve State Park
- FWC Lands: Bull Creek, Three Lakes, and Triple N Ranch Wildlife Management Areas, Lake Wales Ridge Wildlife and Environmental Area
- SFWMD Lands: Kissimmee Chain of Lakes and lands along the Kissimmee River
- U.S. Department of Defense: Select management units on Avon Park Air Force Range
- USDA Forest Service (in cooperation with Florida Trail Association): Florida National Scenic Trail

Figure 1 outlines the conservation lands within the Study Area. For a more detailed list of managed lands that include areas open to the public see Appendix B.

Scenic Trails

Several hiking trails are found in the Study Area, the most notable of which is the Florida Trail. One of only eight National Scenic Trails, the Florida Trail, was designated in 1983. The trail includes over 1,800 miles of hiking trails and runs from Big Cypress National Preserve through the middle of the state into the western portion of the Panhandle (Florida Trail Association and USDA Forest Service 2006). A segment of the trail that originates at Lake Okeechobee runs roughly through the center of the Study Area along much of the Kissimmee River and area lakes (e.g., Lake Kissimmee and Lake Tohopekaliga). At the county level, several parks offer hiking trails, although few of these are contained within the Study Area.

Hunting

The variety of upland and wetland habitats found in the Study Area supports a diversity of game species, including deer, wild hog, turkey, waterfowl, dove, quail, alligator, and a variety of small game. Many of these species attract sport and game enthusiasts to the area. Several of the game species hunted in the Study Area are discussed further below. The FWC's WMA system has been highly instrumental in providing quality hunting opportunities in Florida, beginning as early as the 1940s with the purchase of Cecil M. Webb (62,500 acres) and the J. W. Corbett (52,000 acres) areas with Pittman-Robertson Wildlife Restoration funds. Later, FWC began entering into agreements with USDA Forest Service and Department of Defense to include national forests and military installations in the WMA system. In 2008, 19 different partners/cooperators had their lands in the WMA system, with over 5.6 million acres open to public hunting (FWC 2008). Within the Study Area, several landowners offer private hunting leases.

Data on game densities, hunter success rates, and other factors related to hunting specific to managed lands in the Study Area were not available during the writing of this EA. In general, hunting success on some of the WMAs in the Study Areas is related to the degree of hunting opportunities available. WMAs that have more hunting restrictions and less access tend to have hunts that are more likely to be successful (P. Glass, FWC, pers. comm. April 2011).

Deer

White-tailed deer are the most popular game animal in Florida, and based on surveys collected in 2006 approximately 168,000 hunters (or 71 percent of all hunters) targeted this species (USFWS and U.S. Census Bureau 2006). Compared to many other states, Florida's deer densities are generally lower due to its poorer soils, resulting in decreased foraging opportunities (FWC 2008a). Habitats in Florida where relative deer densities tend to be higher include pine flatwoods, scrub, and wet prairie. These habitats make up a large portion of the natural lands within the Study Area.

Wild Hog

Wild hog, a nonnative species, is the second-most popular large animal taken by hunters in the state (FWC 2011). Hog hunting on state-owned public lands is managed by FWC and requires a license. Although wild hog is generally considered a nuisance species, there are bag limits on some public lands to maintain a quality hunt. On private lands, no license is required and typically there are no bag limits, unless otherwise dictated by the landowner. Wild hogs are numerous in many areas, particularly areas that include wetlands and other sources of water and dense cover. Several WMAs in the vicinity of the Study Area rank among the highest in the state in terms of numbers of hogs taken (FWC 2011).

Alligator

Once rare, the American alligator has rebounded across much of its range and is now legally hunted in several states, including Florida. FWC manages alligator populations within the state and allows a statewide alligator hunt. Since 2000, the number of alligators taken in Florida has more than doubled, from 2,552 in 2000 to 7,844 in 2009. The estimated value of wild alligator products (meat, hides, etc.) was $2,962,832 in 2009. Alligators are also commercially farmed in Florida, and a set number of farms is permitted to collect eggs and hatchlings from the wild for their operations. In 2009, the estimated value of farmed alligators was $2,343,281 (FWC 2011). FWC has designated a number of alligator management units across the state, several of which lie in the Study Area.

Portions of the Kissimmee River are popular with alligator hunters, with over 480 permits issued in 2008. Based on a 2008 survey, hunters took an average of at least one alligator per person on three Kissimmee River alligator management units that year (FWC 2011).

Wild Turkey

Another much sought-after game species in Florida is the Osceola or Florida turkey, one of five subspecies of wild turkey found in North America. The Osceola turkey is only found on the Florida peninsula, making it extremely popular with out-of-state hunters (FWC 2011). Based on survey data collected in 2006, approximately 82,000 hunters (or 35 percent of all hunters) targeted wild turkey in Florida (USFWS and U.S. Census Bureau 2006). Osceola turkey are habitat generalists and are likely to thrive in areas as long as a variety of vegetation types is present to allow for foraging, resting, nesting, and brood-rearing (FWC 2008b). Tracts of lands with intensive agriculture or that are more urbanized tend to have lower turkey densities, which includes parts of the northern Study Area and locations west of the Kissimmee River. However, several tracts east of the Kissimmee River are believed to support medium to high turkey densities (FWC 2008b).

Waterfowl

Waterfowl comprise an important part of migratory birds hunted in the United States, and according to national survey data, approximately 1.8 million hunters targeted ducks and geese in 2006 (USFWS and U.S. Census Bureau 2007). In Florida, there were approximately 42,000 migratory bird hunters in 2006 (USFWS and U.S. Census Bureau 2006). Species taken include: black duck, mottled duck (Florida duck), fulvous whistling-duck, canvasback, pintail, redhead, scaup, wood duck, scoter, mallard, coot, merganser, light geese (snow, including blue, and Ross), and Canada geese. The state's numerous open water and wetland habitats, many of which are open to public hunting, have resulted in hunter success rates that are double the national average for ducks (FWC 2011). The Study Area contains a variety of waterbodies such as the Kissimmee River and numerous lakes that include sovereign state waters (sovereign submerged lands) that are open to FWC-regulated public waterfowl hunting.

Quail

In 2006, approximately 32,000 hunters (14 percent of all hunters that year) sought Northern bobwhite across Florida (USFWS and U.S. Census Bureau 2006). Of these hunters, less were likely successful in their endeavors compared to hunters decades ago, due to declining populations of this game species. During the last 50 years, the numbers of quail taken in Florida have decreased by over ten-fold (FWC 2011). Quail require a combination of open areas and dense cover in order to thrive. Across their range, quail are declining as a result of habitat loss due to urbanization, increased grassland cultivation, and the transition of native, grassy fields into woods and forests (Riddle et al. 2010). In Florida, flatwoods and dry prairie are believed to be the primary habitats for quail (Martin 2003). These habitats are among the dominant types found in the Study Area.

Dove

The mourning dove (*Zenaida macroura*) is the leading migratory game bird in the United States and more doves are harvested annually than all other migratory game birds combined (Dolton et al. 2007). In 2008, over 17 million doves were harvested in the United States, with approximately 516,500 taken in Florida (Sanders and Parker 2010). FWC manages public dove fields on several

WMAs, including sites located in and in the vicinity of the Study Area. According to recent data, the number of doves reported on managed fields was ranked as "fair" (FWC 2011). Data were not obtained on dove fields located on private lands.

Other Small Game

In addition to quail and dove, other small game hunted in Florida includes snipe, woodcock, rabbit, and squirrel. Of these, squirrels are among the most targeted, with over 49,000 hunters seeking this species in 2006 (USFWS and U.S. Census Bureau 2007). The Study Area includes several WMAs (e.g. Three Lakes, Triple N Ranch, and Bull Creek) that typically rank among the best small game areas in FWC's Northeast Region (FWC 2011). These WMAs contain large areas of flatwoods, interspersed with hardwood hammocks, and other habitat types that support a diversity and abundance of small game. Table 17 outlines the general hunting seasons (please contact FWC for more detailed information about state hunting seasons).

Table 17. General hunting seasons for selected game species in the Study Area
(to be used for the purposes of this EA only; for current, detailed seasons and dates, refer to FWC website: http://myfwc.com/hunting/season-dates)

Game Species	General Hunting Season
Deer	Mid-October through mid-February
Hog	Year-round
Alligator	Mid-August through September
Wild Turkey	Fall: Mid-October through January Spring: First week of March through late April
Ducks	Late September through early February
Geese	Early September through late January
Quail	Mid-October through first week of March
Dove	October through early January
Rabbit	Year-round
Raccoon	Year-round
Opossum	Year-round
Snipe	November through mid-February
Woodcock	Mid-December through mid-January

Fishing

Florida's climate and vast water resources provide numerous and varied opportunities for saltwater and freshwater fishing. The state contains over 3 million acres of lakes, ponds, and reservoirs, and 10,550 miles of rivers, streams, and canals. According to a 2006 survey, over 1.4 million resident and visiting freshwater anglers fished inland waters (USFWS and U.S. Census Bureau 2007). Popular freshwater fish

include largemouth bass, crappie, bluegill, various sunfish, warmouth, striped and white bass, several catfish species, as well as a few nonnative species such as peacock bass and Mayan cichlid (FWC 2011). The Study Area contains a large portion of the Kissimmee River as well as numerous lakes and ponds, with shore and boat access available to anglers.

Wildlife Viewing

Wildlife viewing comprises the largest group of people engaged in wildlife-dependent recreational activities. During 2006, approximately 3.4 million participants engaged in wildlife watching in Florida, more than hunters and anglers combined (USFWS and U.S. Census Bureau 2006). Although hunting and fishing have seen declines in participation rates in recent years (Aiken 2010), wildlife watching continued to grow in popularity nationally and in Florida between 1991 and 2006, based on survey data (Aiken 2009). The Florida Trail, WMAs, and other public lands and waters located in the Study Area provide a host of wildlife observation and photography opportunities. Wildlife viewing is often conducted in association with a variety of outdoor activities, including boating, fishing, hunting, horseback-riding, and other outdoor activities.

RANCHING

Ranching is an important land use in the Study Area. In 2003, cattle ranching contributed $348 million to the state's economy (Main et al. 2003). In the Study Area, ranching is a major economic mainstay. Table 18 shows a summary of 2009 economic activity associated with ranching and farming in selected south-central Florida counties (MIG, Inc. 2009). Total economic output from ranching and farming in Highlands, Okeechobee, Osceola, and Polk Counties was almost $95 million in 2009 (Table 18).

Table 18. Farming and ranching economic output in Highlands, Okeechobee, Osceola, and Polk Counties

County	Output or Revenue (million $)	Export Sales (million $)	Total Value Added (million $)	Total Value Added Impacts (million $)	Employment (Full-time & Part-time Jobs)	Employment Impacts (Full-time & Part-time Jobs)
Cattle ranching and farming	94.9	70.6	14.4	43.2	652.2	1,212.3
Highlands	24.3	18.1	3.7	10.5	179	331
Okeechobee	26.3	17.4	4.0	9.4	207	335
Osceola	23.9	18.7	3.6	11.9	106	237
Polk	20.4	16.3	3.1	11.4	160	309

Source: MIG, Inc. 2009

ECOSYSTEM SERVICES

Ecosystem services are the suite of goods and services that are provided by healthy ecosystems. Humans benefit from resources and processes supplied by natural ecosystems, examples of which include clean drinking water, flood protection, and recreational opportunities. The concept of ecosystem services has been around for some time (Costanza et al. 1997). From 2001 to 2005, the Millennium Ecosystem Assessment involved more than 1,300 scientists worldwide to provide a state-of-the-art scientific appraisal of the condition and trends in the world's ecosystems and the services they provide, as well as the scientific basis for action to conserve and use them sustainably (Millennium Ecosystem Assessment 2005). The Millennium Ecosystem Assessment organized ecosystem services into four broad categories: provisioning, such as the production of food and water; regulating, such as the control of climate and disease; supporting, such as nutrient cycles and crop pollination; and cultural, such as spiritual and recreational benefits (Millennium Ecosystem Assessment 2005).

Many of the ecosystem goods and services have traditionally been viewed as free benefits to society, or "public goods." Lacking a formal market, these natural assets are traditionally absent from society's balance sheet; their critical contributions are often overlooked in public, corporate, and individual decision-making (U.S. Department of Agriculture 2007). Costanza and others (1997) were among the first to assign a dollar amount to the world's major ecosystems, in terms of the goods and services that these provide. According to their analysis, wetlands were worth approximately $6,022 per acre annually, primarily as a result of flood and water supply regulation, as well as waste treatment. This amount was a global average, an aggregate based on all the world's wetlands. Regionally, an analysis conducted by the Arthur R. Marshall Foundation showed that Everglades restoration would more than pay for itself over time (Giraud et al. 2010; unpublished report).

J. CULTURAL RESOURCES

Section 106 of the National Historic Preservation Act of 1966, as amended, and Section 14 of the Archaeological Resources Protection Act require the Service to evaluate the effects of any of its actions on cultural resources [e.g., historic, architectural, and archaeological that are listed or eligible for listing in the National Register of Historic Places (NRHP)]. In accordance with these regulations, the Service has coordinated the review of this project with the Florida State Historic Preservation Office.

The body of federal historic preservation laws has grown dramatically since the enactment of the Antiquities Act of 1906. Several themes recur in these laws, their promulgating regulations, and more recent executive orders. They include: (1) Each agency is to systematically inventory the historic properties on its holdings and to scientifically assess each property's eligibility for the National Register of Historic Places; (2) federal agencies are to consider the impacts to cultural resources during the agencies' management activities and seek to avoid or mitigate adverse impacts; (3) the protection of cultural resources from looting and vandalism are to be accomplished through a mix of informed management, law enforcement efforts, and public education; and (4) the increasing role of consultation with groups, such as Native American tribes, in addressing how a project or management activity may impact specific archaeological sites and landscapes deemed important to those groups. The Service, like other federal agencies, is legally mandated to inventory, assess, and protect cultural resources located on those lands that the agency owns, manages, or controls. The Service's cultural resource policy is delineated in 614 FW 1-5 and 126 FW 1-3. In the Service's Southeast Region, the cultural resource review and compliance process is initiated by contacting the Regional Historic Preservation Officer/Regional Archaeologist (RHPO/RA). The RHPO/RA will determine whether the undertaking has the potential to impact cultural resources, identify the "area of potential effect," determine the appropriate level of scientific investigation necessary to ensure legal

compliance, and initiate consultation with the pertinent State Historic Preservation Office (SHPO) and federally recognized tribes. The Service believes that the acquisition of lands will have no adverse effect on any known or yet-to-be identified NRHP-eligible cultural resources. However, in the future, if the Service plans or permits any actions that might affect eligible cultural resources, it would carry out appropriate site identifications, evaluations, and protection measures as specified in the regulations and in Service directives and manuals.

The Study Area for the Everglades Headwaters NWR and Conservation Area spans five counties and runs north from Lake Okeechobee to East Lake Tohopekaliga. It encompasses the watershed of the Kissimmee River. Given the history of this area, cultural resource sites are expected to be encountered. Further, the Study Area encompasses numerous sites of interest to the Seminole Tribe of Florida and potentially includes sites of interest to the Miccosukee Tribe of Indians of Florida. Sites that might be encountered within the 50,000-acre refuge include green corn dance sites, villages, camps, cemeteries, and historic landscapes, such as the Okeechobee Battlefield. Further, the Brighton Reservation of the Seminole Tribe of Florida is located in Glades County, adjacent to the Study Area and the Miccosukee Tribe of Indians of Florida has cattle grazing lands in Highlands County.

The cultural resources discussion which follows will provide a thumbnail sketch of the cultural history of the watershed. A more detailed cultural resources management plan, which includes sections describing recorded historic properties and past historical and archaeological investigations, may be drafted at a future date if needed, and/or cultural resources will be further detailed in a subsequent comprehensive conservation plan.

Although the earliest known human occupation in Florida dates to the Paleoindian Period (ca. 10,000-8,000 BCE), the first widespread human settlement in the Kissimmee watershed and Lake Okeechobee basin occurs during the Belle Glade I Period (800 BCE-200 CE). Earlier sites, such as the Nalcrest Site (8PO15), have been recorded in the Study Area. The Nalcrest Site is a Late Paleoindian/Early Archaic lithic workshop, which included a variety of microlithic tools and cores likely used for leatherworking and/or processing plant fibers for cordage and basketry (Milanich 1994: 58). Geological evidence indicates that the Kissimmee River is a relatively young river that did not consistently flow prior to 3000 BCE, which may account for the sparseness of Paleoindian and Archaic Period sites (Osborn, Wilder, O'Steen, and Carrier Jones 2008: 27).

The Belle Glade Period spans 1000 BCE to 1715 CE and is divided into five discrete subperiods. Sites dating to this time period often have elaborate earthworks that include mounds, burrows, ponds, ditches, canals, and linear and annular embankments. One of the better known and most elaborate Belle Glade sites is Fort Center, which was excavated by Sears (1982). Smaller and less elaborate sites are seen throughout the basin close to rivers and on hammocks along deep water sloughs, marshes, and seasonal ponds (Newman, Memory, and Swann 2000: 6). Belle Glade Plain and Glade Plain wares dominate the early cultural sequence. Decorated wares and St. Johns types appear later. Belle Glade populations exploited a range of plants and animals, though they may have modified wet areas for use as gardens or agricultural fields. Sears (1982) recovered maize pollen from several locations at Fort Center; the earliest date is ca. 450 BCE coming out of the fill of circular ditches. As Milanich (1994: 290) noted, it is undetermined now whether maize constituted a major component of the diet or a highly specialized commodity for specific high-status residents (Poplin, McMakin, and Harvey 1996: 28).

European explorers and colonists stayed primarily along Florida's coastal margins, though at least one group of Spanish soldiers based in Tampa Bay traveled inland meeting Urriaparocoxi in 1539 near Lake Apopka. Urriaparocoxi was the paramount chief of the Tampa Bay region. The Study Area was part of Florida referred to by the Spanish as "la rinconada," which loosely translated as corner or nook. Several

tribes were mentioned in and around this area, such as the Jororo, the Ais, the Guacata, and the Jaega. The Ais were located in the Indian River area to the east; the Guacata on the St. Lucie Sound and River; and the Jaega around Jupiter Inlet (Swanton 1979). Two Jororo sites – the Goodnow Mound near Sebring in Highlands County and the Philip Mound near Lake Marian in Polk County – have yielded 17th century Spanish artifacts, though it is unclear whether this represents direct contact between the Jororo and the Spanish or a movement of goods through an existing trade network. The Jororo were described by the Spanish as hunter-gatherers heavily reliant on fishing and wild plants. Their language was different from the Timucuans of the coastal and St. Johns basin (Osborn, Wilder, O'Steen, and Carrier Jones 2008: 28). By the late 1700s, most of Florida's indigenous groups had been devastated by European-introduced diseases, conflicts with European settlers, and cultural disruption. The Study Area remained largely unknown and unmapped by European and, later American, settlers until the mid-19th century (Newman, Memory, and Swann 2000: 7).

In the early 18th century, the Spanish encouraged the Lower Creeks to move into northern Florida. The Spanish called these groups "cimarrones" or "wild ones." As the "cimarrones" moved further into the Florida peninsula and away from the Creek sphere of influence, they emerged as the Seminoles (Weisman 1999: 14). The history and archaeology of the Seminole and Miccosukee Tribes have been the subject of numerous investigations (Carr and Steele 1993; Covington 1993; Fairbanks 1978; Kersey 1987; MacCauley 1887; Weisman 1999 & 2000; and Wright 1986). The reader is referred to these well-written and accessible volumes. The Study Area has and continues to play an important role in Seminole history, ethos, and sovereignty. Village and campsites associated with Chief Jumper, Sam Jones, Chipco, and Tallahassee; "old Indian fields" and pastures for cattle; Green Corn Dance grounds; and sites and battlefields associated with the Seminole Wars are scattered throughout the five-county Study Area. The Brighton Reservation (of the Seminole Tribe of Florida) abuts the Study Area's southwestern corner (Carr and Steele 1993; Masson, Carr, Goldman, and Steele 1987; Weisman 1999).

The Armed Occupation Act of 1842 and the Federal Swamp Act of 1850 opened the Kissimmee watershed to American settlement. Ranchers and cattle herds spread over the vast prairies east of the central Florida ridge. During the American Civil War, ranchers provided beef to both the Confederate and Union forces. After the war, they found new markets first in Cuba and then locally. Other industries, such as commercial citrus groves, phosphate mining, timber and naval stores' production, formed the foundation of the area's economy. By the mid-19th century, cattle families, such as the Streaty Parker, Benjamin and Joseph Guy, A. E. Godwin, John M. Pearce, Mitchell Alderman, and Eli Morgan, ran cattle first on open range lands along the Kissimmee River. Open range gave way to fenced pasturage following the early 20th century outbreak of the fever or "Texas" tick. In 1924 Florida enacted a law making cattle dipping compulsory. The state provided funding for dipping vats, as well as financial incentives for each cow dipped. During the tick epidemic, cattlemen needed to treat their cattle every eleven days. Dipping vats became centers of social activities during this period. In addition to dipping vats, other traces of the cattle industry can be found throughout the Study Area. These traces include remains of cow pens, farmsteads, ranch houses, cattle camps, and fence lines (Newman, Memory, and Swann 2000: 14-16; Hughes and Groover 1999). Akermen (2007) provides a detailed account of Florida's cowmen and the cattle business.

Water management has been a critical factor in altering and controlling the Study Area's landscape. The earliest efforts are seen at Belle Glade sites, such as Fort Center, and represent a specialized adaptation to area's wetlands, savannahs, and hammocks (1000 BCE-1715 CE). As noted above, Belle Glade sites are characterized by elaborate earthworks, which include ponds, borrow pits, ditches, canals, and linear and annular embankments. The Federal Swamp Act of 1850 transferred federal wetlands and overflowed lands to the states with caveat that proceeds of any sales go to drainage and land reclamation. Florida created the Trustees of the Internal Improvement Trust

Fund in 1855 to handle such sales and to oversee drainage and reclamation projects. Following the American Civil War, the Internal Improvement Trust Fund sought to re-invigorate the land reclamation process and contracted Hamilton Disston in 1881, to drain extensive areas in the Kissimmee and Caloosahatchee Basins. Disston would procure rights or titles to alternate sections of land along his canals. His first major drainage and water transportation project was a series of canals connecting Lake Kissimmee, Lake Hatchineha, Cypress Lake, and Lake Tohopekaliga and a canal from Lake Okeechobee west to Lake Hicpochee and to Lake Flirt. To deal with the increased amount of water flowing into Lake Okeechobee, Disston cut canals into the Caloosahatchee, Miami, and St. Lucie Rivers. Levee construction was planned to contain rivers in banks and to prevent water from re-flooding drained marsh areas. The Everglades Drainage District was established in 1913. The District extended just north of Lake Okeechobee south to the end of the peninsula and was charged with permanently lowering the lake's water levels and preventing overflow into the Everglades. Its primary objective was the expansion of agricultural lands, primarily for sugar cane cultivation. The District was bankrupt and out of business by 1928. Beginning in the late 1930s, the Central and South Florida Flood Control Project, under the direction of USACE, sought further to tame the watershed and its surrounding area for flood control and to ensure a supply of freshwater for human consumption and agriculture. The USACE channelized the sinuous Kissimmee River and constructed a network of canals, levees, and control structures. The USACE's flood control and water storage projects achieved these objectives, but have lead to extensive damage of wetlands heavily used by migratory waterfowl, decreased water quality, and the eutrophication of Lake Okeechobee (Poplin, McMakin, and Harvey 1996: 48-80).

III. ALTERNATIVES, INCLUDING THE PREFERRED ALTERNATIVE

A. INTRODUCTION

This chapter presents the alternatives including our Preferred Alternative that we believe best meets the purposes, vision, and goals for the Everglades Headwaters NWR and Conservation Area. The vision is to "conserve, protect, and manage one of the great grassland and savanna landscapes of eastern North America for current and future generations by protecting the important wildlife and habitats of the working rural landscape of central Florida's Kissimmee River Basin that is home to abundant fish and wildlife resources, that is vital to restoration and protection of the water quality and quantity for the Everglades ecosystem, that is resilient to the effects of global climate change, and that offers outdoor recreational opportunities important to the region's economy."

Several purposes were identified to further the vision for the Everglades Headwaters NWR and Conservation Area, as listed.

> *"... conservation, management, and ... restoration of the fish, wildlife, and plant resources and their habitats ... for the benefit of present and future generations of Americans..." 16 U.S.C. 668dd(a)(2) (National Wildlife Refuge System Administration Act)*
>
> *"…to conserve (A) fish or wildlife which are listed as endangered species or threatened species…or (B) plants…" 16 U.S.C.1534 (Endangered Species Act of 1973)*
>
> *"…the conservation of the wetlands of the Nation in order to maintain the public benefits they provide and to help fulfill international obligations contained in various migratory bird treaties and conventions ..." 16 U.S.C.3901(b), 100 Stat. 3583 (Emergency Wetlands Resources Act of 1986)*
>
> *"…for use as an inviolate sanctuary, or for any other management purpose, for migratory birds…." 16 U.S.C.715d (Migratory Bird Conservation Act)*
>
> *"…for the benefit of the United States Fish and Wildlife Service, in performing its activities and services. Such acceptance may be subject to the terms of any restrictive or affirmative covenant, or condition of servitude..." 16 U.S.C.742f(b)(1) "…for the development, advancement, management, conservation, and protection of fish and wildlife resources...." 16 U.S.C.742f(a)(4), (Secretarial powers to implement laws related to fish and wildlife) (Fish and Wildlife Act of 1956)*
>
> *"…suitable for (1) Incidental fish and wildlife-oriented recreational development, (2) the protection of natural resources, (3) the conservation of endangered species or threatened species ..." 16 U.S.C. 460k-1 "... the Secretary ... may accept and use ... real ... property. Such acceptance may be accomplished under the terms and conditions of restrictive covenants imposed by donors ..." 16 U.S.C. 460k-2 [Refuge Recreation Act (16 U.S.C.460k-460k-4), as amended]*

Four overarching goals were then developed for the Everglades Headwaters NWR and Conservation Area. The goals are intentionally broad, descriptive statements of the desired future conditions. They embrace the refuge purposes and the vision statement. Descriptions of the three alternatives address

the goals in narrative form, and offer an explanation of how each alternative addresses the refuge's goals. The Preferred Alternative (Alternative C) is addressed in more detail in the Conceptual Management Plan (Appendix A, Final LPP) and in the Interim Compatibility Determinations (Appendix B, Final LPP), which provide general, interim management direction for the refuge until approval of a considerably more detailed comprehensive conservation plan. The Service will develop a comprehensive conservation plan for the Everglades Headwaters NWR and Conservation Area within 15 years of the date of this Final EA. The goals established for the Everglades Headwaters NWR and Conservation Area address a functional conservation landscape; habitat for fish and wildlife; enhanced water quality, quantity, and storage; and wildlife-dependent recreation and education, as listed.

> **Goal 1. Functional Conservation Landscape.** The upper Everglades watershed will become a more connected and functional conservation landscape that will provide effective habitat connections between existing conservation areas and allow habitats and species to shift in response to urban development pressures and global climate change.
>
> **Goal 2. Habitat for Fish and Wildlife.** The Everglades Headwaters NWR and Conservation Area will provide a wide range of quality Kissimmee River Basin habitats to support migratory birds, federal and state listed species, state designated species of conservation concern, and native wildlife diversity.
>
> **Goal 3. Enhanced Water Quality, Quantity, and Storage.** Focusing on restoring or mimicking natural hydrologic processes, the Everglades Headwaters NWR and Conservation Area will contribute to water quality, water quantity, and water storage capacity of the upper Everglades watershed to support Everglades restoration goals and objectives and water quality and supply for central and south Florida.
>
> **Goal 4. Wildlife-dependent Recreation and Education.** Refuge visitors of all abilities will enjoy opportunities for hunting, fishing, wildlife observation, wildlife photography, and environmental education and interpretation, while increasing knowledge of and support for conservation of the important grassland and savanna landscape of the headwaters of the Everglades.

Under the National Environmental Policy Act (NEPA), the Service developed and evaluated a reasonable range of alternatives. The Preferred Alternative defines what the Service plans to do or recommend, but cannot implement without considering other reasonable, environmentally sensitive alternatives. Other reasonable alternatives to the Preferred Alternative that could also be viewed as fulfilling the purposes of the refuge are described in this EA, thereby offering the Service and the reviewing public an opportunity to consider a range of reasonable alternatives for the Preferred Alternative, and thus fulfilling one of the key tenets of NEPA.

B. FORMULATING ALTERNATIVES

The Service developed and evaluated a reasonable range of alternatives based on the issues raised during internal and public scoping by the Service, the public, other federal governmental agencies, Native American tribal governments, state and local governmental agencies, organizations, and local businesses. Alternatives describe complementary management approaches for achieving the missions of the Service and Refuge System, the purposes for which the refuge is established, and its vision and goals, while responding to issues and opportunities identified during the planning process (see the Public Participation section in Chapter I for more information).

The basic process for formulating alternatives involved wildlife and habitat databases and modeling, including the FWC's 2003 raster graphic land cover layer, the SFWMD's 2004 vector version of the FDOT Future Land Use and Cover Classification System (FLUCCS) code coverage, and a new coverage recently completed by the FNAI Cooperative Land Cover Map. The alternative formulation planning process was based on two objectives: (1) To identify high-priority ecological value lands that are currently unprotected, and (2) to identify potential corridors for animal movement across the landscape and habitat connectivity between existing public lands (e.g., state parks or wildlife management areas) or other similar natural lands (e.g., Avon Park Air Force Range and The Nature Conservancy's landholdings). FWC and Service experts met to identify the habitats considered most rare or most in need of protection within the Study Area, because they support either keystone species or federally listed threatened or endangered species. Generally, the highest priority habitats were dry prairie (with any associated wet prairie habitat that could support Florida grasshopper sparrows), cutthroat grass plant communities, and Florida scrub or sandhill (that supports endemic xeric plants and animals). The second highest ranking habitats were all pine flatwoods types (scrubby, mesic, and hydric), and other upland and wetland forests. The third highest priority habitats were long-hydroperiod herbaceous marshes. The next step was to analyze connectivity throughout the landscape using the databases listed above using Geographic Information System (GIS) software. Several areas including urban and developed lands were not considered in the development of the alternatives, since they were determined to not meet the Service's criteria for additional conservation or protection. This analysis of ecological value and connectivity resulted in the identification of areas potentially suitable for refuge acquisition. (See Appendix C for a more detailed explanation of this process.)

To help further the development of alternatives, the Study Area was divided into two distinct geographic areas, based upon the distinctly different resource values (e.g., habitat for listed species, endemic habitats, focal species, and landscape connectivity): (1) Ridge (west of the Kissimmee River Basin divide) and (2) Prairie (east of the Kissimmee River Basin divide). Each of these areas was further divided into North, Central, and South Units, resulting in six units. These units identified high conservation value areas proposed for acquisition. Unit designation is primarily used to define the specific areas for ease of discussion (See Alternative C description and figures.)

Based on this process to identify and evaluate alternatives, the Service selected three alternatives, including the NEPA required No Action Alternative, to provide a baseline for comparing the other two action alternatives. The three alternatives evaluated in detail are listed.

- Alternative A. No Refuge and No Conservation Area (No Action Alternative)
- Alternative B. Refuge Only Approach
- Alternative C. Conservation Partnership Approach (Preferred Alternative)

Once priority habitats and connectivity were identified and public input was considered, we developed the description of the alternatives. For Alternative B, the more traditional approach, we selected four planning units containing high-priority conservation lands in which to focus fee-title acquisitions: Ridge North, Ridge South, Prairie Central, and Prairie South. These areas were determined to be some of the most important in terms of habitat value and connectivity and identified approximately 50,000 acres for fee-title acquisition. For Alternative C, the conservation partnership approach, the lands identified expanded upon the high-priority conservation features identified in Alternative B. Based on our analysis (Appendix C), an area of approximately 130,000 acres was identified (i.e., the Conservation Focal Area for the refuge), within which the Service will have a purchase cap of up to approximately 50,000 acres. This Conservation Focal Area will enable the Service to respond to opportunities for land acquisition, while still limiting Service acquisition to 50,000 acres. Beyond the

three outlined alternatives, three other alternatives were considered, but discarded, since they were determined not to be feasible and did not serve the stated purpose and need, mission of the Service and Refuge System, and vision and goals.

One alternative evaluated, but discarded, focused only on proposing a refuge in a single, contiguous block of 50,000 acres. This 50,000-acre proposal would have a fee-title acquisition focus, while less-than-fee-title methods of acquisition would also be considered. Although this approach would add to broad conservation goals within this landscape, it was determined to not further the outlined purpose of landscape-scale strategic habitat conservation, and would only provide landscape connectivity in one specified location in the landscape. This approach would not provide greater connectivity between existing conservation lands and resiliency across the landscape to allow wildlife to better respond to the impacts of global climate change. An overriding concern is to enhance the functionality of the conservation landscape in the Kissimmee River Basin, which this alternative would not achieve.

Another alternative evaluated, but discarded, proposed to focus exclusively on utilizing conservation easements (i.e., Service purchase of only certain landowner rights and privileges such as development rights) without any fee-title acquisitions (i.e., Service ownership of all landowner rights and privileges). It was determined that this approach would not provide the Service the opportunity to provide wildlife-dependent outdoor recreation and education opportunities. Since the specifics of conservation easements are highly dependent upon the landowners, the Service could not guarantee under this alternative the ability to provide opportunities for wildlife-dependent recreation and education. Although a conservation easements-only approach was determined not to be feasible, conservation easements are useful tools that were incorporated into a more robust approach to landscape-scale conservation that is outlined in the Preferred Alternative.

The third alternative evaluated, but discarded, would have allowed the Service to acquire interests in lands (e.g., by conservation easements or fee-title acquisitions) and then turn over ownership or management of these lands to another conservation agency or organization (e.g., FWC). This approach was also determined not to be feasible since the Service does not have sufficient authority to divest its interest in land ownership in this type of wholesale manner to another management entity. Under this type of alternative, the Service would not be able to assure or guarantee that future funds or support would be available to support the accepting management entity. Additionally, other agencies and organizations do not have the capacity to assume management responsibilities without reimbursement and compensation. Due to the inability of the Service to obligate future management funds and the inability of other management organizations to assume management responsibilities without compensation, this approach was not considered further. Although the approach to turn over wholesale ownership and/or management was determined not to be feasible, working with partners to assist in conservation and management within this landscape, including management of recreational opportunities, was incorporated into a more robust approach to landscape-scale conservation that is outlined in the Preferred Alternative.

C. ALTERNATIVES

The three alternatives are summarized, followed by a narrative description of each alternative with appropriate figures. The narrative description for each alternative describes the possible management activities that would help meet the overarching goals of the Everglades Headwaters NWR and Conservation Area. Maps are used to illustrate lands that could be included under each alternative.

To help explain the alternatives, definitions are listed for several terms (i.e., Conservation Partnership Area, Conservation Area, Conservation Focal Area, Refuge Acquisition Boundary, Refuge Boundary, and Study Area) and the matrix in Table 19 provides a broad overview of each alternative.

Conservation Partnership Area	A specified area within which the Service would work with partners and willing landowners to achieve conservation goals and within which the Service would have authority to work with willing landowners to acquire less-than-fee-title interest or enter into management agreements. The Service would only be authorized to acquire up to a specified amount or acreage cap. Alternative C identifies an approximately 745,000-acre Conservation Partnership Area. The Service would have an acquisition cap of 100,000 acres for less-than-fee-title acquisitions (with a conservation-easement focus). The designation of a Conservation Partnership Area would not convey authority to establish rules and regulationsthisarea. The Conservation Partnership Area acres do not include protected lands in this landscape, areas removed from consideration), and major lakes.
Conservation Area	The less-than-fee-title interest acquired within the Conservation Partnership Area. As less-than-fee-title interests in lands were acquired from willing landowners, they would become the Conservation Area. Under Alternative C, the Conservation Area total would be 100,000 acres.
Conservation Focal Area	A specified area within which the Service would have the authority to purchase property for a proposed refuge, but where the Service would be limited to an acquisition cap smaller than the Conservation Focal Area itself. The Service would be limited to acquiring property within the Conservation Focal Area, but would have the ability to adjust specific parcel acquisition to respond to changing landowner interest, conditions, and opportunities. Under Alternative C, the Conservation Focal Area would be approximately 130,000 acres with an acquisition cap of 50,000 acres.

Refuge Acquisition Boundary	A Refuge Acquisition Boundary defines specific parcels of property which the Service would have the authority to purchase from willing sellers. Under Alternative B, the proposed Refuge Acquisition Boundary would be 50,000 acres.
Refuge Boundary	A Refuge Boundary is the management boundary of an approved refuge. A Refuge Boundary is generally comprised of Service-owned property, but can include other properties through some sort of agreement with the landowner (e.g., management agreement, lease, and easement). Under both alternatives B and C, the proposed Refuge Boundary would be 50,000 acres.
Study Area	A generalized area of interest within which the Service would evaluate opportunities for additional conservation measures. The Study Area for this project totals approximately 1.8 million acres of the Kissimmee River Basin. The designation of a Study Area does not convey authority to establish rules and regulations throughout the 1.8 million-acre area.
Areas Not Considered	During the planning process, certain areas were removed from consideration for fee-title or less-than-fee-title acquisition, including incorporated and developed areas and areas determined not to meet the Service's criteria for additional conservation.

Table 19. Overview of the alternatives

	Alternative A No Refuge and No Conservation Area (No Action Alternative)	Alternative B Refuge Only Approach	Alternative C Conservation Partnership Approach (Preferred Alternative)
Total Acres Proposed to be Protected by the Service	0 acres	50,000 acres	150,000 acres
Proposed National Wildlife Refuge	No Refuge	50,000-acre Refuge Acquisition Boundary Up to 50,000 acres authorized for Service acquisition Fee-title acquisition focus with potential use of less-than-fee-title methods	Approximately 130,000-acre Conservation Focal Area Up to 50,000 acres fee-title acquisition authorized Fee-title acquisition focus with potential use of less-than-fee-title methods
Proposed Conservation Area	No Conservation Area No Conservation Focal Area	No Conservation Area No Conservation Focal Area	100,000-acre Conservation Area Up to 100,000 acres of less-than-fee-title interest authorized within Kissimmee River Basin which supports acquisition focal area Conservation easement focus with potential use of other less-than-fee-title methods

Alternative A. No Refuge and No Conservation Area (No Action Alternative)

The No Action Alternative required by NEPA serves as a baseline to which the other alternatives are compared. In this alternative the Service would not create a new refuge, no designated acquisition boundary would be developed, and no conservation area would be created. Habitat protection and management would continue by existing organizations and government programs. The landscape within the Study Area boundary currently contains approximately 421,232 acres of conservation lands protected by agricultural easements; private conservation organizations; and municipal, state, and federal ownership and management (Figure 1). The Service would pursue no new opportunities for refuge-based wildlife-dependent public uses, partnerships, or scientific research.

Alternative B. Refuge Only Approach

This alternative proposes an acquisition boundary of up to 50,000 acres containing portions of the priority habitats identified in the proposal; focuses the bulk of the proposed refuge within mostly contiguous areas; and complements existing municipal, state, and federal conservation within this landscape (Figure 7). The Service would use a suite of conservation tools to protect land, including fee-title acquisitions and conservation easements. This alternative would protect important wildlife habitat within the landscape, serving both common and rare wildlife species. It would offer opportunities for wildlife management, compatible wildlife-dependent public uses, and new refuge-based partnerships and scientific research. Public use opportunities under this alternative would include hunting and fishing, as well as wildlife observation, photography, environmental education, and interpretation.

Alternative C. Conservation Partnership Approach (Preferred Alternative)

Alternative C is the Service's Preferred Alternative; the alternative recommended for implementation. Conservation of up to 150,000 acres containing portions of the priority habitats identified in this project (Figure 8) will be undertaken by the Service. To best complement existing municipal, state, and federal conservation within this landscape, the Service identified: (1) A Conservation Focal Area of approximately 130,000 acres within which the Service will have the authority to acquire up to 50,000 acres, and (2) a Conservation Partnership Area within which the Service will have the authority to acquire less-than-fee-title interest in up to 100,000 acres as a Conservation Area.

Working with willing landowners, protection of lands under Alternative C will focus fee-title acquisition of up to 50,000 acres, and less-than-fee-title acquisition on 100,000 acres. Specific ranking criteria will be used to identify and prioritize all lands targeted for acquisition. For the refuge portion of Alternative C, the Service has identified an approximately 130,000-acre Conservation Focal Area within which the Service will be authorized to only acquire up to approximately 50,000 acres. For the Conservation Area under Alternative C, the Service will be authorized to consider less-than-fee-title acquisitions (with a focus on the use of conservation easements) on approximately 100,000 acres. This alternative will protect and meet the needs of both rare and common wildlife, provide wildlife corridors linking existing conservation lands, and restore additional wetlands and wetland function, as well as provide opportunities for wildlife-dependent public use activities and help maintain the cultural ranching heritage of the area. Public use opportunities under Alternative C will include hunting and fishing, as well as wildlife observation, photography, environmental education, and interpretation.

Figures 7 and 8, for Alternatives B and C respectively, also depict areas that were not considered in the development of the alternatives. These areas were determined to not meet the Service's criteria for additional conservation or protection and also included incorporated and developed areas.

Figure 7. Alternative B - refuge only approach

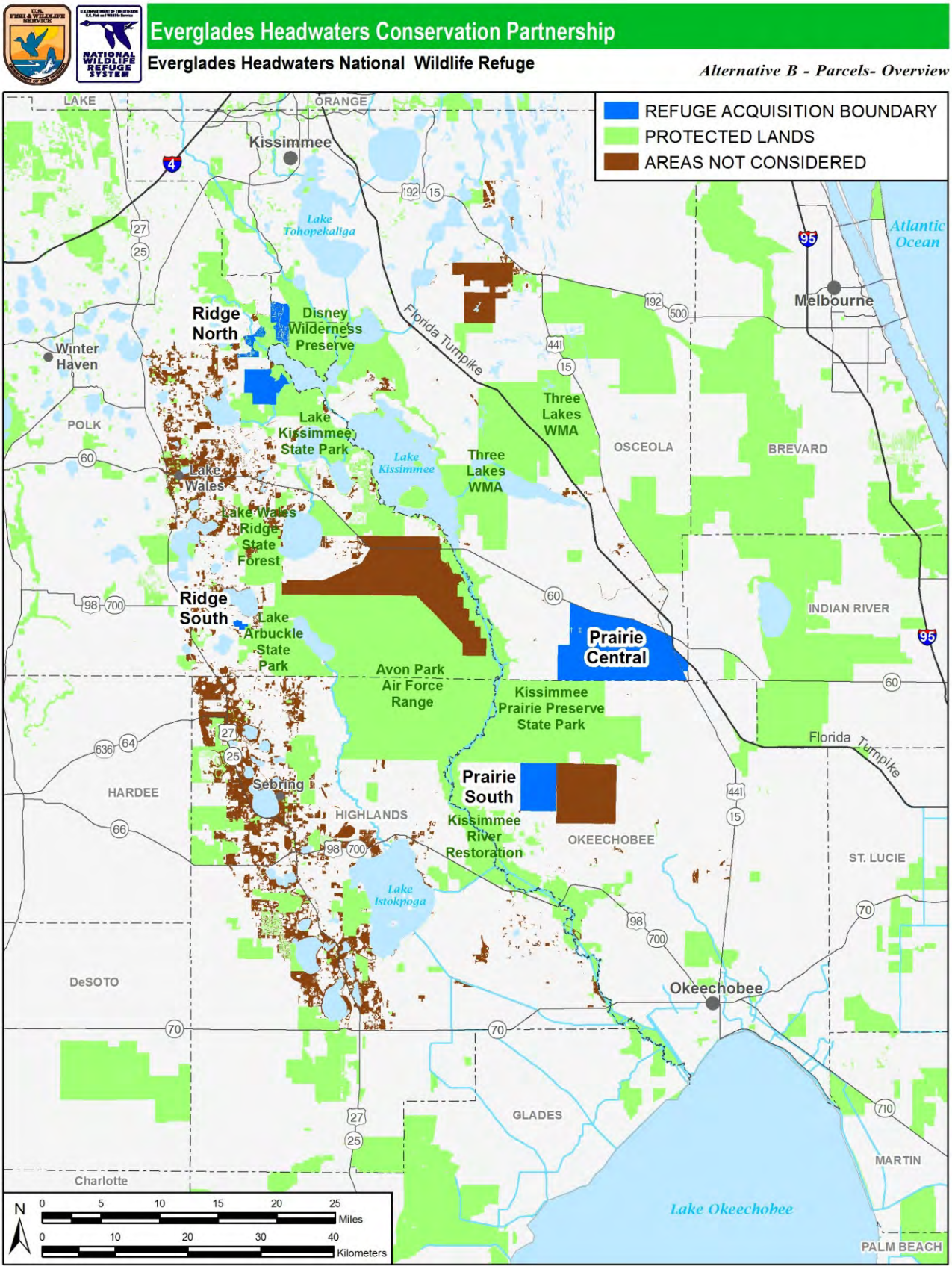
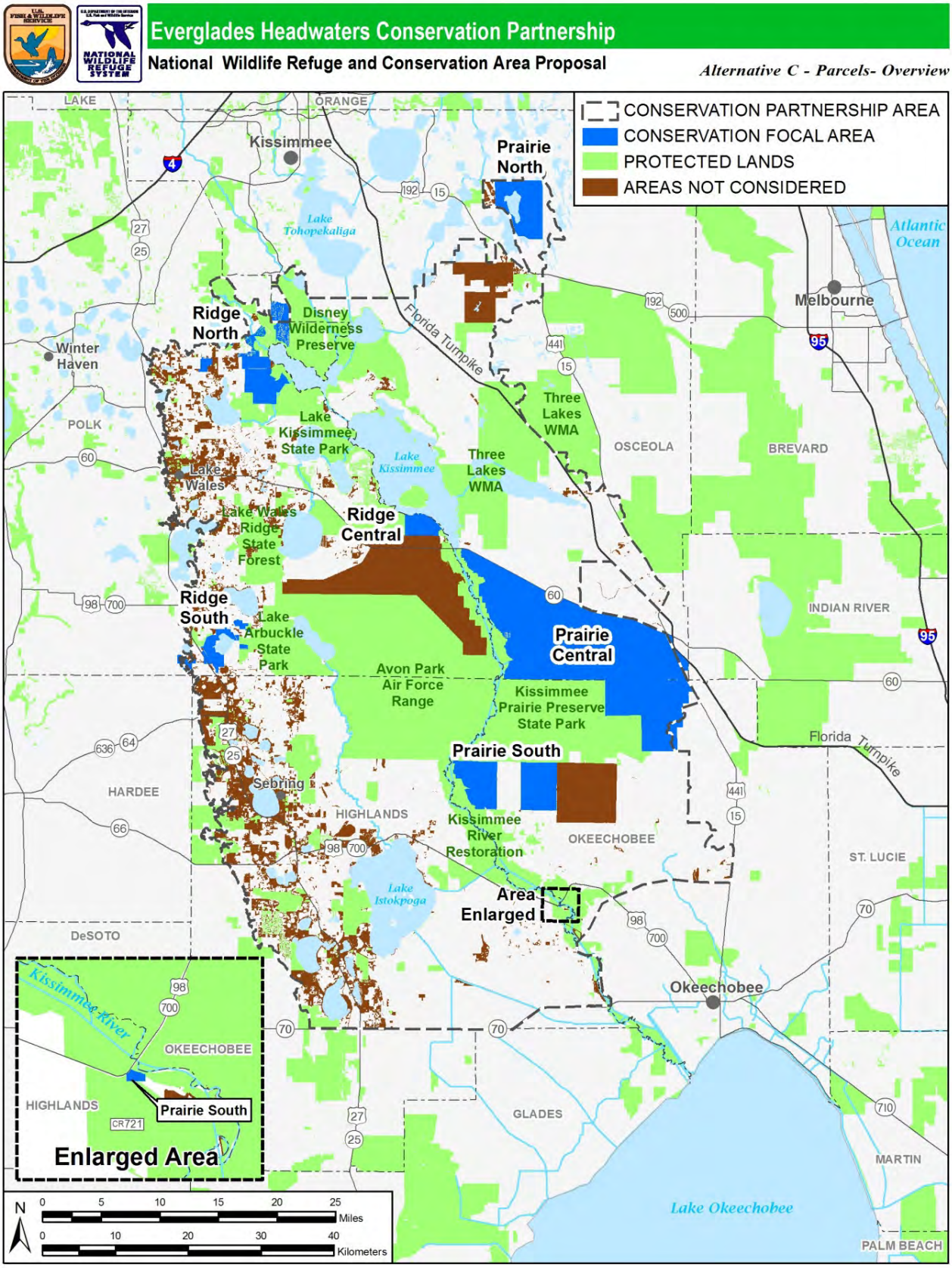


Figure 8. Alternative C - Conservation partnership approach (Preferred Alternative)



To help provide an overview of the acreage of habitats available for conservation under Alternatives B and C, please see Table 20. Please refer to Chapter II, Affected Environment, for detailed descriptions of the Study Area's resources.

Table 20. Acreage of major habitat types associated with Alternatives B and C

Land Cover	Alternative B		Alternative C	
	Acres	% of Alt. B	Acres	% of Alt. C
Dry Prairie	7199.8	14.29	13414.6	10.31
Freshwater Forested Wetlands	2849.5	5.65	9181.2	7.06
High Pine, Florida Scrub, Sandhill	900.7	1.79	2176.8	1.67
Improved and Unimproved Pasture	19811.2	39.31	63017.5	48.43
Intensive Agriculture	2065.2	4.10	3814.5	2.93
Mesic and Hydric Pine Flatwoods and Scrubby Flatwoods	5959.4	11.83	10123.4	7.78
Mesic Temperate Hammock	1075.8	2.13	1686.5	1.30
Open Water	65.0	0.13	169.6	0.13
Shrub and Brushland	12.6	0.03	662.9	0.51
Urban	81.2	0.16	627.5	0.48
Wet Prairie and Freshwater Marshes	10375.4	20.59	25233.4	19.39
Total	**50395.8**	**100%**	**130,107.9**	**100%**

Notes:

- *Alternatives B and C both propose to conserve up to approximately 50,000 acres in fee-title acquisition, although the Conservation Focal Area in Alternative C contains approximately 130,000 acres.*
- *Although cutthroat wetlands are recognized in this proposal as an important plant community, most spatial analysis incorporate them into other habitat types, thus they are not depicted here as a separate land cover type.*

ALTERNATIVE A. NO REFUGE AND NO CONSERVATION AREA (NO ACTION ALTERNATIVE)

This alternative represents the current state of land protection activity within the Everglades headwaters watershed without a refuge or conservation area designation by the Service, thereby offering an important baseline to which the action alternatives can be contrasted (Figure 1). The Service would take no action to establish the Everglades Headwaters NWR and Conservation Area within this alternative, but would continue activities it has pursued over the past several years, which are noted below. This alternative is referred to interchangeably as "Alternative A," "No Action Alternative," or the "No Refuge and No Conservation Area" alternative throughout this document.

Currently, the landscape of the upper Everglades watershed is dominated by a mix of active cattle ranches, scattered homesteads, citrus groves and farms, small communities, lakes, river corridors, isolated wetland basins, grassland savannahs, sandhills, and scrub habitat. A mix of conservation lands ranging from agricultural conservation easements to a military installation to private conservation lands to municipal, state, and federal ownerships is also present.

Approximately 23 percent of this landscape is currently protected and managed. Currently, there are approximately 421,000 acres of lands protected by conservation easements; private conservation; and municipal, state, and federal ownership within the Study Area. Of the lands currently protected, over 250,000 acres are priority habitats as defined in this project.

This alternative is described more fully through its ability to serve the outlined overarching goals.

Goal 1. Functional Conservation Landscape

The upper Everglades watershed will become a more connected and functional conservation landscape that will provide effective habitat connections between existing conservation areas and allow habitats and species to shift in response to urban development pressures and global climate change.

The existing conservation lands currently represent 23 percent of the overall land base within the Study Area. As Figure 1 illustrates, these lands are often times disparate and do not allow for the genetic interchange of isolated populations of species, such as the Florida grasshopper sparrow. Some species found within this landscape, such as Florida black bear, require vast areas to forage, find mates, breed, and raise young. Recently, one radio telemetry marked bear was captured near Sebring on Lake Wales Ridge NWR, after wandering north just west of Orlando, returning south through the Kissimmee River valley to the shores of Lake Okeechobee, and eventually ending up in the Fisheating Creek watershed west of the Lake Wales Ridge. It spent the majority of time on conservation lands, but crossed minor roads, while avoiding interstates and populated areas and occupied scrub and forested wetlands, staying close to river and wetland corridors (Archbold Biological Station, unpublished data). Under Alternative A, the fragmented landscape of this area currently limits habitat use, migration, and dispersal of a variety of species.

While debate continues regarding when the cumulative impacts of global climate change will alter human behavior and occupation of coastal environments, some effects are currently known. For instance, present day Florida has experienced 8 to 16 inches of sea level rise over the last 70 years (Wanless et al. 1994). Whether this rise is natural or human-induced is not relevant. What is relevant is that much of south Florida is at or very near sea level elevation. It is anticipated that the human environment and the natural environment will ultimately be impacted by sea level rise and a forced inland and upslope retreat will be forthcoming. The fact that Florida's shoreline has receded historically is not without precedent, since the system of central Florida sand ridges represents the historic shoreline that has pulsed across the peninsula several times during the past 2.5 million years (U.S. Fish and Wildlife Service 2010). Under Alternative A, the fragmentation of this landscape and the anticipated human development patterns would continue to limit the ability of wildlife species and plant communities to respond to the impacts associated with global climate and human demographic changes.

Conservation lands in this landscape would continue to be managed by their respective agencies and organizations under the No Action Alternative, but no further Service efforts to connect them would likely be forthcoming. Additional conservation lands managed by other agencies may be added to the conservation landscape through programs such as Florida Forever. However, current economic conditions have precluded any funding for this state's land acquisition program, and other conservation organizations are attempting to divest some of their current landholdings. Taken together, the respective missions of the preceding groups provide an ability to assist in the protection of habitats of the area, but do not provide increased long-term protection from the anticipated effects of climate change and the changes anticipated in the distribution of the human population in this environment. Based on this collective effort, protection of about 421,232 acres of habitats currently protected by agricultural easements, private conservation, municipal, state, and federal ownerships would continue.

Cattle ranches, citrus groves, and row crop agricultural operations dominate the landscape outside of the currently conserved lands. Within the Study Area, agricultural lands occupy approximately 786,686 acres or 43 percent of the area. Cattle ranches provide considerable amounts of wildlife habitat in this area. Improved pasture, riparian corridors, and wetland basins provide habitat for species such as Audubon's crested caracara, southeastern kestrel, and wood stork. Threats to this agricultural community abound. Planned urban growth immediately removes both wildlife habitat and agricultural production from the landscape. Infrastructure required to accommodate this growth follows with the development and associated increases in roadways and utilities. Changing demographics of the ranch community also impact the ability of the ranching traditions to exist. Tax structure and financial opportunities, such as investments in biofuels, also threaten the existing agricultural landscape. Additionally, even conservation measures, such as deep water storage, could threaten habitat values, depending upon their placement in the landscape.

Under the No Action Alternative, 786,686 acres of agricultural lands would remain in place on the landscape for some amount of time, but these lands would continue to face the threat of development.

Goal 2. Habitat for Fish and Wildlife

The Everglades Headwaters NWR and Conservation Area will provide a wide range of quality Kissimmee River Basin habitats to support migratory birds, federal and state listed species, state designated species of conservation concern, and native wildlife diversity.

Habitats found within the Study Area include scrub, sandhill, cutthroat seepage wetlands, pine flatwoods, wet and dry prairie, and multiple wetland types. Also found within this landscape are large tracts of improved pastures (areas of pine flatwoods, wet and dry prairie, and wetlands that have been cleared and drained for the planting of tame, horticultural varieties of grasses as improved grass forage). Under the No Action Alternative, protection and management of these habitats would be limited to existing conservation lands and programs, leaving remaining habitats vulnerable to a variety of threats, including development patterns and pressures. Development pressure would continue to threaten this landscape. Developments of Regional Impact (e.g., planned residential and light commercial development), alternative fuels (e.g., biofuel agricultural and processing plants), and expanded urban growth (e.g., housing, roadways, and mass transit) all threaten to reduce the amount of natural habitats found in this landscape.

Conservation lands in this landscape are not directly threatened by this development pressure, but may be affected by adjacent development pressures, decreases in the amount of habitat available, and increased demand for the use of the area by residents and visitors. Current conservation efforts in this landscape include state parks, state wildlife management areas, military reservations, Native American tribal lands, and Lake Wales Ridge NWR. Taken together, the respective missions of the preceding groups provide an ability to assist in the protection of habitats of the area. This collective ability, however, falls short of meeting the needs of wildlife as evidenced by the numbers of state and federal listed species and state designated species of conservation concern found in this landscape. Based on this collective effort, Alternative A would maintain protection of 421,232 acres of habitats currently protected by agricultural easements, private conservation, municipal, state, and federal ownerships.

Goal 3. Enhanced Water Quality, Quantity, and Storage

Focusing on restoring or mimicking natural hydrologic processes, the Everglades Headwaters NWR and Conservation Area will contribute to water quality, water quantity, and water storage capacity of the upper Everglades watershed to support Everglades restoration goals and objectives and water quality and supply for central and south Florida.

The landscape surrounding the headwaters of the Everglades includes the large urban populations of the Tampa/St. Petersburg area and the metropolitan Orlando area. Further south, this watershed provides recreational, agricultural, and drinking water for all of the urban and suburban populations from the Palm Beaches and Ft. Lauderdale area south to the greater Miami area and the Florida Keys, including the seasonal increases of vacationers to the area. Overall, this area boasts approximately 13 million residents.

The agricultural and rural lands in this landscape are ecologically healthy, but are impacted by wetland drainage to accommodate agricultural uses. There are approximately 324,000 acres of drained wetlands within the Study Area. Much of this drainage has been accomplished by shallow surface ditches and the channelization of streams large and small. This drainage has led to unnatural increased water flows to the main Kissimmee River corridor during periods of heavy rainfall, and decreased flows during periods of drought. These pulses affect downstream management of the watershed. Additionally, the quick release of water from the landscape allows for excess nutrients to enter directly into the water flows, instead of slowly remaining in the wetland basins and allowing the natural uptake of nitrogen and phosphorous to occur.

The major water quality problems within the Study Area are elevated nutrients and low dissolved oxygen (DO), with several water bodies being classified as impaired or not meeting water quality standards (FDEP 2008). Much of the elevated nutrients, metal, and pesticide concentrations can be attributed to urban and/or agricultural land uses. Mercury contamination is thought to result from atmospheric deposition and mediated by human-caused sulfate conditions (which result from fertilizer use). Groundwater contamination of the Lake Wales Ridge area is well known and coincides with intensive agricultural practices. Nitrates and several pesticides are noted. Copper contamination associated with the citrus industry is also a concern for species such as the Everglade snail kite, which forages on snails that are known to uptake copper (Winger et al. 1984).

Additional development pressure also threatens this landscape. Developments of Regional Impact (e.g., planned residential and light commercial development), alternative fuels (e.g., biofuel agricultural and processing plants), and expanded urban growth (e.g., housing, roadways, and mass transit) all threaten to reduce the amount of wetlands in this landscape, whether they occur today as intact or drained wetlands.

Conservation lands in this landscape are not directly threatened by development pressure, but may be indirectly affected by adjacent development pressures, increasing stormwater flows and nutrient loads. Current efforts in this landscape to increase the water storage capacity through wetland restoration activities include NRCS wetland reserve program, Florida Ranchlands and Environmental Services Program (FRESP), and state and federal assistance programs on private lands. These programs, however, are limited in scope and funding, providing limited opportunities for willing landowners to restore degraded wetlands. Additional reductions to the capacity of the landscape to absorb rainfall will only add to the current flow pulses and nutrient loads.

Taken together, the respective missions of the preceding groups provide an ability to assist in the protection of the wetland resources of the area. This collective ability, however, has proven to be too limited to meet the needs of the Everglades ecosystem and the human population that depends on clean and consistent water supplies. Based on this collective effort, Alternative A would neither hurt nor promote the continued protection of approximately 176,859 acres of wetlands currently protected by agricultural easements, private conservation, municipal, state, and federal ownerships.

Goal 4. Wildlife-dependent Recreation and Education

Refuge visitors of all abilities will enjoy opportunities for hunting, fishing, wildlife observation, wildlife photography, and environmental education and interpretation, while increasing knowledge of and support for conservation of the important grassland and savanna landscape of the headwaters of the Everglades.

The Service seeks opportunities to promote appropriate and compatible wildlife-dependent recreation on national wildlife refuges. There would be no refuge-based recreational opportunities under the No Action alternative. A number of wildlife-dependent recreational activities exists within the landscape and would continue. Hunting and fishing occur under regulations administered by the FWC. Much hunting occurs on private lands. Public hunting occurs on approximately 227,862 acres of public lands within the Study Area.

Fishing is recreationally and economically important to the local population. Central Florida, specifically the Kissimmee River and Kissimmee Chain of Lakes area, is world renowned as a fishing destination for many types of freshwater fish. These areas, as well as other water bodies found throughout the Study Area, would continue to provide recreational fishing opportunities.

Other outdoor wildlife-dependent recreation and educational opportunities abound. FWC and SFWMD provide hiking and equestrian trails. Kayaking, canoeing, and boating occur on the water resources found in the area. The FWC sponsors fishing events, “Becoming an Outdoors Woman” workshops, youth camps, and other outdoor wildlife-dependent programs and activities. These wildlife-dependent activities would continue under the No Action Alternative.

ALTERNATIVE B. REFUGE ONLY APPROACH

The Refuge Only Approach alternative is a more traditional Service approach to conservation and would create an acquisition boundary of up to 50,000 acres containing portions of the priority habitats; would focus the bulk of the refuge within a limited number of contiguous areas; and would complement existing municipal, state, and federal conservation within this landscape (Figure 7). The Service would use a suite of conservation tools to protect land, including fee-title acquisitions and conservation easements. This alternative would protect important wildlife habitat within the landscape, serving both common and rare wildlife species. It would offer opportunities for wildlife management, compatible wildlife-dependent public uses, and new refuge-based partnerships. Public use opportunities under this alternative would include hunting and fishing, as well as wildlife observation, photography, and environmental education and interpretation.

Alternative B outlines four proposed areas for fee-title acquisition representing six management tracts of land: Ridge North (Figure 9a), Ridge South (Figure 9b), Prairie Central (Figure 9c), and Prairie South (Figure 9d). The four Ridge North tracts were identified and selected based on the prioritization protocol described in Chapter III.B; a land transfer from the Bureau of Land Management; and best professional judgment, specifically noting the ability of these tracts to mostly complete the conservation landscape in the northwest portion of the Study Area surrounding Hatchineha Lake. Ridge south is represented by one tract that abuts existing conservation lands and is in close proximity to existing units of the Lake Wales Ridge NWR, This tract is being offered to the Service as a donation and contains restored high-quality scrub and wetlands. Prairie Central represents one management tract of land and has been identified by the prioritization protocol as some of the highest quality habitat. Prairie Central represents the upper watershed of the water supply for Kissimmee Prairie Preserve State Park and would ensure that this watershed would remain intact. Prairie South also contains identified high-quality

Figure 9a. Alternative B - Ridge North Planning Unit

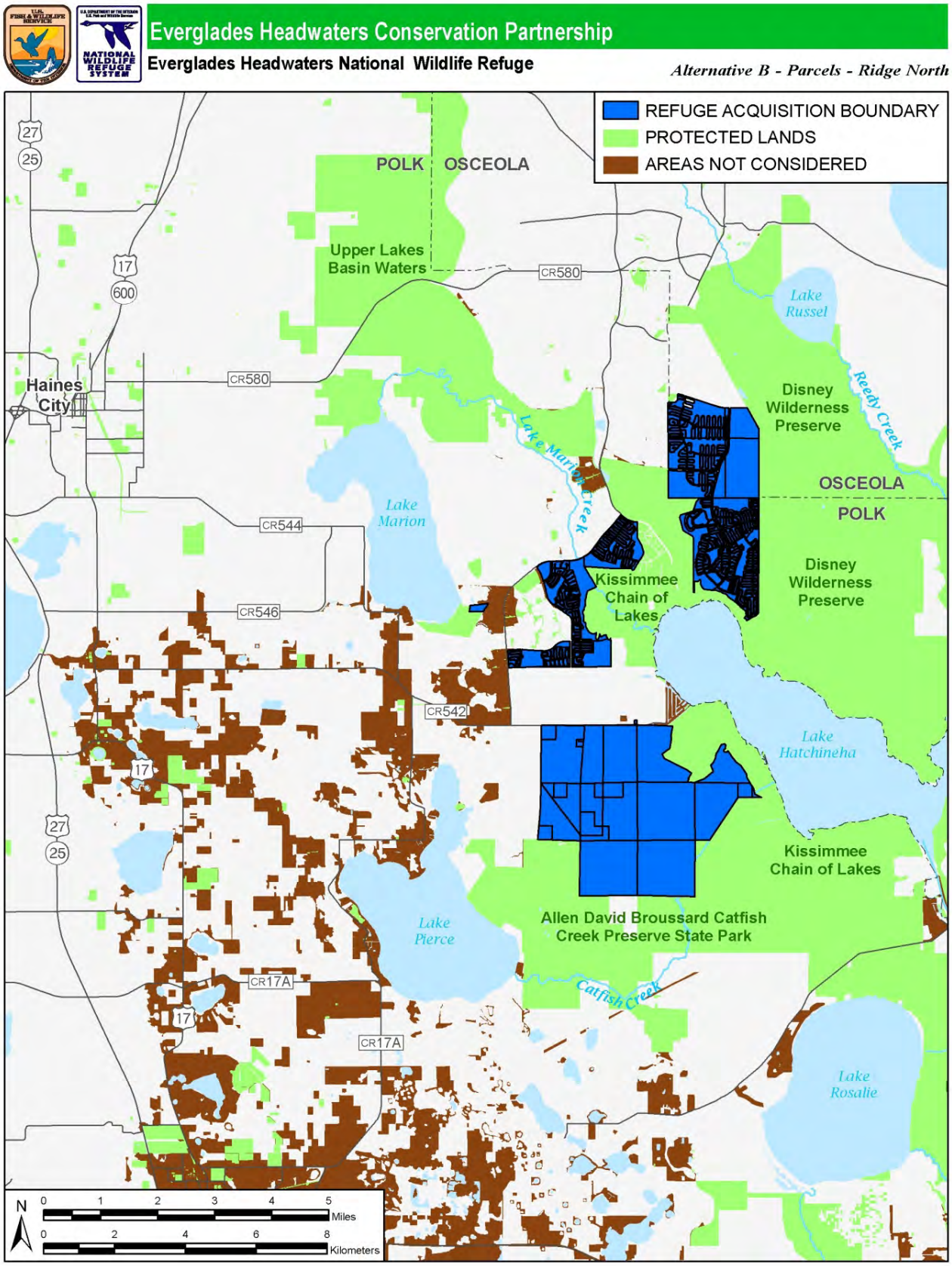


Figure 9b. Alternative B - Ridge South Planning Unit

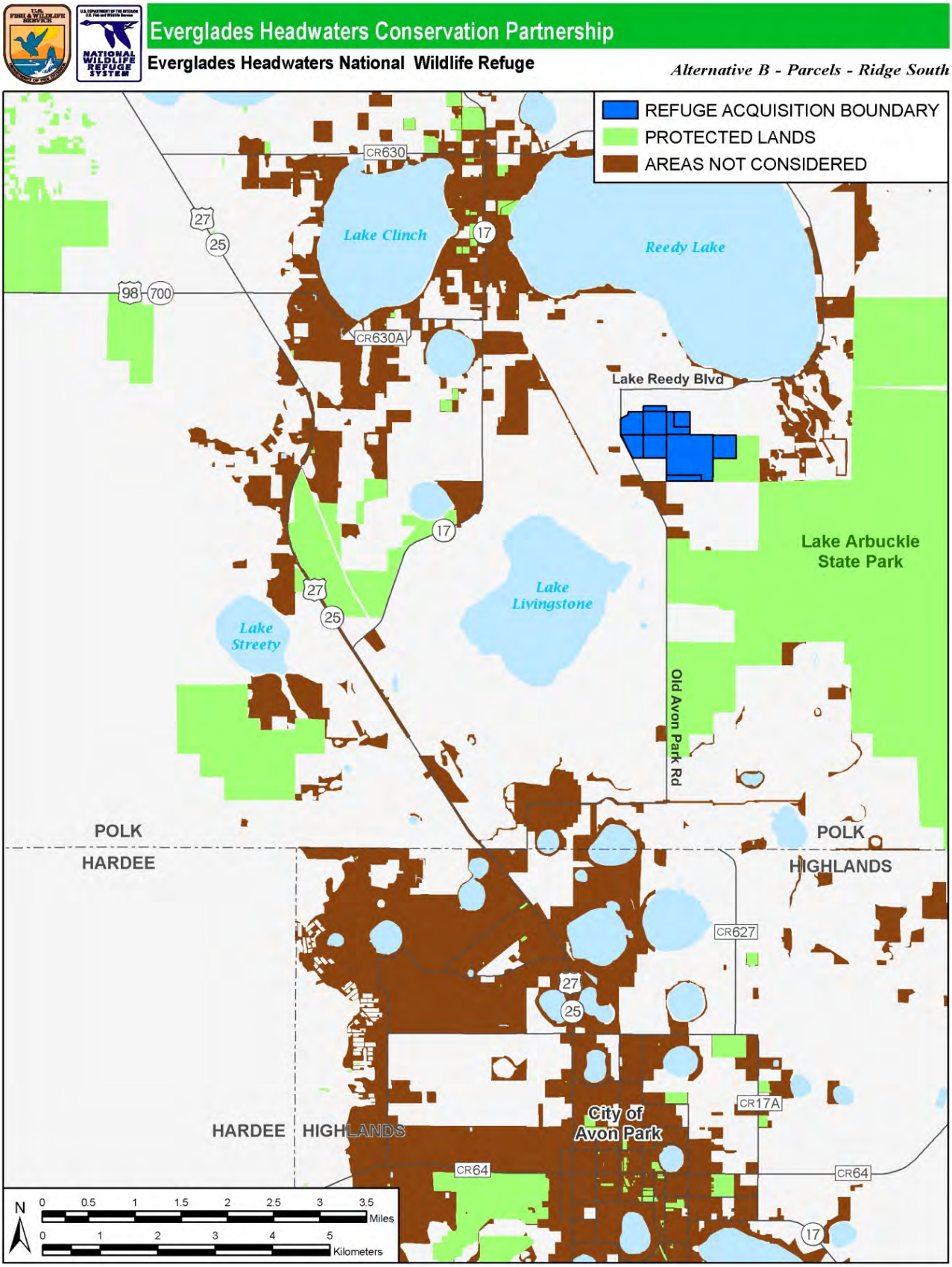


Figure 9c. Alternative B - Prairie Central Planning Unit

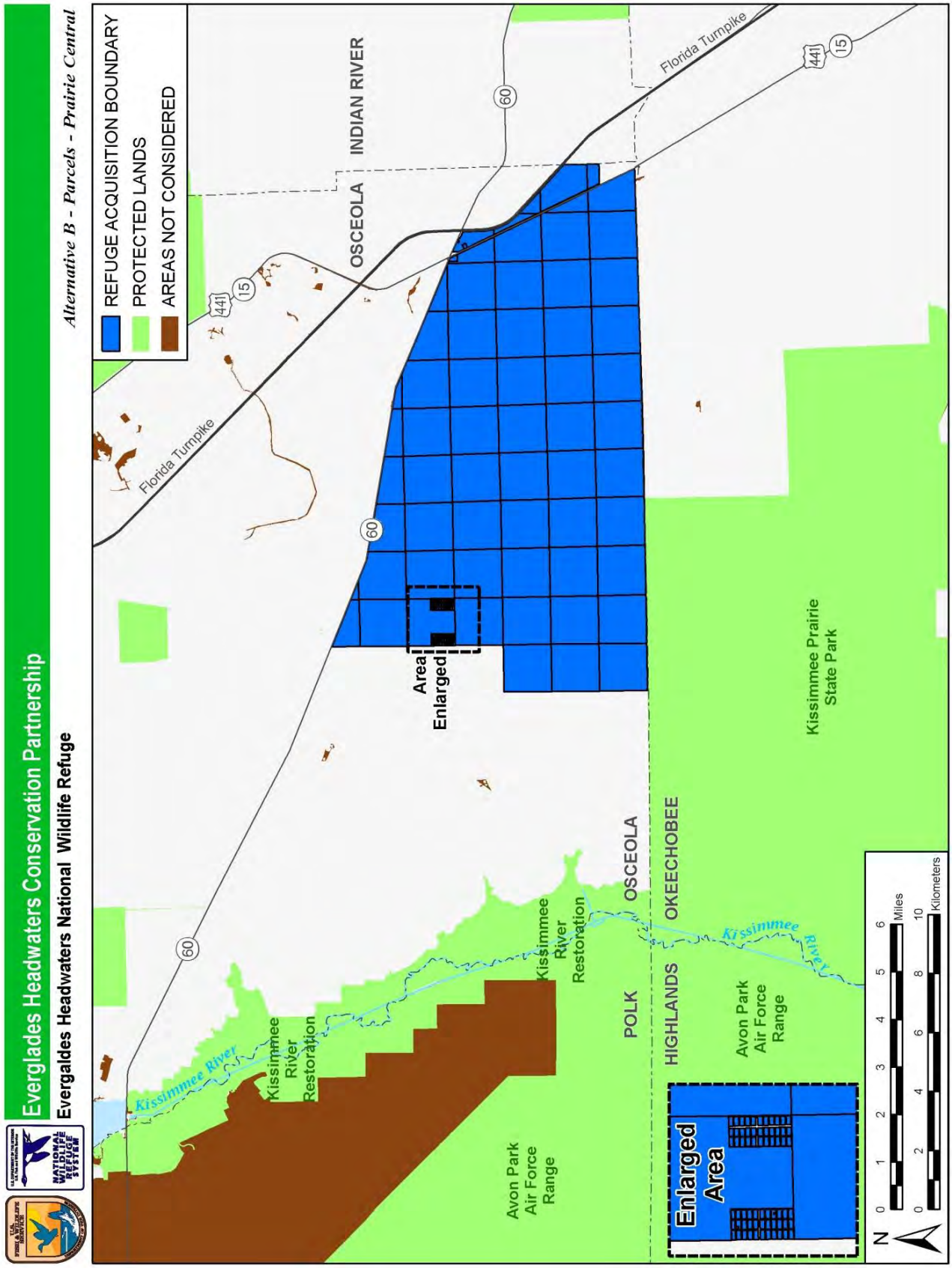
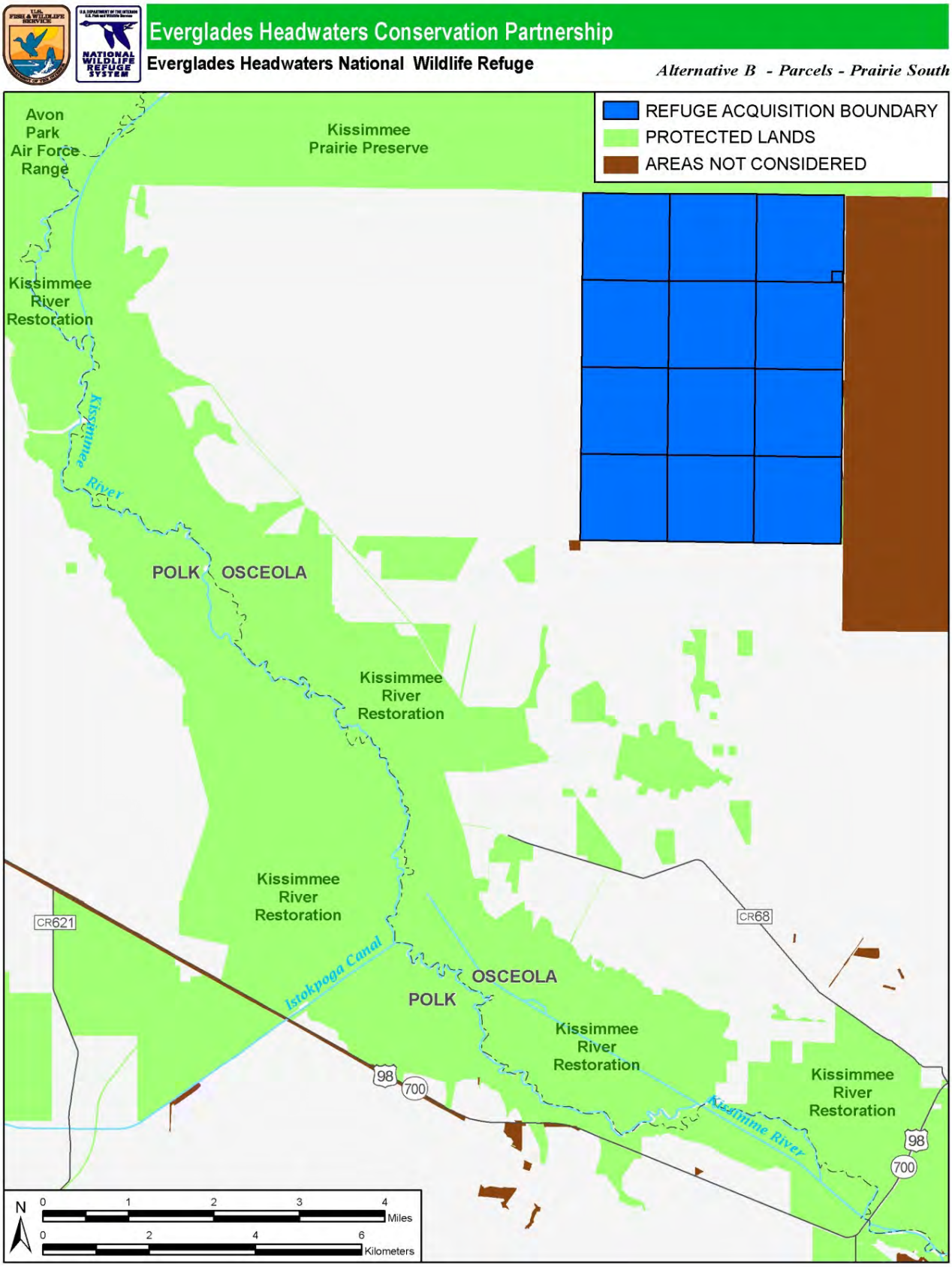


Figure 9d. Alternative B - Prairie South Planning Unit



habitat and represents a key component of the watershed surrounding Kissimmee Prairie Preserve State Park. The approach to protect lands within four geographic areas instead of one large tract was derived at to protect representative high-quality habitats from throughout the landscape, and also to complete critical linkages to the conservation landscape which were geographically separated.

This alternative is described more fully through its ability to serve the outlined overarching goals.

Goal 1. Functional Conservation Landscape

The upper Everglades watershed will become a more connected and functional conservation landscape that will provide effective habitat connections between existing conservation areas and allow habitats and species to shift in response to urban development pressures and global climate change.

The Refuge Only approach would add 50,000 acres of conserved lands and waters to this conservation landscape, while protecting some of the most important linkages, it would only provide limited overall opportunity to link existing conservation lands within the landscape. Under Alternative B, there would be a modest addition to the conservation landscape, thus building limited linkages to the fragmented landscape of this area, which currently limits habitat use, migration, and dispersal of a variety of species. This alternative would increase the conserved landscape from 23 to 25 percent. Although the Service would continue to provide technical assistance within this landscape, refuge management and expertise would be focused on the lands and waters of the refuge. Landscape-scale considerations would be left to existing programs.

The impacts of global climate and human demographic changes would be similar to those described for Alternative A. Under Alternative B, the fragmentation of this landscape and the anticipated human development patterns would continue to limit the ability of wildlife species and plant communities to respond to the impacts associated with global climate and human demographic change. However, the lands identified as part of Alternative B would provide a moderate increase in the opportunity of species to persist on the landscape. Further, Alternative B may lessen impacts to local and regional climate.

Conservation lands in this landscape would continue to be managed by their respective agencies and organizations under Alternative B, with limited efforts to connect them. Taken together, the respective missions of the preceding groups and the Service provide an ability to assist in the protection of habitats of the area, but do not provide long-term protection from the anticipated effects of climate change and the changes anticipated in the distribution of the human population in this environment. Based on this collective effort, Alternative B would increase protection of approximately 50,000 acres of habitats (e.g., through the acquisition of fee-title and conservation easement rights of ownership).

Cattle ranches, citrus groves, and row crop agricultural operations dominate the landscape outside of the currently conserved lands, and would continue to do so under Alternative B. Within the Study Area, agricultural lands occupy approximately 786,686 acres or 43 percent of the area. Cattle ranches provide considerable amounts of wildlife habitat in this area. Improved pasture, riparian corridors, and wetland basins provide habitat for species such as Audubon's crested caracara, southeastern kestrel, and wood stork. Threats to this agricultural community abound. Planned urban growth immediately removes both wildlife habitat and agricultural production from the landscape. Infrastructure required to accommodate this growth follows with the development and associated increases in roadways and utilities. Changing demographics of the ranch community also impact the ability of the ranching traditions to exist. Tax structure and financial opportunities, such as investments in biofuels, also threaten the existing agricultural uses. Additionally, even conservation measures, such as deep water storage, could threaten habitat values, depending upon their

placement in the landscape. The addition of approximately 50,000 acres of lands identified within Alternative B would conserve a relatively few number of sites.

This alternative would provide limited opportunity to work with the local ranching community. Grazing, as a management tool, is used on refuges nationwide and would be available here on a limited basis as well. However, the application of grazing would only be used through a lease agreement with local ranchers and would provide the opportunity to work with the local ranching community only when there was a specific habitat management need on Service-owned and Service-managed lands.

Although this alternative would add approximately 50,000 acres to the conservation landscape, it would provide limited actions to address the overall picture of habitat connectivity and enhanced conservation throughout the landscape. It does address the threats of urban development, altered ecological processes, and the impacts of global climate change, but confines actions to the approximately 50,000 acres.

Under Alternative B, 786,686 acres of agricultural lands would remain in place on the landscape for some amount of time, but these lands would continue to face the threat of development.

Goal 2. Habitat for Fish and Wildlife

The Everglades Headwaters NWR and Conservation Area will provide a wide range of quality Kissimmee River Basin habitats to support migratory birds, federal and state listed species, state designated species of conservation concern, and native wildlife diversity.

Alternative B would add approximately 50,000 acres of wildlife habitat to this landscape to support protection and management for migratory birds, federal and state listed species, state designated Species of Special Concern, and native wildlife diversity. Compared to the No Action Alternative, restoration, protection, and management of habitats would increase within the landscape with refuge management on Service-owned and Service-managed lands. These habitats would be limited geographically to the lands and waters identified in Figure 7 and would not assist, to any great degree, with the restoration, protection, and management of adjacent, privately owned properties. The majority of restoration, protection, and management of habitats, other than wetlands, would occur on Service-owned lands and is estimated to total approximately 37,171 acres.

Habitats

Diverse habitats and their respective ecological systems for trust species and species of conservation concern would be protected through this alternative. Of the approximately 50,000 acres to be protected by this alternative, the estimated acreage of key habitats to be protected would be as follows: 7,200 acres of dry prairie; 10,375 acres of wet prairie and freshwater marshes; 5,959 acres of pine flatwoods; 901 acres of sandhill and scrub habitats; and 2,850 acres of freshwater forested wetlands (Table 20). The remainder of the lands identified within this landscape represents opportunities for restoring a variety of habitats. Protecting and restoring these habitats would contribute to the conservation of wetland birds; waterfowl; shorebirds; grassland birds; neotropical migratory birds; native bird species, such as turkey and bobwhite; white-tailed deer; Florida black bear; and the occasional Florida panther. Some of the most important habitat types are discussed below.

Sandhill and Scrub

Approximately 901 acres of sandhill and scrub habitat would be included under Alternative B. Sandhill habitats and scrub occur on well-drained, nutrient-poor sandy soils. Grasses and scrubby oaks dominate this fire-dependent landscape. The sandy soils typical of these habitats allow for rainfall to enter the groundwater system. Discharge from these habitats gives rise to cutthroat seepage wetlands. Several of the species found on these habitats are endemic to central peninsular Florida and many are federally listed species, such as Florida scrub-jay, sand skink, Florida ziziphus, and Garrett's mint.

Pine Flatwoods

Approximately 5,959 acres of pine flatwoods habitat would be included under Alternative B. Pine flatwoods are characterized by level topography and poorly drained soils. These pine forests vary greatly depending on hydrology and can have a dominant understory of wiregrass, saw palmetto, or other low shrubs. The overstory of pine flatwoods can be of longleaf, slash, or pond pine and cabbage palm. They are important for a variety of invertebrates and vertebrates such as neotropical migratory birds, red-cockaded woodpecker, Florida black bear, Florida panther, fox squirrel, and white-tailed deer.

Dry Prairie

Approximately 7,200 acres of dry prairie habitat would be included under Alternative B. Dry prairie is endemic to central peninsular Florida, occurring on poorly drained soils. It is fire-dependent and typically treeless with a low ground cover of wiregrass, stunted saw palmetto, and low-growing runner oak. It harbors numerous endemic vertebrates. The Florida grasshopper sparrow is the flagship species of this habitat.

Wet Prairie and Freshwater Marsh

Approximately 10,375 acres of wet prairie and freshwater marsh habitats would be included under Alternative B. Freshwater marshes and wet prairie are both seasonal wetlands that differ by the duration of inundation and fire regime. Sawgrass, sedges, rushes, and dwarf cypress dominate wet prairie, whereas cattail, sawgrass, pondweeds, water lilies, and numerous sedges and rushes dominate freshwater marshes. The Everglade snail kite, wood stork, whooping crane, and Audubon's crested caracara are noted residents of these habitats.

Forested Wetlands

Approximately 2,850 acres of forested wetland habitat would be included under Alternative B. Forested wetlands range from isolated depression swamps and shoreline to flowing water swamps. Bald cypress, red maple, and bay trees may dominate the overstory, while a mix of shrub species forms the understory. Many smaller isolated swamps have been converted to agricultural uses, and many of the remaining swamps are degraded by drainage and nutrient runoff. The wood stork, eastern indigo snake, and Florida panther can be found in these habitats.

Threatened, Endangered, and Species of Conservation Concern

The Study Area includes 38 federal and 143 state listed species (Endangered and Threatened), 3 Candidate species for federal listing, 75 federal Species of Concern, and 23 state Species of Special Concern (Appendix E). A total of 289 species are listed by the Federal Government and/or State of Florida or designated by the state as a species of conservation concern. Their habitat needs vary

greatly across the landscape, some being exclusively dependent on the habitats that are endemic to central Florida, such as dry prairie and scrub. The Study Area lies within the Atlantic Flyway for migratory birds, with the proposed refuge being located within NABCI's Bird Conservation Region 31(BCR), the Atlantic Coast Joint Venture, and the operational area for the Peninsular Florida Landscape Conservation Cooperative. The following is a brief description of some of the focal species expected to benefit from the proposed refuge.

Audubon's Crested Caracara

The federally threatened Audubon's crested caracara occurs within the wet and dry prairie habitat of central peninsular Florida, but is also found in pastures with scattered cabbage palms. It often feeds on wetland species, but is also noted to feed on road-killed animals as well. Audubon's crested caracara would be expected to use the refuge under Alternative B.

Everglade Snail Kite

The federally endangered Everglade snail kite forages exclusively on apple snails. Apple snails can be found in a variety of wetlands, ranging from permanent wetlands and lakes to seasonal wetlands and ditches. While several larger wetlands throughout the Study Area provide nesting habitat, restoration and management of wetlands in this proposal are focused on providing improved foraging opportunities. The Everglade snail kite would be expected to use the refuge under Alternative B.

Florida Grasshopper Sparrow

The federally endangered Florida grasshopper sparrow historically occurred throughout the prairie region of peninsular Florida. They are closely associated with the fire-dependent dry prairie habitat and today are now found on only a few parcels of public land and nearby ranches. The Florida grasshopper sparrow would be expected to use the refuge under Alternative B.

Wood Stork

The federally endangered wood stork forages and breeds within the marshes and cypress swamps of southern Florida. It shares these habitats with other more common wading birds, such as the great egret and white ibis. Only two active nest colonies exist within the Study Area, but five abandoned colony locations can be found in the area. Wood storks would be expected to use the refuge under Alternative B.

Florida Black Bear

Listed by the state as a threatened species, the Florida black bear once ranged throughout Florida and the southeast states, but now occupies only 18 percent of its historic range. Using a wide variety of habitats, the Florida black bear is known to wander widely in search of food, cover, mates, and other resources. The Florida black bear would be expected to use the refuge under Alternative B.

Other Migratory Birds

Two subspecies of sandhill crane, a state listed threatened species, can be found within the Study Area. The Florida sandhill crane is a non-migratory, year-round breeding resident, while the greater sandhill crane is migratory and only winters in Florida. Both subspecies use a wide variety of wetlands and pastures throughout the Study Area and would be expected to use the refuge under Alternative B.

Blue-winged teal and mottled duck are the two most commonly observed waterfowl species, with many other species of waterfowl noted throughout the winter period. They would also be expected to use the refuge under Alternative B.

Resident Wildlife

A wide variety of resident wildlife species can be found throughout the Study Area. Northern bobwhite, wild turkey, white-tailed deer, grey squirrel, and rabbit occur in abundance, providing ample hunting and wildlife observation opportunities. The wild hog, although a nonnative and nuisance species, is also considered a game species and can be found in abundance in many areas throughout Florida. All of these species would be expected to use the refuge under Alternative B.

Listed Plant Species

There are approximately 23 federally listed plant species found throughout the landscape with most occurring in scrub habitat. Nearly all species are fire-dependent and their populations have been impacted by fire suppression, which has allowed brush and overstory species to become established. Some of the federally listed species found within the Study Area include beautiful pawpaw, scrub lupine, Florida ziziphus, and Garrett's mint. Due to the wide distribution and site-specific nature of their occurrences, only a few of these important plant species would be expected to occur on the refuge under Alternative B.

Goal 3. Enhanced Water Quality, Quantity, and Storage

Focusing on restoring or mimicking natural hydrologic processes, the Everglades Headwaters NWR and Conservation Area will contribute to water quality, water quantity, and water storage capacity of the upper Everglades watershed to support Everglades restoration goals and objectives and water quality and supply for central and south Florida.

By adding approximately 50,000 acres of conservation lands to this landscape, the Service would support the enhancement of water quality, quantity, and storage. Compared to the No Action Alternative, Alternative B would provide increased opportunities to restore wetlands within the upper Everglades watershed. Increased storage capacity, groundwater recharge, and water quality benefits would be localized within certain sub-watersheds where the fee-title lands would be located. It is estimated that approximately 12,922 acres of wetlands could be restored.

The human dimensions of and impacts to the landscape surrounding the headwaters of the Everglades include the large urban populations of the Tampa/St. Petersburg area and the metropolitan Orlando area and would not change from that described in Alternative A. The agricultural and rural lands in this landscape are ecologically healthy, but are impacted by wetland drainage to accommodate agricultural uses. The major water quality problems within the Study Area are elevated nutrients, low dissolved oxygen, and mercury in fish (FDEP 2006b) and would remain constant under this alternative. With approximately 324,000 acres of drained wetlands within the Study Area and only 12,922 acres contained within Alternative B, opportunity to improve the water quality and quantity would be limited. Some shallow surface ditches and channelized streams located on the lands identified in Alternative B would be restored, leading to improved water quality, including drinking water, and storage capacity. Increased water flows to the main Kissimmee River corridor during periods of heavy rainfall and decreased flows during periods of drought would be moderated under this alternative. Additionally, excess nutrients would have greater opportunity to be

absorbed within the refuge by wetland vegetation, reducing the nitrogen and phosphorus loading of the watershed. The reduction and change of the grazing regime and any conversion of improved pasture to native pasture would reduce or eliminate runoff of nutrients associated with cattle grazing.

Additional development pressure would continue to threaten this landscape. Developments of Regional Impact (e.g., planned residential and light commercial development), alternative fuels (e.g., biofuel agricultural and processing plants), and expanded urban growth (e.g., housing, roadways, and mass transit) all threaten to reduce the amount of wetlands in this landscape, whether they occur today as intact or drained wetlands.

Conservation lands in this landscape are not directly threatened by this development pressure, but may be affected by adjacent development pressures, increasing stormwater flows, and nutrient loads. Current efforts in this landscape to increase the water storage capacity through wetland restoration activities include NRCS's Wetland Reserve Program, FRESP, and state and federal assistance programs on private lands and would be joined by Service efforts on lands identified within this alternative. These programs, including those of the Service, are limited in scope and funding, which limits opportunities for willing landowners to restore degraded wetlands. Additional reductions to the capacity of the landscape to absorb rainfall would only add to the current flow pulses and nutrient loads.

Taken together, the respective missions of the preceding groups provide an ability to assist in the protection of the wetland resources of the area. This collective ability, however, has proven to be too limited to meet the needs of the Everglades ecosystem and the human population that depends on clean and consistent water supplies. Based on this collective effort, Alternative B would increase protection of 13,225 acres of wetlands.

Goal 4. Wildlife-dependent Recreation and Education

Refuge visitors of all abilities will enjoy opportunities for hunting, fishing, wildlife observation, wildlife photography, and environmental education and interpretation, while increasing knowledge of and support for conservation of the important grassland and savanna landscape of the headwaters of the Everglades.

With the addition of approximately 50,000 acres of Service managed lands to the conservation landscape, wildlife-dependent recreation and education opportunities would increase under Alternative B, compared to the No Action Alternative, and would approach the opportunities described in Alternative C. The Service would work cooperatively with FWC and other partners to provide public hunting and fishing opportunities on designated sites, and the Service would provide interpretive and educational programs. Because the Service would focus its land acquisition program in four primary locations, all wildlife-dependent recreation and education opportunities would be tied directly to these parcels. The Ridge North Unit parcel would be smaller and located nearby to urban centers. More controlled access would be envisioned, with the focus being primarily on wildlife-dependent interpretation, recreation, photography, and observation. Opportunities may exist for youth or mobility impaired hunting and fishing programs. The Ridge South Unit is located directly adjacent to existing conservation lands and could complement their existing recreational programs. The Prairie Center and South Units are larger, found in a rural setting, and lie directly adjacent to Kissimmee Prairie Preserve State Park. Access for all priority public uses would increase with the Prairie Units, with considerably more opportunities for hunting and fishing programs as compared to the Ridge Units. Refuge Units located in this area would increase hunting opportunities in the local area, since the Kissimmee Prairie Preserve State Park does not offer hunting opportunities.

The National Wildlife Refuge System Improvement Act of 1997 established six priority public uses on refuges. Those priority uses depend on the presence, or the expectation of the presence, of wildlife. These uses include hunting, fishing, wildlife observation, wildlife photography, and environmental education and interpretation. Although these priority uses must receive consideration in planning for public use, they also must be compatible with the purposes for which a refuge is established and the mission of the Refuge System. Compatibility determinations, which evaluate the effects of a particular use or activity in the context of species or habitats on a refuge, aid in making those decisions. As refuge lands are acquired within the Study Area, compatibility determinations would be used to decide which, where, and how public use opportunities would be permitted.

Public use opportunities contribute to the long-term protection of wildlife resources by promoting understanding, appreciation, and support for wildlife conservation. The six priority public uses would be accommodated to the maximum extent possible where they would not have significant negative effects on wildlife. All of the proposed public use activities are contingent upon availability of staff and funding to develop and implement these programs. The Service would promote opportunities for volunteers and develop community interpretive materials and programs to enhance awareness of and appreciation for the area's resources. Development of school and other group programs would be considered. An increase in public use would be expected due to the development of new facilities and programs, such as new hunting opportunities, new and expanded trails, new parking areas, new fishing access, new interpretive overlooks, and new observation platforms. The Service would allow public access for day use on many newly acquired lands, provided there are no expected negative effects on sensitive species (e.g., ESA-listed species) or habitats, and would consider overnight access as a component of other public use activities (e.g., hunting in remote locations).

Hunting and Fishing

The Service would open designated tracts of newly acquired lands for hunting and fishing in accord with the state's regulations after reviewing and evaluating the biological, ecological, and human safety impacts. Newly acquired lands that traditionally have been open for public hunting and fishing would remain open, at the same level of intensity, under Interim Compatibility Determinations until the Service completed the planning process to formally open the refuge to those activities. To this end, the Service would continue discussions with FWC regarding the co-management opportunities for hunting, fishing, and other recreational activities. Additionally, and if possible, the Service would provide American with Disabilities Act (ADA)-compliant hunts and youth hunt opportunities. Generally, the Service would allow hunting, based on state hunting seasons and consistent with the refuge's comprehensive conservation plan and hunt plan (once developed). The Service would continue discussions with FWC to manage hunting and fishing opportunities on acquired refuge lands as units of the state's Wildlife Management Area program. Youth fishing opportunities would be encouraged.

Wildlife Observation, Wildlife Photography, and Environmental Education and Interpretation

Beyond hunting and fishing, the refuge would also provide opportunities for wildlife observation, wildlife photography, and environmental education and interpretation. Working with state and local agencies, the Service would study the feasibility of connecting existing hiking, bicycling, and horseback riding trails through refuge lands. The refuge may also provide interpretive and environmental education programs and increase partnership opportunities to interpret the cultural and natural resources within the refuge and the watershed.

Environmental education, one of the six priority wildlife-dependent uses encouraged on refuge lands, incorporates onsite, offsite, and distance learning materials, activities, programs, and products that address the audience's course of study, the mission of the Refuge System, and the management

purposes of the refuge. The goal of environmental education is to promote an awareness and understanding of the basic ecological foundations of the interrelationship between human activities and natural systems. Through curriculum-based environmental education, on- and off-refuge, refuge staff, educators, and partners hope to motivate students and other persons interested in learning the role of management in the maintenance of healthy ecosystems, working landscapes, and conservation of our fish and wildlife resources.

On April 16, 2010, President Obama announced the America's Great Outdoors Initiative, calling for a grass roots effort to protect our Nation's lands and waters and to connect all Americans to their natural and cultural heritages (CEQ 2010). Our country has a legacy of conserving its natural resources for the benefit of its citizens. Recent generations find it difficult to connect and enjoy these outdoor resources. Through this initiative, all Americans would have the opportunity to enjoy and appreciate our central Florida outdoor resources.

For years, national wildlife refuges have been connecting children with the land and with the agency's conservation mission. It is now apparent that such connections are of immense importance. New information shows that most children spend their time indoors with televisions, video games, computers, and cell phones, rather than experiencing nature (Louv 2005).

As the Nation's primary conservation agency, the Service has a strong incentive to promote children's nature-based activities. We would work with school districts and teachers to develop environmental education curriculum featuring the areas' unique species and communities. The Service would work with the conservation and education partners to promote environmental education, thereby maximizing resources and time commitments for each partner organization. We would utilize the refuge for habitat restoration projects, docent-led trail walks, birding festivals, guest lectures, and youth hunting and fishing efforts.

ALTERNATIVE C. CONSERVATION PARTNERSHIP APPROACH (PREFERRED ALTERNATIVE)

The Conservation Partnership Approach outlined in Alternative C is the Service's Preferred Alternative. This alternative offers the most comprehensive and collaborative habitat and wildlife conservation effort. Alternative C will provide the opportunity to work cooperatively with the local ranching community on conservation measures of mutual benefit. Additionally, the Service will work cooperatively with private organizations, municipal, state, and other federal agencies to implement conservation practices across the landscape. The Service will conserve approximately 150,000 acres within the Kissimmee River Basin, containing portions of the priority habitats identified in Figure 8. Of these 150,000 acres, the Service will pursue acquisition from willing sellers of up to 50,000 acres in fee-title acquisition and up to 100,000 acres in less-than-fee-title acquisition. Less-than-fee-title acquisitions (e.g., conservation easements) will be acquired in perpetuity. For the refuge portion of Alternative C, the Service has identified approximately 130,000 acres as the Conservation Focal Area, within which the Service will be authorized to only acquire up to 50,000 acres.

Under Alternative C, the Service will have the opportunity to work cooperatively within the Kissimmee River Basin to pursue the acquisition of a 100,000-acre Conservation Area through less-than-fee-title methods, with a focus on the use of conservation easements. Wetland mitigation banks, conservation banks, and management agreements will also be considered. Acceptance of interest in conservation and mitigation banks or entering into management agreements typically involves the acceptance of less-than-fee-title interest.

The Conservation Focal Area of approximately 130,000 acres identifies the specific parcels of property from which the Service will target the purchase of up to 50,000 acres. Identifying an area larger than that sought for acquisition will provide the opportunity for the Service to adapt and respond to changes, over time, in landowner interest and availability of high-quality habitat. All lands within the Conservation Focal Area, after the acquisition of the 50,000 acres of fee-title lands, will still be available for less-than-fee-title acquisition (i.e., the other 80,000 acres).

This flexible yet focused land acquisition strategy for both fee-title and less-than-fee-title acquisition will allow the Service to respond to changing habitat conditions, acquisition opportunities, and changing landowner interests.

Planning Unit Description

In order to organize and describe this conservation partnership approach (Alternative C), it was necessary to develop a hierarchy of levels of conservation, ranging from the overall landscape perspective down to the individual landowner parcels. The following description summarizes how Alternative C is organized.

To best complement existing municipal, state, and federal conservation within this landscape, Alternative C, the Conservation Partnership Approach alternative contains two areas:

- an approximately 130,000-acre Conservation Focal Area where the Service will have opportunity and authority to acquire up to 50,000 acres with a fee-title focus and
- an approximately 745,000-acre Conservation Partnership Area with a less-than-fee-title acquisition focus where the Service will have the authority to acquire up to 100,000 acres with a conservation-easement focus.

The Conservation Area will provide the Service the opportunity to work together with landowners; private organizations; and municipal, state, and federal governments to conserve wetlands and improve the groundwater recharge, water storage capacity, and water quality of the upper Everglades watershed.

Six planning units have been identified for the Conservation Focal Area: Ridge North (Figure 10a), Ridge Central (Figure 10b), and Ridge South (Figure 10c), and Prairie North (Figure 10d), Prairie Central (Figure 10e), and Prairie South (Figure 10f) (see Appendix C for a detailed description of the methods used to identify and develop the priority areas). Fee-title acquisition will be limited to these six units. These six planning units are based upon two primary criteria: (1) The key habitats that support the focal species described in the Affected Environment section of this Final EA (see Chapter II), and (2) connectivity between existing areas of conservation.

This alternative will protect and meet the needs of both rare and common wildlife, provide wildlife corridors linking existing conservation lands, and restore additional wetlands and wetland function, as well as provide opportunities for wildlife-dependent public use activities and help maintain the cultural ranching heritage of the area. Public use opportunities under this preferred alternative will include hunting, fishing, wildlife observation, wildlife photography, and environmental education and interpretation. This alternative is described more fully through its ability to serve the outlined overarching goals.

Figure 10a. Alternative C - Ridge North Planning Unit

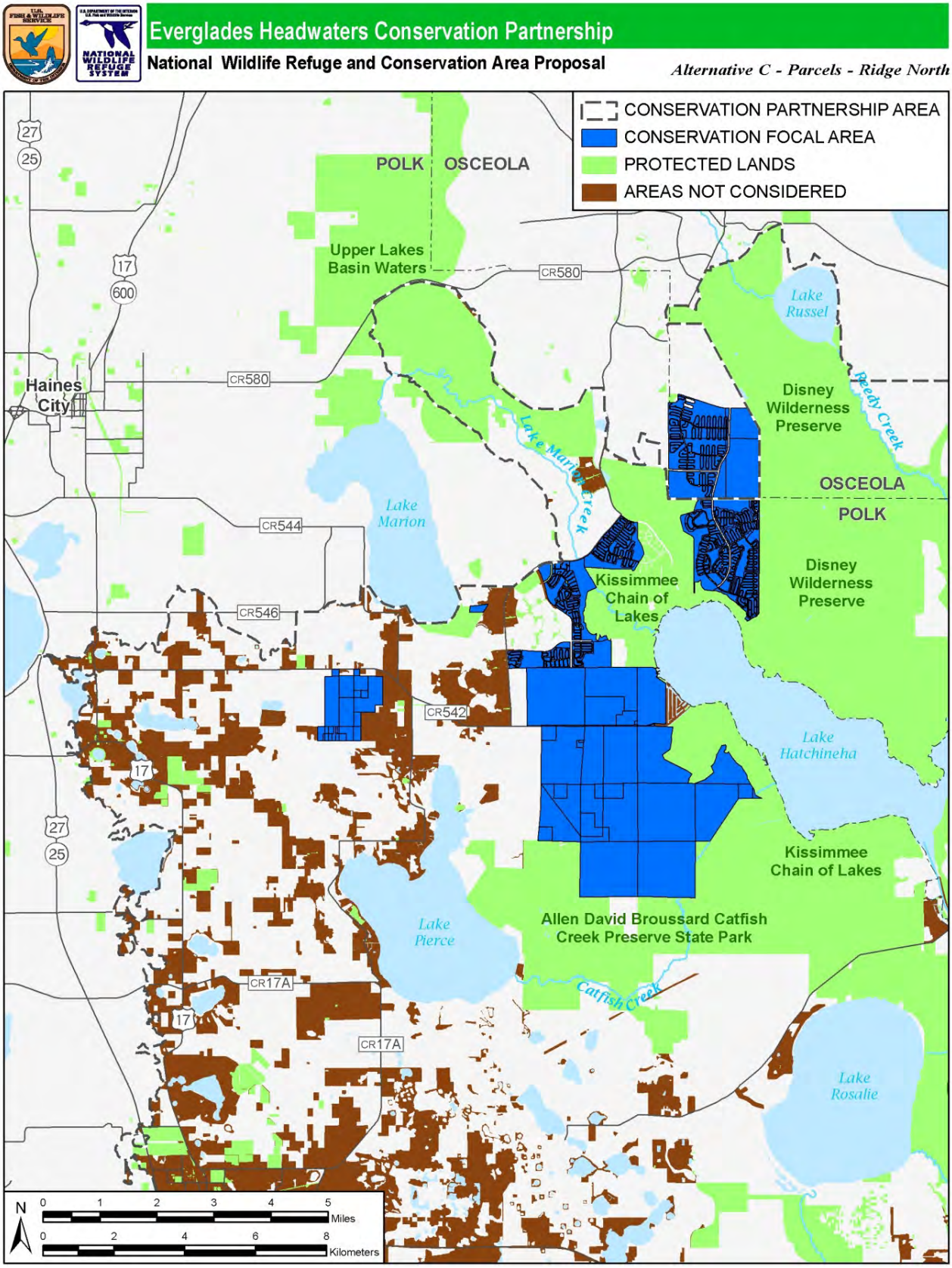


Figure 10b. Alternative C - Ridge Central Planning Unit

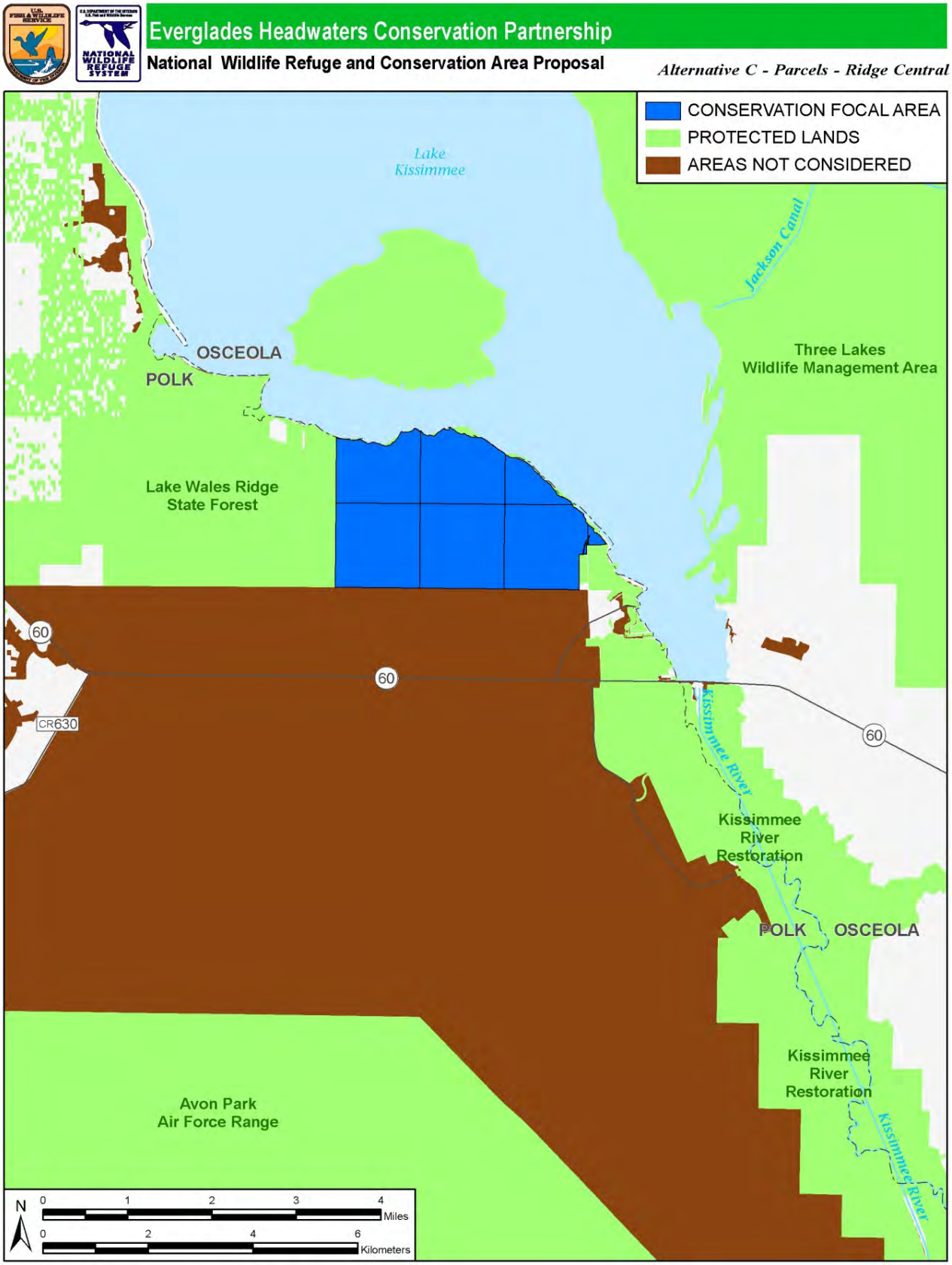


Figure 10c. Alternative C - Ridge South Planning Unit

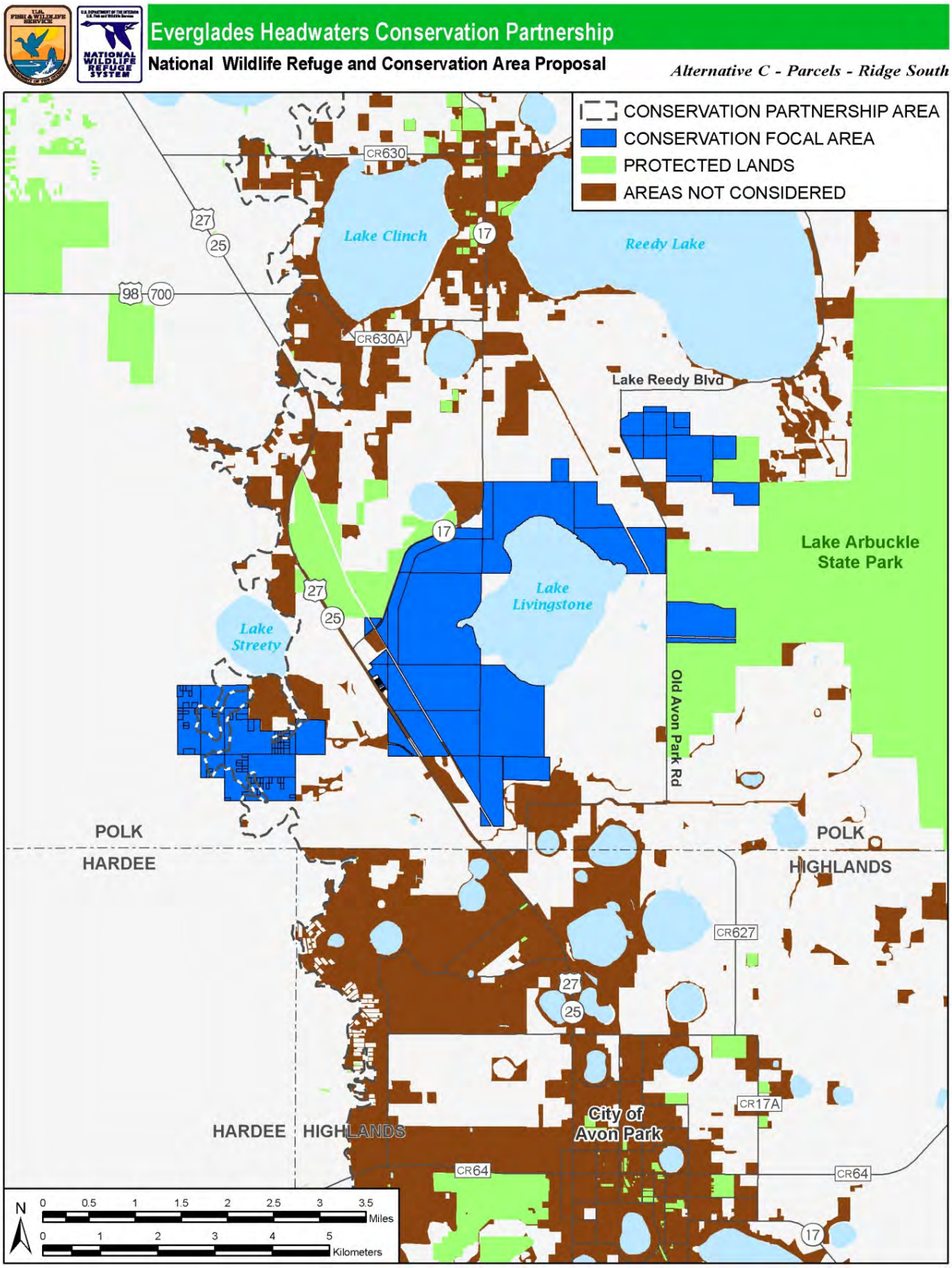


Figure 10d. Alternative C - Prairie North Planning Unit

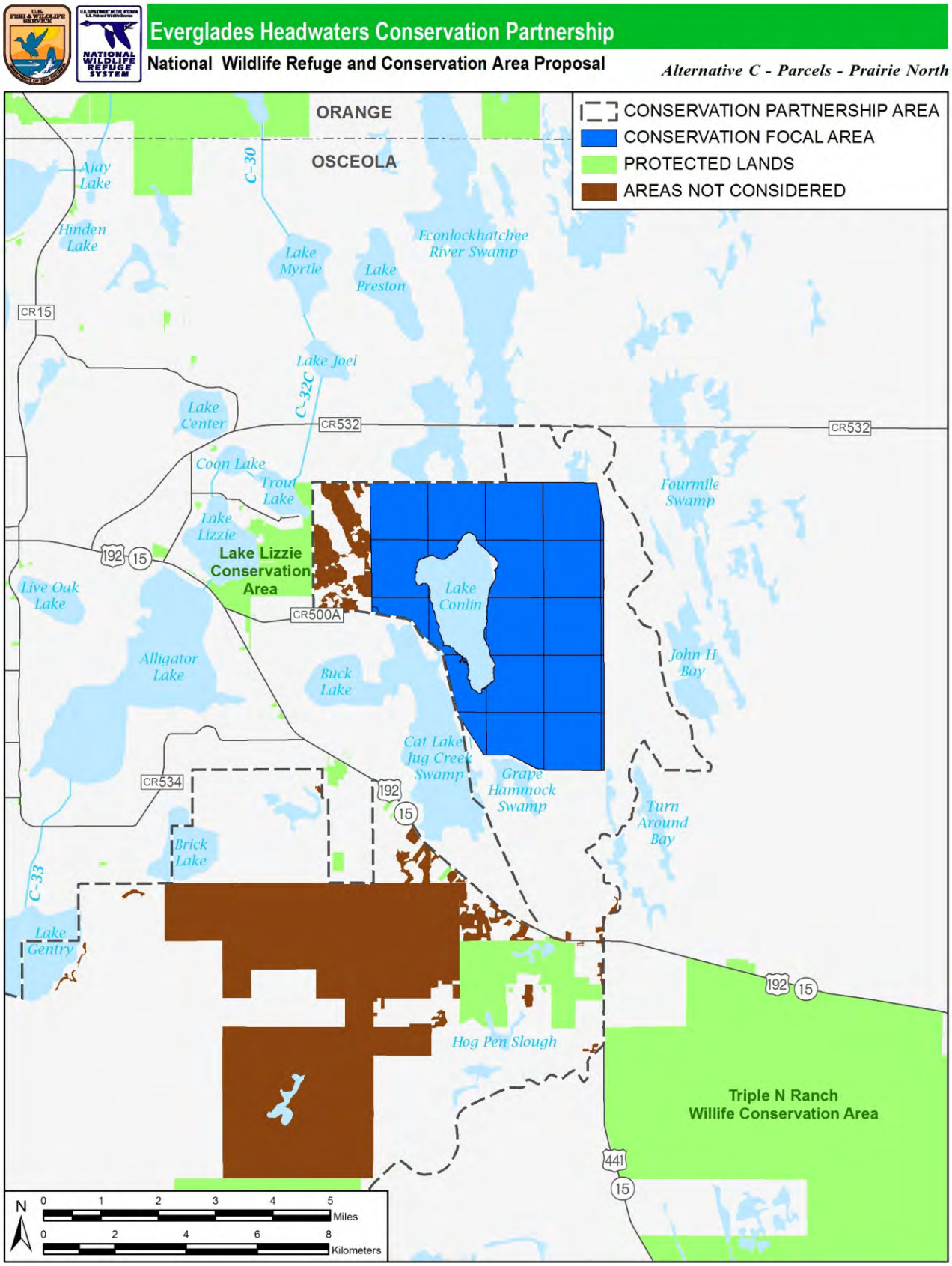


Figure 10e. Alternative C - Prairie Central Planning Unit

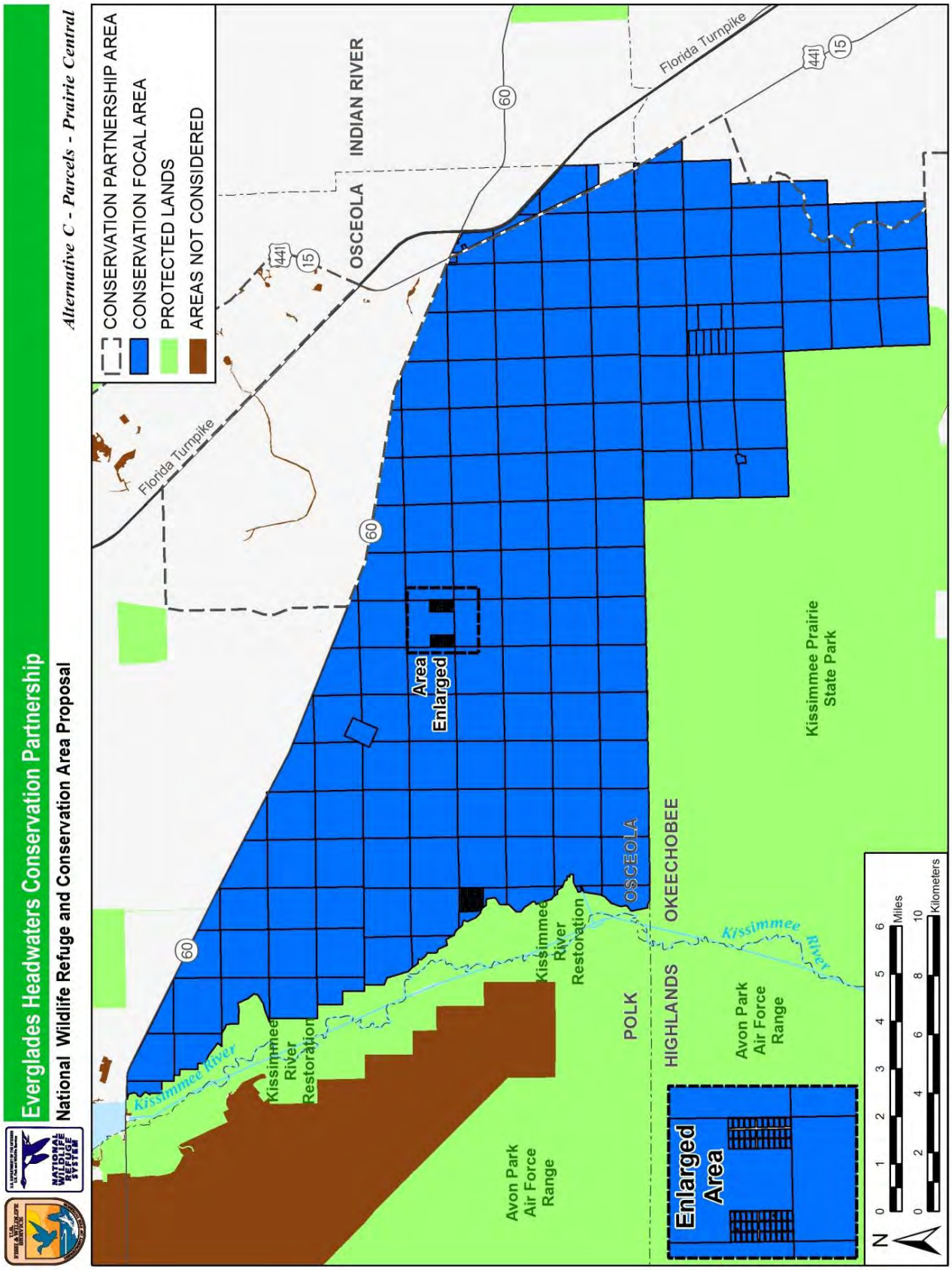
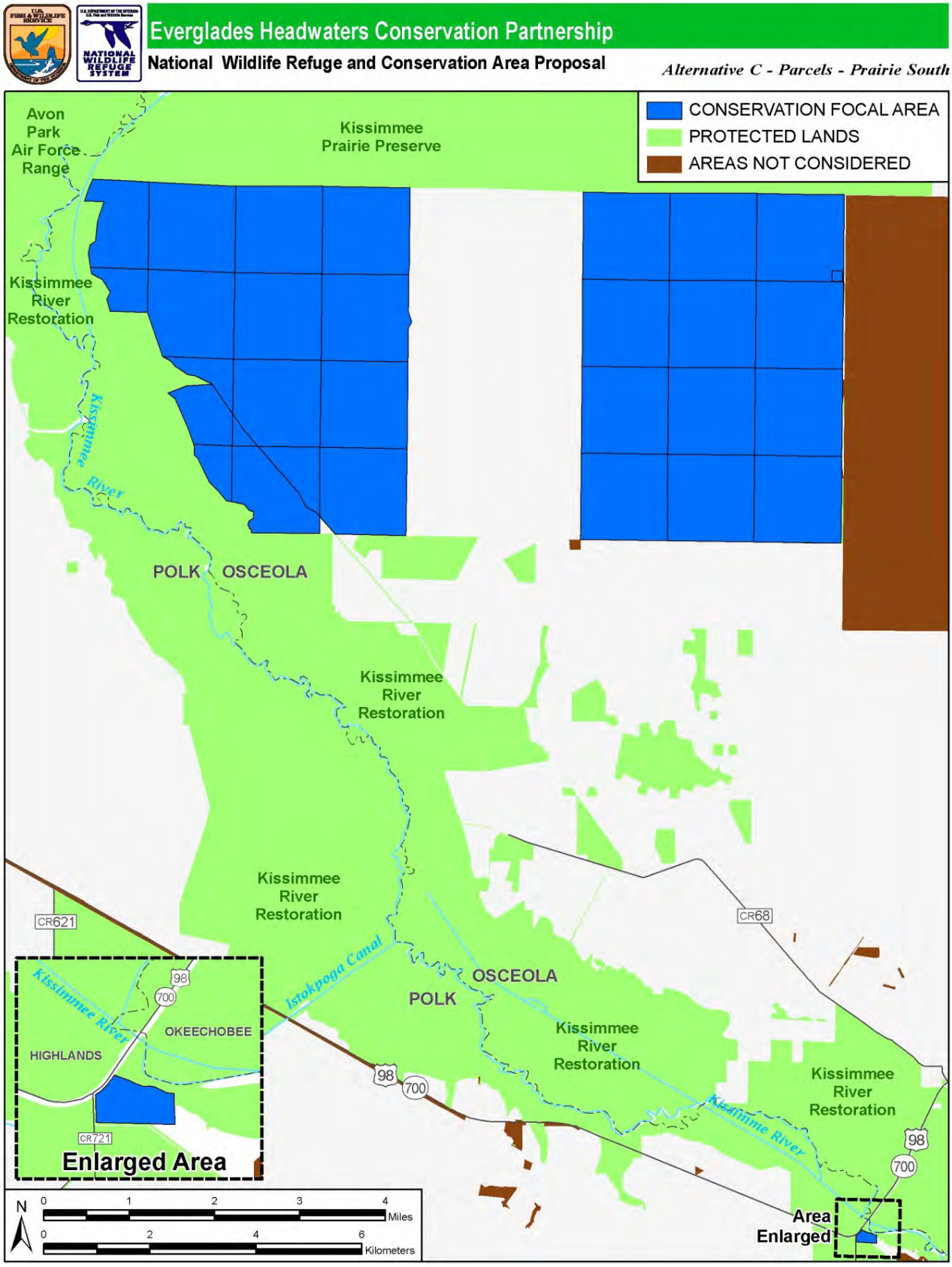


Figure 10f. Alternative C - Prairie South Planning Unit



Goal 1. Functional Conservation Landscape

The upper Everglades watershed will become a more connected and functional conservation landscape that will provide effective habitat connections between existing conservation areas and allow habitats and species to shift in response to urban development pressures and global climate change.

The Everglades Headwaters NWR and Conservation Area lands will provide an important link for migratory birds and important habitat for several species of concern. The preferred action will complement the management of adjacent and nearby conserved lands, both public and private, thus enhancing the Service's wildlife management contribution to the region and helping to make the entire landscape a more functional conservation landscape (Figure 8). Links to existing conserved lands will also provide the opportunity for species to migrate and adapt to changes in habitats anticipated to occur from the impacts of global climate change. The Everglades Headwaters NWR and Conservation Area in central Florida will provide local and regional benefits to wildlife by working in concert with existing conservation areas and partners, including SFWMD's Kissimmee River Restoration efforts, Avon Park Air Force Range, The Nature Conservancy's Disney Wilderness Preserve, Kissimmee Prairie Preserve State Park, Three Lakes Wildlife Management Area, and various designated trails throughout this area.

Although the acreage for fee-title acquisition is the same as for Alternative B, the ability to work within a larger Conservation Focal Area will provide the Service with an enhanced ability to adapt to changing circumstances over time. As landowner interests and opportunities for acquisition change, having the ability to select alternative lands of the same conservation value eliminates the need for the Service to reinitiate land acquisition planning activities. Often times, refuge acquisition boundaries remain uncompleted because the lands initially identified are fixed on the landscape and are sold to other individuals, agencies, or organizations. Thus the opportunity for the Service to participate in conservation efforts is lost. For example, the Lake Wales Ridge NWR initially identified an approximately 20,000-acre refuge acquisition boundary. Today, the Service owns less than 2,000 acres, with other partners conserving approximately 10,000 acres. Much of the remainder has been sold to other private interests leaving the Service with little or no opportunity to reach the objectives established during the planning process for that refuge. In the case of the Everglades Headwaters NWR, identifying an acquisition boundary that is larger than the authorized final acquired acreage will allow the Service a greater opportunity to meet the goals and objectives established in this Final EA, while only authorizing the 50,000 acres for acquisition.

The flexibility of being able to select fee-title acquisition parcels over time within a larger focal area, along with this same flexibility being built into acquiring conservation easements, will better enable us to provide corridors and linkages and to maintain a working landscape. The additional easement lands associated with the Conservation Area to be acquired under the preferred alternative will allow complete connectivity between many existing conservation lands. This will be especially important for species such as the Florida grasshopper sparrow whose breeding subpopulations are isolated. Fee-title acquisition will not be feasible at the large geographic scale that separates these populations, but easements provide a mechanism that allows landowners to maintain their livelihood, while at the same time securing the conservation landscape.

Less-than-fee-title acquisition provides the Service the opportunity to work closely with local landowners and ranchers to provide corridors across working landscapes for wildlife movement between existing conservation lands, while at the same time providing the opportunity for the landowners to continue to engage in ranching pursuits. It may not be necessary to have large tracts

of intervening lands under conservation ownership, when the need is simply to protect those corridors from development. Under this alternative, the Service will continue to work with landowners to protect sensitive corridor areas such as the lands along the base of the east flank of Lake Wales Ridge.

Under this alternative, the Service will work with the public and private partners to promote and protect the active ranching community in this area, as well as its cultural and historical resources. Without the stewardship of the ranching community, the opportunity to conserve the multiple species and habitats found in this landscape would likely not exist today. The partnership approach to conserving these resources, as well as the habitat and wildlife resources described above, is a key to successfully meeting this goal. Fully two-thirds of the acreage under Alternative C, approximately 100,000 acres, are specifically designated to be protected using less-than-fee-title means (e.g., through conservation easements), thereby providing the opportunity for conservation of wildlife and habitats, while at the same time providing the opportunity to assure a healthy and vibrant ranching community and economy.

Goal 2. Habitat for Fish and Wildlife

The Everglades Headwaters NWR and Conservation Area will provide a wide range of quality Kissimmee River Basin habitats to support migratory birds, federal and state listed species, state designated species of conservation concern, and native wildlife diversity.

Habitats

Diverse habitats and their respective ecological systems for trust species and species of special concern will be protected through this alternative. The Conservation Focal Area provides the opportunity to protect a mix of habitats whose acreage may vary depending upon the specific parcels ultimately selected. The same is true for the Conservation Partnership Area. For the Conservation Focal Area, the total fee-title lands to be acquired are the same (50,000 acres) as for Alternative B. The acreages available for conservation under Alternative C vary however. Thus, the acreage of key habitats available to be protected will be as follows: 13,415 acres of dry prairie; 10,123 acres of pine flatwoods; 2,177acres of sandhill and scrub habitats; and 25,233 acres of wet prairie and freshwater marshes. The remaining acreage is primarily improved pasture which provides opportunity to restore important habitats.

The additional acreage to be protected by conservation easement will also vary depending upon the specific parcels that are acquired. Prioritization and selection of lands for conservation easements will be guided by the habitat prioritization model (Appendix C), location within the Conservation Partnership Area, partnership opportunity, and best professional judgment. Protecting these habitats will contribute to the conservation of wetland birds; waterfowl; shorebirds; grassland birds; neotropical migratory birds; native bird species, such as turkey and bobwhite; white-tailed deer; Florida black bear; and the occasional Florida panther. The following is a description of some of the most important habitat types:

Sandhill and Scrub

Approximately 2,177 acres of sandhill and scrub habitat will be available for conservation within the Conservation Focal Area. Additional sandhill and scrub habitat acreage not protected by fee-title acquisition could be protected by less-than-fee-title acquisitions, especially conservation easements. Sandhill habitats and scrub occur on well-drained, nutrient-poor sandy soils. Grasses and scrubby oaks dominate this fire-dependent landscape. The sandy soils typical of these habitats allow rainfall to enter the groundwater system. Discharge from these habitats gives rise to cutthroat seepage wetlands,

and these could also be protected through less-than-fee-title acquisitions. Several of the species found on these habitats are endemic to central peninsular Florida and many are federally listed species, such as Florida scrub-jay, sand skink, Florida ziziphus, and Garrett's mint.

Pine Flatwoods

Approximately 10,123 acres of pine flatwoods habitat will be available for conservation within the Conservation Focal Area. Additional pine flatwoods habitat acreage not protected by fee-title acquisition could be protected by less-than-fee-title acquisitions, especially conservation easements. Pine flatwoods are characterized by level topography and poorly drained soils. These pine forests vary greatly depending on hydrology and can have a dominant understory of wiregrass, saw palmetto, or other low shrubs. The overstory of pine flatwoods can be of longleaf, slash, or pond pine and cabbage palm. They are important for a variety of invertebrates and vertebrates, such as neotropical migratory birds, red-cockaded woodpeckers, Florida black bears, Florida panthers, fox squirrels, and white-tailed deer.

Dry Prairie

Approximately 13,415 acres of dry prairie habitat will be available for conservation within the Conservation Focal Area. Additional dry prairie habitat acreage not protected by fee-title acquisition could be protected by less-than-fee-title acquisitions, especially conservation easements. Dry prairie is endemic to central peninsular Florida, occurring on poorly drained soils. It is fire-dependent and typically treeless with a low ground cover of wiregrass, stunted saw palmetto, and low-growing runner oak. It harbors numerous endemic vertebrates. The Florida grasshopper sparrow is the flagship species of this habitat.

Wet Prairie and Freshwater Marsh

Approximately 25,233 acres of wet prairie and freshwater marsh habitats will be available for conservation within the Conservation Focal Area. Additional wet prairie and freshwater marsh habitat acreage not protected by fee-title acquisition could be protected by less-than-fee-title acquisitions, especially conservation easements. Freshwater marshes and wet prairie are both seasonal wetlands that differ by the duration of inundation and fire regime. Sawgrass, sedges, rushes, and dwarf cypress dominate wet prairie, whereas cattail, sawgrass, pondweeds, water lilies, and numerous sedges and rushes dominate freshwater marshes. The Everglade snail kite, wood stork, whooping crane, and Audubon's crested caracara are noted residents of these habitats.

Forested Wetlands

Approximately 9,181 acres of forested wetlands habitat will be available for conservation within the Conservation Focal Area. Additional forested wetlands habitat acreage not protected by fee-title acquisition could be protected by less-than-fee-title acquisitions, especially conservation easements. Forested wetlands range from isolated depression swamps and shoreline to flowing water swamps. Bald cypress, red maple, and bay trees may dominate the overstory, while a mix of shrub species forms the understory. Many smaller isolated swamps have been converted to agricultural uses, and many of the remaining swamps are degraded by drainage and nutrient runoff. The wood stork, eastern indigo snake, and Florida panther can be found in these habitats.

Threatened, Endangered, and Species of Conservation Concern

The Study Area includes 40 federal and 161 state listed species (Endangered and Threatened), 3 Candidate species for federal listing, and 33 state Species of Special Concern (Appendix E). Their habitat needs vary greatly across the landscape, some being exclusively dependent on the habitats that are endemic to central Florida, such as dry prairie and scrub. The Study Area lies within the Atlantic Flyway for migratory birds with the refuge being located within NABCI's Bird Conservation Region (BCR) 31, the Atlantic Coast Joint Venture, and the operational area for the Peninsular Florida Landscape Conservation Cooperative. Listed below is a brief description of some of the focal species expected to benefit from the refuge.

Audubon's Crested Caracara

The federally threatened Audubon's crested caracara occurs within the wet and dry prairie habitat of central peninsular Florida, but is also found in pastures with scattered cabbage palms. It often feeds on wetland species, but is also noted to feed on road-killed animals as well. Audubon's crested caracara will be expected to use the Everglades Headwaters NWR and Conservation Area. Less-than-fee-title acquisitions will continue to provide caracara with foraging and nesting habitats, while at the same time providing the ranching community the opportunity maintain its livelihood.

Everglade Snail Kite

The federally endangered Everglade snail kite forages exclusively on apple snails. Apple snails can be found in a variety of wetlands, ranging from permanent wetlands and lakes to seasonal wetlands and ditches. While several larger wetlands throughout the Study Area provide nesting habitat, restoration and management of wetlands in this project are focused on providing improved foraging opportunities. The Everglade snail kite will be expected to use the Everglades Headwaters NWR and Conservation Area. Wetlands restored on less-than-fee-title acquisitions will provide additional wetland foraging areas for the Everglade snail kite as compared to lands that would have been protected under Alternative B.

Florida Grasshopper Sparrow

The federally endangered Florida grasshopper sparrow occurs throughout the prairie region of peninsular Florida. They are closely associated to the fire-dependent dry prairie and are now found on only a few parcels of public land and nearby ranches. Opportunities for conservation easements and restoration of pastures may provide the opportunity to link these isolated populations. The Florida grasshopper sparrow will be expected to use the dry prairie habitats on fee-title and less-than-fee-title acquisitions to a greater extent as compared to lands that would have been protected under Alternative B.

Wood Stork

The federally endangered wood stork forages and breeds within the marshes and cypress swamps of southern Florida. It shares these habitats with other more common wading birds, such as the great egret and white ibis. Only two active nest colonies exist within the Study Area, but five abandoned colony locations can be found in the area. Wetlands restored on less-than-fee-title acquisitions will provide additional wetland foraging areas for the wood stork as compared to lands that would have been protected under Alternative B.

Florida Black Bear

Listed by the state as a threatened species, the Florida black bear once ranged throughout Florida and the southeast states, but now occupies only 18 percent of its historic range. Using a wide variety of habitats, the Florida black bear is known to wander widely in search of food, cover, mates, and other resources. The population found within the Study Area is isolated and opportunity exists within this project to link them with a larger population found within the St. Johns River watershed. The less-than-fee-title acquisition lands will provide the Florida black bear greater opportunities for movement across the landscape as compared to Alternative B.

Other Migratory Birds

Two subspecies of sandhill crane, a state listed threatened species, can be found within the Study Area. The Florida sandhill crane is a non-migratory, year-round breeding resident, while the greater sandhill crane is migratory and only winters in Florida. Both subspecies use a wide variety of wetlands and pastures and will be expected to have increased nesting and foraging opportunities as compared to Alternative B.

Blue-winged teal and mottled duck are the two most commonly observed waterfowl species, with many other species of waterfowl noted throughout the winter period. They will be expected to have greater amounts of wintering habitat as compared to Alternative B.

Resident Wildlife

A wide variety of resident wildlife species can be found throughout the Study Area. Northern bobwhite, wild turkey, white-tailed deer, grey squirrel, and rabbit occur in abundance, providing ample hunting and wildlife observation opportunities. Wild hog, although a nonnative and nuisance species, is also considered a game species and can be found in overabundance in many areas throughout Florida. All of these species will be expected to have greater amounts of habitat as compared to Alternative B.

Listed Plant Species

There are approximately 25 federally listed plant species found throughout the landscape with most occurring in scrub habitat. Nearly all species are fire-dependent and their populations have been impacted by fire suppression, which has allowed brush and overstory species to become established. Some of the federally listed species found within the Study Area include beautiful pawpaw, scrub lupine, Florida ziziphus, and Garrett's mint. Many important plant species will be expected to receive greater protection as compared to Alternative B.

Goal 3. Enhanced Water Quality, Quantity, and Storage

Focusing on restoring or mimicking natural hydrologic processes, the Everglades Headwaters NWR and Conservation Area will contribute to water quality, water quantity, and water storage capacity of the upper Everglades watershed to support Everglades restoration goals and objectives and water quality and supply for central and south Florida.

Alternative C will add 150,000 acres of conservation lands to the upper watershed of the Everglades ecosystem, supporting the enhancement of water quality, quantity, and storage of this landscape. An estimated 8,846 acres of degraded wetlands will be restored under this alternative on any fee-title lands acquired. There are approximately 237,000 acres of degraded wetlands within the Conservation Partnership Area where the Service will have the opportunity to restore an

estimated additional 23,065 acres of wetlands on less-than-fee-title lands. The three primary wetland types that will be restored will be seasonal (short hydroperiod, 3 to 4 months), semi-permanent (long hydroperiod, 6 to 9 months), and cutthroat seepage wetlands. Seasonal and semi-permanent wetland basins occur throughout the prairie and savannah landscape, and cutthroat seepage wetlands are associated with the sandhill and scrub habitats of the Lake Wales Ridge. Cutthroat seepage slope wetlands are an endemic wetland type found at the base of the slope of sandhill habitat in south-central Florida. Groundwaters entering underground aquifers sometimes express themselves at the ground surface, creating a mosaic of seasonal wetlands ranging from marshes to pine forests dominated by an understory of cutthroat grass. Many of these wetland types have been ditched and drained, while others have been fire suppressed, allowing for hardwoods to encroach.

The primary method of wetland modification has been surface ditching to remove excess standing water from sloughs and wet and dry prairie systems. These surface ditches are rarely more than 2 to 3 feet deep and are easily restored through the reestablishment of the original surface contours of the landscape. Restoration of these types of wetlands will help serve multiple ecosystem service functions. By blocking surface flow, additional water will be stored in the wetland basin, allowing for slower water discharge, groundwater recharge, and nutrient uptake. Other agencies and organizations, such as NRCS, have wetland restoration programs. Opportunities to complement these restoration activities with Service restoration activities will further serve to benefit the overall watershed, including that of the Kissimmee River, Lake Okeechobee, and the Everglades.

Goal 4. Wildlife-dependent Recreation and Education

Refuge visitors of all abilities will enjoy opportunities for hunting, fishing, wildlife observation, wildlife photography, and environmental education and interpretation, while increasing knowledge of and support for conservation of the important grassland and savanna landscape of the headwaters of the Everglades.

With the addition of 50,000 acres of Service managed lands to the conservation landscape that could support compatible wildlife-dependent public use opportunities, wildlife-dependent recreation and education opportunities will increase under Alternative C, compared with the No Action Alternative, and will be similar in nature to Alternative B. The Service will work cooperatively with FWC and other partners to provide public hunting and fishing opportunities, and the Service will provide interpretive and educational programs.

The National Wildlife Refuge System Improvement Act of 1997 establishes six priority public uses on refuges. Those priority uses depend on the presence, or the expectation of the presence, of wildlife. These uses are: hunting, fishing, wildlife observation, wildlife photography, and environmental education and interpretation. Although these priority uses must receive consideration in planning for public use, they also must be compatible with the purposes for which a refuge is established and the mission of the Refuge System. Compatibility determinations, which evaluate the effects of a particular use or activity in the context of species or habitats on a refuge, aid in making those decisions. As refuge lands are acquired, compatibility determinations will be used to decide which, where, and how public use opportunities will be permitted.

Public use opportunities contribute to the long-term protection of wildlife resources by promoting understanding, appreciation, and support for wildlife conservation. The six priority public uses will be accommodated to the maximum extent possible, where they will not have significant negative effects on wildlife. All of the public use activities are contingent upon availability of staff and funding to develop and implement these programs. The Service will promote opportunities for volunteers and develop community interpretive materials and programs to enhance awareness of and appreciation

for the area's resources. School and other group programs will be considered. Once the refuge is established, an increase in public use will be expected from new facilities and programs such as new hunts, new trails, new parking areas, new fishing access, new interpretive overlooks, and new observation platforms that will be a part of the new refuge. The Service will allow public access for day use on many newly acquired lands, provided there are no expected negative effects on sensitive species (e.g., ESA-listed species) or habitats, and will consider overnight access as a component of other public use activities (e.g., hunting in remote locations). See Appendix B of the Final LPP for the Interim Compatibility Determinations.

Hunting and Fishing

The Service will open designated tracts of newly acquired lands for hunting and fishing in accordance with the state's regulations after reviewing and evaluating the biological, ecological, and human safety impacts. Newly acquired lands that traditionally have been opened to hunting and fishing will remain so, at their current level, under Interim Compatibility Determinations until the Service completes the planning process to formally open the refuge to those activities. To this end, the Service will continue discussions with FWC regarding the co-management opportunities of the hunting, fishing, and other recreational activities associated with this project. If possible, the Service will provide Americans with Disabilities Act (ADA)-compliant hunts and youth hunt opportunities. Generally, the Service will allow hunting, based on state hunting seasons and consistent with the refuge's comprehensive conservation plan and hunt plan (once developed). The Service will continue discussions with FWC to manage hunting and fishing opportunities on acquired refuge lands as units of the state's Wildlife Management Area program. Youth fishing opportunities will be encouraged.

Wildlife Observation, Wildlife Photography, and Environmental Education and Interpretation

Beyond hunting and fishing, the refuge will also provide opportunities for wildlife observation, wildlife photography, and environmental education and interpretation (see Appendix B of the Final LPP for Interim Compatibility Determinations addressing these uses). Working with state and local agencies, the Service will study the feasibility of connecting existing hiking, bicycling, and horseback riding trails through refuge lands. The refuge may also provide interpretive and environmental education programs and increase partnership opportunities to interpret the cultural and natural resources within the refuge and the watershed.

Environmental education, one of the six priority wildlife-dependent uses encouraged on refuge lands, incorporates onsite, offsite, and distance learning materials, activities, programs, and products that address the audience's course of study, the mission of the Refuge System, and the management purposes of the refuge. The goal of environmental education is to promote an awareness of the basic ecological foundations of the interrelationship between human activities and natural systems. Through curriculum-based environmental education both on- and off-refuge, refuge staff, educators, and partners hope to motivate students and other persons interested in learning the role of management in the maintenance of healthy ecosystems, working landscapes, and conservation of our fish and wildlife resources.

On April 16, 2010, President Obama announced the America's Great Outdoors Initiative, calling for a grass roots effort to protect our Nation's lands and waters and connecting all Americans to their natural and cultural heritages (CEQ 2010). Our country has a legacy of conserving its natural resources for the benefit of its citizens. Recent generations find it difficult to connect and enjoy these outdoor resources. Through this initiative, all Americans will have the opportunity to enjoy and appreciate central Florida outdoor resources.

For years, national wildlife refuges have been connecting children with the land and with the Service's conservation mission. It is now apparent that such connections are of immense importance. New information shows that most children spend their time indoors with televisions, video games, computers, and cell phones, rather than experiencing nature (Louv 2005). As the Nation's primary conservation agency, the Service has a strong incentive to promote children's nature-based activities. We will work with school districts and teachers to develop environmental education curriculum featuring the areas' unique species and communities, as well as the human dependence and agricultural need for ranching and farming to sustain a healthy working environment and economy. The Service will work with the conservation and education partners to promote environmental education, thereby maximizing resources and time commitments for each partner organization. We will utilize the refuge for habitat restoration projects, docent-led trail walks, birding festivals, guest lectures, and youth hunting and fishing efforts.

D. SUMMARY

Partnerships with surrounding landowners, and municipal, state, and other federal agencies will be the key to successful management of the Everglades Headwaters NWR and Conservation Area. This document was developed cooperatively with state partnering agencies and is supported by the land conservation partners working in the greater Everglades landscape. The Service will continue to cooperate with the conservation partners, all of whom are instrumental in helping accomplish habitat management goals and objectives. The strength of potential partnerships is illustrated by the team that is participating in partnership discussions as part of the Greater Everglades Partnership Initiative.

Taken together, the respective missions of the groups engaged in partnership discussions cover the protection of ranchland, listed species, a wide variety of habitat types, and open space that the local community has identified as important for conservation. Based on this effort, Alternative C (Preferred Alternative) identifies approximately 150,000 acres that will conserve the area's most important areas for maintaining biological integrity, diversity, and environmental health of the refuge, and will provide habitat connectivity to other areas of protected lands, resulting in a more functional conservation landscape in the headwaters of the Everglades.

As noted in detail above, many of the organizations with whom the Service is collaborating have already protected key habitats in the upper Everglades watershed and will continue to do so within the limits of their available resources. When the Everglades Headwaters NWR and Conservation Area become a reality, there is a clear need for continued local, state, and federal support. The Service recognizes its inability to solve the problems of habitat fragmentation, urban development, altered ecological processes, impacts from sea level rise and global climate change, and land protection on its own. Thus, it is incumbent upon all agencies and organizations to continue the efforts of communication and cooperation through the Greater Everglades Partnership Initiative. Through this effort, the Service will work to combine its efforts with those of its existing partners, as well as numerous other partners yet to be identified. On designated newly acquired lands that traditionally have been opened, hunting and fishing will remain at the same level of intensity under Interim Compatibility Determinations (Appendix B, Final LPP) until the Service completes the planning process to formally open the refuge. To this end, the Service will continue discussions with FWC regarding the co-management opportunities of hunting, fishing, and other recreational activities associated with this project. If possible, the Service will provide Americans with Disabilities Act (ADA)-compliant hunts, and youth hunts. Generally, the Service will allow hunting, based on state hunting seasons and consistent with the refuge's comprehensive conservation plan and hunt plan (once developed). The Service will continue discussions with FWC to manage hunting and fishing opportunities on acquired refuge lands as units of the state's Wildlife Management Area program. Fishing will be allowed, where accessible, and the refuge may be able to support fishing derbies for children.

Through Alternative C, the Service will have the additional opportunity to establish a Conservation Service Center approach to conservation and environmental education. As envisioned, agencies and organizations will be co-located at various offices and visitor contact stations, both existing and proposed, so that all of the public's conservation and outdoor wildlife-dependent recreation and education needs could be met at this one-stop shop approach to conservation. This approach will also reduce duplication of conservation program efforts amongst agencies and organizations, thereby allowing all agencies and organizations to become more fiscally efficient.

The Service and the Refuge System will work toward the overarching goals outlined in this document, addressing a functional conservation landscape; habitat for fish and wildlife; enhanced water quality, quantity, and storage; and wildlife-dependent recreation and education. It is clear that partnerships with the public; landowners; neighbors; conservation organizations; and municipal, state, and other federal agencies will be the only path to a successful Everglades Headwaters NWR and Conservation Area.

IV. ENVIRONMENTAL CONSEQUENCES

This section analyzes and discusses the potential environmental impacts associated with implementation of the three management alternatives described in Chapter III.

Potential impacts, positive and negative, to resources resulting from the implementation of the three management alternatives were identified and placed into one of the listed categories.

- None – no impacts expected
- Minor – impacts are anticipated to be too small to cause any discernible degradation to the environment; could include localized impacts that are minimal in context; impacts are not anticipated to be significant
- Substantial – impacts are measurable and are individually or cumulatively significant; an Environmental Impact Statement will be required to analyze these impacts

A. ALTERNATIVE A. NO REFUGE AND NO CONSERVATION AREA (NO ACTION ALTERNATIVE)

Under this alternative, the Service would take no action to acquire, protect, and manage any lands to establish the Everglades Headwaters NWR and the Conservation Area.

Future habitat protection under existing laws and regulations may be insufficient to prevent substantial degradation of the area's fish and wildlife resource values. Federal executive orders involving the protection of wetlands and floodplains only apply to federal agencies. They do not apply to habitat alterations by non-federal entities which receive no federal funds.

The primary deterrent against the loss of resource values is the USACE Section 404 permit program, which is administered under the authority of the Clean Water Act. This program requires permits for most types of work in wetlands. Wetlands in the project area would be regulated under this program. In addition, the State of Florida has regulatory authority over the area and would not permit any developments that would violate the state's water quality standards.

However, there is no assurance that the protection offered by these regulations would be consistent with protection of the area’s fish and wildlife resources. The regulatory programs are designed to accomplish different objectives. In addition, these programs are subject to changes in the law and to varying definitions and interpretations, potentially to the detriment of wetlands. The USACE regulatory authority provides for the issuance of Section 10 and/or Section 404 permits when it is not contrary to the public interest to do so and provided other conditions are met. Fish and wildlife conservation is only one of several public interest factors that are considered in these permit issuance decisions. If fish and wildlife conservation is outweighed by other factors, permits that would alter the wetlands in the refuge area could be issued.

The desired fish and wildlife protection objectives, therefore, cannot be achieved to any degree under this alternative. Specifically, implementation of the No Action Alternative would not achieve our objectives and would have adverse impacts to the area's valuable fish, waterfowl, and wildlife habitats.

EFFECTS ON THE PHYSICAL ENVIRONMENT

Land Use Patterns

Florida's population is projected to double in 50 years from approximately 18 to 36 million people, based on the report, "Florida 2060: A Population Distribution Scenario for the State of Florida" (Zwick and Carr 2006). The Florida 2060 data were derived from population growth models produced by the University of Florida's Bureau of Economic and Business Research (BEBR). Based on the report, Florida would have approximately 22,894,140 residents by 2020 (Zwick and Carr 2060). As a comparison, a 1997 report by U.S. Census Bureau estimated that Florida's population would reach 19,634,000 by 2020 (U.S. Census Bureau 1997), which is about three million people less than what the Florida 2060 report projects. However, the 1997 U.S. Census Bureau report underestimated Florida's population growth for 2010, which they predicted would be 17,363,000 (U.S. Census Bureau 1997). In 2010, Florida's population was approximately 18,801,310 according to the latest Census data (U.S. Census Bureau 2011). Furthermore, other population projections for Florida have underestimated rates of increase in the number of residents, as detailed in the section on socioeconomics in Chapter II (Affected Environment).

The rise in population will likely dramatically alter Florida's current landscape, as dwellings, strip-malls, industrial parks, parking lots, roads, and other infrastructure are constructed. According to the Florida 2060 report, an additional seven million acres of undeveloped land in the state will be converted to urban areas by 2060 (Zwick and Carr 2006). The change in land use in Florida between 2005 and 2060, as projected by the Florida 2060 report, is illustrated in Figures 11 and 12, reprinted here from the Florida 2060 report with permission. It is predicted that about 2.74 million acres of current native habitat and 2.70 million acres of agricultural lands will be lost to development by 2060 (Zwick and Carr 2006). As can be seen in Figures 11 and 12, a substantial portion of lands contained in the Study Area is likely to be developed during the next 50 years. Previously discussed in the Socioeconomic section of Chapter II, Florida's population growth has not abated substantially, even with the economic downturn of the last few years, and although surplus housing and commercial real estate has reduced the rate of new development, population pressures over the next decades will likely result in continued conversion of land to urban use (Margaret Carr, University of Florida, personal communication, April 20, 2011).

The effect of urbanization is not limited to the conversion of open space to developed lands; it also has indirect effects on how adjacent conservation lands can be maintained. Conservation lands, particularly those in Florida, are often managed using prescribed fire to maintain ecosystem health and to reduce the risk of wildfires. Frequently, as urban areas become established immediately adjacent to conservation lands, the use of prescribed fire as a habitat and wildfire management tool becomes increasingly difficult due to smoke and safety considerations (Davis 1991, Rice et al. 1991). Hence, even land use on established protected areas can be negatively affected as urban areas expand.

Under the No Action Alternative, lands trusts, the State of Florida, and other conservation land managers would continue to protect some of the lands in the Study Area. Florida has a history of funding land protection efforts, and since 2001 the Florida Forever program has acquired more than 668,000 acres of land. Almost 800,000 acres of lands are proposed for acquisition under Florida Forever in 2010, with a substantial portion being in counties in and adjacent to the Study Area (FDEP 2010). However, the State of Florida has recently seen a drastic reduction in land acquisition activities dues to budget reductions. Even if these lands are acquired over the next several decades, many conservation lands in the Study Area would remain unprotected and remain at risk from development, biofuel production, mining, and other land uses incompatible with natural resource protection efforts.

Figure 11. 2005 developed and conservation lands in Florida (modified from Zwick and Carr 2006; used with permission from 1000 Friends of Florida)

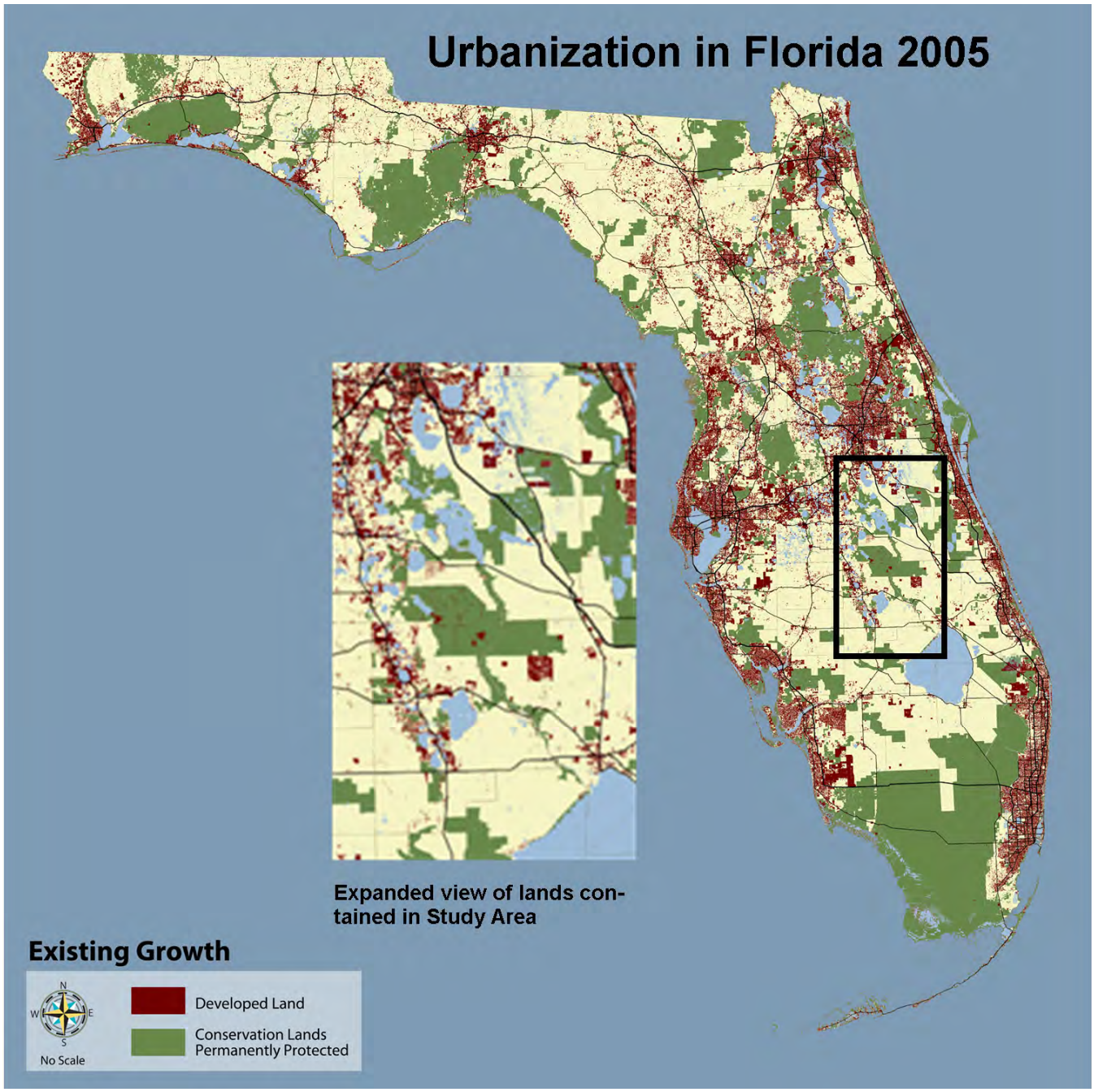
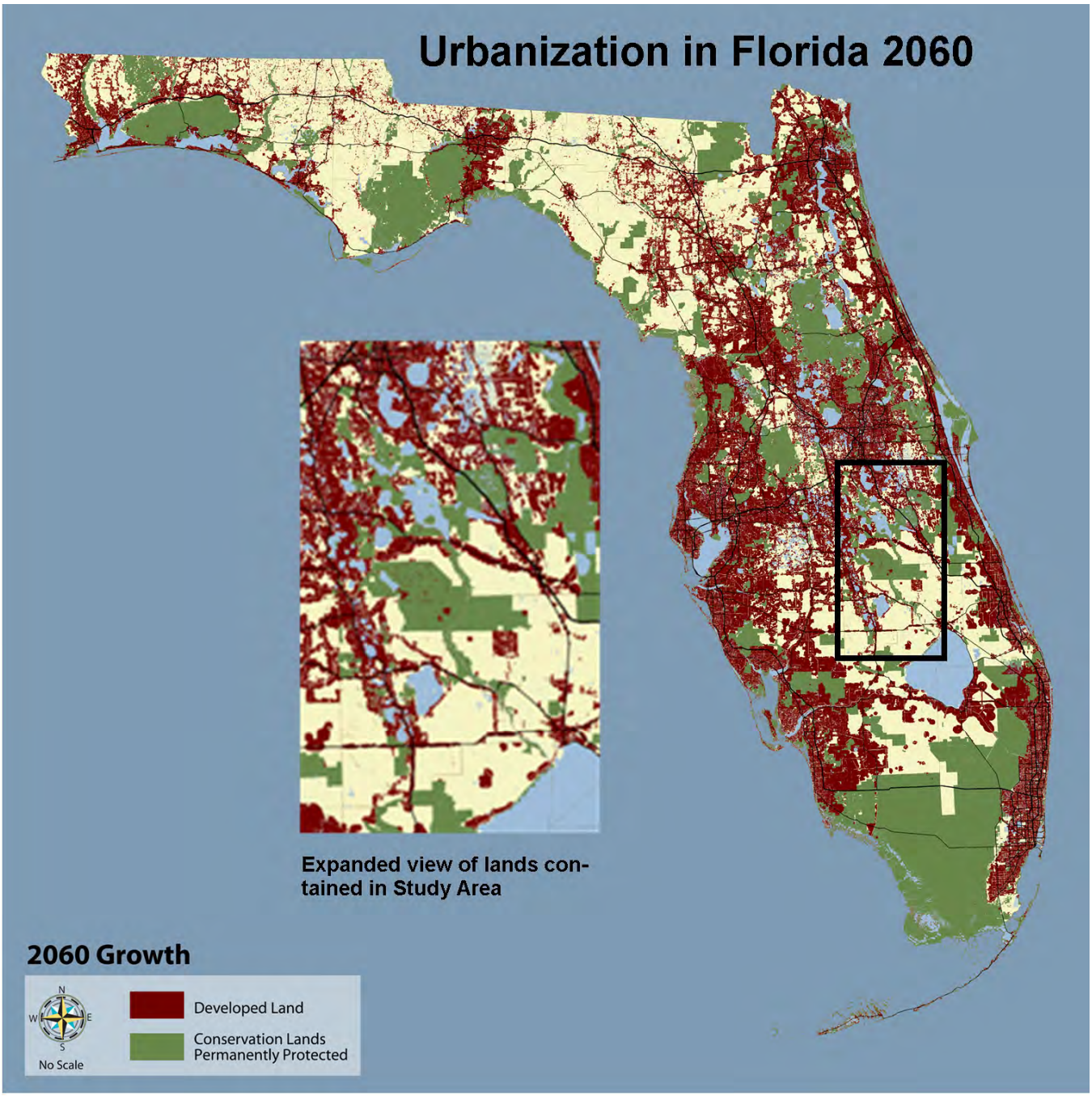


Figure 12. Projected developed and conservation lands in Florida by 2060 (modified from Zwick and Carr 2006; used with permission from 1000 Friends of Florida)



Economic effects associated with land use under the No Action alternative are discussed under the Socioeconomics section below.

Climate

The climate impacts include those impacts associated with global climate change.

Beneficial Effects

Under this alternative, areas within the Study Area would not be expected to become carbon sinks and therefore would not contribute to buffering the negative impacts anticipated with regard to global climate change.

Adverse Effects

Vegetation, alive or dead, is an important carbon stock, and ecosystems in the United States contain approximately 66,600 million tons of carbon (Heath and Smith 2004). According to the U.S. Climate Change Science Program, the size of the carbon sink in U.S. forests appears to be declining, based on inventory data from 1952 to 2007 (Birdsey et al. 2007). The carbon density (the amount of carbon stored per unit of land area) is highly variable, as it is directly correlated to the amount of biomass in an ecosystem or plant community. The total carbon in an ecosystem also includes the organic component of soil, which can be substantial, depending on the vegetation cover type and other factors (Bruce et al. 1999). When land is cleared of vegetation, carbon dioxide that was stored in plant material and soil is released into the atmosphere through such processes as decomposition, burning, and soil oxidation. Additionally, without vegetation, the ability of the land to sequester or store carbon is reduced to minimal levels. The exact extent of unprotected natural lands that would eventually be converted to agricultural or urban use is unknown. However, based on population models and current trends, substantial amounts of land would become sources of carbon in the Study Area (Zwick and Carr 2006). Compared to all lands in the United States, the relative contribution of carbon dioxide and other greenhouse gases that would be emitted by land conversion in the Study Area is relatively small. The No Action alternative would not contribute to buffering the anticipated impacts of global climate change. However, negative impacts to both local and regional climates may be experienced.

Topography

Beneficial Effects

Under this alternative, additional lands would not be protected or conserved in the Study Area and potential impacts such as mining could occur on those parcels, thus positive impacts with regard to the topography in the Study Area are not anticipated.

Adverse Effects

Some lands that remain unprotected could be used to mine sand, limestone, and other mineral resources. At least six large sand mines currently operate along the relic dune system that makes up Lake Wales Ridge (FDEP 2011a). Sand mining operations along the ridge remove entire dunes, resulting in an altered landscape. Additionally, larger mining pits are typically not filled in Florida (Newman, FDEP, personal communication, April 13, 2011) and become lakes or ponds where the water table is relatively high, which would further alter the local topography to

some degree. While localized negative impacts of these types of topography changes may be experienced, the negative impacts to topography across the 1.8 million-acre Study Area under the No Action Alternative are anticipated to be minor.

Hydrology and Water Quantity

Beneficial Effects

This alternative is not expected to provide additional protection or conservation of hydrology and water quantity of the area and no beneficial impacts are anticipated.

Adverse Effects

Although some hydrological restoration would be conducted under this alternative (e.g., portions of the Kissimmee River), the flow of water on most unprotected lands in the Study Area would continue to be altered as a result of the construction of drainage ditches, roads, and other impervious surfaces. Impervious surfaces associated with urbanized areas reduce the area available for rainwater to percolate into the soil. This generally has two direct consequences when it rains: there is less water available for recharging the local Surficial aquifer, while at the same time the amount of runoff that flows into low-lying area increases. Various stormwater management systems required by water management districts would help mitigate some of the impacts associated with impervious surfaces. However, extreme rainfall events (such as those associated with tropical systems) would likely exceed the capacity of most stormwater systems, and some runoff would be transported to area waters. Situated below the greater Orlando metropolitan area, the Kissimmee River Basin is particularly vulnerable to changes in hydrology, such as increased run-off, associated with developed areas. According to a study conducted by USACE, the flow regime in the basin has undergone a major shift and is now predominantly surface runoff with increased volume discharged at a faster rate during flood events (USACE 1991). It is expected that continued development in the Kissimmee River Upper Basin will further compound this situation and place increased demands on the regional water management system (Williams et al. 2006). At a more local level, increased storm water volumes and peak discharge rates associated with urbanization can produce drastic changes in stream channels, resulting in eroded banks and more frequent flooding that can cause damage to adjacent property, homes, and wildlife habitat. Increased surface run-off associated with urban areas would also have regional effects, as the general hydraulic gradient is north-to-south, where excess surface water flows from the Kissimmee River Upper Basin in the north through Lake Okeechobee and potentially to the Caloosahatchee or St. Lucie estuaries or the Everglades in the south. Hence, large pulses of water would increasingly tax water management of Lake Okeechobee, whose water has to be maintained at specific levels for the purposes of minimizing levee damage and flood risk (SFWMD 2011) and conserving the Lake's ecology. Conversely, developed areas also tend to exacerbate periods of water shortage. Because impervious surfaces limit the amount of water that seeps into the ground, less water is stored in subsurface areas. Subsurface water plays an important part in the hydrology of an area by providing streams and rivers with a steady supply of water during droughts. As more lands are urbanized, the water-storage ability of an area is reduced, limiting water supplies needed for wildlife and human use.

As with hydrology, water quantity in the Study Area is expected to continue to be negatively affected under this alternative. As farmlands expand, the natural flow of water would increasingly be altered to provide for irrigation and drainage to support crop production. Taken together, the amount of water available for wildlife, native habitats, and recreational opportunities would decline, as more water would be diverted to support expanding farm operations and increasing populations.

Under the No Action Alternative, hydrology and water quantity would not be protected in approximately 150,000 acres of the Study Area, constituting a minor negative impact across the Study Area.

Geology

Beneficial Effects

No beneficial impacts to the geology of the Study Area are expected under this alternative, since no additional protection or conservation of these resources is proposed.

Adverse Effects

As discussed under the Topography section above, mining operations would likely continue in some of the unprotected areas. Sand mines in the area are generally about 65 feet deep (Newman, FDEP, personal communication, April 13, 2011). The effects of mining operations on the underlying geology can be substantial, but they are limited to a particular site. Hence, because the Study Area is large compared to the surface area occupied by mines (even if several are added over the next 15 years), minor negative impacts to the underlying geology of the area are anticipated.

Soils

Beneficial Effects

No beneficial impacts to soils in the Study Area are expected under the No Action Alternative, since no additional protection or conservation of these resources is proposed.

Adverse Effects

In unprotected areas, soils would continue to be disturbed as a result of various land use practices, including agricultural operations, road-building, and the construction of buildings, parking lots, and other infrastructure needed to support expanding human settlements. Natural soil-formation processes would no longer occur in areas covered by impervious surfaces (e.g., roads, parking lots, and buildings). Soil compaction is also expected at sites where construction occurs. Additionally, soils would continue to be degraded by various contaminants resulting from the application of agricultural chemicals and run-off from roads and urban areas. Overall, we expect the effects on soils to constitute a minor negative impact.

Air Quality

Beneficial Effects

Positive effects on air quality in the Study Area are not expected under this alternative, since no additional protection or conservation of these resources is proposed.

Adverse Effects

Under this alternative, unprotected lands that are currently in a natural state may continue to be converted to agriculture and urban areas. Air quality declines tend to be correlated to increasing urbanization, due to higher levels of traffic, increases in air pollution from point sources, and reductions in vegetated areas (Song et al. 2008). Trees have been shown to reduce the

concentration of ozone (O_3), sulfur dioxide (SO_2), nitrogen dioxide (NO_2), carbon monoxide (CO), and particulate matter less than 10 and 2.5 microns in diameter (PM10 and PM2.5), primarily through direct uptake and adhesion to stems and leaves (Escobedo et al. 2007). Some tree species naturally produce volatile organic compounds that can convert to ozone under certain atmospheric conditions, such as high temperatures and stagnant air (Chameides et al. 1988). However, because vegetated areas also remove ozone and other air pollutants from the atmosphere, there tends to be net reduction in air quality as areas become increasingly developed and forests are lost (Song et al. 2008). Florida's air quality has remained relatively good in recent years, even as the population has increased. In 2009, the state continued to be within the acceptable standards for air quality as defined by the EPA for all criteria pollutants (FDEP 2009). Hence, we expect the No Action Alternative to have a minor negative impact on air quality across the Study Area.

Water Quality

Beneficial Effects

Under the No Action Alternative, additional improvements to water quality are not anticipated in the Study Area.

Adverse Effects

Under this alternative, water quality is expected to decline in the Study Area. Land use directly affects water quality, and in undeveloped areas, the natural physical, chemical, and biological processes interact to recycle most of the materials found in stormwater runoff. However, as natural vegetated lands are converted to farms or urban use, these natural processes are disrupted. As a result of everyday human activities, materials such as leaves, animal wastes, oil, greases, metals, fertilizers, pesticides, and other materials are washed off by rainfall and are carried by stormwater to our wetlands, lakes, rivers, and bays. These materials can create high pollutant loadings of sediment, nutrients, metals, petroleum hydrocarbons, and coliform bacteria and viruses (FDEP 1993). Additionally, the lack of vegetation can cause nutrients (such as nitrogen and phosphorus), which are typically used by plants, to flow directly into surface water bodies, contributing to harmful algal blooms or HABs (Bushaw-Newton and Sellner 1999). The incidence of HABs has sharply increased nationally (HAB Research Development, Demonstration, and Technology Transfer 2008) and in Florida (Abbott et al. 2009), resulting in human health risks, fish and wildlife die-offs, and substantial economic losses (Anderson et. al 2000, Hoagland et al. 2002). HABs are not limited to estuarine or marine waters, and freshwater HABs are increasing (Lopez et al. 2008).

Overall, water quality in the Kissimmee River Basin and important waterbodies further south (e.g., Lake Okeechobee) are likely to continue to be adversely affected by agricultural operations and expanding urban land use. Although increased management efforts by the SFWMD and its partners may help reduce water quality degradation, it is expected that urban growth will continue to cause declines in water quality across the Study Area, constituting a negative cumulative impact.

Noise

Beneficial Effects

The soundscape of the Study Area is not expected to benefit under the No Action Alternative.

Adverse Effects

Although noise from various sources currently affects rural lands in the Study Area, substantial tracts of land remain where anthropogenic noise levels are relatively low. Without protection, additional lands in the Study Area would continue to be converted to agricultural and urban use. Noise levels associated with farm equipment, road and air traffic, and industrial operations would increase. Increases in the intensity and frequency of noise associated with a growing population would alter the soundscape of the area. National Park Service research shows that the effects of human-induced sounds on the overall park experience are causes for concern. In a 1998 survey conducted by the National Park Service, 72 percent of visitors stated that one of the most important reasons for having national parks was to provide opportunities to experience the natural quiet and sounds of nature. According to the National Park Service, uncharacteristic sounds or sound levels affect visitors' perceptions of solitude and tranquility and can generate high levels of annoyance (NPS 2009). Furthermore, there is evidence that human-induced noise can interfere with various aspects of animal behavior including preventing predator warning signals, disrupting breeding behavior, and discouraging birds from singing during the day when noise levels are highest (Brown 2001). There is currently no specific information about the impacts of noise on the soundscape in the Study Area, but human-induced sounds and noise on wildlife and visitors should not be underestimated. Taken together, the impact of increased noise levels across the Study Area within the No Action alternative is expected to constitute a minor negative impact.

Visual Resources

Beneficial Effects

Under the No Action Alternative, visual resources are not expected to benefit.

Adverse Effects

Largely rural, the visual characteristics of the Study Area are expected to be negatively affected under this alternative. With increasing urbanization, various structures such as roads, communication towers, high voltage power lines, and buildings will alter the visual aspects of the landscape. Given that various structures already alter the aesthetics of the landscape, the negative impacts to visual resources of the area are expected to be minimal.

EFFECTS ON THE BIOLOGICAL ENVIRONMENT

Habitats

Beneficial Effects

Under the No Action Alternative, uncertainty exists as to the potential for beneficial impacts to native habitats and species. Although adverse impacts to native habitats and species are anticipated under the No Action Alternative, it is possible to conceive that continued development and loss of habitat resources in the years leading up to 2060, could sway popular opinion in such a way that additional conservation

efforts could be undertaken by public, private, and/or governmental organizations. Under the No Action Alternative, it is possible that other conservation strategies could be implemented more intensely in the future. We have no way to predict the likelihood of this occurrence, but it would likely require additional funding and changes in social values (i.e., more people might desire habitat conservation than do currently) and it would also depend on similar or lower real estate costs in the Study Area. However, given past actions and trends, it is anticipated that human population growth and development would continue and that further development of the landscape would continue to convert native habitats and natural systems to developed lands, resulting in continued loss of these resources and further fragmenting remaining natural lands and waters.

Adverse Effects

Based on the information presented in the Florida 2060 Report, we anticipate that existing native and natural habitats would be lost to residential and agricultural development. Figure 12 shows that the spatial extent of urbanization would increase along transportation routes and cover the northern half of the Study Area thereby destroying or fragmenting existing native and natural areas in the Kissimmee Chain of Lakes and along the Lake Wales Ridge and SR 60 in Osceola and Polk Counties. The water resources of the upper basin would be impacted by increased stormwater runoff from the increase in impervious surfaces (e.g., roads, parking lots), leading to a deterioration of water quality of the area lakes and streams (stormwater runoff can contain pollutants such as nutrients, pesticides, endocrine disrupters, garbage, and petrochemicals). Lake levels would likely fluctuate more on a seasonal basis thereby altering their ecosystems. The loss of groundwater recharge (due to increased impervious surfaces) and the increase in residential and agricultural water consumption would increase the frequency of drying events of these water bodies and could reduce or eliminate valuable recreational fishing (either through navigation impacts or loss of fish species or biomass). Wading birds could also be more challenged to find forage if hydroperiods are disrupted. These impacts could also manifest in downstream water bodies such as Lake Okeechobee and therefore, the No Action Alternative could have additional negative effects outside of the Study Area. Ecologically healthy scrub and sandhill habitats along the Lake Wales Ridge that are not protected would become even rarer or possibly eliminated entirely. We also know that landowners within the project area have expressed interest in converting their pasture habitat, which supports federally listed species such as the wood stork and Audubon's crested caracara, to bio-fuel production facilities. This would reduce or eliminate the habitat quality for many species including storks and caracaras. The loss of this and similar pasture or rangeland habitats with the No Action Alternative would limit the ability of land managers to protect, conserve, or restore the dry prairie ecosystem that once existed there. Besides these rare and unique habitats, we would expect overall losses of other ecologically valuable habitats (e.g., pine flatwoods, hardwood hammocks, forested and herbaceous wetlands, and pastures) as they are converted to residential and more intensive agricultural uses. Additional adverse effects from urbanization would be related to increased roads and traffic leading to a higher likelihood of road-killed animals and a higher incidence of feral cats that could prey on native animal species.

Wildlife

Beneficial Effects

Under the No Action Alternative, there would be no benefits to native fish or wildlife populations with the possible exception of those species that can tolerate some urbanization. These could include species such as gray squirrel, opossum, cotton rat, blue jay, mocking bird, black racer, Cooper's hawk, white ibis, Brazilian free-tailed bat, and various insects (e.g., love bug, mosquito, and cockroach).

Adverse Effects

As native and natural habitats continue to decline in quality and spatial extent, and as habitat patches become more fragmented, the animal species that use these habitats would decline in numbers or fitness. The No Action Alternative would promote this decline in Florida's fauna and because some of these species are endemic or greatly restricted in their distribution, it may contribute to the future listing of species under the ESA [e.g., Florida sandhill crane, Florida black bear, Sherman's fox squirrel, gopher tortoise, Archbold (Scrub) anomala scarab beetle, and caracara commensal scarab beetle]. Additionally, nonnative animal species (e.g., starling, Cuban tree frog, fire ant, and pollution tolerant fishes like blue tilapia, or Asian swamp eel) may become more prevalent furthering the disruption of the native ecosystems.

FEDERALLY THREATENED, ENDANGERED, AND CANDIDATE SPECIES

Beneficial Effects

Under the No Action Alternative, there would be no additional habitats protected or conserved and therefore no benefits to threatened or endangered species.

Adverse Effects

<u>Birds</u>

Audubon's Crested Caracara

With the No Action Alternative, the further loss of this species' preferred habitat (dry or wet prairies and pastures) along with the anticipated reduction in its wetland-dependent prey-base may reduce the distribution of this species in the Study Area. We would expect that entire territories could be lost due to development (habitat fragmentation) and this would therefore, reduce the reproductive potential of the species.

Everglade Snail Kite

The Everglade snail kite population has recently dropped dramatically to a point where additional losses in adults or reproduction could increase the risk of extinction. With the No Action Alternative, the anticipated degradation of water bodies such as Lakes Tohopekaliga (Toho), Kissimmee, and East Lake Toho (in the Kissimmee Chain of Lakes) and the potential for water quality and water level impacts in downstream areas like Lake Okeechobee could curtail this species reproductive capacity. This could be manifested as a reduction in the populations of apple snails in these nesting water bodies (by drought or seasonal lake level fluctuations) and nest failure (from too low lake stages, or increased boat usage associated with an increased human population). Also, the potential for increased residential development on lake shores could increase disturbance of nesting kites (noise, people, boat docks, boat usage, and pesticides) and potentially reduce quality of nesting habitat leading to less reproductive success. The anticipated further degradation of water quality, particularly runoff of phosphorus from agricultural and urban sources, would increase the threat to this species under the No Action Alternative.

Florida Grasshopper Sparrow

With the No Action Alternative and the concurrent expectation that properties would be developed for biofuels or residential development, we would lose the opportunity to restore that property back to dry prairie habitat for the grasshopper sparrow. Of the total five populations of Florida grasshopper sparrows, the three at Avon Park Air Force Range have recently exhibited severe declines. The populations at Kissimmee Prairie Preserve State Park and Three Lakes Wildlife Management Area have also exhibited declining trends in recent years. However, with the No Action Alternative we would have lost an opportunity to conserve and restore additional habitat for this species. As a result, there is a real possibility the selection of the No Action Alternative would increase the risk of extinction of the Florida grasshopper sparrow or the extirpation of the species from the wild.

Florida Scrub-Jay

With the No Action Alternative, the scrub-jay may lose occupied habitat due to the anticipated development on upland oak ecosystems within the Study Area. There could also be a fragmentation of existing habitat and because scrub-jays need a minimum of five hectares per pair, some currently occupied scrub may become inhabitable if this threshold is not maintained. Also, as residential development increases there is a lower likelihood that necessary fire management would be allowed to maintain the quality of existing scrub-jay habitat. There is currently a process in place for creating scrub-jay conservation banks as a way to compensate for impacts to scrub-jays. This is a credit-purchasing mechanism that allows the destruction of occupied scrub-jay habitat as long as there is a protection and management of a similar amount within the scrub bank at a two to one ratio (two acres protected for each acre destroyed). In the end, more acres of scrub-jay habitat are protected than are currently, but habitat may still be still lost compared to the existing condition (unless habitat is restored to increase scrub-jay carrying capacity).

Red-Cockaded Woodpecker

Red-cockaded woodpeckers are sparsely present in pine flatwoods or pine-dominated stands on unprotected lands within the Study Area. They are also present on protected lands at Avon Park Air Force Range and Three Lakes Wildlife Management Area. They may also be present on private pine lands for which we do not have access and hence, no survey data. Under the No Action Alternative, there could be additional losses in occupied or potentially occupied habitat.

Whooping Crane

Adverse effects to the Nonessential Experimental Population of the Florida Nonmigratory Whooping Crane population (Osceola, Lake, and Polk Counties) could result from the No Action Alternative. Even though this crane population is small (21 individuals are being monitored) and additional releases have ceased due to problems with survival and reproduction, the additional loss or deterioration of large freshwater marshes, pastures, and wet and dry prairies would further hamper this species' recovery efforts in Florida.

Wood Stork

There are only two active wood stork breeding colonies remaining in the Study Area; however, this species is expected to forage in water bodies throughout the entire Study Area. There are three active wood stork nesting colonies within approximately 20 miles of the Study Area. Under the No Action Alternative, we anticipate continued degradation of aquatic resources (freshwater marshes, wet prairies,

and cypress swamps) that could reduce or eliminate forage for this species, and as a result, reduce reproductive potential or success. Associated with agricultural or residential development, there may be an increase in stock ponds, seasonally flooded roadside or agricultural ditches, or managed impoundments; however, it is unclear if these features provide the abundance or diversity of wood stork forage that would be present in more natural water resource features.

Mammals

Florida Bonneted Bat

Under the No Action Alternative, the continued loss in quality of aquatic resources could reduce forage for this species. A loss in the number of trees may also reduce roosting locations; however, an increase in manmade structures may provide some additional roost sites. Not as much is known about this species (compared with other species of concern in the Study Area), so it is difficult to accurately address the adverse effects of project alternatives with a high degree of certainty on the Florida bonneted bat.

Florida Panther

Although at the present time only dispersing male panthers occur north of the Caloosahatchee River, the Study Area provides habitat for the potential expansion of the breeding portion of the panther population. Under the No Action Alternative, the continued loss of habitat would hamper the potential for population expansion that is necessary for panther recovery (Service 2008c).

West Indian Manatee

The manatee is only present in the Study Area in the lower Kissimmee River. The continued degradation of water resources associated with the No Action Alternative would likely worsen the quality of the aquatic habitat for manatees in this area and downstream of the Study Area (Lake Okeechobee, and the rim canal). Increased fluctuations of water levels (more droughts or more high-water events, especially in Lake Okeechobee) could reduce plant forage for manatees. Also, if water turbidity increased (under the No Action Alternative) to the point where manatees could not be observed by boat operators, then the risk of water vessel collisions resulting in manatee injury or mortality may increase.

Reptiles

Sand Skink and Bluetail Mole Skink

Similar to scrub-jays, both the bluetail mole and sand skinks have conservation banks servicing the Study Area as a way to compensate for impacts to these species' habitats from development. While we do not yet have a good understanding of skink population trends, under the No Action Alternative, the continued development along the Lake Wales Ridge on xeric soils is likely to reduce the quality and quantity of native skink habitat. Fragmentation of habitat could also increase. Pike et al. (2008) indicated that this species can occupy degraded or converted habitat including overgrown scrub, pine plantation, citrus grove, old field, or pasture conditions where soil types are suitable regardless of vegetative cover. However, it is unclear if the skink densities and reproductive success on these altered habitats are similar to those of native skink habitats.

Eastern Indigo Snake

The eastern indigo snake is a habitat generalist that requires a large home range. Average male indigo snake home ranges at Archbold Biological Station have been estimated at 185 acres (Layne and Steiner 1996). R. Bolt (Dynamac Corporation, Pers. Comm., 2003) reported a maximum home range in Florida of 805 acres. Habitat loss, degradation, or fragmentation of these large home ranges and vehicle/equipment mortality (in developed areas) would likely increase with the No Action Alternative as more native and natural habitats are developed. We would also anticipate an increase in mortality from an increased human population associated with lawnmowers, ophidiophobia (fear of snakes), or pet (cat and dog) predation. The lack of an effective survey technique, coupled with the secretive nature of this species, would make it difficult to verify adverse effects associated with the No Action Alternative.

Gopher Tortoise

Similar to other species that are widespread, but still have specific habitat requirements, we expect that the gopher tortoise's habitat (uplands) would also be the areas most at risk for additional development. Therefore, we would expect that as development increases, under the No Action Alternative, there would be a decrease in the gopher tortoise population (even though some tortoises can survive, but at lower densities, in residential areas). Because this species is a candidate for listing under the Endangered Species Act, additional adverse effects may result in it becoming federally listed as endangered or threatened. Because gopher tortoise burrows also provide homes for about 250 other species of animals, a loss in their abundance would also likely cause a loss in those commensal species as well under the No Action Alternative.

Invertebrates

Highland's Tiger Beetle

Under the No Action Alternative, we would expect continued residential and agricultural development in this species preferred habitat (i.e., scrub or pine woodland with a high percent of open sand) or other occupied habitats (open sandy areas within or adjacent to scrub or sandhill). As a result, we would expect additional habitat loss, degradation, or fragmentation. The increase in residential development may also increase the risk of insecticide use which may be an additional threat to this species.

Plants

Okeechobee Gourd

Under the No Action Alternative, adverse effects to the Okeechobee gourd are difficult to predict, because it is ephemeral in nature and occupies muck soils that become dry during the winter and spring. This species is currently present in the Study Area, but only at the extreme southern end around the shores of Lake Okeechobee and the rim canal. It is possible that the hydrologic changes (more extreme high and low water events) or spread of nonnative plants associated with increased urbanization could adversely alter the habitat for the Okeechobee gourd. Increased or inappropriate herbicide use could cause both mortality of gourds and alter gourd habitat.

Beautiful Pawpaw

Recently, the beautiful pawpaw has only been reported near the Study Area in Orange County east of Orlando. Much of the suitable pineland habitat in the historic range has been destroyed or converted to residential housing, commercial activities, and agriculture, and numbers and distribution of plants have decreased as a result. Under the No Action Alternative, we expect continued decline in unprotected pineland habitats that could or would be restored to support this species.

Florida Ziziphus

Under the No Action Alternative, 10 of the 14 extant Florida ziziphus populations are unprotected and would be at risk. They occupy yellow sand pasture habitats that historically supported longleaf pine wiregrass sandhills or oak hickory scrub. If these pastures are converted to residential or more intensive agricultural land uses, these ziziphus populations would likely decrease or be extirpated.

Scrub Plant Species

There are 22 species of federally listed scrub plants that may occupy similar xeric habitats within the Study Area on the Lake Wales Ridge and potentially other nearby ridges. These are: scrub lupine, Avon Park harebells, Britton's beargrass, Carter's mustard, wide-leaf warea, American chaffsead, Highlands scrub hypericum, Florida bonamia, Florida perforate cladonia, Garrett's mint, Lewton's polygala, papery whitlow-wort, pigeon wings, pygmy fringetree, sandlace, scrub blazing star, scrub buckwheat, scrub plum, scrub mint, short-leaved rosemary, snakeroot, and wireweed. As with other species that occupy scrub habitat in Florida, these are some of the most at-risk species today. With increased urbanization on the ridges within the Study Area expected to occur under the No Action Alternative, these plant species that are not already on protected lands are at additional risk of extirpation.

Selected State Threatened and Endangered Species

The Study Area includes 143 state listed species and 23 state Species of Special Concern (Appendix E). We identified a few of the more at-risk species to discuss here. For the other species, the No Action Alternative would provide no benefits, but has a good potential to cause similar adverse effects.

Florida Black Bear

Today, black bears occupy 18 percent of their historic range in Florida. Under the No Action Alternative, the continued fragmentation and decline in forested habitats could reduce the population even more. The increase in urbanization would increase the risk of road mortality and the general increase in human presence in potential bear habitat would reduce bear use in those areas even if the habitat is otherwise suitable. As this species declines in abundance and distribution, it may warrant federal protection under the Endangered Species Act.

Sherman's Fox Squirrel

Under the No Action Alternative, we would expect additional losses of the Sherman's fox squirrel habitat [sandhills, high pine (dry, longleaf pine savanna), pine flatwoods, pastures, and other open, ruderal habitats with scattered pines and oaks]. If the overall abundance of oak trees decreases with the No Action Alternative, these squirrels would lose some of their important seasonal food and nesting materials.

Bald Eagle

The existing nesting and open-water foraging habitat within the Study Area is of regional importance to the bald eagle. Under the No Action Alternative, we'd expect that some of these nesting areas could remain (being conspicuous and protected by law); however, we also expect a deterioration of the quality of the foraging habitat as more pressure is placed on fish populations from hydrologic or water quality changes and possibly an increase in human fishing pressure (associated with an increased human population). There is also the possibility that eagles would be more at risk of being shot despite being protected.

Sandhill Crane

Under the No Action Alternative, we would expect additional habitat losses for the sandhill crane (i.e., losses in wetland quality and quantity, and conversion of pasture and prairie habitats to residential or more intensive agricultural land uses). An increase in roads and vehicle traffic associated with increased urbanization may also increase the risk of mortality by vehicle collision as cranes forage in grassed areas along transportation routes.

Long-Legged Wading Birds

There are 13 species of "long-legged" wading birds (Order Ciconiiformes: storks, herons, egrets, ibises, and bitterns) that may occupy the Study Area. Under the No Action Alternative, we expect that these biological indicators of overall ecosystem health would decline in abundance. The anticipated hydrologic and land cover changes due to increased urbanization could reduce prey for foraging and shrubs or trees for nesting. This pattern has already occurred within the Study Area as the number of active wading bird nesting rookeries has decreased from 17 (in the 1970s) to 7 active wading bird nesting rookeries.

Nonnative Species

Beneficial Effects

The increases in water management complexity (e.g., canals, water storage basins) associated with the No Action Alternative could increase the distribution of those nonnative species that are tolerant of urbanization but also may provide some benefits (e.g., tilapia, other cichlids, and other nonnative fishes that are a component of subsistence fishing).

Adverse Effects

The urbanization that is expected to occur under the No Action Alternative could allow for the proliferation of nonnative invasive species such as Brazilian pepper, Lygodium, melaleuca, torpedo grass, Formosa termites, and fire ants. Increases in some types of agriculture could also increase the spatial extent of nonnative pasture grasses (e.g., Bahia) and associated nonnative and invasive plants (e.g., kudzu, and tropical soda apple). As nonnative and invasive species gain a greater foothold in Florida, they reduce habitat for native species and are very costly to control.

EFFECTS ON CULTURAL RESOURCES

Beneficial Effects

No positive impacts to archaeological and historic resources are expected under the No Action Alternative.

Adverse Effects

The No Action Alternative could have a negative effect on the protection of historical and archaeological resources in the Study Area. Without additional protection, cultural resources, whether listed or not, tend to be vulnerable to development, disturbance, take, and vandalism. Without the Everglades Headwaters NWR and Conservation Area, fewer lands would be managed by the Service and its partners, which have a clear responsibility for protection of cultural resources.

Landowners and developers have no similar legal responsibilities, unless one of their activities possesses a federal or state nexus (i.e., FDEP Water Quality Certificate, USACE 404 Permit, or a Service Incidental Take Permit). If a nexus did exist, it would require a landowner or developer to comply with either Section 106 of the National Historic Preservation Act or the Florida Historic Resources Act prior to the issuance of any permit. If a nexus did exist, archaeological and historic investigations, if deemed necessary by the federal agency, the Florida Division of Historic Resources, and the tribes, would be limited to the project area in question. The activity could proceed provided that the landowner or developer has taken steps to avoid, minimize, or mitigate adverse impacts to historic properties identified within the specific project area. A number of landowners within the Study Area possess a strong conservative ethic. Their efforts to protect and conserve critical habitats on their holdings are often beneficial for cultural resource sites.

However, population growth, increased urbanization, and evolving land use patterns projected for the Study Area guarantees that a number of historic properties would be adversely impacted under the No Action Alternative.

EFFECT ON SOCIOECONOMIC ENVIRONMENT

Beneficial Effects

Under the No Action Alternative, development rates, tax revenues, and business revenues would remain subject to future market conditions. Any changes would be due to existing influences and market forces and would not be associated with Service activities that are part of this project.

Adverse Effects

A potential, but unsubstantiated, economic outcome of not having the Everglades Headwaters NWR and Conservation Area within the Study Area would be the loss of refuge visitor expenditures at local businesses. As detailed in Chapter II (Affected Environment), wildlife-dependent recreation can benefit local economies through direct and indirect expenditures associated with activities such as hunting, fishing, and wildlife observation. Under the No Action Alternative, opportunities for wildlife-dependent recreation are likely to become increasingly limited as unprotected lands are converted to urban use, as further detailed in the “Land Use Patterns” section above. Open space can also provide other economic benefits, in terms of cost savings provided by functioning natural systems (e.g., clean drinking water, reductions in stormwater runoff, air-pollution reduction) and reduced costs of government services. A 2010 study found that Long Island’s parks and open

space provide quantifiable economic benefits worth over $2.74 billion a year (The Trust for Public Land 2010). It must be noted that the agricultural lands were included in the analysis, and had a combined estimated worth of $288 million annually, slightly more than 10 percent of the total cost benefit. Parks and open spaces were found to reduce the cost of government services, such as schools, police, roads, and other public services associated with residential development. It was concluded that with property tax revenues and expenditures for services taken into account, residential development was more costly to local governments than parks and open spaces (The Trust for Public Land 2010). Further, under Alternative A, for landowners in the area, the potential continues for trespass from adjacent private lands and from negative impacts of adjacent land use activities (e.g., biofuel operations).

B. ALTERNATIVE B: REFUGE ONLY APPROACH

Under this alternative, the Service would acquire approximately 50,000 acres of habitat as part of the Everglades Headwaters NWR. The Conservation Area would not be a component of this alternative. The land protection priorities and methods of acquisition are summarized in Appendix C. Although beneficial positive impacts are expected from implementation of this alternative, they are anticipated to be minor (e.g., given the small size of the project in relation to the Study Area). No significant impacts are anticipated from implementation of this alternative.

EFFECTS ON THE PHYSICAL ENVIRONMENT

Land Use Patterns

Beneficial Effects

Under Alternative B, the total area of protected lands used for habitat and wildlife conservation and compatible wildlife-dependent recreation would increase in the Study Area. As further detailed in the “Land Use Patterns” section under the No Action Alternative, natural areas would continue to be lost due to increased population growth, demand for biofuels, and mineral extraction. Currently, approximately 1,409,190 acres (77 percent) of the land in the Study Area are unprotected. A substantial portion, approximately 374,383 acres of these unprotected lands, have already been altered for intensive agriculture (263,475 acres), urban use (96,605 acres), transportation/utility corridors (8,194 acres), and mining/spoil sites (6,109 acres). In addition, the Study Area contains approximately 14,262 acres of open water in the form of lakes, rivers, canals, and stormwater retention ponds. Hence, this leaves about 1,020,546 acres (72 percent) of lands in the Study Area that would potentially be useful as conservation lands deserving protection. It must be noted that lands currently not substantially altered for urban, transportation, or agricultural uses include areas of unknown size that have been degraded by past uses or are fragments isolated from larger contiguous protected lands. Realistically, this means that there is actually less than 1,020,546 acres that would warrant protection. Given the projected land use changes predicted over the next 50 years, which are further detailed under the No Action Alternative, many natural lands in the Study Area are at risk of being converted to urban and other uses largely incompatible with wildlife conservation (Zwick and Carr 2006). This alternative would protect, in perpetuity, up to 50,000 acres (less than 5 percent) of currently unprotected natural areas in the Study Area (Figure 7).

Adverse Effects

A potential adverse effect under Alternative B is the loss of land (50,000 acres) available for agriculture, urban development, and other non-conservation uses. This is believed to constitute a minor impact, as the refuge lands comprise a relatively small percentage of the total area available (5.4 percent of the area available and less than 3 percent of the Study Area).

Climate Change

Beneficial Effects

Under this alternative, approximately 50,000 acres of refuge lands would continue to act as carbon sinks, resulting in a positive impact with regard to climate change. As further detailed in the "Climate Change" section under the No Action Alternative, many natural areas have the ability to store carbon (live and dead vegetation and soil). Habitats differ in their ability to store carbon, depending on the amount of vegetation they support and other factors. Some habitats such as certain wetlands, although they store carbon, also produce methane (Bridgham et al. 2007), which is a powerful greenhouse gas (NOAA 2011). Estimates of various carbon densities for each habitat that would be included in the refuge were not obtained for this Final EA. However, it is believed that the refuge lands would provide a net reduction in greenhouse gases, even with potential sources (see discussion of Adverse Effects below) of these gases taken into account. Overall, this benefit would be minor due to the comparatively small size of the refuge relative to all lands in the Study Area and nationally.

Adverse Effects

Under this alternative, refuge operations and facilities, public visitation, and habitat management would contribute greenhouse gases to the atmosphere.

The amount of carbon that would potentially be released through refuge operations (e.g., combustion engines and electrical equipment use) was not estimated for this Final EA. However, the Everglades Headwaters NWR would aim to minimize its carbon emissions. As the Refuge System works to implement many of the strategies for achieving Service-wide carbon neutrality by 2020 (Service 2011a: Strategic Plan for Climate Change), refuge energy use is expected to decline. These actions would include use of hybrid vehicles, building energy efficient facilities, video-conferencing, and green purchasing. These strategies, combined with those of other Service offices and the Federal Government in general, would likely result in a beneficial reduction in the rate of greenhouse gas emissions nationally.

Refuge visitation would be associated with a number of vehicles on the refuge. The low rate of speed necessitated would minimize emissions. In addition, the number of vehicles on the refuge at any given time would not be expected to create a significant impact to greenhouse gas emissions.

Prescribed burning would be a valuable habitat management tool within several habitats of the refuge. The primary gases released during prescribed fire include CO_2, CO, and water vapor, with other gases present in trace amounts (EPA 2011). Most of these are greenhouse gases. However, it has been shown that prescribed fires can decrease the risk of wildfires, which typically release greater amounts of greenhouse gases (National Science Foundation 2010). Wildfires tend to burn entire habitats, including mature trees, whereas prescribed fires are aimed at reducing groundcover and low-growing shrubs. The amount of greenhouse gases contributed to the atmosphere as a result of prescribed fires on the refuge is expected to be minor.

Topography

Beneficial Effects

Under this alternative, mining would not be permitted within the 50,000-acre Everglades Headwaters NWR, and the topography would be protected from mining and other activities that could substantially alter the landscape. As discussed under the "Topography" section under the No Action Alternative, current mining operations are changing the topography at selected sites within the Study Area. Given the future demand for sand and other mineral resources, additional areas would likely be targeted for these activities. We expect this to be a minor benefit, as the 50,000-acre Everglades Headwaters NWR would be relatively small compared to the overall Study Area.

Adverse Effects

No construction activities would occur that would affect the topography. Any possible new construction (i.e., visitor center, refuge offices) is not expected to result in adverse impacts to this resource.

Hydrology and Water Quantity

Beneficial Effects

This alternative is expected to result in positive impacts to the hydrology and water quantity of the area. Lands in the 50,000-acre Everglades Headwaters NWR would be protected from the construction of extensive drainage ditches, roads, and large areas of impervious surfaces associated with development that would otherwise alter the hydrology. See the "Hydrology and Water Quantity" section under the No Action Alternative for a discussion on the impacts of various structures on water flow and quantity. The benefit is expected to be minor, as the 50,000 acres constitute a relatively small proportion of the Study Area.

Although Service needs for water are unknown, the state and water management district cannot commit to meeting future water quality, quantity, timing, or distribution needs of the Everglades Headwaters NWR, but would collaborate with the refuge, other agencies, and private landowners to work toward strategies supported by all stakeholders.

Adverse Effects

Under this alternative, there would be some impacts to hydrology and water quantity resulting from construction projects on the Everglades Headwaters NWR. Infrastructure such as visitor and office facilities, paved areas, and landscaped areas would alter, to some degree, the local hydrology and amount of water available to down-stream areas. Specific site plans for public use building(s) and refuge offices have not yet been developed, so the amounts of impervious surfaces are unknown at this time. However, impervious surfaces, such as roads, sidewalks, and buildings, reduce the area available for rainwater to percolate into the soil. This generally has two direct consequences when it rains: there is less water available for recharging the local surficial aquifer, while at the same time the amount of runoff that flows into low-lying area increases. Stormwater management systems would help mitigate many of the impacts associated with impervious surfaces. However, extreme rainfall events (such as those associated with tropical systems) would likely exceed the capacity of most stormwater systems, and some runoff would be transported offsite. Although additional environmental studies

would likely be conducted in association with any future construction, it is not believed that there would be significant impacts to the hydrology or water quantity. Overall, the negative effects on hydrology and water quantity are believed to be minor under this alternative.

Geology

Beneficial Effects

As discussed under the "Topography" section above, mining operations would likely continue in the Study Area. These activities would not be permitted on the 50,000-acre Everglades Headwaters NWR, offering protection to a relatively small percentage of the total Study Area. Hence, a minor benefit to geology is expected under this alternative.

Adverse Effects

Any construction projects anticipated would not be expected to result in impacts to the geology of the area. No negative impacts to this resource are projected under Alternative B.

Soils

Beneficial Effects

Soils within the Everglades Headwaters NWR would be protected from disturbance and degradation associated with agriculture and development (see "Soils" section under the No Action Alternative for a more detailed discussion on how these land use activities could affect soils). Relative to the 1.8 million-acre study area, the protection offered by a 50,000 acre refuge would constitute a minor benefit to soils.

Adverse Effects

Within the Everglades Headwaters NWR, some soils would be disturbed due to the construction of several buildings, parking lots, and other infrastructure needed to support refuge visitors and operations. Natural soil-formation processes would no longer occur in areas covered by impervious surfaces (e.g., roads, parking lots, and buildings). Soil compaction is also expected at sites where construction occurs. Best management practices would be used to minimize these impacts. Additional environmental analyses would be conducted in association with any substantial (e.g., roads, parking lots, and buildings) construction projects, per Service policy. Although the exact acreage needed for any new refuge infrastructure is unknown at this point, it is believed it would be a small percentage of the total refuge area. The negative impacts to soils resulting from this alternative are expected to be minor.

Air Quality

Beneficial Effects

A positive effect on air quality is anticipated as a result of this alternative. With the establishment of the Everglades Headwaters NWR, sources of air pollution resulting from agricultural operations and urbanization would be halted within 50,000 acres. This benefit is expected to be minimal, given that the refuge would cover a relatively small percentage (less than 3 percent) of the total Study Area.

Adverse Effects

Under this alternative, refuge operations and facilities, public visitation, and habitat management would contribute some pollutants to the atmosphere, affecting air quality.

Some air pollutants would be released through refuge operations (e.g., combustion engines and electrical equipment use). However, the Everglades Headwaters NWR would aim to minimize its emissions from vehicles as well as the indirect emissions associated with electrical energy use. As the Refuge System works to implement many of the strategies for achieving Service-wide carbon neutrality by 2020 (Service 2011a: Strategic Plan for Climate Change), refuge energy use is expected to decline. These actions would include use of hybrid vehicles, building energy efficient facilities, video-conferencing, and green purchasing. These strategies, combined with those of other Service offices and the Federal Government in general, would likely result in a beneficial reduction air pollutants.

Refuge visitation would be associated with a number of vehicles on the refuge. The low rate of speed necessitated would minimize emissions of air pollutants. In addition, the number of vehicles on the refuge at any given time would not be expected to create a significant impact to air quality.

Prescribed burning would be a valuable habitat management tool within several habitats. Prescribed fires release several air pollutants, including CO and particulate matter. The Everglades Headwaters NWR would work with its partners to reduce smoke-related issues in adjacent areas that result from prescription fires. The risk of wildfires would be minimized through a fire management program. One positive consequence of prescribed fire is the reduction in the frequency and intensity of wildfires, which tend to release larger amounts of air pollutants (National Science Foundation 2010).

Overall, the negative consequences to air quality associated with this alternative are expected to be minor.

Water Quality

Beneficial Effects

The water quality found within the Study Area is generally felt to be sufficient to achieve refuge objectives and this alternative is expected to result in benefits to water quality in the Study Area. The Everglades Headwaters NWR would protect 50,000 acres from future agricultural operations and urbanization. These land uses are associated with declines in water quality, as further detailed in the “Water Quality” section under the No Action Alternative. Conservation lands, such as the refuge, tend to improve water quality downstream as plants absorb some of the nitrogen and phosphorus. These nutrients, particularly in south Florida, are largely responsible for declines in water quality as a result of eutrophication and associated harmful algal blooms, which are further discussed in the section on “Water Quality” under the No Action Alternative. The impacts to water quality are expected to be minor, given that the Everglades Headwaters NWR would comprise a relatively small portion of the Study Area.

Adverse Effects

Under Alternative B, there may be some impacts to water quality resulting from new construction, refuge operations, and visitor use. If impairments are noted, the Service would participate in reduction strategies identified through the State’s Total Maximum Daily Load and Basin Management Action Plan process.

The construction of office and visitor-use buildings, parking areas, trails, and other facilities and infrastructure needed for operations and public use programs would cause some vegetation clearing, soil disturbance, and associated runoff. Best management practices would be used to minimize these effects. Runoff from roads and parking lots would cause some oils, grease, and other materials from vehicles to leach into soils or be carried as runoff into low-lying areas. Stormwater retention/detention ponds would help mitigate most of the water quality impacts associated with runoff.

Prescribed fires and clearing of nonnative plants would cause some vegetation to be removed, leaving soils exposed to runoff and erosion. In general, it is expected that runoff would be buffered by vegetated areas and would likely not contaminate waterbodies. If nonnative plant removal operations were to occur in riparian zones, best management practices would help ensure that impacts to water quality were kept to a minimum. Use of approved herbicides for controlling nonnative plants could cause some of these chemicals to leach into the groundwater or make their way into surface waters. Adherence to product usage guidelines and Service requirements would keep any of these adverse effects to water quality at a minimum.

Public use would include hunting, with some associated trampling of vegetation. This is expected to be a minimal impact, given that hunter densities would likely be sufficiently low to reduce the chances of foot paths from becoming established. Erosion associated with wildlife watching would be minimized by limiting these activities to trails, and possibly, overlooks and observation towers. For anglers, some improved access (e.g., boardwalks and docks) to fishing areas would likely be constructed, minimizing erosion to shorelines.

In general, it is believed that any negative consequences to water quality would be minor.

Noise

Beneficial Effects

The soundscape of the refuge areas would benefit under this alternative. Sources of noise from farm machinery, heavy traffic, and industrial operations would not occur within the refuge boundary, providing minor benefits to this resource.

Adverse Effects

Some noise would be associated with use of vehicles by refuge staff and the visiting public on the refuge. Because high levels of speed would not be permitted, associated noise levels would be kept to a minimum. Hunting would cause some noise disturbance, but the frequency and duration would be at levels that would keep it at minimal levels. Overall, it is expected that the Everglades Headwaters NWR would have a minor negative impact on this resource.

Visual Resources

Beneficial Effects

Establishment of the Everglades Headwaters NWR would maintain the visual characteristics (esthetics) of the 50,000 acres largely rural in nature. No communication towers, multi-story buildings, high-power electrical transmission corridors, or other tall structures would be built. Much of the landscape has already been altered in terms of this resource and because the refuge is comparatively small with respect to the Study Area, it is anticipated that there would be a minor positive effect on esthetics.

Adverse Effects

Buildings and public use infrastructure (e.g., observation towers) would be constructed to minimize their visual impact on the landscape. No adverse impacts are expected to this resource.

EFFECTS ON THE BIOLOGICAL ENVIRONMENT

Habitats

Introduction

With implementation of Alternative B, the upper Everglades watershed would become a more connected and functional conservation landscape that may allow habitats and species to shift in response to climate and human demographic change. A modest addition to the conservation landscape is proposed, thus building limited linkages to the fragmented landscape of this area which currently limits habitat use, migration, and dispersal of a variety of species. Under Alternative B, the existing and projected loss or fragmentation of habitats would still be problematic at the broader landscape level; however, Alternative B would alleviate some localized habitat loss and therefore, increase the opportunity for many species to persist in the Study Area.

Alternative B would protect or conserve up to approximately 50,000 acres and serve to support the fish and wildlife resources on other protected and non-protected lands. These wildlife resources include migratory birds, federal and state listed species, state designated species of conservation concern, and native wildlife diversity. Appendix E outlines at-risk species, including federal and state listed species.

Focusing on restoring or mimicking natural hydrologic processes, Alternative B would contribute to water quality, water quantity, and water storage capacity of the upper Everglades watershed to support Everglades restoration goals and objectives and water supply needs for south Florida. One way that this would be accomplished would be through wetland restoration. Using GIS, we calculated the acreage of former hydric soils (from the NRCS's Soil Survey Geographic Database) that are currently not functioning as wetlands (based on the FNAI land cover classification). Within Alternative B lands, there are 10,137 acres of non-functioning, potentially restorable wetland soils. See Table 21 for the amount of potentially restorable hydric soils in each Unit. There is an additional acreage of wetlands that are partially functioning on Alternative B lands and we would enhance these to increase their function.

Alternative B would also provide opportunities for hunting, fishing, wildlife observation, wildlife photography, and environmental education and interpretation, while increasing knowledge of and support for conservation of the important grassland and savanna landscape of the headwaters of the Everglades.

Table 21. Acres of degraded, potentially restorable wetland soils in Alternative B

Planning Unit	Acres
Prairie Central	5846.4
Prairie South	1968.2
Ridge North	2170.3
Total	**9,984.9**

Beneficial Effects

Under Alternative B, we expect minor benefits to native and natural habitats, given the small size of the refuge compared to the Study Area. Up to 50,000 acres would be protected or conserved; Table 22 identifies the percentages of various land covers (or ecosystems) that comprise Alternative B. Under Alternative B, we also anticipate that up to 10,137 acres of former hydric soils that are currently degraded wetlands could also be restored. (Note: Although we refer to Alternative B as encompassing up to approximately 50,000 acres, the analysis conducted using GIS software indicated that the total acreage is approximately 50,396 acres.)

Table 22. Percentage of land cover types in Alternative B

Land Cover Type	Percent of Alternative B
Improved, Unimproved, and Woodland Pasture	39.31
Wet Prairie and Freshwater Marsh	20.59
Dry prairie	14.29
Scrubby, Mesic, and Hydric Pine Flatwoods	11.83
Freshwater Forested Wetlands	5.65
Intensive Agriculture	4.10
Mesic Temperate Hammock	2.13
High Pine, Florida Scrub, and Sandhill	1.79
Urban	0.16
Open Water	0.13
Shrub and Brushland	0.03
Total	100.00

Approximately 39 percent of Alternative B is improved, unimproved, and woodland pastures. At first glance, it may seem curious as to how pasture habitat came to comprise the largest percentage of land covers in Alternative B, especially considering that it was ranked as a lower priority than native habitats. This happened because: (1) Pasture habitat is widespread across the Study Area landscape; (2) we combined three different pasture types, some of which provide a higher level of ecological quality; and (3) pasture was interspersed with the higher quality land covers such as dry prairie, wetlands, and pine flatwoods. Therefore, the GIS neighborhood analysis and the subsequent selection of breakpoints for the different model classes captured some of those pasture acres even

though we did not particularly target pasture habitat. However, from a restoration perspective, pasture would be much easier to restore to dry prairie or herbaceous wetlands than other more intensive forms of agriculture (row crops or citrus).

Although these pastures vary in appearances, they generally are low herbaceous systems (e.g., Bahia grass) usually with scattered to moderate numbers of cabbage palms, oaks, and saw palmettos, and in the case of woodland pasture, larger clumps of woody vegetation species interspersed amongst the grassland. The degree of ditching varies and as a result, the amount of functioning wetland acreage per pasture type also varies. However, all of these pasture types have a high degree of potential for being restored to native grassland and herbaceous wetland ecosystems with initiation of restoration activities within 2 to 5 years of acquisition. Therefore, with implementation of Alternative B, we expect that these 15,070 acres of pasture on the Prairie Central and South Units would be largely restored to a dry prairie and herbaceous wetland mosaic (similar to pre-development conditions). Depending on the quality of the habitat, pastures support federally listed species such as crested caracara, Florida grasshopper sparrow, wood stork, eastern indigo snake, and Florida ziziphus (if the proper soil is present). State listed species such as sandhill crane, gopher tortoise, and Sherman's fox squirrel also use pasture. If the pasture connects forested areas, it may also be used as a movement corridor by the state listed Florida black bear. During the rainy season, pastures that become inundated may provide habitat for ducks and wading birds, or allow aquatic and semi-aquatic species to move across the landscape. There are also many migratory birds that are pasture inhabitants (e.g., meadowlark, bobwhite quail, turkey, loggerhead shrike, barn owl, and sparrow and other passerine bird species).

Approximately 10,375 acres (21 percent) of Alternative B are herbaceous wetlands. This includes wet prairie, freshwater marsh, slough, and isolated and depression marshes. Many of these wetlands can be categorized based on vegetation type (as is the case with sawgrass or cattail marsh) or hydroperiod (i.e., short versus long). Short hydroperiod wetlands (e.g., wet prairie and isolated or depression marshes) are important for wading bird foraging because they are shallower (and therefore accessible) at times of the year when the long hydroperiod marshes (freshwater marsh and slough) are too deep. Short-hydroperiod wetlands, especially in the Kissimmee Prairie area (i.e., Prairie Central and South Units) are also critical for amphibian reproduction because there are fewer predators (e.g., fish, alligators). Both short- and long-hydroperiod wetlands in the Study Area provide forage for the federally listed wood stork, crested caracara, Everglade snail kite, and the candidate species, the Florida bonneted bat. State listed plants that may occupy these wetlands include Florida loosestrife, celestial lily, yellow fringeless orchid, cutthroat grass, Arcadian St. John's wort, giant airplant, and spoonleaf sundew. Under Alternative B, these areas would be protected and up to an additional 10,137 acres of drained wetlands could be restored.

Approximately 7,200 acres (14 percent) of Alternative B are dry prairie. This rare native ecosystem is greatly in decline throughout central Florida and this project represents the best near-term opportunity to protect, conserve, or restore this habitat type for one of the most imperiled species in Florida – the Florida grasshopper sparrow. Dry prairie is an herbaceous community, but has taller vegetative cover than pastures. Dry prairie also has open bare sand patches and much more vegetative species diversity than pasture habitat. The crested caracara, Florida panther, whooping crane, and eastern indigo snake could also occupy dry prairie. State listed inhabitants of dry prairie may include the gopher frog, burrowing owl, southeastern American kestrel, gopher tortoise, Florida black bear, Florida sandhill crane, cutthroat grass, Catesby's lily, Florida beargrass, blueflower butterwort, yellow butterwort, giantspiral lady's tresses, and giant orchid. Under Alternative B, we expect that existing dry prairie would be protected at existing quality or restored (then protected), and we would likely increase the spatial extent on the Prairie Central and South Units from 7,200 acres to approximately 19,200 acres (assumes 80 percent conversion of all pasture to dry prairie).

Alternative B also includes 5,959 acres (12 percent) of pine flatwoods. These include hydric, mesic, and scrubby flatwoods; although the majority (91 percent) is classified as mesic flatwoods in Alternative B. The Prairie Central Unit accounts for 70 percent and the Ridge North Unit accounts for the remainder of the mesic flatwoods in Alternative B. There are 372 acres of scrubby flatwoods and 151 acres of hydric flatwoods in Alternative B. We could expect that some restoration of flatwoods would occur in the future if Alternative B had been selected. It is unclear at this time where those acres would be restored, or the number of acres that would be restored. It is likely that pine flatwoods were more historically present on the Ridge Units than the Prairie Units; therefore, one would expect that some portion of the existing 4,740 acres of pasture on the Ridge North and South Units of Alternative B could be restored to flatwoods (or other forested communities). Depending on the tree species, this could take several decades for restoration to be completed. Pine flatwoods are important habitats for red cockaded woodpecker, eastern indigo snake, Florida panther, Florida black bear, Sherman's fox squirrel, gopher tortoise, gopher frog, pine snake, white-tailed deer, beautiful pawpaw, scrub blazing star, Britton's beargrass, Carter's mustard, pigeon wings, among other plants and animals.

Alternative B also includes 2,850 acres (6 percent) of freshwater forested wetlands. These include swamps, mixed forest wetlands, cypress, bayhead, shrub wetlands, and tupelo wetlands. The Ridge North Unit contains 65 percent of the existing forested wetlands in Alternative B. The Prairie Central Unit contains 34 percent of Alternative B's forested wetlands. Similarly to the previous section regarding flatwoods, we would expect some restoration of forested wetlands under Alternative B, but it is difficult to predict either where, or how many, acres would be restored. We believe that some potential restorable habitat would be available on most parcels acquired, but it would likely be at a lesser spatial extent than for previously mentioned ecosystems. Forested wetlands are important for the wood stork, Florida panther, Everglade snail kite, swallowtail kite, bald eagle, Sherman's fox squirrel, cutthroat grass, Chapman's sedge, yellow anise, Florida loosestrife, celestial lily, eared spleenwort, plumed rockcap fern, and many other plants and animals.

Alternative B also includes 2,065 acres (4 percent) of intensive agriculture. This is in the form of field crops (1,366 acres) and citrus (698 acres) on the Prairie Central Unit. We would expect that these areas would be restored to native wetland and upland habitats, although this process could take longer due to the higher degree of alteration (when compared to pastures). There may also be copper contamination in the soils of citrus groves or other chemical contamination (pesticides) on field crops; this may hamper restoration of these areas.

Alternative B also includes 1,076 acres (2.1 percent) of mesic temperate hammock, which occurs mostly (91 percent; 980 acres) on the Prairie Central and South Units. Approximately 75 acres (7 percent) were classified as "mixed hardwood-coniferous" on the Ridge North Unit. Under Alternative B, these areas would be protected and restored if needed. Because this ecosystem is present at a lesser spatial extent than other native communities, it is unlikely to provide a large suite of benefits with Alternative B; however, it could still be used by Florida panther, Sherman's fox squirrel, eastern indigo snake, bald eagle, Florida black bear, Florida milkvine, giant airplant, giant orchid, gingerbush, Craighead's noddingcaps, yellow anise, and other species.

Alternative B also includes 901 acres (1.8 percent) of Florida scrub. Some of this (20 acres) is classified as "xeric hammock." It is not surprising that such a small amount of scrub habitat is included in Alternative B, because there is so little scrub left in Florida compared to pre-development conditions, or other available habitats. According to our analysis, approximately half of the 50,000 acres of scrub habitat in the Study Area is protected. The remainder is at risk, but not necessarily available for acquisition. Florida scrub is one of the most important ecosystems to protect due to its high degree of endemic species and its position on the landscape that increases its risk of destruction by development. The sandy soils typical of this habitat also allow rainfall to recharge the groundwater

system. Subsequent discharge from these habitats gives rise to cutthroat seepage wetlands. Cutthroat grass communities are even rarer than scrub in Florida, but 99.7 percent of the 11,060 cutthroat acres within the Study Area are already protected. The species found on Florida scrub and sandhill habitats include many of the same species found on mesic temperate hammocks, but also includes Florida scrub-jay, sand skink, blue-tailed mole skink, short-tailed snake, Florida ziziphus, and 20 other species of federally threatened or endangered plants.

Alternative B also includes lesser amounts of urban , open water, and shrub and brushland (159 acres combined). Many of the urban areas were classified as “rural open” and therefore, may be restorable to native habitats. Other urban areas (buildings, commercial) may provide some benefits as maintenance or administrative service structures for the refuge. Open water habitats would likely remain as is if they are natural (32 acres) or may be modified if not (26 acres). The shrub and brushland areas (12 acres) would probably be restored to fit the restoration view for the adjacent areas. This category seems to be a catch-all for more or less indescribable habitats.

Beneficial Connectivity

Alternative B does provide some connectivity and creates larger patches of habitat. For example, the Prairie Central (33,046 acres) and Prairie South (7,995 acres) Units connect to Kissimmee Prairie Preserve State Park (53,786 acres) to provide a 94,827-acre block of habitat. This should benefit those species which need more habitats to increase their overall population size (e.g., Florida grasshopper sparrow, caracara, and burrowing owl). In the case of the sparrow, it may be an important piece for the recovery, or at least delay the extinction, of that species. Similarly, much of the Ridge North Unit (9,509 acres) provides connectivity from the Kissimmee State Park through the Allen David Broussard Catfish Creek Preserve State Park to Disney Wilderness Preserve and the Upper Lakes Basin Waters. These large blocks of contiguous habitat would make it easier for animals to move across the landscape and would alleviate some impacts associated with urbanization and climate change. The shore of Lake Hatchineha would be mostly protected and, as such, those riparian and aquatic resources would be better protected.

Water Quality, Quantity, and Storage Benefits

By adding 50,000 acres of conservation lands to this landscape, the Service would support the Everglades restoration goals and objectives of improved water quality, quantity, and storage capacity of the upper Everglades watershed to assist meeting water supply needs of south Florida. Compared to the No Action Alternative, Alternative B would provide increased opportunities to restore wetlands within the upper Everglades watershed. Increased storage capacity, groundwater recharge, and water quality benefits would be localized within certain sub-watersheds where the lands would be acquired and restored. It is estimated that up to approximately 10,137 acres of wetlands could be restored under Alternative B. Furthermore, an additional acreage of existing wetlands could be enhanced.

The human dimensions of and impacts to the landscape surrounding the headwaters of the Everglades includes the large urban populations of the Tampa/St. Petersburg area and the metro Orlando area and would not change from that described in Alternative A. The agricultural and rural lands in this landscape are ecologically healthy, but are impacted by wetland drainage to accommodate agricultural uses. The major water quality problems within the Study Area are elevated nutrients, low dissolved oxygen (DO), and mercury in fish (FDEP 2006b) would remain constant in this alternative. Some shallow surface ditches and channelized streams located on the lands identified in Alternative B would be restored, leading to improved water quality and storage capacity. However, with approximately 371,692 acres of drained wetlands within the Study Area and only 10,137 acres contained within Alternative B, the opportunity to improve the water quality and quantity

would be limited. For example, if the maximum average depth across these restored wetlands was 12 inches, then the restored wetlands could store approximately 10,000 acre-feet of water. This amount of water, if it were in Lake Okeechobee, would translate to less than one-quarter of an inch of lake elevation. Increased water flows to the main Kissimmee River corridor during periods of heavy rainfall, and decreased flows during periods of drought would be moderated under this alternative. Additionally, excess nutrients would have greater opportunity to be absorbed by restored wetland and upland vegetation, reducing the nitrogen and phosphorus loading of the watershed to downstream water bodies (although it is difficult at this time to quantify this benefit due to the variability of factors such as site-specific hydrologic characteristics and legacy phosphorus in the soil).

Adverse Effects

Based on the information presented in the Florida 2060 Report, we anticipate that existing native and natural habitats would still be lost to residential and agricultural development under Alternative B. This would fragment remaining natural lands and waters. However, we expect that the distribution of these impacts might change if Alternative B were implemented. For example, Alternative B would protect up to 50,000 acres from further agricultural or residential development, but it may also attract development to its periphery. A frequent real estate selling point is the ability to own land where there are fewer neighbors and some people may desire to live adjacent to a refuge or other protected natural area. This could entice residential development around the Alternative B Units on lands not already protected. In this event, the periphery of these Units could be affected by adjacent landowners (human disturbance) and wildlife connectivity could be reduced. In the interim, the price for these adjacent lots may also increase due to their anticipated desirability. That increase in cost may make it more difficult for the Service or other conservation agencies or entities to buy additional lands or easements in those areas.

Wildlife

Beneficial Effects

Non-listed Species

There are roughly 370 non-listed fish, amphibian, reptile, bird, and mammal species potentially present in the Study Area. Many of the approximately 30 bird species are winter migrants and, as such, may only be present in the Study Area for a few weeks or months of the year. These species require a good forage base during their migrations, so it is important that the Study Area provide those resources as well as sheltering habitat. The other vertebrate species present in the Study Area are considered resident species (present throughout the year), and add to the functionality of the landscape mosaic. Terrestrial and aquatic arthropods (insects, snails, crustacean, etc.) are also abundant in the Study Area. According to the Comprehensive Conservation Plan and Environmental Assessment for the Lake Wales Ridge National Wildlife Refuge (Service 2010), there are over 60 species of ants, 70 species of bees, 45 species of spiders, and 120 species of beetles occurring on the ridge. We do not have arthropod species counts for non-ridge habitats in the Study Area, but suffice it to say it is likely to be in the hundreds to thousands. Under Alternative B, the largest benefit would be to those species that occupy primarily grasslands, prairie, wetlands, or pine flatwoods.

Game Species

A wide variety of game species can be found throughout the Study Area. Bobwhite quail, wild turkey, white-tailed deer, grey squirrels, and rabbits occur in abundance, providing ample hunting and wildlife observation opportunities. Blue-winged teal and mottled duck are the two most commonly observed

waterfowl species, with many other species of waterfowl noted throughout the winter period. The wild hog, although a nonnative and nuisance species, is also considered a game species and can be found in overabundance in many areas throughout Florida. All of these species would be expected to use the refuge under Alternative B.

Federally Threatened, Endangered, and Candidate Species

Beneficial Effects

Birds

Audubon's Crested Caracara

With Alternative B, there would be approximately 37,398 acres of caracara habitat protected. This includes pastures, dry prairie, herbaceous wetlands, and shrub and brushland. Using 3,000 acres as an average territory size, these contiguous habitats under Alternative B could support up to 12 caracara home ranges. (Note: One assumption could be that these home ranges already exist. In that case, Alternative B would protect these existing territories). If the habitat quality is optimal (either now or after restoration of uplands and wetlands), then Alternative B could possibly support more caracara home ranges.

Everglade Snail Kite

Alternative B would protect approximately 10,000 acres of Everglade snail kite foraging habitat (long hydroperiod wetlands and open water), and possibly a greater amount created as wetlands are restored under Alternative B. Everglade snail kites nest in the Kissimmee Chain of Lakes, and therefore, if foraging or nesting habitat were available to them on the Ridge North Unit, one could assume that they would use it. Historically, the Prairie Central and Prairie South Units were probably too dry to support any Everglade snail kite reproduction; however, with additional wetland restoration on these units, and the push to store more water during the wet season, it is conceivable that this species could forage and possibly nest on these units in the future.

Florida Grasshopper Sparrow

With Alternative B, there would be up to approximately 22,584 acres of habitat protected for the Florida grasshopper sparrow. Some of this would come from the protection of 7,200 acres of dry prairie habitat; the remainder from the protection and restoration of pasture and wet prairie habitat on the Prairie Central and Prairie South Units. We do believe that the proximity of the Prairie Units to the existing Florida grasshopper sparrows on the Kissimmee Prairie Preserve State Park would be a major factor in the success of establishing a breeding population on Alternative B lands. However, because we do not have a good population viability model for this species, or even know what their minimum habitat requirements are, it is difficult to predict how many Florida grasshopper sparrows could be supported by Alternative B. Alternative B represents roughly a 15 percent increase in potential Florida grasshopper sparrow habitat, if you consider that the three main existing populations occupy approximately 155,000 acres (on Three Lakes Wildlife Management Area, Kissimmee Prairie Preserve State Park, and Avon Park AFR). The quality of the management of the potential additional lands would also dictate the abundance of this species supported by Alternative B.

Florida Scrub-Jay

In the Study Area, the Florida scrub-jay may occupy Florida scrub and scrubby flatwoods. Under Alternative B, there would be approximately 575 acres of habitat protected for the Florida scrub-jay on the Ridge North Unit. A portion of this (approximately 350 acres) is already designated as the Hatchineha Conservation Bank for Florida scrub-jays and skinks. On the Ridge South Unit there are 300 acres of pasture that are underlain by muck and fine sand soils; therefore, they would probably not be successfully converted to scrub habitat. Using a minimum patch size of 5 hectares (12.3 acres) of habitat per Florida scrub-jay family, Alternative B could support up to 46 existing or future Florida scrub-jay families on the Ridge North Unit (assuming habitat is mostly contiguous and of high quality). Using the average Florida scrub-jay territory size of approximately 25 acres (if habitat is less than optimal), this estimate could be lowered to up to 23 existing or future Florida scrub-jay families.

Red-Cockaded Woodpecker

In the Study Area, the red-cockaded woodpecker may occupy high pine (dry, longleaf pine savanna) and pine flatwoods. Under Alternative B, there would be approximately 5,959 acres of flatwoods habitat protected that could be suitable for the red-cockaded woodpecker. To our knowledge, this species does not occupy any of the lands targeted for acquisition under Alternative B, but comprehensive surveys have not been conducted. However, if pineland habitats can be restored on Alternative B parcels, then red-cockaded woodpeckers could occupy the refuge in the future (after the trees reach the necessary age/size).

Whooping Crane

It is difficult to predict the effects of Alternative B on the whooping crane. Additional releases of individuals into this experimental population have stopped due to problems with survival and reproduction. It is possible with the protection or restoration of wet and dry prairies and freshwater marshes, that Alternative B could support additional whooping cranes releases in the future.

Wood Stork

The wood stork may forage in wetlands throughout the Study Area. Under Alternative B, there would be approximately 13,290 acres of forested or herbaceous wetland habitat protected and available to the wood stork. Up to an additional 10,137 acres of wetlands could be restored; therefore, we expect the total wetland acreage available to wood storks to increase over time. We also expect that Alternative B could provide foraging habitat for the existing two wood stork rookeries and the three adjacent rookeries; however, it is difficult to predict how much forage biomass may be provided under Alternative B. That would depend on the management of the hydroperiod, control of nonnative species, and water quality conditions for forage species.

<u>Mammals</u>

Florida Bonneted Bat

Due to a general lack of ecological data, it is difficult to predict how Alternative B would affect the Florida bonneted bat. However, we know that wetland conservation and restoration would foster support as this species forages on insects over open water. We anticipate that Alternative B would protect 2,849 acres of forested wetlands, 10,375 acres of herbaceous wetlands, and 65 acres of open water (total = 13,289 acres). This species would also benefit from wetland restoration but also requires roosting areas in concert with wetlands.

Florida Panther

The Florida panther needs forested areas to persist. Alternative B would protect up to approximately 10,797 acres of forested habitat and 7,200 acres of dry prairie habitat (total = 17,997 acres) that exists today. These areas combined with the other potential Florida panther habitats outside of Alternative B lands support only a few dispersing males in the Study Area. To help this species under Alternative B, the existing 19,811 acres of pasture habitat would need to be restored to more forested habitat or at least provide more vegetative cover than it does now. And even then, a single Florida panther needs much more than 20,000 additional acres split into three units to maintain a home range. In essence, Alternative B would do very little for the Florida panther.

West Indian Manatee

Alternative B would likely do little to protect or conserve the manatee. This is mainly because the species is present 30 miles downstream of the southernmost Alternative B lands in the extreme lower Kissimmee River and Lake Okeechobee. There may be some small water quality benefits by the protection of 50,000 acres of land, but there are many other opportunities for water quality to be degraded after it leaves Alternative B lands and before it reaches waters occupied by manatees.

Reptiles

Sand Skink and Bluetail Mole Skink

Except for a few locations, we have little information about the overall abundance and population trends of the sand skink or bluetail mole skink. Christman (2005) estimated sand skink density averages (on occupied sites) for Orange and Osceola Counties to be 15.6 per 0.1-acre and for Polk and Highlands Counties to be 6.5 per 0.1-acre. Both skink species may occupy Florida scrub and high pine (dry, longleaf pine savanna) habitats in the Study Area; although occupancy is based on soil type, not vegetative cover. Alternative B would protect approximately 548 acres of scrub on the Ridge North Unit. We do not have skink densities but know that skinks are present throughout the designated 350-acre Hatchineha Conservation Bank for skinks and Florida scrub-jays. The acres of pasture habitat on the Ridge North Unit are underlain by poorly and somewhat poorly drained soils, and therefore, would likely be too wet after restoration to support either of these two skink species. It is also unlikely that any of the 300 acres of pasture on the Ridge South Unit may be restorable to skink habitat because it is underlain by muck or fine sand soils. Furthermore, we do not expect that skinks occupy scrub or sandhill soils on the Prairie South or Central Units because these units are outside their historic range.

Eastern Indigo Snake

Because the eastern indigo snake is a habitat generalist, we expect that much of the 50,000 acres of Alternative B would protect existing habitat (of various qualities) for this species. The exceptions to this would be the 698 acres of field crops, 65 acres of open water, the 82 acres of urban land cover, and some of the pasture lands with little or no herbaceous cover (hard to quantify this acreage). We expect that eastern indigo snakes would use citrus; therefore, we included those 2,065 acres as suitable habitat. With an average home range size of about 200 acres, Alternative B protects habitat for roughly 150 (if all pasture is unsuitable) to 250 eastern indigo snakes (assuming habitat, including pasture, is suitable and saturated). Of course, for that acreage that is not now suitable, it may in the future support eastern indigo snakes after restoration.

Gopher Tortoise

The gopher tortoise typically uses a variety of scrub, pine flatwoods, and dry prairie communities within the Study Area. It may also be found on canal levees and in low- or medium-density residential areas. Alternative B could protect up to approximately 21,600 acres of existing gopher tortoise habitat. There would be an additional opportunity to provide up to approximately 12,000 more acres of Gopher tortoise habitat, assuming that the improved pasture habitat could be restored or made more suitable for this species under Alternative B.

Invertebrates

Highland's Tiger Beetle

Alternative B protects approximately 548 acres of scrub habitat in the Ridge North Unit. Highland's tiger beetles currently exist on portions of this area, so Alternative B would protect and possibly improve that habitat. The acres of pasture habitat on the Ridge North Unit are underlain by poorly and somewhat poorly drained soils, and therefore, would likely be too wet after restoration to support a xeric species like the Highland's tiger beetle. The 300 acres of pasture habitat on the Ridge South Unit does not likely support the tiger beetle currently and would also probably be too wet after restoration.

Plants

Okeechobee Gourd

Alternative B is not likely to have a beneficial effect on the Okeechobee gourd. Similar to the manatee, the gourd is present at the southern end of the Study Area. Therefore, any water quality or habitat benefits from Alternative B, 30 miles away, would be diluted by other factors (e.g., hydrologic, land use, and non-point source pollution).

Beautiful Pawpaw

Based on current information, this species is not in the Study Area, but exists immediately adjacent in Orange County. It is possible that some as yet unknown populations of this plant exist in the hydric pine flatwoods in the Study Area. Absent of this, we do not believe that Alternative B would provide any immediate benefits to the beautiful pawpaw. It is possible that it may be transplanted or reseeded in current or restored hydric pine flatwoods on Alternative B lands. The current amount of hydric pine flatwoods in Alternative B is 151 acres on the North Ridge Unit. At this point, it is unclear how many acres of hydric pine flatwoods could be restored with Alternative B.

Florida Ziziphus

Ten of the fourteen extant Florida ziziphus populations are within the Study Area and are on unprotected lands. None of these locations are within Alternative B. The Florida ziziphus occupies sandhill habitat underlain by yellow sand. Alternative B is not likely to benefit the Florida ziziphus.

Scrub Plant Species

Only the Ridge North Unit of Alternative B is known to support any of the 22 federally listed scrub plants. That species is the papery whitlow-wort. It is possible that additional specimens (of these 22 species) exist, but have not yet been found on the 575 acres of scrub and scrubby flatwoods on the Ridge North Unit. It is also possible that some of these species could be transplanted or

reintroduced into existing or restored scrub soils under Alternative B. We expect that the maximum scrub acreage after restoration would still be close to the existing amount (as pasture areas are underlain by more mesic or hydric soil types).

Selected State Threatened and Endangered Species

Florida Black Bear

The Florida black bear once ranged throughout Florida and the southeast states, but now occupies only 18 percent of its historic range. Using a wide variety of habitats, the Florida black bear is known to wander widely in search of food, cover, mates, and other resources. Some bears of the Glades/Highlands sub-population live and move along the Lake Wales and other ridge systems into (or out of) the Fisheating Creek watershed. Bears were once abundant on the ridges and in the forested areas of Fisheating Creek, but the populations have declined due to habitat loss and fragmentation as they have become increasingly separated from areas like the Ocala National Forest to the north and Big Cypress National Preserve to the south where stable sub-populations of bears exist. Vehicle mortality is also a reason for bear decline in the Study Area (the most recent available data indicate that seven bears were road-killed in 2008 and 2009 along the ridge and in Fisheating Creek watershed). The Florida black bear would be expected to use the refuge under Alternative B; however, due to the placement of parcels mostly on the prairie (away from areas that bears may frequent) the connectivity benefit to bears is likely to be small.

Sherman's Fox Squirrel

This fox squirrel uses a variety of pinelands and forested swamps. Alternative B would protect up to approximately 8,000 acres of these habitat types in the Prairie Central and Ridge North Units for the Sherman's fox squirrel.

Bald Eagle

The bald eagle can forage in most any aquatic, pasture, prairie, or forested habitat. Large trees are needed for nesting, and the Study Area provides habitat for a significant number of nesting bald eagles. Alternative B would protect up to approximately 38,000 acres of potential eagle habitat, and could enhance an additional 12,000 acres of improved pasture habitat so that almost all of Alternative B could provide either potential foraging or nesting habitat for bald eagles.

Florida Sandhill Crane

The Florida sandhill crane is a non-migratory, year-round breeding resident species that uses a wide variety of wetlands, pastures, prairies, and flatwoods throughout the Study Area and would be expected to use those same habitats under Alternative B. This alternative would provide up to approximately 43,300 acres of existing habitat for this species.

Long-Legged Wading Birds

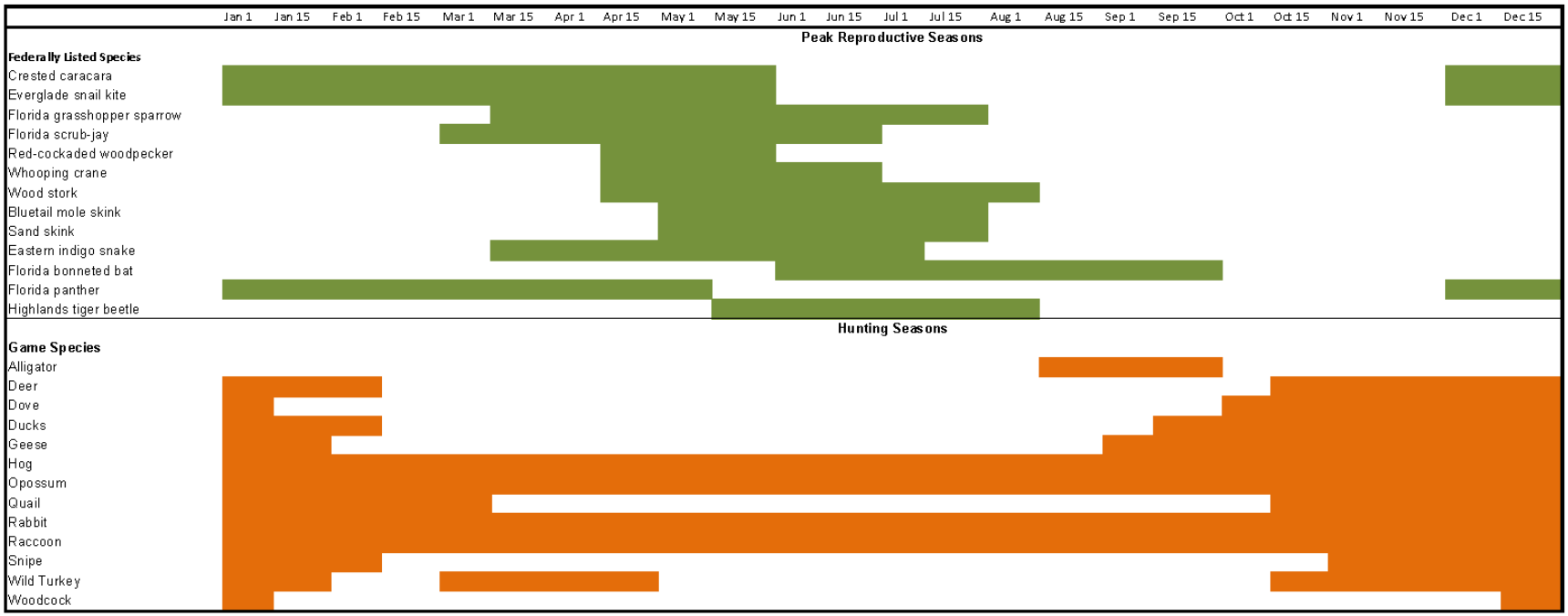
The 13 species of "long-legged" wading birds that may occupy the Study Area would undoubtedly benefit from the protection of the existing 13,225 acres of wetlands and the potential restoration of up to 10,137 acres of wetlands with Alternative B. It is unclear at this time if these wetland benefits would be great enough to restore any of the long-legged wading bird nesting rookeries that have been lost over the last 40 years.

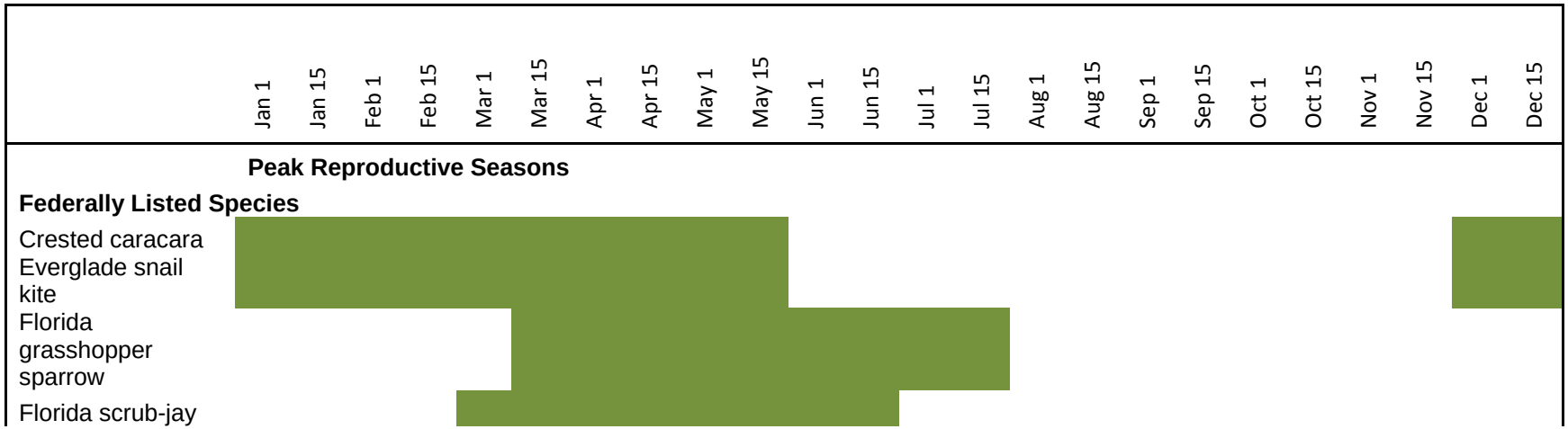
Adverse Effects

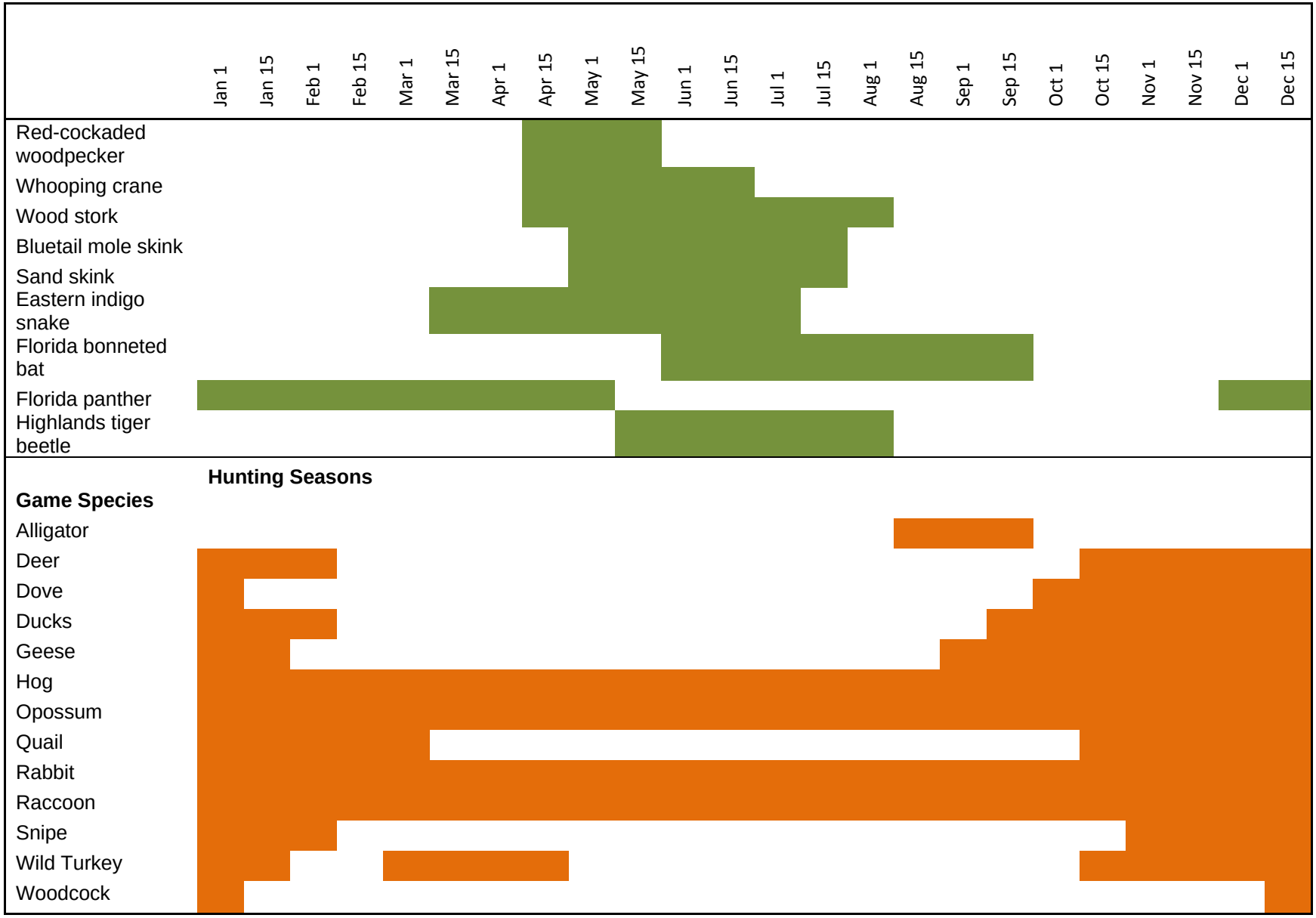
Adverse effects on listed or non-listed plants and animals associated with Alternative B are minimal. We expect that short-term adverse effects may result from habitat restoration or management activities such as prescribed fire or other fire management techniques (fire breaks, vegetation removal) especially for species such as skinks and indigo snakes. These effects could be temporary loss of habitat, or injury or mortality to a small percentage of the population. Residential development patterns could shift slightly towards refuge lands if people view it as a desirable recreational area. This could fragment adjacent unprotected habitats. Also, chemical contaminants in former agricultural soils could pose a risk to fish and wildlife, especially aquatic species during activities such as wetland restoration; however, if the properties are properly assessed and remediated, if necessary, then this risk should be mitigated or minimized. Conflicts between recreational use (hunting, or simply accessing the land) during sensitive breeding times of listed species would be an adverse effect. This could be alleviated by careful planning and timing or location of recreational activities. Table 23 identifies the time of year when federally listed species in the Study Area are in their peak reproductive season and the various game species hunting seasons. In general, the overlaps are small. This is when we would expect potential adverse effects from hunting activities disrupting reproduction. For example, the Florida grasshopper sparrow breeds from late March through July. Of the 13 game species, only the hunting seasons for feral hog, opossum, rabbit, raccoon, and wild turkey (spring season) overlap. Therefore, it would be prudent to only allow hunting for these species where and when Florida grasshopper sparrows are not nesting. The hunting of deer, alligator, dove, quail, ducks, geese, snipe, woodcock, or turkey (fall season) should not conflict with Florida grasshopper sparrow nesting. In contrast, caracara nesting is in its peak from January to March, and overlaps hunting seasons for almost all of the game species. In this case, land managers would need to be specific about where hunting can occur so that it does not disrupt caracara reproduction. Similar concerns could occur between snail kite nesting and waterfowl hunting if snail kites occupy Alternative B lands. Florida scrub-jays would likely be managed (with regards to hunting), similar to Florida grasshopper sparrows.

Table 23. Peak reproductive seasons for federally listed species in the project area and hunting seasons

Key: Peak Reproduction Seasons Hunting Seasons






Jan 1
Jan 15
Feb 1
Feb 15
Mar 1
Mar 15
Apr 1
Apr 15
May 1
May 15
Jun 1
Jun 15
Jul 1
Jul 15
Aug 1
Aug 15
Sep 1
Sep 15
Oct 1
Oct 15
Nov 1
Nov 15
Dec 1
Dec 15
Red-cockaded woodpecker
Whooping crane
Wood stork
Bluetail mole skink
Sand skink
Eastern indigo snake
Florida bonneted bat
Florida panther
Highlands tiger beetle
Hunting Seasons
Game Species
Alligator
Deer
Dove
Ducks
Geese
Hog
Opossum
Quail
Rabbit
Raccoon
Snipe
Wild Turkey
Woodcock

Nonnative Species

Beneficial Effects

We anticipate that nonnative invasive species (primarily plants but also feral hogs and nonnative fish) would be controlled on Alternative B lands. This would serve to improve the overall ecology of the Study Area by limiting further spread of these species.

Adverse Effects

Some of these nonnative species (feral hogs, tilapia and other cichlid fishes) are sport and subsistence species. The reduction of these species' abundance may represent a minor adverse effect to some people; however, it is unlikely that we would ever completely eradicate these species under either Alternative B or C, and the expectation is that we would provide improved habitat condition for native species (deer, turkey, bass, crappie, or other sunfish) that would replace these nonnative species.

EFFECTS ON CULTURAL RESOURCES

Beneficial Effects

Beneficial impacts would be anticipated from the implementation of Alternative B. The Service's acquisition of up to 50,000 acres of habitat in the greater Everglades landscape, as well as any historic properties contained therein, would place these properties under the federal historic preservation protective umbrella. The Service, like other federal agencies, has several legally mandated responsibilities that include development of a cultural resource management plan, compliance with the Section 106 of the National Historic Preservation Act prior to any undertaking that possesses the potential to impact historic properties, archaeological inventory of its lands and subsequent National Register eligibility testing, research-directed testing or excavation, site protection, and interpretation. Critical to these efforts are the Florida Division of Historical Resources, the Seminole Tribe of Florida, the Miccosukee Tribe, the Seminole Nation of Oklahoma, the Poarch Band of Creeks, and the Muscogee (Creek) Nation, and a number of interested parties, such as nearby universities, adjacent landowners, and state resource agencies. The Service would, when possible, partner with the Seminole Tribe and/or other interested Native American tribes to facilitate archaeological and ecological investigations, protection, and interpretation of sites deemed to have culturally and religiously significance for the tribe(s). Protection of historic properties would be enhanced by incorporating concepts of site stewardship and ownership, where appropriate, into public use materials and interpretive panels. This effort would be further enhanced by providing advanced archaeological resource protection training to refuge law enforcement personnel.

Adverse Effects

Negligible impacts to cultural resources could be anticipated under Alternative B. There could be some risk that refuge visitors may inadvertently or intentionally damage or disturb cultural resource sites; however, we would employ all means available to protect archaeological sites, historic structures, cemeteries, and historic landscapes through scientific investigations, public education, partnerships with tribal, state, and local governments, and law enforcement efforts.

EFFECTS ON SOCIOECONOMIC ENVIRONMENT

Beneficial Effects

Several positive effects to the area's socioeconomics are expected under this alternative. As discussed in the "Socioeconomic Resources" section under the No Action Alternative, wildlife-dependent activities would contribute to the region's economy. A segment of the visiting public would spend its money at area hotels and restaurants. Furthermore, visitors would locally buy some equipment and supplies associated with public uses such as hunting, fishing, and wildlife-watching/photography. Conservation lands have also been shown to produce economic benefits to local communities by reducing costs associated with providing clean water, stormwater management, and improving air quality (The Trust for Public Land 2010). A study of a 73-square-mile watershed conducted by the University of Illinois showed that there were substantial economic benefits associated with conservation lands. Areas down-stream of conservation lands had higher property values due to reduced flood risks. In addition, municipalities located downstream of conservation lands were able to save money on replacing or repairing culverts due to a reduced frequency and intensity of high volume events (Johnston et al. 2006). Neighboring landowners of the refuge in Alternative B would benefit from improved water quality from restoration of refuge lands and waters to native habitats and from the assurance that those refuge properties would not be developed or operated in ways that might have a negative impact to the neighboring properties. Further, as development patterns change, the potential exists for increased land values for those neighboring properties. If the Service were to buy fee-title and less-than-fee-title interests in 50,000 acres identified in Alternative B, we believe positive benefits for communities in Florida would include: increased property values, increased watershed protection, maintenance of many traditional uses, increased opportunities for public use activities, and increased revenues for local businesses from refuge visitors who participate in bird watching, hunting, fishing, and wildlife observation.

Adverse Effects

There would likely be some adverse impacts, namely a potential decline of tax revenue to local counties (as lands come under Service ownership). The Refuge Revenue Sharing Act of June 15, 1935 (16 U.S.C. 715s) offsets the loss of local tax revenues from federal land ownership through payments to local taxing authorities. The refuge provides annual payments to taxing authorities, based on the acreage and value of refuge lands located within their jurisdiction. Money for these payments comes from the sale of oil and gas leases, timber sales, grazing fees, the sale of other Refuge System resources, and from congressional appropriations, which are intended to make up the difference between the net receipts from the Refuge Revenue Sharing Fund and the total amount due to local taxing authorities. The actual Refuge Revenue Sharing payment does vary from year-to-year, because Congress may or may not appropriate sufficient funds to make full payment. The exact amount of the annual payment depends on the congressional appropriation, which in recent years has tended to be less than the amount to fully fund the authorized level of payments.

The refuge Revenue Sharing payments are based on one of three different formulas, whichever results in the highest payment to the local taxing authority. The payments are based on three-quarters of 1 percent of the appraised fair market value (or the purchase price of a property until the property is reappraised). The Service reappraises the value of refuge lands every 5 years, and the appraisals are based on the land's highest and best use. On wetlands and formerly farmland-assessed properties, the full entitlements refuge Revenue Sharing payments sometimes exceed the real estate tax; in other cases, refuge Revenue Sharing payments may be less than the local real estate tax. For the nearby Lake Wales Ridge NWR, 2009 Refuge Revenue Sharing payments were: $23,252 for 1,685 acres in Highlands County and $2,278 for 172 acres in Polk County.

The fact that, in general, refuges put little demand on the infrastructure of a municipality and this must be considered in assessing the financial impact on the municipality. For example, there is little-to-no demand placed on the school system, roads, utilities, police and fire protection, and other systems and services. There is a substantial body of literature that shows that development, especially residential development, actually costs a community more in schools, roads, sewers, and other services than the tax revenue generated by the development (Land Trust Alliance 1994).

The potential does exist under Alternative B for neighboring landowners to experience trespass by the public using refuge properties. The Service would design public use opportunities and programs and would work with neighboring landowners to minimize or eliminate any negative impacts.

Taking all the socioeconomic factors into account, we believe there to be a net positive effect to the region under Alternative B. Compared to all of the economic activity in the Study Area, it is believed this effect would be minor.

C. ALTERNATIVE C. CONSERVATION PARTNERSHIP APPROACH (PREFERRED ALTERNATIVE)

Under this alternative, the Service will acquire interest in approximately 150,000 acres of land, of which up to approximately 50,000 acres will be fee-title lands included as part of the Everglades Headwaters NWR and approximately 100,000 acres of less-than-fee-title acquisition as part of the Conservation Area. Alternative C contains two areas:

- an approximately 130,000-acre Conservation Focal Area where the Service will have opportunity and authority to acquire approximately 50,000 acres of fee-title land; and
- a Conservation Partnership Area surrounding the fee-title acquisition focal area and focusing opportunity for approximately 100,000 acres of less-than-fee-title acquisition.

The Conservation Partnership Area will provide the Service the opportunity to work together with landowners; private organizations; and municipal, state, and federal governments to conserve wetlands and improve the groundwater recharge, water storage capacity, and water quality of the upper Everglades watershed. The Conservation Partnership Area will guide the Service to areas of most interest for less-than-fee-title acquisition. The Conservation Focal Area will guide and also restrict fee-title acquisition to specified areas within the landscape.

Six planning units have been identified for the Conservation Focal Area: Ridge North (Figure 10a), Ridge Central (Figure 10b), and Ridge South (Figure 10c), and Prairie North (Figure 10d), Prairie Central (Figure 10e), and Prairie South (Figure 10f) (see Appendix C for a detailed description of the identification and development of priority areas). Within the six units, the Service will have the opportunity to participate in fee-title and less-than-fee-title acquisitions. These six planning units are based upon two primary criteria: (1) The key habitats that support the focal species described in the Affected Environment section of this Final EA (Chapter II), and (2) connectivity between existing areas of conservation.

Although beneficial impacts are expected from implementation of this alternative, they are anticipated to be minor (e.g., given the small size of the project in relation to the Study Area). No significant impacts are anticipated under implementation of this alternative.

EFFECTS ON PHYSICAL ENVIRONMENT

Land Use Patterns

Beneficial Effects

Under Alternative C, the total area of protected lands used for habitat and wildlife conservation and compatible wildlife-dependent recreation will increase over the No Action Alternative and Alternative B. In addition, this alternative will potentially protect an additional 100,000 acres as conservation easements.

Adverse Effects

A potential adverse effect under Alternative C is the loss of land (150,000 acres) available for agriculture, urban development, and other non-conservation uses. This is believed to constitute a minimal impact, as the refuge lands comprise a relatively small percentage of the total Study Area (150,000 acres out of 1.8 million acres or about 8 percent). Furthermore, some former uses will continue and development may also occur on lands suitable for the conservation easements.

Climate Change

Beneficial Effects

Under this alternative, approximately 150,000 acres of refuge lands and conservation easements will continue to act as carbon sinks, and help to buffer the anticipated effects of climate change. These benefits are further detailed under Alternative B. Overall, this benefit will be minor due to the comparatively small size of the Everglades Headwaters NWR and Conservation Area relative to all lands in the Study Area and nationally.

Adverse Effects

Under this alternative, refuge operations and facilities, public visitation, and habitat management will contribute greenhouse gases to the atmosphere; however, we expect that the negative contribution will be less than that under the No Action Alternative. These adverse impacts are further described under Alternative B. For Alternative C, it is believed that the total net contribution of greenhouse gases resulting from the establishment of the Everglades Headwaters NWR and Conservation Area will constitute a minor impact.

Topography

Beneficial Effects

Under this alternative, the topography will be protected within 150,000 acres of Everglades Headwaters NWR and Conservation Area. This is expected to be a minor benefit, as the 150,000-acre Everglades Headwaters NWR and Conservation Area are relatively small compared to the overall Study Area.

Adverse Effects

Impacts will be similar to those described under Alternative B.

Hydrology and Water Quantity

Beneficial Effects

This alternative is expected to result in positive impacts to the hydrology and water quantity of the area. These benefits will include those detailed under Alternative B, except that in this case there will be additional positive effect given that more lands (100,000 acres of conservation easements) will be protected from development and mining under Alternative C. Conservation easements will not preclude the ability of the landowner from implementing pollutant reduction strategies identified through the state's Total Maximum Daily Load and Basin Management Action Plan process. The benefit is expected to be minor, as the 150,000 acres constitute a relatively small proportion of the Study Area.

Adverse Effects

Under Alternative C, there could be some localized impacts to hydrology and water quantity resulting from construction projects on refuge lands (i.e., Service-construction will not occur on conservation easements). The negative effects on hydrology and water quantity will be similar to those described under Alternative B and are believed to be minor.

Geology

Beneficial Effects

Under Alternative C, more land (e.g., an additional 100,000 acres of conservation easements) will be protected from large construction projects and mining operations, resulting in additional benefits to those described under Alternative B. Overall, these benefits will be minor, as 150,000 acres of potentially protected lands is a relatively small percentage of the total Study Area.

Adverse Effects

Adverse effects will be similar to those discussed under Alternative B.

Soils

Beneficial Effects

This alternative will provide benefits to soils similar to those described under Alternative B, except that a larger area (an additional 100,000 acres of conservation easements) will be protected. This positive effect will be minor.

Adverse Effects

As described under Alternative B, there would be some minimal, localized adverse effects on soils under this alternative resulting from the construction of a refuge office and public use buildings. Some limited construction (e.g., expanding an existing dwelling) may be allowed on the conservation

easements, depending on the type of agreements that are made with landowners. Those details are not available at this time. However, it is anticipated that any impacts to soils resulting from those activities will be minor.

Air Quality

Beneficial Effects

Under Alternative C, there will be additional benefits to air quality compared to Alternative B as a result of the added 100,000 acres of conservation easements being protected.

Adverse Effects

Impacts to air quality will be similar to those described under Alternative B for refuge lands. Under Alternative C, there will be some sources of air pollution resulting from such activities as prescribed burning on the conservation easements. Overall, the negative consequences to air quality associated with this alternative are expected to be minor.

Water Quality

Beneficial Effects

Compared to Alternative B, this alternative will result in added benefits to water quality, although beneficial impacts are anticipated to be minor. In addition to the 50,000-acre Everglades Headwaters NWR, another 100,000 acres of conservation easements will become established, further protecting the watershed from development and associated declines in water quality.

Adverse Effects

Under this alternative, there will be impacts to water quality on the 50,000 acres of refuge lands similar to what is described under Alternative B. In general, it is believed that any negative consequences to water quality resulting from the refuge will be limited to increased sediment loads during wetland restoration activity resulting in minor negative impacts. These effects could be minimized or eliminated by conducting construction during the dry season (November through May).

Noise

Beneficial Effects

There will be additional benefits to the soundscape under this action as compared to Alternative B. More lands will be protected from development and other land uses that are associated with higher levels of noise. These benefits are expected to be minor.

Adverse Effects

Effects on noise will be similar to what was discussed under Alternative B for the refuge lands. Under this alternative, there will be some landowner and public use (e.g., hunting) activities in the refuge that will generate noise. It is not expected that these will have any significant effects on the area's soundscape as they are similar to what currently occurs on many of the lands.

Visual Resources

Beneficial Effects

Under this alternative, visual resources will be maintained on a larger area, compared to Alternative B, further protecting the aesthetics of the local landscape. These benefits are considered minor.

Adverse Effects

Impacts will be the same as those under Alternative B.

EFFECTS ON THE BIOLOGICAL ENVIRONMENT

Habitats

Introduction

Alternative C, the Service's Preferred Alternative, consists of up to 150,000 acres containing a 50,000-acre refuge (with a fee-title acquisition focus) and a 100,000-acre Conservation Area (with a conservation-easement focus). For the refuge portion of Alternative C, the Service has identified approximately 130,000 acres within which it will be authorized to only acquire up to 50,000 acres based on specific ranking criteria to meet the refuge's goals and objectives, and landowner willingness. For the Conservation Area portion of Alternative C, conservation easements will also be based on suitability criteria; however, we expect that ranching or other types of low-intensity agriculture will continue on approximately 80 percent of the 100,000 acres. This format for both the Everglades Headwaters NWR and Conservation Area will allow the Service the flexibility to respond to changing economic conditions and landowner interest.

With implementation of Alternative C, the upper Everglades watershed will become a more connected and functional conservation landscape that may allow habitats and species to shift in response to climate and human demographic change. It offers the most comprehensive habitat and wildlife conservation effort of all alternatives. A larger addition to the conservation landscape will build larger linkages to the fragmented landscape of this area which currently limits habitat use, migration, and dispersal of a variety of species. Under Alternative C, the existing and projected loss or fragmentation of habitats could still be problematic at the broader landscape level; however, Alternative C will alleviate more localized habitat loss and therefore increase the opportunity for many species to persist in the Study Area.

Both the Everglades Headwaters NWR and Conservation Area will provide an important link for migratory birds and important habitat for both rare and common wildlife. This management alternative will complement the management of adjacent and nearby conserved lands, both public and private, thus enhancing the Service's wildlife management contribution to the regional landscape and helping to make the entire landscape a more functional conservation landscape (Figure 8). The Everglades Headwaters NWR and Conservation Area in central Florida will provide local and regional benefits to wildlife by working in concert with existing conservation areas and partners, including SFWMD's Kissimmee River Restoration efforts, Avon Park Air Force Range, Disney Wilderness Preserve, Kissimmee Prairie Preserve State Park, Three Lakes WMA, and various designated trails throughout this area. Alternative C will also restore wetlands and wetland function and will contribute to water quality, water quantity, and water storage capacity of the upper Everglades watershed to support Everglades' restoration goals and objectives and water supply needs for south Florida. Alternative C will provide opportunities for

wildlife-dependent public use activities and help maintain the cultural ranching heritage of the area. Public use opportunities under this alternative will include hunting, fishing, wildlife observation, wildlife photography, and environmental education and interpretation.

For the 50,000-acre refuge component of Alternative C, we will expect very similar benefits to those predicted from the 50,000 acres of Alternative B. However, because we have identified a larger Conservation Focal Area (approximately 130,000 acres) we will have the opportunity to select different lands that will support the refuge goals and objectives even better than Alternative B lands. This could occur where additional field investigations change our original assumptions about the quality of the habitat, or where continued residential or agricultural development or climate change alter the landscape in the intervening years so that a parcel which was once desirable becomes undesirable, or vice-a-versa. Additionally, because Alternative C includes all lands in Alternative B, we will not expect the environmental benefits of Alternative C to be worse than Alternative B.

Beneficial Effects

Under Alternative C, we expect up to 50,000 acres will be protected or conserved, constituting a minor positive benefit. Table 24 identifies the percentages of various land covers (or ecosystems) that comprise Alternative C. While the percentages of each land cover may be different between Alternatives B and C, the rank of the percentages remains similar. Because Alternative C protects or conserves similar amounts and types of habitat to that in Alternative B, we have not repeated duplicate benefits here and encourage the reader to consider the Alternative B benefits to listed species, and other plants and animals while reading this section. Where Alternative C provides additional benefits, we discuss them in this section.

Table 24. Percentage of land cover types in Alternative C

Land Cover Type	Percent of Alternative C
Improved, Unimproved, and Woodland Pasture	48.43
Wet Prairie and Freshwater Marsh	19.39
Dry Prairie	10.31
Scrubby, Mesic, and Hydric Pine Flatwoods	7.78
Freshwater Forested Wetlands	7.06
Intensive Agriculture	2.93
Mesic Temperate Hammock	1.30
High Pine, Florida Scrub, and Sandhill	1.67
Urban	0.48
Open Water	0.13
Shrub and Brushland	0.51
Total	**100.00**

Approximately 48 percent of lands available to Alternative C are improved, unimproved, and woodland pastures (see Alternative B for a discussion of why pasture habitats had the highest percentage). All of these pasture types have a high degree of potential for being restored to native grassland and herbaceous wetland ecosystems in 2 to 5 years. Therefore, with implementation of Alternative C, there will be up to 63,018 acres of pasture habitat available for restoration. If we

wanted to select the planning unit with the greatest amount of pastures, we would select the Prairie Central Unit (47,958 acres). We expect that the acres of pasture in the Prairie Central and South Units will be largely restored to a dry prairie and herbaceous wetland mosaic (similar to pre-development conditions) to support primarily Florida grasshopper sparrow, crested caracara, Florida black bear, waterfowl, and wading birds. Pasture habitats on the Ridge Units will likely be restored to a wetland and upland forest mosaic (to mimic predevelopment conditions).

Approximately 25,233 acres (19 percent) of lands available to Alternative C are herbaceous wetlands. These include wet prairie, depression marsh, freshwater marsh, slough, and isolated and emergent vegetation marshes. The planning unit with the largest amount of herbaceous wetlands is the Prairie Central Unit, which has 5,914 acres of short-hydroperiod and 13,047 acres of long-hydroperiod wetlands. Wet prairies and other short-hydroperiod wetlands on the Prairie Central and South Units are critical for amphibian reproduction and as part of the dry prairie - wet prairie mosaic, much of which has been converted to other uses.

Approximately 13,415 acres (10 percent) of lands available to Alternative C are dry prairie. This project represents the best near-term opportunity to protect, conserve, or restore this habitat type for one of the most imperiled species in Florida – the Florida grasshopper sparrow. The planning units that provide the greatest amount of dry prairie are the Prairie Central and South Units (7,573 and 5,840 acres, respectively). Under Alternative C, we expect that existing dry prairie will be protected at existing quality or restored (then protected), and we will likely increase the spatial extent on those planning units by restoring pasture habitat to dry prairie.

Lands available to Alternative C also include 10,123 acres (8 percent) hydric, mesic, and scrubby pine flatwoods. The majority (8,338 acres or 82 percent) is classified as mesic flatwoods. All Alternative C planning units possess mesic flatwoods, with Prairie Central (4,283 acres) and Prairie North (2,036 acres) having the most acres. Scrubby flatwoods, an ecotone between scrub and pine flatwoods, occupy 1,179 acres, most of which are on the Ridge South (434 acres) and Prairie Central (36 acres) Units. Hydric flatwoods are rarer (only 228 acres total), but an assumption is that some hydrologic restoration could increase this acreage on refuge lands.

Lands available to Alternative C include 9,172 acres (7 percent) of freshwater forested wetlands. These include primarily cypress, mixed wetland hardwoods, isolated freshwater swamp, and shrub bog. Most of the cypress (3,093 acres or 85 percent) is in the Prairie North Unit. Planning units with other substantial amounts of forested wetlands include Ridge North, Prairie Central, and Ridge South Units. We expect some restoration of forested wetlands under Alternative C, but it is difficult to predict either where, or how many, acres will be restored.

Lands available to Alternative C also include 3,814 acres (3 percent) of intensive agriculture. This is in the form of citrus (1,922 acres) and field crops (1,366 acres), primarily in the Prairie Central Unit. We expect that these areas will be restored to native wetland and upland habitats, although this process could take longer due to the higher degree of alteration (when compared to pastures). There may also be copper contamination in the soils of citrus groves or other chemical contamination (pesticides) on field crops; this may delay restoration of these areas.

Lands available to Alternative C also include 1,686 acres (1.3 percent) mesic temperate hammock, which occurs mostly in the Prairie Central Unit (976 acres). Approximately 354 acres (21 percent) were classified as “mixed hardwood-coniferous,” which occurs on 4 of the 6 planning units. Under Alternative C, these areas will be protected and restored if needed. Because this ecosystem is present at a lesser spatial extent than other native communities in Alternative C, it is unlikely to provide as large of a suite of benefits.

Lands available to Alternative C also include 2,177 acres (1.6 percent) Florida scrub and sandhill. The specific amounts are 1,747 acres of scrub, 370 acres of sandhill, and 60 acres of xeric hammock. Alternative B only contained 901 acres of these xeric habitats, so by selecting slightly different lands under Alternative C we could potentially double the amount of scrub conservation or restoration by acquiring additional properties in the Ridge North Unit. This will also likely increase the suite of benefits for the many federal or state listed scrub plants and animals.

Lands available to Alternative C also include lesser amounts of urban, open water, and shrub and brushland (1,461 acres combined). Many of the urban areas (628 acres) were classified as "rural open" and therefore, may be restorable to native habitats. Other urban areas (buildings, commercial) may provide some benefits as maintenance or administrative services structures for the refuge. Open water habitats will likely remain as is if they are natural (96 acres) or may be modified if not (74 acres). The shrub and brushland areas (663 acres) will probably be restored to fit the restoration of adjacent areas. This category seems to be a catch-all for more or less indescribable habitats. The majority of shrub and brushland (494 acres) occurs on the Prairie Central Unit.

Conservation Easement Benefits

We expect that native and improved pasture habitats will comprise a large part of the 100,000-acre conservation easement component of Alternative C. These areas are largely pasture now, with some native or natural communities interspersed. We anticipate that up to 80 percent of the pasture habitat will remain; but that wetlands will be restored within these pastures and that at least 20 percent of the site will be protected or restored to an appropriate native land cover. However, because the current area for these lands is so vast, it is difficult to make any accurate predictions about the amount or quality of native and natural habitats on these lands under Alternative C other than to expect that we will add an additional 20,000 acres of native habitats (with easements) to the 50,000 acres (with fee simple acquisition).

Beneficial Connectivity

Alternative C provides a similar level of connectivity and creates larger habitat patches as does Alternative B when considering just the 50,000-acre refuge component. However, Alternative C provides much more connectivity than Alternative B and creates larger patches of habitat when the 100,000 acres of conservation easements are included.

Water Quality, Quantity, and Storage Benefits

By protecting or conserving an additional 150,000 acres of conservation lands on this landscape, the Service will support the Everglades restoration goals and objectives of improved water quality, quantity, and storage capacity of the upper Everglades watershed to assist meeting water supply needs for south Florida. Compared to the No Action Alternative and Alternative B, Alternative C will provide increased opportunities to restore wetlands within the upper Everglades watershed. Increased storage capacity, groundwater recharge, and water quality benefits will be localized within certain sub-watersheds where the lands will be acquired and restored.

Using GIS, we calculated the acreage of former hydric soils (from the NRCS's Soil Survey Geographic Database) that are currently not functioning as wetlands (based on the FNAI land cover classification). Within the approximately 130,000 acres of lands that form the Conservation Focal Area, there are 23,065 acres of non-functioning, potentially restorable wetland soils. Table 25 shows the amount of potentially restorable hydric soils in each Planning Unit. Assuming that Alternative C will contain at least an equal amount of restorable soils as in Alternative B, then

10,137 acres of former wetlands could be restored (in addition to an unquantified acres of existing wetlands enhanced). Beyond this it is difficult to predict how many acres of wetlands could be restored with Alternative C, because it will depend on the parcels acquired and the amount of potentially restorable hydric soils therein.

Table 25. Acres of non-functioning, potentially restorable wetland soils under Alternative C

Planning Unit	Acres
Prairie North Unit	755.3
Prairie Central Unit	15,235.6
Prairie South Unit	3,159.9
Ridge North Unit	2,519.6
Ridge Central Unit	695.5
Ridge South Unit	699.5
Total	**23,065.4**

When compared to Alternative B, we expect Alternative C to provide additional hydrologic benefits simply based on the increased acreage. Those additional acres that will be protected from further development will remove those impervious surfaces from the future without the project condition, and therefore, will help to maintain the current hydrologic conditions in those areas. The restoration of refuge lands will have similar benefits under both Alternatives B and C. We expect augmented groundwater infiltration that will both decrease stormwater flows to the main Kissimmee River corridor and increase flows during periods of drought. Additionally, excess nutrients will have greater opportunity to be absorbed by restored wetland and upland vegetation, reducing the nitrogen and phosphorus loading of the watershed to downstream water bodies (although it is difficult at this time to quantify this benefit due to the variability of factors such as site-specific hydrologic characteristics and legacy phosphorus in the soil).

Adverse Effects

Based on the information presented in the Florida 2060 Report, we anticipate that existing native and natural habitats will still be lost to residential and agricultural development under Alternative C. This may fragment remaining natural lands and waters. However, we expect that the distribution of these impacts might change as Alternative C is implemented. For example, Alternative C will protect up to 50,000 acres from further agricultural or residential development, but it may also attract development to its periphery. On adjacent lands not already protected, the periphery of these units could be affected by adjacent landowners (human disturbance) and wildlife connectivity could be reduced. In the interim, the price for these adjacent lots may also increase due to their anticipated desirability. That increase in cost may make it more difficult for the Service or other conservation agencies or entities to buy additional lands or easements in those areas.

Similarly, the acquisition of conservation easements on 100,000 acres may decrease the amount of land available for development and increase the cost of adjacent properties. This may increase the price of land to the point where it is economically infeasible for additional conservation efforts in the immediate area.

Wildlife

Beneficial Effects

Non-listed Species

There are approximately 370 non-listed fish, amphibian, reptile, bird, and mammal species potentially present in the Study Area that will benefit under Alternative C, just as they would under Alternative B. Alternative C protects or restores up to an additional 20,000 acres of native or natural habitat on conservation easement lands and up to 80,000 acres of pasture lands. These additional lands will provide additional habitat for these non-listed species. Under Alternative C, the largest benefit will be to those species that occupy primarily pastures, grasslands, prairies, wetlands, or pine flatwoods.

Game Species

All of the game species that would be expected to use the refuge as proposed under Alternative B would also use lands under Alternative C. The additional easement lands will also provide habitat for game species; therefore Alternative C will provide a greater benefit to game species.

Federally Threatened, Endangered, and Candidate Species

Beneficial Effects

Because the overall acreages of habitats either protected or restored remained similar under both Alternatives B and C, the effects to federally listed species will be similar. Where differences are likely to occur, they are discussed below. On the conservation easement lands of Alternative C, we will expect benefits to some species from the additional up to 20,000 acres of conserved native or natural habitat and the up to 80,000 acres of pasture habitat.

Birds

Audubon's Crested Caracara

With Alternative C, there will be up to approximately 102,329 acres of caracara habitat available to be protected within the 50,000-acre refuge and additional 100,000 acres of habitat placed into conservation easements. These habitats include pastures, dry prairie, herbaceous wetlands, and shrub and brushland. Using 3,000 acres as an average territory size, these contiguous habitats of Alternative C could support up to 50 caracara home ranges. (Note: One assumption could be that these home ranges already exist. In that case, Alternative C will protect these existing territories). If the habitat quality is optimal (either now or after restoration of uplands and wetlands), then Alternative C could possibly support more caracara home ranges.

Everglade Snail Kite

With Alternative C there will be up to approximately 18,127 acres of Everglade snail kite foraging habitat (long hydroperiod wetlands and open water) available to be protected. There will be an additional amount as wetlands are restored under Alternative C. We also assume that some of the conservation easement areas will protect or restore wetlands that this species may use. Everglade snail kites nest in the Kissimmee Chain of Lakes, and therefore, if foraging or nesting habitat were available to them on the Ridge North Unit or Ridge Central Unit, we assume that they will use it.

Florida Grasshopper Sparrow

With Alternative C, there will be up to approximately 83,709 acres of habitat available to be protected for the Florida grasshopper sparrow. Some of this will come from the protection of up to 13,415 acres of dry prairie habitat; the remainder from the protection and restoration of pasture (up to 63,018 acres) and wet prairie habitat (up to 7,276 acres) on the Prairie Central and Prairie South Units. Easement lands could provide up to an additional 20,000 acres of native lands and up to an additional 80,000 acres of pasture lands (although it is unlikely that all of these lands will be suitable for this species). We do believe that the proximity of the South and Central Prairie Units to the existing Florida grasshopper sparrows on the Kissimmee Prairie Preserve State Park will be a major factor in the success of establishing a breeding population on Alternative C lands. However, because we do not have a good population viability model for this species, or even know what their minimum habitat requirements are, it is difficult to predict how many could be supported by Alternative C.

Florida Scrub-jay

In the Study Area, the Florida scrub-jay may occupy Florida scrub and scrubby flatwoods. Under Alternative C, there will be up to approximately 2,177 acres of scrub habitat available to be protected for the scrub-jay. The majority of this is on the Ridge North (930 acres) and Ridge South (780 acres) Units. The 350 acres of scrub in the Hatchineha Conservation Bank (Ridge North Unit) supports scrub-jays and skinks. There is a proposed scrub-jay conservation bank for a 60-acre property also in the Ridge North Unit. Using a minimum patch size of 5 hectares (12.3 acres) and an average size (25 acres) of habitat per Florida scrub-jay family, and assuming that we could not acquire all 2,132 acres of scrub, but could acquire the three largest blocks (which equals 2,106 acres), we could protect land for up to between 84 and 170 Florida scrub-jay families. Furthermore, the up to 20,000 acres of conservation easement lands could add to this, but it is difficult to accurately predict how much until we know where these lands will be located.

Red-cockaded Woodpecker

In the Study Area, the red-cockaded woodpecker may occupy high pine (dry, longleaf pine savanna) and pine flatwoods. Under Alternative C, there will be approximately 10,123 acres of flatwoods habitat available to be protected that could be suitable for the red-cockaded woodpecker. To our knowledge, this species does not occupy any of the lands targeted for acquisition under Alternative C. However, we do know that they exist on pinelands on some of the ranches on the east side of the Study Area between SR 60 and Three Lakes Wildlife Management Area. If we can acquire conservation easements on these areas, then we can protect additional lands for the red-cockaded woodpecker.

Whooping Crane

It is difficult to predict the effects of Alternative C on the whooping crane. Additional releases of individuals into this experimental population have stopped due to problems with survival and reproduction. It is possible with the protection or restoration of wet and dry prairies and freshwater marshes that Alternative C could support additional whooping cranes releases in the future.

Wood Stork

The wood stork may forage in wetlands throughout the Study Area. Under Alternative C, there will be up to approximately 34,414 acres of forested or herbaceous wetland habitat available to be protected for the wood stork on refuge lands and an additional acreage of wetlands on easement lands plus those wetlands that could be restored; therefore, we expect the total wetland acreage available to wood

storks to increase over time. We also expect that Alternative C could provide foraging habitat for the existing two stork rookeries and the three adjacent rookeries; however, it is difficult to predict how much forage biomass may be provided under Alternative C. That will depend on the management of the hydroperiod, control of nonnative species, and water quality conditions for forage species.

Mammals

Florida Bonneted Bat

Due to a general lack of ecological data, it is difficult to predict how Alternative C will affect the Florida bonneted bat. However, we know that wetland conservation and restoration will foster support as this species forages on insects over open water. We anticipate that Alternative C will have up to 9,181 acres of forested wetlands, 25,233 acres of herbaceous wetlands, and 170 acres of open water (total = 34,584 acres) on the approximately 130,000 acres of lands, the majority of which are on the Prairie South and Central Units. This species will also benefit from wetland restoration but also requires roosting areas in concert with wetlands. We expect that the conservation easement lands will also support this species provided wetlands can be protected or restored.

Florida Panther

The Florida panther needs forested areas to persist. Alternative C could have up to approximately 23,830 acres of existing forested habitat and 13,415 acres of dry prairie habitat available for acquisition (total = 37,245 acres). These habitats combined with the other potential Florida panther habitats outside of Alternative C lands support only a few dispersing males in the Study Area. To help this species under Alternative C, the entire 50,000-acre refuge will need to be restored to Florida panther habitat and the conservation easement areas will also need to have as much habitat as possible for this species. And even then, if 150,000 acres of new panther habitat were created, it would only provide enough habitats for 6 to 8 Florida panthers. In essence, unless Alternative C can provide corridors to other existing or future conservation lands, it will do very little for the Florida panther.

West Indian Manatee

Alternative C will likely do little to protect or conserve manatees. This is mainly because the species is present 30 miles downstream of the southernmost Alternative C lands in the extreme lower Kissimmee River and Lake Okeechobee. There may be some small water quality benefits by the protection of 50,000 acres of land, and the 100,000-acre conservation easements, but there will be other opportunities for water quality to be degraded after it leaves Alternative C lands and before it reaches waters occupied by manatees.

Reptiles

Sand Skink and Bluetail Mole Skink

Except for a few locations, we have little information about the overall abundance and population trends of the sand skink or bluetail mole skink. Both skink species may occupy Florida scrub and high pine (dry, longleaf pine savanna) habitats in the Study Area. Alternative C could acquire up to approximately 930 acres of scrub on the Ridge North Unit and 780 acres of scrub on the Ridge South Unit. It is unlikely that the conservation easements will benefit skinks since these easements are anticipated to be off the ridge in pasture habitat. Approximately 350 acres of Ridge North Unit make up the Hatchineha Conservation Bank for skinks and scrub-jays. Another conservation bank for skinks is proposed in the Ridge North Unit (60 acres).

Eastern Indigo Snake

Because the eastern indigo snake is a habitat generalist, we expect that much of the 50,000 acres of Alternative C will protect existing habitat (of various qualities) for the eastern indigo snake. The exceptions to this will be open water, urban land cover, field crops, and some of the pasture lands with little or no herbaceous cover (hard to accurately quantify this acreage). We anticipate that the 100,000 acres of conservation easements could also largely support eastern indigo snakes as long as there is some herbaceous cover. After restoration, more or improved eastern indigo snake habitat will exist.

Gopher Tortoise

The gopher tortoise typically uses a variety of scrub, pine flatwoods, and dry prairie communities within the Study Area. It may also be found on canal levees and in low- or medium-density residential areas. Lands identified under Alternative C contain up to approximately 25,000 acres of existing gopher tortoise habitat. There are an additional 63,018 acres of pasture habitat available under Alternative C that may be restored, in part, for gopher tortoises. Similarly, the 100,000 acres of conservation easements also provide the opportunity to protect or restore land for this ecologically important species.

Invertebrates

Highland's Tiger Beetle

There is approximately 930 acres of scrub habitat on the Ridge North Unit available to Alternative C for this species. Highland tiger beetles currently occupy parts of this unit, so Alternative C could protect and possibly expand that habitat. The acres of pasture habitat on the Ridge North Unit are underlain by poorly and somewhat poorly drained soils, and therefore, will likely be too wet after restoration to support a xeric species like the Highland's tiger beetle. The 780 acres of scrub habitat on the Ridge South Unit may also support this species or could after restoration.

Plants

Okeechobee Gourd

Alternative C is not likely to have a beneficial effect on the Okeechobee gourd. Similar to the manatee, the gourd is present at the southern end of the Study Area. Therefore, any water quality or habitat benefits from Alternative C, 30 miles away, will probably be diluted by other factors (e.g., hydrologic, land use, and non-point source pollution).

Beautiful Pawpaw

Based on current information, this species is not in the Study Area, but exists immediately adjacent in Orange County. It is possible that some as yet unknown populations of this plant exist in the hydric pine flatwoods in the Study Area. Absent of this, we do not believe that Alternative C will provide any immediate benefits to the beautiful pawpaw. It is possible that it may be transplanted or reseeded in current or restored hydric pine flatwoods on Alternative C lands. The current amount of hydric pine flatwoods in Alternative B is 228 acres mostly on the North Ridge Unit, but there are also 56 acres on the Prairie North Unit and this is the closest land for acquisition to a current beautiful pawpaw population. As such this will likely be the best candidate for reintroduction assuming it is not present on these lands. At this point, it is unclear how many acres of hydric pine flatwoods could be restored with Alternative C, either on the refuge or the conservation easement lands.

Florida Ziziphus

Ten of the fourteen extant Florida ziziphus populations are within the Study Area and are on unprotected lands. None of these locations are within the refuge component of Alternative C. The Conservation Focal Area includes the area around Lake Pierce, which has the greatest opportunity to protect existing Florida ziziphus populations that are at risk on private lands. If these lands could be acquired, then Alternative C could likely benefit Florida ziziphus.

Scrub Plant Species

It is possible that any of the 22 federally listed scrub plants may occur on scrub and scrubby flatwoods habitats along the Lake Wales Ridge or smaller ridges. Lands in the Ridge North Unit support the papery whitlow-wort. Other Ridge North or Ridge South Unit lands are the most likely candidates for supporting some of these listed species currently. If not present on these lands currently, it may also be possible to transplant or reintroduce some of these species into existing or restored scrub soils under Alternative C. About half of the 935 acres of pasture on the Ridge South Unit are underlain by non-hydric soils and therefore, may be restored to scrub or scrubby flatwoods. Other pasture areas close to the ridges may be restored to support scrub plants under conservation easements, but it is unclear to what extent that could occur until those lands are identified.

Selected State Threatened and Endangered Species

Florida Black Bear

The Florida black bear will be expected to use the refuge under Alternative C, especially forested areas in those planning units closer to the ridge (where bears may be found now). The 100,000-acre easement component of Alternative C could also increase habitat for bears and could provide a connectivity benefit that will not otherwise exist.

Sherman's Fox Squirrel

This fox squirrel uses a variety of pinelands and forested swamps. Alternative C will have available up to approximately 19,304 acres of these habitat types across all Planning Units for the Sherman's fox squirrel. The native and natural component of the conservation easements could provide up to an additional 20,000 acres of potential habitat for this species.

Bald Eagle

The bald eagle can forage in most any aquatic, pasture, prairie, or forested habitat. Large trees are needed for nesting, and the Study Area provides habitat for a significant number of nesting bald eagles. Alternative C has available approximately 61,000 acres of native potential eagle habitat, and could enhance an additional up to 63,000 acres of pasture habitat so, in essence there is more protectable and restorable eagle habitat in the Alternative C parcels than can be acquired under fee simple acquisition. The conservation easement component of Alternative C could also protect or restore either potential foraging or nesting habitat for bald eagles.

Florida Sandhill Crane

The Florida sandhill crane is a non-migratory, year-round breeding resident species that uses a wide variety of wetlands, pastures, prairies, and flatwoods throughout the Study Area and will be expected to use those same habitats under Alternative C. The parcels in this alternative have over 124,000 acres of existing habitat for Florida sandhill cranes. The 100,000-acre conservation easement component of Alternative C will provide or protect even more habitat for cranes.

Long-legged Wading Birds

The 13 species of long-legged wading birds that may occupy the Study Area could benefit from the protection of the existing 25,233 acres of wetlands and the potential restoration of additional wetlands with Alternative C. The 100,000-acre conservation easement component of Alternative C will provide additional habitat for long-legged wading birds. It is unclear at this time if these wetland benefits will be great enough to restore any of the long-legged wading bird nesting rookeries that have been lost over the last 40 years.

Adverse Effects

Adverse effects on federal and state listed species associated with Alternative C are minimal. As with Alternative B, short-term habitat losses could occur with fire management or other land management activities. Some fossorial listed species (skinks, eastern indigo snakes) may be injured or killed during these activities as well. Residential development patterns could shift slightly towards refuge lands if people view it as a desirable recreational area. This could fragment adjacent unprotected habitats. Conflicts between recreational use (hunting, or simply accessing the land) during sensitive breeding times of listed species will be an adverse effect. This could be alleviated by careful planning and timing or location of recreational activities. Also, chemical contaminants in former agricultural soils could pose a risk to fish and wildlife, especially aquatic species during activities such as wetland restoration; however, if the properties are properly assessed and remediated, if necessary, then this risk should be mitigated or minimized.

Nonnative Species

Beneficial Effects

We anticipate that nonnative invasive species (primarily plants but also feral hogs and nonnative fish) will be controlled on Alternative C lands. This will serve to improve the overall ecology of the Study Area by limiting further spread of these species.

Adverse Effects

Some of these nonnative species (feral hogs, tilapia and other cichlid fishes) are sport and subsistence species. The reduction of these species' abundance may represent a minor adverse effect to some people; however, it is unlikely that we will ever completely eradicate these species under either Alternative B or Alternative C, and the expectation is that we will provide improved habitat condition for native species (deer, turkey, bass, crappie, or other sunfish) that could replace these nonnative species.

EFFECTS ON CULTURAL RESOURCES

Beneficial Effects

Under this alternative, cultural resources will benefit. As described in Alternative B's effects on cultural resources, the Everglades Headwaters NWR will bring these resources under the federal historic preservation protective umbrella as the Service acquires up to 50,000 acres of habitat within the greater Everglades area. The benefits for cultural resources located in the 100,000-acre Conservation Area will be more limited. The Service will acquire protective or restrictive easements from willing landowners that will prevent urban and commercial developments that damage or destroy both critical habitats and cultural resources. However, any historic property located in the Conservation Area will remain in private ownership. We, like other federal agencies, have several legally mandated responsibilities that include development of a cultural resource management plan, compliance with Section 106 of the National Historic Preservation Act prior to any undertaking that possesses the potential to impact historic properties, archaeological inventory of its lands and subsequent National Register eligibility testing, research-directed testing or excavation, site protection, and interpretation. Critical to these efforts are the Florida Division of Historical Resources, the Seminole Tribe, the Miccosukee Tribe, the Seminole Nation, the Poarch Band of Creeks, and the Muscogee (Creek) Nation, and a number of interested parties, such as nearby universities, adjacent landowners, and state resource agencies. The Service will, when possible, partner with the Seminole Tribe and/or other interested Native American tribes to facilitate archaeological and ecological investigations, protection, and interpretation of sites deemed to have cultural and religious significance for the tribe(s). Protection of historic properties will be enhanced by incorporating concepts of site stewardship and ownership, where appropriate, into public use materials and interpretive panels. This effort will be further enhanced by providing advanced archaeological resource protection training to law enforcement personnel.

Adverse Effects

As with Alternative B, minor negative impacts to cultural resources could be anticipated under Alternative C. There could be some risk that refuge visitors may inadvertently or intentionally damage or disturb historic properties; however, we will employ all means available to protect archaeological sites, historic structures, cemeteries, and historic landscapes. This will be accomplished through scientific investigations; public education; partnerships with tribal, state, and local governments; and law enforcement efforts. However, the Service's management and legal authorities will not be extended to the Conservation Area, as it is not part of the refuge. Section 106 of the National Historic Preservation Act will be complied with during our acquisition of an easement and then only when the Service funds, permits, or conducts future management actions on the easements. Protections delineated under Archaeological Resources Protection Act and Native American Grave Protection and Repatriation Act will not extend to the Conservation Area, though the comparable state historic preservation laws will.

EFFECTS ON THE SOCIOECONOMIC ENVIRONMENT

Beneficial Effects

Minor benefits to the local economy will be expected under Alternative C. The positive effects will be like those described under Alternative B, but greater in scope due to the additional lands (an added 100,000 acres) set aside for conservation under this alternative. Neighboring landowners of the Everglades Headwaters NWR will benefit from improved water quality from restoration of refuge lands and waters to native habitats and from the assurance that those refuge properties will not be

developed or operated in ways that might have a negative impact to the neighboring properties. Further, as development patterns change, the potential exists for increased land values for those neighboring properties. The potential also exists for maintained or increased wildlife movement through the area, which could be seen by many as a positive impact on the quality of life, including wildlife observation and hunting. Further, as development patterns change, the potential exists for increased land values for those neighboring properties.

With conservation easements under Alternative C, we expect that pastures or more native rangelands will be managed appropriately to provide both an economic benefit to the rancher (livestock production and game hunting) and ecologic benefits in the form of soil and water conservation and habitat management (control of nonnative species and fire management). We anticipate that we will negotiate easement agreements with landowners in addition to the NRCS. The NRCS could also provide funds (for easement acquisitions) and technical assistance under its Wetlands Reserve Program, Environmental Quality Incentives Program, or other similar programs.

Were the Service to buy fee-title and less-than-fee-title interests in most of the lands in the project area in pursuit of the 150,000 acres as outlined in the Final LPP, we believe positive benefits for communities in Florida will include: increased property values, increased watershed protection, maintenance of many traditional uses, increased opportunities for public use activities, and increased revenues for local businesses from refuge visitors who participate in bird watching, hunting, fishing, and wildlife observation.

Adverse Effects

There will likely be some minor adverse impacts, namely a potential decline of tax revenue to local counties (as lands come under Service ownership). The Refuge Revenue Sharing Act of June 15, 1935 (16 U.S.C. 715s) offsets the loss of local tax revenues from federal land ownership through payments to local taxing authorities. Refuges provide annual payments to taxing authorities, based on the acreage and value of refuge lands located within their jurisdiction. Money for these payments comes from the sale of oil and gas leases, timber sales, grazing fees, the sale of other Refuge System resources, and from congressional appropriations, which are intended to make up the difference between the net receipts from the Refuge Revenue Sharing Fund and the total amount due to local taxing authorities. The actual Refuge Revenue Sharing payment does vary from year-to-year, because Congress may or may not appropriate sufficient funds to make full payment. The exact amount of the annual payment depends on the congressional appropriation, which in recent years has tended to be less than the amount to fully fund the authorized level of payments.

The Refuge Revenue Sharing payments are based on one of three different formulas, whichever results in the highest payment to the local taxing authority. The payments are based on three-quarters of 1 percent of the appraised fair market value (or the purchase price of a property until the property is reappraised). The Service reappraises the value of refuge lands every 5 years, and the appraisals are based on the land's highest and best use. On wetlands and formerly farmland-assessed properties, the full entitlements of Refuge Revenue Sharing payments sometimes exceed the real estate tax; in other cases, Refuge Revenue Sharing payments may be less than the local real estate tax. For the nearby Lake Wales Ridge NWR, 2009 Refuge Revenue Sharing payments were: $23,252 for 1,685 acres in Highlands County and $2,278 for 172 acres in Polk County, while 2010 Refuge Revenue Sharing payments were: $16,406 for 1,689 acres in Highlands County and $1,605 for 172 acres in Polk County.

The fact that, in general, refuges put little demand on the infrastructure of a municipality must be considered in assessing the financial impact on the municipality. For example, there is little to no demand placed on the school system, roads, utilities, police and fire protection, and other systems and services. There is a substantial body of literature that shows that development, especially residential development, actually costs a community more in schools, roads, sewers, and other services than the tax revenue generated by the development (Land Trust Alliance 1994).

The potential does exist under Alternative C for neighboring landowners to experience trespass by the public using refuge properties. The Service will design public use opportunities and programs and will work with neighboring landowners to minimize or eliminate any negative impacts.

Overall, impacts will be the same as described under Alternative B. Further, the potential will also exist for maintained or increased movement of wildlife within the landscape that could result in negative human-wildlife or livestock-wildlife interactions. The Service will work with the partners and neighboring landowners to minimize these impacts. Taking all the socioeconomic factors into account, we believe there to be a net positive effect to the region under Alternative C.

D. CUMULATIVE EFFECTS

According to the Council on Environmental Quality NEPA implementing regulations in 40 CFR 1508.7, “cumulative impact” is 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.

PHYSICAL RESOURCES

Some minimal and minor impacts on physical resources are expected, under each of the alternatives, but none of these are anticipated to be cumulatively significant. Cumulative effects on individual physical resource categories are further discussed below.

Land Use

The No Action Alternative will be expected to have a negative cumulative effect on land use in the Study Area due to continued urbanization over the next decades. Currently, these lands are largely rural, but projected population growth will likely result in the spread of developed areas. State and other land protection efforts will have a difficult time keeping pace with the loss of natural and other open areas. Alternatives B and C will have positive cumulative effects on land use of the area by helping protect portions of the landscape from urbanization.

Climate Change

Under Alternative A (No Action), a minimal negative cumulative impact on climate change is expected as land currently functioning as carbon sinks will likely become net sources of greenhouse gases. Conversely, lands protected under Alternatives B and C will not have a significant cumulative negative effect on climate change. Under these alternatives, additional lands that are believed to function as net carbon sinks will be protected. Growing vegetation and natural soil formation processes will continue to sequester carbon.

Topography

The No Action alternative will have a minimal negative cumulative effect on the topography of the Study Area. Without protection, mining and other activities that can alter the topography will continue. Under Alternatives B and C, no adverse cumulative effects are predicted to this resource.

Hydrology and Water Quantity

Hydrology and water quantity will suffer some minimal cumulative effects under the No Action Alternative. Insufficient lands will likely be protected from development and associated adverse impacts to these resources without the Service acquiring lands as outlined under Alternatives B and C. Increased urbanization and associated changes in drainage patterns and declines in water availability will exacerbate current issues affecting these resources. As previously discussed, Alternatives B and C will result in net benefits to the hydrology and water quantity in the Study Area by protecting vegetated areas.

Both Alternatives B and C propose wetland restoration activities within the 50,000-acre refuge. Since both action alternatives target generally intact habitats, including intact wetlands, for acquisition and conservation, they limit the extent of wetland restoration activities that might be needed. Wetland restoration activities will likely be limited to approximately 8,000 acres or less within the Conservation Focal Area. Alternative C also will protect through less-than-fee-title means (targeting conservation easements as the primary tool) another 100,000 acres within the Conservation Partnership Area, which will further limit development activities and the associated human demand for water use. An additional approximately 16,000 acres of wetlands could be restored. Neither of the action alternatives are anticipated to have significant cumulative impacts on the availability of water for human use from Lake Okeechobee.

Geology

Under Alternative A, there will be minimal negative cumulative effects on the geology of the Study Area resulting from mining operations. No adverse impacts on geology are expected under Alternatives B and C.

Soils

Alternative A will likely result in minimal cumulative impacts to soils in the Study Area. Without protection, lands in the Study Area will continue to be converted to urban use. Soil disturbance will result from the construction of buildings, roads, parking lots, and other infrastructure associated with development. Furthermore, an increase in impervious surfaces will alter natural soil formation processes. Alternatives B and C are expected to have net beneficial effects on soils in the Study Area as more lands will be protected from development.

Air Quality

Alternative A (No Action) will likely contribute to an acceleration of poor air quality over the long term simply due to the expected continued increases in development and its concomitant contributions to pollutant emissions. Alternatives B and C are not expected to have significant cumulative adverse impacts on air quality, locally or regionally, since they will help retain vegetated areas within the acquisition boundaries. Some short-term, local deterioration in air quality will be expected from air emissions of motor vehicles used by refuge visitors and staff, as well as habitat management (e.g., prescribed burning).

Water Quality

The No Action alternative is expected to result in minimal adverse cumulative effects on water quality. Land conversion to high-intensity agriculture and development is likely to continue in unprotected areas, resulting in a deterioration of water quality. Overall, Alternatives B and C are predicted to have net positive benefits to water quality in the Study Area as they will protect vegetated areas within the acquisition boundaries and help slow the flow of water, helping to improve water quality.

Noise

Cumulative effects on noise are anticipated to be minimal under the No Action. Increased urbanization and associated sources of noise will continue to negatively impact the soundscape of the Study Area. Conversely, Alternatives B and C will have a net beneficial effect on the area's soundscape by helping to maintain a more rural landscape.

Visual Resources

Alternative A will have minimal negative cumulative effects on the area's visual resources. Without protection, the landscape will increasingly be altered by tall structures, roads, and other infrastructure associated with urbanization. Alternatives B and C will result in a positive benefit to the area's aesthetics by protecting lands from development.

BIOLOGICAL RESOURCES

Effects of Habitat Loss

Under Alternative A there will be an expectation of cumulative negative effects on the biological resources over the long term, due to the lack of additional habitat protection and connectivity for the fish and wildlife resources in the Study Area. Areas currently not set aside for conservation will continue to be converted to urban, agricultural, and other uses. More habitats for fish and wildlife will be lost under this alternative compared to Alternatives B (protection of up to 50,000 acres) and C (protection of up to 150,000 acres). No significant cumulative adverse effects to biological resources under Alternative B or C are expected since valuable habitats will be protected and their ecological integrity will be retained. Management activities in Alternatives B and C, along with the Conceptual Management Plan (Appendix A, Final LPP), will be expected to have long-term minor beneficial effects to the Kissimmee River Basin's fish and wildlife resources. The Service will likely manage nonnative/invasive species. Management efforts for exotic species will include preventing their introduction, controlling their spread, or eradication. The loss of these nonnative/invasive species will not be considered adverse.

Hunting Impacts

The cumulative effects from hunting on populations of game species are discussed below for deer, feral hog, alligator, wild turkey, waterfowl, dove, quail, and other small game.

Deer

Deer hunting on the refuge will not have regional population impacts due to relatively small home ranges these species have compared to the Study Area. The average deer home range in Florida is 500 to 600 acres for an adult female and 750 to 1,600 acres for adult males (FWC 2008a). Therefore, only local impacts are expected to occur. Generally, the Service will allow hunting, based

on state (i.e., FWC) hunting seasons and consistent with the refuge's Interim Compatibility Determinations and Conceptual Management Plan. Later a comprehensive conservation plan and hunt plan (once developed), will provide guidance for the hunt program. FWC is charged with managing the state's population of deer and other game species. State hunting regulations are designed, in part, to support the goals set forth in FWC's *Strategic Plan for Deer Management in Florida 2008-2018* (FWC 2008a) The three goals identified are: (1) Ensure the existence of robust deer populations that meet the public's desire for recreational opportunities and protection of private property while ensuring the long-term welfare of the species, (2) ensure a high degree of public satisfaction with deer management in Florida, and (3) manage deer habitats consistent with ecosystem health, deer population goals, and customer satisfaction goals (FWC 2008a).

State-wide, approximately 100,000 deer are harvested annually (FWC 2008a), which represents approximately 15 percent of the state's total population, estimated at 600,000 (Labisky 2000). Like many prey species, deer populations adjust to various harvest levels through a compensatory response. As deer densities are reduced through hunting (or predation), more forage is available for surviving deer, increasing their reproductive capacity. A study conducted in Florida showed that mean number of fetuses per pregnant doe was greater on hunted land than on non-hunted sites. Furthermore, incidence of twinning (doe producing twins) was 38 percent on hunted sites and 14 percent on non-hunted sites. No twinning was observed among pregnant fawns or yearlings from non-hunted areas, whereas 6 of 33 (18 percent) of the pregnant yearlings and 1 of 3 (33 percent) pregnant fawns from hunted areas carried twins (Richter and Labinsky 1985). Additionally, white-tailed deer are adapted to and thrive in highly fragmented habitats (Nixon et al. 2001) and their numbers are likely to remain at huntable levels even as the landscape becomes more urban. The preferred alternative will likely result in an increase in deer taken, as more lands that are currently closed to the public will be opened. Under Alternative B, deer hunting opportunities will increase compared to the No Action alternative. It is not expected that local deer populations will be significantly affected under either of the action alternatives. Overall, regulated hunting is not expected to have any significant cumulative effects on deer populations in the Study Area.

Feral Hog

The feral hog is an invasive, nonnative species. However, because hogs are popular with hunters, they are considered a game species in Florida. Bag limits are established for feral hogs on some WMAs.

Hunting of feral hogs on refuge lands will be considered a management tool in reducing this detrimental species, while providing recreational opportunities to hunters. Cumulative effects to a nonnative, invasive species should not be of concern because the Service will likely work to extirpate this species on refuge lands. Hunting of hogs is not considered detrimental to the biological integrity of the refuge, is not likely to create conflict with other public uses, and is within the wildlife-dependent public uses to be given priority consideration. Since hogs are nonnative, they are a priority species for refuge management only in terms of their negative impacts on refuge biota and need for eradication. They are a popular game species though, and the public interest will best be served by allowing this activity on the refuge. However, even with hunting, feral hogs are likely to always be present because they are prolific breeders. Hence, Alternatives B and C are expected to have a net positive effect through the reduction of feral hogs. This will benefit any agricultural lands adjacent to the refuge lands, as feral hogs can cause crop loss and other damage. Under the No Action alternative, feral hog numbers are unlikely to be controlled at levels where their damage to native vegetation and croplands in the vicinity is minimal.

Alligator

Alligator hunting is likely to occur primarily on state sovereign waters that may be within Service-acquired lands and will be regulated solely by FWC in those areas. FWC regulates the hunting of alligators to allow for this hunting opportunity, while also ensuring the viability of the species. No cumulative effects are expected under any of the alternatives.

Wild Turkey

Turkey is a non-migratory species and therefore hunting only impacts the local population. Turkey populations in Florida have increased substantially since 1970, as evidenced by a statewide distribution assessment conducted in 2001 (Nicholson et al. 2005). Habitat loss, not hunting, appears to be the primary factor limiting their populations. Research has shown that in many cases hunters can remove a large portion of the gobblers from a population (up to 30 percent) and still have a healthy turkey population (Vangiler 1992). The preferred alternative would increase wild turkey hunting opportunities by opening up more land to the public. Alternative B would also increase wild turkey hunting opportunities, albeit less than under Alternative C. Turkey hunting will be in accordance with applicable regulations, which help ensure the provision of the hunting opportunity and the viability of the species. Neither of these alternatives is expected to have significant cumulative effects on local wild turkey populations.

Migratory Birds

The Service annually prescribes frameworks, or outer limits, for dates and times when hunting may occur and the number of birds that may be taken and possessed. These frameworks are necessary to allow state selections of season and limits for recreation and sustenance; aid federal, state, and tribal governments in the management of migratory game birds; and permit harvests at levels compatible with population status and habitat conditions. Because the Migratory Bird Treaty Act stipulates that all hunting seasons for migratory game birds are closed unless specifically opened by the Secretary of the Interior, the Service annually promulgates regulations (50 CFR 20) establishing the frameworks from which states may select season dates, bag limits, shooting hours, and other options for each migratory bird hunting season. The frameworks are essentially permissive in that hunting of migratory birds will not be permitted without them. Thus, in effect, federal annual regulations both allow and limit the hunting of migratory birds.

Migratory game birds are those bird species so designated in conventions between the United States and several foreign Nations for the protection and management of these birds. Under the Migratory Bird Treaty Act (16 U.S.C. 703-712), the Secretary of the Interior is authorized to determine when "hunting, taking, capture, killing, possession, sale, purchase, shipment, transportation, carriage, or export of any ... bird, or any part, nest, or egg" of migratory game birds can take place, and to adopt regulations for this purpose. These regulations are written after giving due regard to "the zones of temperature and to the distribution, abundance, economic value, breeding habits, and times and lines of migratory flight of such birds, and are updated annually (16 U.S.C. 704(a)). This responsibility has been delegated to the Service as the lead federal agency for managing and conserving migratory birds in the United States. Acknowledging regional differences in hunting conditions, the Service has administratively divided the Nation into four flyways for the primary purpose of managing migratory game birds. Each flyway (Atlantic, Mississippi, Central, and Pacific) has a Flyway Council, a formal organization generally composed of one member from each state and province in that flyway. The Study Area is within the Atlantic Flyway.

The process for adopting migratory game bird hunting regulations, located in 50 CFR 20, is constrained by three primary factors. Legal and administrative considerations dictate how long the rulemaking process will last. Most importantly, however, the biological cycle of migratory game birds controls the timing of data-gathering activities and thus the dates on which these results are available for consideration and deliberation. The process of adopting migratory game bird hunting regulations includes two separate regulations-development schedules, based on "early" and "late" hunting season regulations. Early hunting seasons pertain to all migratory game bird species in Alaska, Hawaii, Puerto Rico, and the Virgin Islands; migratory game birds other than waterfowl (e.g., dove, woodcock, etc.); and special early waterfowl seasons, such as teal or resident Canada geese. Early hunting seasons generally begin prior to October 1. Late hunting seasons generally start on or after October 1 and include most waterfowl seasons not already established. There are basically no differences in the processes for establishing either early or late hunting seasons. For each cycle, Service biologists and others gather, analyze, and interpret biological survey data and provide this information to all those involved in the process through a series of published status reports and presentations to Flyway Councils and other interested parties. Under the preferred alternative, waterfowl hunting is expected to occur primarily in sovereign state waters, which would not be subject to regulation by a future refuge. Some waterfowl hunting could occur in areas subject to management by the refuge, but those opportunities are expected to be relatively limited and numbers of waterfowl taken from those areas will be low. As such, it is not anticipated that any of the alternatives will have a significant cumulative effect on waterfowl resulting from hunting.

Because the Service is required to take abundance of migratory birds and other factors into consideration, we undertake a number of surveys throughout the year in conjunction with the Canadian Wildlife Service, state and provincial wildlife-management agencies, and others. To determine the appropriate frameworks for each species, we consider factors such as population size and trend, geographical distribution, annual breeding effort, the condition of breeding and wintering habitat, the number of hunters, and the anticipated harvest. After frameworks are established for season lengths, bag limits, and areas for migratory game bird hunting, migratory game bird management becomes a cooperative effort of state and federal governments. After Service establishment of final frameworks for hunting seasons, the states may select season dates, bag limits, and other regulatory options for the hunting seasons. States may always be more conservative in their selections than the federal frameworks, but never more liberal. Season dates and bag limits for national wildlife refuges open to hunting are never longer or larger than the state regulations. In fact, based upon the findings of an environmental assessment developed when a national wildlife refuge opens a new hunting activity, season dates and bag limits may be more restrictive than the state allows.

NEPA considerations by the Service for hunted migratory game bird species are addressed by the programmatic document, ‘‘Final Supplemental Environmental Impact Statement: Issuance of Annual Regulations Permitting the Sport Hunting of Migratory Birds (FSES 88– 14),’’ filed with the Environmental Protection Agency on June 9, 1988. We published notice of availability in the Federal Register on June 16, 1988 (53 FR 22582), and our Record of Decision on August 18, 1988 (53 FR 31341). Annual NEPA considerations for waterfowl hunting frameworks are covered under a separate Environmental Assessment, “Duck Hunting Regulations for 2006-07,” and an August 24, 2006, Finding of No Significant Impact. Further, in a notice published in the September 8, 2005, *Federal Register* (70 FR 53376) the Service announced its intent to develop a new Supplemental Environmental Impact Statement for the migratory bird hunting program. Public scoping meetings were held in the spring of 2006, as announced in a March 9, 2006, *Federal Register* notice (71 FR 12216). More information may be obtained from: Chief, Division of Migratory Bird Management, U.S. Fish and Wildlife Service, Department of the Interior, MS MBSP-4107-ARLSQ, 1849 C Street, NWR, Washington, DC 20240.

Waterfowl

Waterfowl hunting within the acquisition boundaries will likely be on sovereign state waters, and will be regulated by FWC, not the Service. Hence, none of the alternatives are expected to have an effect on this resource with regards to hunting and there will be no cumulative impacts.

Dove

Although migratory, doves in Florida are typically resident. Hence, hunting on refuge lands will only affect local populations. This species is a prolific breeder, capable of producing several broods per year. A habitat generalist, it thrives in secondary growth, pastures, cultivated fields, and suburban areas. Under the preferred alternative, more lands will be opened to dove hunting by the public. The same is true for Alternative B, although not to the extent as Alternative C. Neither of these alternatives is expected to have any significant cumulative effects on dove numbers in the Study Area as a result of increased hunting.

Quail

Quail are non-migratory, so hunting on refuge lands will only have effects on local populations. As further described in the section on game species in Chapter II (Affected Environment), quail numbers have been declining during the last decades in Florida, primarily as a result of habitat loss and degradation.

Other Small Game

Squirrel, rabbit, raccoon, and opossum cannot be affected regionally by hunting on any refuge lands because of their limited home ranges. Therefore, only local effects will be discussed. Land use alterations and reductions in predators have contributed to increases in several small game species, particularly raccoon and opossum. Consequently, populations of these species sometimes become higher than optimal, with detrimental effects on other native wildlife (e.g., higher levels of predation on songbird eggs and nestlings), increased crop damage, and spread of diseases (e.g., rabies). Hunting can help regulate opossum and raccoon populations; however, unless the popularity of this type of hunting increases, the numbers of these species will likely be higher than desired. When these species become overabundant, diseases such as distemper and rabies reduce the populations. However, waiting for disease outbreak to regulate their numbers can be a human health hazard. Cumulative adverse impacts to raccoon and opossum are unlikely under Alternatives B and C, considering their high reproductive ability, their being difficult to hunt due to their nocturnal habits, and the fact that they are not as popular for hunting as other game species.

CULTURAL RESOURCES

There could be some cumulative adverse impacts to cultural resources under the No Action Alternative. Less land will be protected from development, increasing the risk of disturbance or destruction of cultural resources. Under Alternatives B and C, beneficial effects will occur because of increased land protection. In addition, increased field surveys will likely be conducted on Service-owned lands to identify and protect any sites discovered.

SOCIOECONOMIC ENVIRONMENT

There will be no expected long-term, significant cumulative change in the local economy under Alternative A. Current development rates, tax revenues, and business revenues will remain subject to market influences. There could be some loss of economic opportunities associated with wildlife-dependent recreation (e.g., hunting, fishing, and wildlife watching). In addition, there could be increased costs to local communities associated with the loss of vegetated areas as urban sprawl continued on unprotected lands. Vegetated areas have been shown to reduce costs of providing clean water and air. Furthermore, vegetated lands help reduce stormwater runoff, providing additional cost savings (e.g., less frequent repairs to water control structures) to nearby communities. Alternatives B and C will have some positive effects on socioeconomic resources. Wildlife-dependent recreation will provide additional direct and indirect economic benefits to the region by drawing visitors. Increased opportunities for wildlife-dependent recreational opportunities will further help improve the quality of life in the Study Area, particularly as open space available to the public becomes increasingly scarce over the next decades. Further, no significant negative impacts will be anticipated to neighboring landowners from the implementation of either Alternative B or Alternative C, including from management and public use activities.

UNAVOIDABLE ADVERSE EFFECTS

Unavoidable adverse effects are the effects of those actions that could cause significant harm to the human environment and that cannot be avoided, even with mitigation measures. There will be some minor, localized unavoidable adverse effects under all the alternatives. The No Action Alternative will maintain the status quo for development and growth in the valley, thus contributing to the unavoidable effects of such development (e.g., increased air emissions, increased impervious surface and stormwater runoff, increased noise). Under Alternatives B and C, there could be, for example, localized adverse effects of building a new refuge headquarters and upgrading access roads. There will be property tax losses to towns and increased visitation that could be unavoidable effects in those years that revenue sharing payments are less than local property taxes. However, none of these effects rises to the level of significance. All will be mitigated, so there will in fact be no significant unavoidable adverse impacts under any of the alternatives.

RELATIONSHIP BETWEEN SHORT-TERM USES OF THE HUMAN ENVIRONMENT AND ENHANCEMENT OF LONG-TERM PRODUCTIVITY

The No Action Alternative is expected to diminish the long-term productivity and sustainability of natural resources in the Study Area. In contrast, Alternatives B and C will strive to maintain or enhance the long-term productivity and sustainability of natural resources on refuge lands and/or Conservation Area. These alternatives will strive to conserve federal trust species and state listed species and the habitats they depend on, as evidenced by management activities described in the Conceptual Management Plan, Appendix A, Final LPP. These alternatives also outline outreach and environmental education activities that will encourage visitors to be better stewards of the environment.

POTENTIAL IRREVERSIBLE AND IRRETRIEVABLE COMMITMENTS OF RESOURCES

Alternative A will have no long-term effect on potential irreversible and irretrievable commitments of federal financial resources. Establishing a refuge, as described under Alternatives B and C, may contribute to irreversible and irretrievable commitments of federal financial resources. For example, one will be the possible construction or modification of a refuge office and associated visitor facility

and access road(s). These typically require long-term commitments of resources. Another irreversible commitment of resources impacting local communities is Service land acquisition. Once the lands are purchased, it is unlikely that they will revert back to private ownership

ENVIRONMENTAL JUSTICE

Executive Order 12898 “Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations” (February 11, 1994), requires that federal agencies consider as part of their action, any disproportionately high and adverse human health or environmental effects to minority and low income populations. Agencies are required to ensure that these potential effects are identified and addressed. The communities surrounding the refuge are relatively homogenous; minority groups do not represent a substantial portion of the affected community. No differential impacts based on minority status are anticipated under any of the alternatives.

SUMMARY OF EFFECTS

Table 26 summarizes the impacts.

Table 26. Comparison of potential environmental effects for Alternatives A, B, and C, evaluated for the Everglades Headwaters NWR and Conservation Area, Florida

Resource	Alternative A: No Refuge and No Conservation Area	Alternative B: Refuge Only Approach (50,000-acre Refuge)	Alternative C: Conservation Partnership Approach (50,000-acre Refuge and 100,000-acre Conservation Area)
PHYSICAL RESOURCES			
Land Use	Beneficial: lands available for agriculture and development Adverse: continued loss of natural areas through conversion to agriculture and developed areas; loss of lands open for public wildlife-appropriate and -compatible public use	Beneficial: some restoration of agricultural areas; additional lands open for public wildlife-appropriate and -compatible public use Adverse: loss of agricultural lands	Beneficial: Similar benefits as B, but over a larger area Adverse: similar to B
Climate Change	Beneficial: none Adverse: vegetative cover lost	Beneficial: net increase in vegetative cover (carbon sequestration) Adverse: negligible emissions from refuge operations and visitor use	Beneficial: Similar benefits as B, but over a larger area Adverse: similar to B
Topography and Geology	Beneficial: none Adverse: lands otherwise protected could be impacted by mining	Beneficial: proposed lands protected from mining. Adverse: none	Beneficial: Similar benefits as B, but over a larger area Adverse: similar to B

Resource	Alternative A: No Refuge and No Conservation Area	Alternative B: Refuge Only Approach (50,000-acre Refuge)	Alternative C: Conservation Partnership Approach (50,000-acre Refuge and 100,000-acre Conservation Area)
Hydrology and water Quantity	Beneficial: none Adverse: continued ditching, new roads and development on unprotected lands will alter hydrology and affect water quantity	Beneficial: some restoration of hydrology; vegetated areas will benefit hydrology and water quality Adverse: none	Beneficial: Similar benefits as B, but over a larger area Adverse: similar to B
Soils	Beneficial: none Adverse: mining, development, agriculture, transportation and utility corridors	Beneficial: vegetative cover will continue to stabilize and form soils Adverse: some minimal impacts from infrastructure projects needed to support refuge operations and public uses	Beneficial: Similar benefits as B, but over a larger area Adverse: similar to B
Air Quality	Beneficial: none Adverse: vegetative cover lost; wildfires; industry and traffic	Beneficial: net increase in vegetative cover Adverse: prescribed fire, traffic associated with public use and refuge operations	Beneficial: Similar benefits as B, but over a larger area Adverse: similar to B
Water Quality	Beneficial: none Adverse: development of unprotected lands will cause further declines in water quality	Beneficial: proposed lands remain vegetated, benefitting water quality Adverse: negligible effects on water quality from refuge operations and visitor uses	Beneficial: Similar benefits as B, but over a larger area Adverse: similar to B

Resource	Alternative A: No Refuge and No Conservation Area	Alternative B: Refuge Only Approach (50,000-acre Refuge)	Alternative C: Conservation Partnership Approach (50,000-acre Refuge and 100,000-acre Conservation Area)
Noise	Beneficial: none Adverse: additional lands developed with higher associated noise levels	Beneficial: lands protected from urbanization and associated noise Adverse: some noise associated with refuge operations and visitor traffic	Beneficial: Similar benefits as B, but over a larger area Adverse: similar to B
Aesthetics	Beneficial: none Adverse: additional lands developed, including tall structures, further altering visual resources	Beneficial: lands protected from development and construction of tall structures Adverse: none	Beneficial: Similar benefits as B, but over a larger area Adverse: similar to B
BIOLOGICAL RESOURCES			
Habitats	Beneficial: none Adverse: many habitats, especially upland types, will continue to be lost or degraded due to agriculture, development, construction of transportation/utility corridors, unfavorable fire regimes, and nonnative species.	Beneficial: uplands will benefit from habitat restoration/ management (primarily through prescribed fire) and control of nonnative species. Wetlands will benefit from improved restoration/management and hydrological connectivity. Adverse: some minor impacts from construction of refuge and public use infrastructure. Minor impacts from public use (vegetation trampling). Minimal impacts to native habitats resulting from herbicides/mechanical removal of nonnative species.	Beneficial: similar to B, but to a greater extent as more lands will be protected Adverse: similar to B

Resource	Alternative A: No Refuge and No Conservation Area	Alternative B: Refuge Only Approach (50,000-acre Refuge)	Alternative C: Conservation Partnership Approach (50,000-acre Refuge and 100,000-acre Conservation Area)
Imperiled and Threatened and Endangered Species (T&E)	Beneficial: none Adverse: imperiled and T&E species will continue to suffer from habitat loss and degradation.	Beneficial: imperiled and T&E species will benefit from habitat restoration/management. Adverse: minimal impacts from public use.	Beneficial: similar to B, but to a greater extent as more lands will be protected Adverse: similar to B
Nonnative Species	Beneficial: none Adverse: continued degradation of natural habitats resulting from spread of nonnative species.	Beneficial: control of nonnative species will increase. Adverse: none	Same as B
Wildlife	Beneficial: none Adverse: land alterations and use will continue to favor generalist species at the expense of listed wildlife and rare habitats.	Beneficial: common species will be managed at more optimal levels, biodiversity will be maintained or increased. Adverse: minimal impacts resulting from hunting program.	Beneficial: similar to B, but to a greater extent as more lands will be protected Adverse: similar to B
CULTURAL RESOURCES			
Archaeological and Historic Resources	Beneficial: none Adverse: cultural resources on unprotected lands will continue to be at risk from development projects	Beneficial: cultural resources will be offered increased protection on refuge lands Adverse: risk from disturbance and damage caused refuge operations or public use will be minimal	Beneficial: similar to B, but to a greater extent as more lands will be protected Adverse: similar to B

Resource	Alternative A: No Refuge and No Conservation Area	Alternative B: Refuge Only Approach (50,000-acre Refuge)	Alternative C: Conservation Partnership Approach (50,000-acre Refuge and 100,000-acre Conservation Area)
SOCIOECONOMICS			
Economics and Wildlife-dependent Public Use	Beneficial: none Adverse: opportunities for appropriate and compatible wildlife-dependent uses will decline as more lands become developed	Beneficial: some local economic benefits associated with wildlife-dependent uses; increased cost-savings to local communities with regards to maintaining clean water and reduced need for stormwater management infrastructure; potential for increased property values for properties near the refuge Adverse: potential for increased development pressure due to the desire to buy land adjacent to the refuge, leading to increased fragmentation of remaining lands	Beneficial: similar to B, but to a greater extent as more lands will be protected Adverse: similar to B

Resource	Alternative A: No Refuge and No Conservation Area	Alternative B: Refuge Only Approach (50,000-acre Refuge)	Alternative C: Conservation Partnership Approach (50,000-acre Refuge and 100,000-acre Conservation Area)
Neighboring Landowners – adjacent to proposed Refuge and Conservation Area	Beneficial: likely no change from current conditions Adverse: potential for trespass from adjacent private lands, potential for negative impacts from adjacent land use activities (e.g., biofuel operations)	Beneficial: adjacent land uses in the refuge to maintain and restore native habitats; potential for increased land values as development patterns change Adverse: potential for trespass by public users from refuge lands	Beneficial: adjacent land uses in the Conservation Area to remain similar to past and existing uses and activities; adjacent land uses in the refuge to be maintained and restored to native habitats; potential for increased land values as development patterns change, potential for maintained or increased movement of wildlife through the area Adverse: potential for trespass by public users from refuge lands; potential for maintained or increased movement of wildlife through the area

E. SUMMARY

Based on the nature of the project, the location of the site and the current land use, the preferred alternative will not have any significant effects on the quality of the human environment including public health and safety. Further, because the purpose of the project is to protect, conserve, maintain, and where possible, enhance the natural habitat of the lands within the acquisition area, the project is not expected to have any significant adverse effects on the area's wetlands and floodplains, pursuant to Executive Orders 11990 and 11988.

Implementation of the preferred alternative is unlikely to involve any highly uncertain, unique, unknown, or controversial effects on the human environment. The preferred alternative will not establish a precedent for future actions with significant effects, nor will it represent a decision in principle about a future consideration. No cumulatively significant impacts on the environment are anticipated.

In addition, the project will not significantly affect any unique characteristic of the geographic area, such as historical or cultural resources, wild and scenic rivers, or ecologically critical areas. The project will not significantly affect any site listed in or eligible for listing in the National Register of Historic Places, nor will it cause loss or destruction of significant scientific, cultural, or historic resources. The area's cultural resources will be protected under the regulations of the National Historic Preservation Act of 1966, as amended, the Archaeological Resources Protection Act, and the Advisory Council on Historic Preservation (36 CFR 800). The Florida State Historic Preservation Office will be contacted whenever any future management activities have the potential to affect cultural resource sites.

All tracts acquired by the Service in fee-title will be removed from local real estate tax rolls, because federal government agencies are not required to pay state or local taxes. However, the Service makes annual payments to local governments in lieu of real estate taxes, as required by the Refuge Revenue Sharing Act (Public Law 95-469). Payment for acquired land is computed on whichever of the following formulas is greatest: (1) Three-fourths of 1 percent of the fair market value of the lands acquired in fee-title; (2) 25 percent of the net refuge receipts collected; or (3) 75 cents per acre of the lands acquired in fee-title. The estimated annual revenue-sharing payment that will be made to the individual county will depend on the amount of acreage acquired in fee-title. No actions will be taken that will lead to a violation of federal, state, or local laws imposed for the protection of the environment.

F. RECOMMENDATION

The Service has selected Alternative C as the preferred alternative, because it better serves the outlined purpose and need, stated goals and objectives, and vision and purposes of the Everglades Headwaters NWR and Conservation Area. Through the establishment of the Everglades Headwaters NWR and Conservation Area, as described in Alternative C, the Service will be able to fully participate with other conservation partners in the management and protection of the wildlife and habitats within the project area. Connectivity between existing conservation lands will be enhanced, movement corridors will be protected, and threatened and endangered species will receive additional management attention. Opportunities for wildlife-dependent recreational activities will be increased, and the existing rural working landscape will receive further protection from development pressure. Further, any cultural resources found within the refuge will be afforded protection by the Service.

Appendix A. Information on Preparers

Contributors to the documents:

- Keenan Adams; Wildlife Refuge Specialist; Pelican Island, Archie Carr, and Lake Wales Ridge NWRs; Merritt Island NWR Complex; USFWS
- James Caudill, Senior Economist, Division of Economics, Washington Office, USFWS
- Cheri M. Ehrhardt, AICP, Natural Resource Planner, Area 2, Southeast Region, USFWS
- Mark Endries, GISP, GIS Analyst, Asheville Ecological Services Field Office, USFWS
- John Galvez, Project Leader, Peninsular Florida Fish and Wildlife Conservation Office, USFWS
- Steve Glass, GIS Specialist, South Florida Ecological Services Field Office, USFWS
- Betty Gouge, Realty Specialist, Realty, Southeast Region, USFWS
- Layne Hamilton, Project Leader, Merritt Island NWR Complex, USFWS
- Laura Housh, Land Protection Planner, Southeast Region, USFWS
- Richard Kanaski, Regional Archaeologist, Southeast Region, USFWS
- Kristen Kneifl; Refuge Biologist; Pelican Island, Archie Carr, and Lake Wales Ridge NWRs; Merritt Island NWR Complex; USFWS
- Lori Miller, CFM, AMS, Senior Hydrologist, South Florida Ecological Services Field Office, USFWS
- Evelyn Nelson, Writer/Editor, Southeast Region, USFWS
- Charlie Pelizza; Refuge Manager; Pelican Island, Archie Carr, and Lake Wales Ridge NWRs; Merritt Island NWR Complex; USFWS
- Pam Repp, former Assistant Field Supervisor for Everglades Restoration, South Florida Ecological Services Field Office, USFWS
- Steve Schubert, Fish and Wildlife Biologist, South Florida Ecological Services Field Office, USFWS
- Marilyn Stoll, Senior Fish and Wildlife Biologist, South Florida Ecological Services Field Office, USFWS
- Oliver van den Ende, Natural Resource Planner, Southeast Region, USFWS
- Mike Waldon, Senior Hydrologist, Department of Interior Everglades Program Team, Arthur R. Marshall Loxahatchee NWR, USFWS
- Allen Webb, Senior Fish and Wildlife Biologist, South Florida Ecological Services Field Office, USFWS
- Barry Wood, GIS Specialist, South Florida Ecological Services Field Office, USFWS

Reviewers of the documents, in whole or in part:

- Chris Belden, Senior Fish and Wildlife Biologist, South Florida Ecological Services Field Office, USFWS
- Dave Bender, Botanist, South Florida Ecological Services Field Office, USFWS
- Robert Frakes, Supervisory Ecologist, South Florida Ecological Services Field Office, USFWS
- Tamar Hogan, Realty Chief, Southeast Region, USFWS
- Rose Hopp, Planning Chief, Southeast Region, USFWS
- Pam Horton, Compatibility Determination Coordinator, Southeast Region, USFWS
- Chuck Hunter, Resource Management Chief, Southeast Region, USFWS

- Marilyn Knight, Fish and Wildlife Biologist, South Florida Ecological Services Field Office, USFWS
- Brian Powell, Fish and Wildlife Biologist, South Florida Ecological Services Field Office, USFWS
- Sandra Sneckenberger, Fish and Wildlife Biologist, South Florida Ecological Services Field Office, USFWS
- Elizabeth Souheaver, Refuge Supervisor, Area 2, Southeast Region, USFWS
- Richard Huffines, Deputy Refuge Chief, Southeast Region, USFWS
- Susan Trokey, Realty Specialist, Southeast Region, USFWS
- Richard Warner, NEPA Coordinator, Southeast Region, USFWS

Appendix B. Known Conservation Lands in the Study Area by County

The following table shows acreages of known conservation lands located in the Study Area by county.

Appendix B. Table 1. Known conservation lands in the Study Area by county

NAME	COUNTY	ACRES
Archbold Biological Station	Highlands	2,634
Avon Park Air Force Range - Highlands	Highlands	54,635
Carter Creek	Highlands	245
Highlands Hammock State Park	Highlands	2,721
Holmes Avenue	Highlands	10
Jack Creek	Highlands	1,285
Kissimmee Prairie Preserve State Park - Highlands	Highlands	4
Kissimmee River - Highlands	Highlands	12,080
Lake June-in-Winter Scrub State Park	Highlands	864
Lake Wales Ridge National Wildlife Refuge	Highlands	1,658
Lake Wales Ridge State Forest - Highlands	Highlands	0
Lake Wales Ridge Wildlife and Environmental Area - Highlands	Highlands	13,564
Paradise Run - Highlands	Highlands	248
	Subtotal	***89,948***

NAME	COUNTY	ACRES
Avon Park Air Force Range - Okeechobee	Okeechobee	118
Kissimmee Prairie Preserve State Park - Okeechobee	Okeechobee	53,261
Kissimmee River - Okeechobee	Okeechobee	18,426
Lake Okeechobee Sanctuaries	Okeechobee	14
Lake Okeechobee Water Retention Phosphorus Removal Project	Okeechobee	194
Lemkin Creek Urban Treatment Area	Okeechobee	154
North of Lake Okeechobee Storage Reservoir	Okeechobee	13
Paradise Run - Okeechobee	Okeechobee	1,431
Taylor Creek/Nubbins Slough STA	Okeechobee	4,783
	Subtotal	***78,394***
North of Lake Okeechobee Storage	Glades	4,701
Paradise Run	Glades	3,328
	Subtotal	***8,029***
Disney Wilderness Preserve - Osceola	Osceola	5,285
Escape Ranch Conservation Easement	Osceola	312
Kissimmee Chain of Lakes - Osceola	Osceola	18,140
Kissimmee Prairie Preserve State Park - Osceola	Osceola	520
Kissimmee River - Osceola	Osceola	4,972

NAME	COUNTY	ACRES
Lake Kissimmee State Park - Osceola	Osceola	85
Lake Lizzie Conservation Area	Osceola	1,073
Lonesome Camp Ranch Conservation Area	Osceola	2,513
Split Oak Forest Mitigation Park Wildlife and Environmental Area - Osceola	Osceola	628
Three Lakes Wildlife Management Area	Osceola	41,762
Upper Lakes Basin Watershed - Osceola	Osceola	490
	Subtotal	***75,780***
Allen David Broussard Catfish Creek Preserve State Park	Polk	8,328
Avon Park Air Force Range - Polk	Polk	53,671
Bok Tower Gardens	Polk	210
Crooked Lake Prairie	Polk	201
Crooked Lake Sandhill	Polk	25
Crooked Lake West	Polk	18
Disney Wilderness Preserve - Polk	Polk	6,698
Hancock Commons Tract	Polk	41
Hatchineha Ranch	Polk	5,126
Hickory Lake Scrub County Park	Polk	56
Kissimmee Chain of Lakes - Polk	Polk	11,126

NAME	COUNTY	ACRES
Kissimmee Prairie Preserve State Park - Polk	Polk	0
Kissimmee River - Polk	Polk	7,903
Lake Kissimmee State Park - Polk	Polk	5,809
Lake Wales Ridge State Forest - Polk	Polk	26,824
Lake Wales Ridge Wildlife and Environmental Area - Polk	Polk	642
Lake Wales Trailways	Polk	3
Mary Male Sanctuary	Polk	20
North/Walk-in-Water Creek	Polk	1,105
SUMICA	Polk	4,038
Saddle Blanket Scrub Preserve	Polk	509
Sherwood L. Stokes Preserve/Lake Marion	Polk	121
Sun Ray Scrub	Polk	9
TNC/Dellock	Polk	11
Tiger Creek Preserve	Polk	4,863
Upper Lakes Basin Watershed - Polk	Polk	2,297
	Subtotal	***139,654***
	Total	**391,805**

Appendix C. Habitat Ranking, Alternative Development, and Land Acquisition Prioritization Methodology

INTRODUCTION

Plans to establish the Everglades Headwaters NWR and Conservation Area led to the identification of an approximately 1.8 million-acre Study Area, a general area of conservation interest in south-central peninsular Florida. Within this area lies a diversity of habitat types and other resource values that are fully described in this Final EA (Chapter II). In addition, landowner interest in the project far exceeds the proposed acquisition boundary acreage. In order to prioritize, evaluate, and identify the specific parcels of land to be included in the 150,000-acre Everglades Headwaters NWR and Conservation Area, a methodology was needed to scientifically and objectively identify focal areas for conservation, and the highest priority lands for acquisition within those focal areas. Prioritization occurred at three levels of resolution. At the landscape level, we needed to first rank habitats based on the goals established for the Everglades Headwaters NWR. Once all habitats were ranked, a set of alternatives was developed and evaluated as part of the NEPA compliance (Chapter III), thereby establishing local priorities. The Preferred Alternative - Alternative C - includes two areas: Conservation Partnership Area and Conservation Focal Area.

Conservation Partnership Area – The area within which the Service will have the ability to work with partners and landowners on an array of less-than-fee-title conservation activities, including management agreements and conservation easements, and within which the Service will have authority to acquire up to 100,000 acres in less-than-fee-title for the Conservation Area.

Conservation Focal Area – The Service identified an approximately 130,000-acre area within which the Service will have authority to acquire up to 50,000 acres with a fee-title acquisition focus.

Lastly, once the preferred alternative was selected, it was necessary at the site-specific scale to further define focal areas for conservation as well as identifying specific parcels for fee-title and less-than-fee-title acquisition. The methodology used to define these parameters is described below.

Objective

The objectives of this prioritization methodology are to:

- At a landscape scale, identify the highest quality habitats within the Study Area, as defined by the stated goals and vision for the Everglades Headwaters NWR and Conservation Area
- At a local scale, identify lands to be contained within the Conservation Focal Area
- At a site specific scale, rank and select specific parcels for acquisition that best meet refuge goals and objectives

Methodology – Landscape-Scale Habitat Ranking

Initial classification for identifying the highest quality habitats within the Study Area was based on two criteria: (1) To identify high-priority ecological value lands that are currently unprotected, and (2) quantify connectivity between currently conserved lands, thus identifying potential corridors for animal movement across the landscape.

This portion of the planning process began with the selection of a land cover layer, Cooperative Land Cover Map (FNAI 2010a). The 112 FNAI land cover types found within the Study Area were then combined into the 12 land cover types used in the analysis for this document (Appendix C, Figure 1), upon which to conduct a Geographic Information Systems (GIS) analysis. FWC's 2003 raster graphic land cover layer, and SFWMD's 2004 vector version of the FDOT Future Land Use and Cover Classification System (FLUCCS) code coverage were assessed and integrated into the base layer along with the FNAI Cooperative Land Cover Map. In an effort to build an analytical model for subsequent alternatives' analysis development for the project, we cross walked each land cover code into a more generalized ecological community based on the Service's South Florida Multi-Species Recovery Plan (Service 1999).

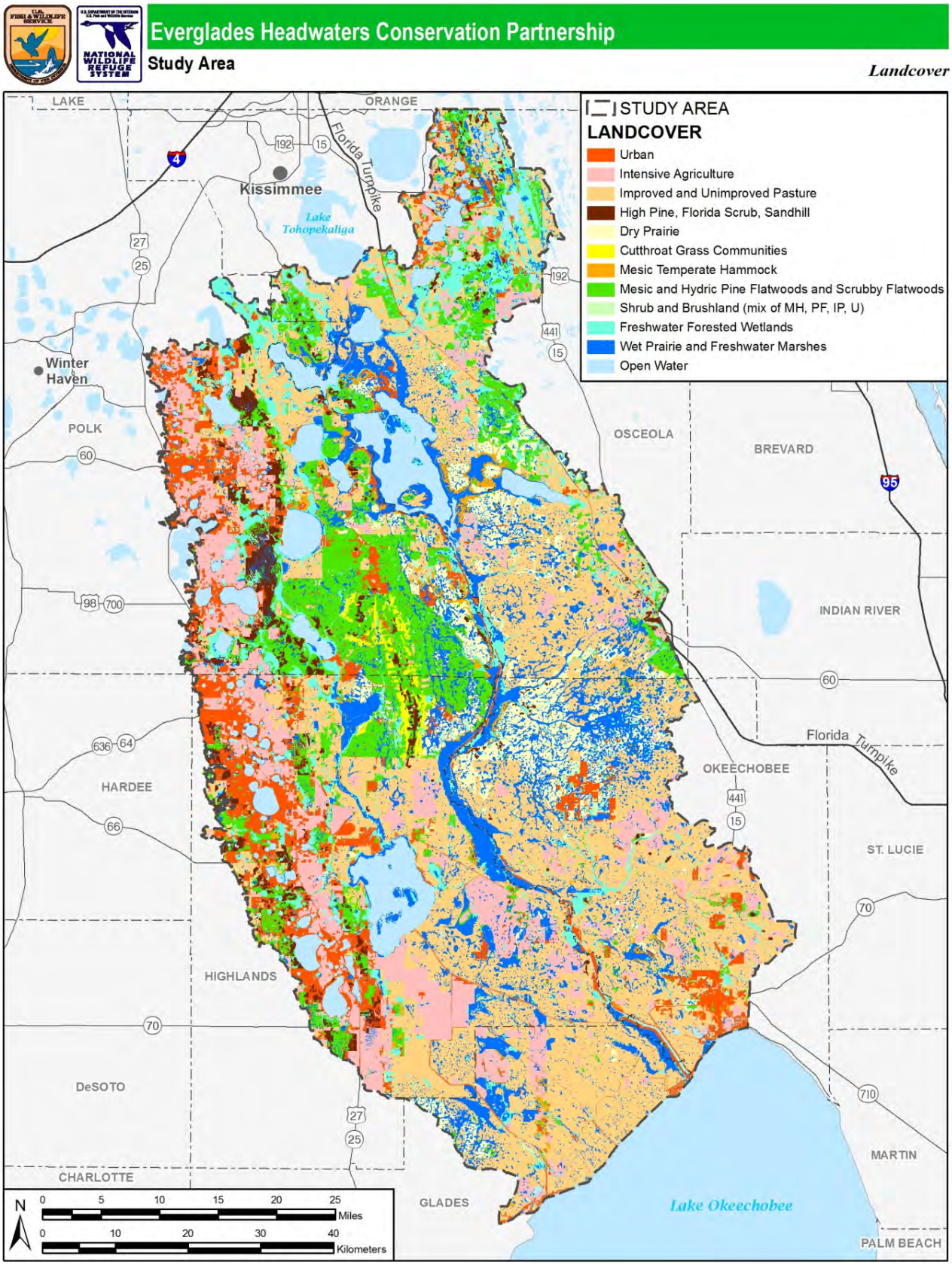
The land cover base map used in this planning process is derived from existing sources and expert review of aerial photography for focal communities, and is improved upon by integrating local ecologically based land cover and data for focal natural communities that were revised through review of aerial photography. The map provides significantly improved data for scrub and sandhill land cover types. All data were cross walked into the Florida Land Use and Cover Classification System. The Service examined the new FNAI coverage data within the Study Area boundary for potential outliers, finding two miscoded land covers. One was "1670 sand beach – coastal uplands," which upon examination was a sandy shoreline along Lake Livingston (freshwater). The other was "5220 tidal flat," which appeared to be a cattle pond dug into a former freshwater marsh surrounded by a ring of deciduous trees within a pasture. These data were recoded to their proper codes.

The area used for the GIS analysis included all areas within 20 kilometers of the Study Area boundary. Analysis was conducted on this larger area so that the Study Area boundary would not inadvertently constrain the analysis and reduce the possibility of inappropriately excluding connectivity options that were available immediately outside of the Study Area boundary.

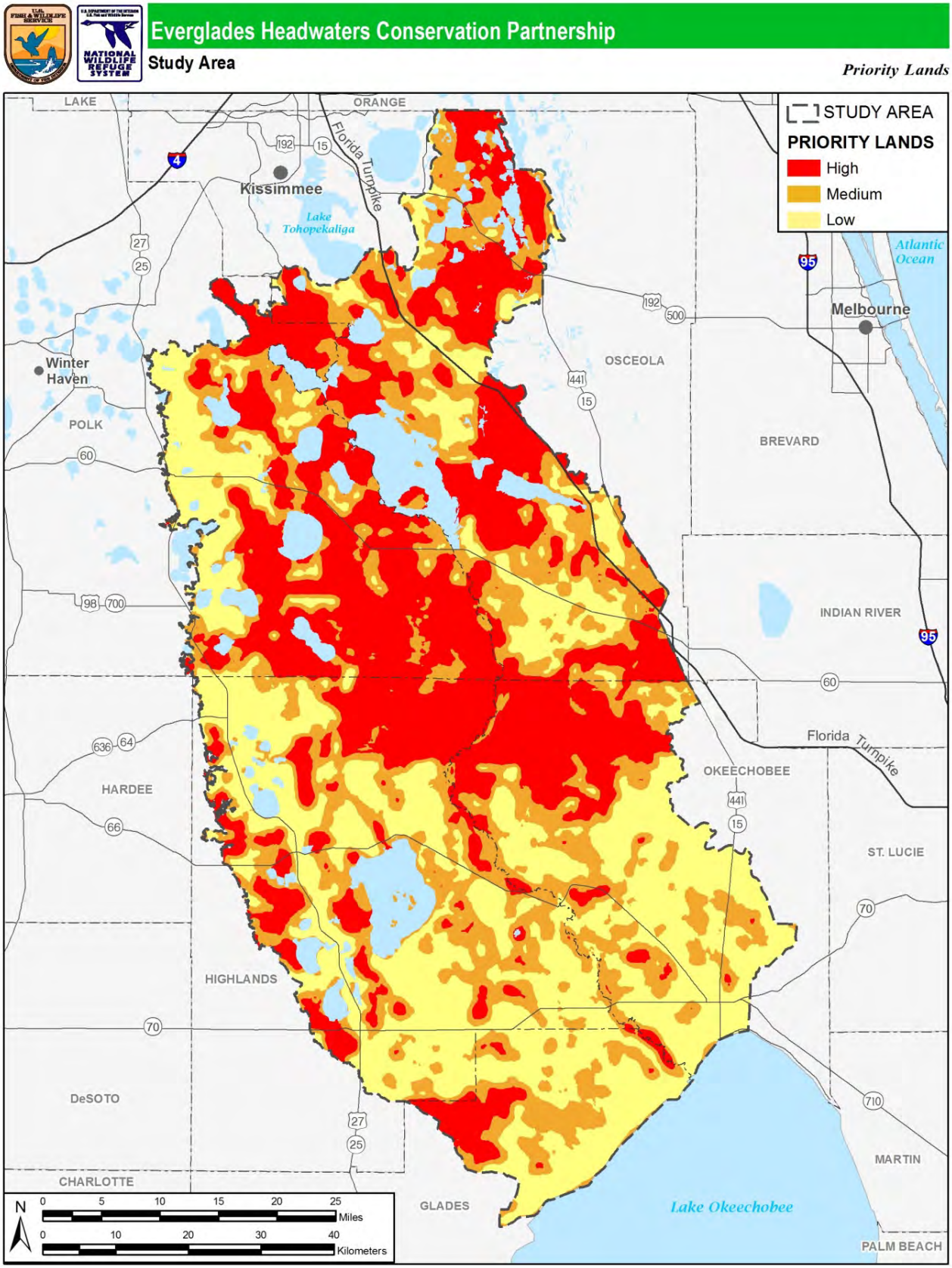
A group of biologists and GIS technicians from the FWC and FWS was convened, and using best professional judgment, framed a strategy for the selection of the habitats considered most rare or most in need of protection within the Study Area, because they support both keystone species and habitats, or federally listed threatened or endangered species. The FNAI Cooperative Land Cover Map was reclassified into a six-class scheme to prioritize the land cover types into five priority classes (the sixth class being of no conservation value), based upon the needs of the project and identifying land cover classes considered to be barriers. Generally, the highest priority habitats were dry prairie (with any associated wet prairie habitat that could support Florida grasshopper sparrows), cutthroat grass and seeps, and Florida scrub or sandhill (that could support xeric plants and animals). The second highest ranking habitats were all flatwoods types (scrubby, mesic, and hydric), and other upland and wetland forests. The third highest priority habitats were primarily long-hydroperiod herbaceous marshes. Fourth and fifth ranked habitats were also developed, but in many cases these were potentially undesirable land covers (e.g., row crops received a rank of 5 due to low wildlife habitat, high level of repeated human disturbance, and potential for chemical contaminants in the soils) (Appendix C, Table 1 and Appendix C, Figure 2).

In order to quantify and demonstrate connectivity between existing landscapes and potential corridors, two neighborhood statistical analyses were run using the Spatial Analyst Extension of ArcGIS (ESRI 2011). The neighborhood statistic creates output values for each cell (pixel) location based on the value for that location and the values identified in a neighborhood specified by the user. The neighborhood statistical analyses were run using a weighted prioritization of the FNAI cooperative land cover. The weighted land cover prioritization gives preference to the higher priority classes

Appendix C. Figure 1. Study Area land cover



Appendix C. Figure 2. Priority land cover



(Appendix C, Table 1). The analysis used sum as the statistic type, circle as the neighborhood, and the distances selected for the neighborhood were 250 meters and one kilometer. For the neighborhood statistic output, as a pixel value increases it identifies areas with greater amounts of higher priority habitats within the neighborhood distance. The one kilometer neighborhood analysis identifies areas with large amounts of priority habitats on a large scale, whereas the 250-meter neighborhood analysis identifies these areas on a finer scale. The 250-meter neighborhood identifies narrower potential corridors and smaller patches of priority habitats than the one kilometer analysis due to the smaller window (neighborhood) in the analysis.

To generate the model conclusions both neighborhood statistic output maps were reclassified using a two-class equal interval classification scheme where the lower half of the pixel values were given a value of No Data and the upper half of pixel values were given a value of one. We retained these reclassified layers in our final model: all areas in the reclassified one kilometer neighborhood analysis, and only patches in the reclassified 250-meter neighborhood analysis that intersect the one kilometer reclassification. The final model uses the reclassified one kilometer neighborhood analysis patches as its foundation for priority areas and incorporates potential finer scale connectivity from these areas by retaining the intersecting reclassified 250-meter neighborhood analysis patches.

Both the Priority Class rank, and the Neighborhood Statistic Value were combined to develop the priority land cover which is used in all subsequent analysis. Appendix C, Figure 2, represents the highest conservation value lands on a landscape scale based upon the criteria set forth in this proposal and satisfies the first objective set forth in Appendix C and also provides the framework for assessing alternative development and land acquisition prioritization strategies. Appendix C, Table 1, shows the priority land cover types, assigned ecological priority classes, and neighborhood statistic value. Appendix C, Figure 2, shows the three priority land covers derived from the above described GIS analysis.

Appendix C. Table 1. Assigned values for prioritization of FNAI cooperative land cover map

Land Cover Type	USFWS Priority Class	Neighborhood Statistic Value
1150 - Xeric Hammock	Priority 1	10
1210 – Scrub	Priority 1	10
1211 - Oak Scrub	Priority 1	10
1213 - Sand Pine Scrub	Priority 1	10
1230 - Upland Coniferous	Priority 1	10
1240 – Sandhill	Priority 1	10
1330 - Dry Prairie	Priority 1	10
2111 - Wet Prairie	Priority 1	10
21112 - Cutthroat Seep	Priority 1	10
222111 - Cutthroat Grass Flatwoods	Priority 1	10
3117 - Sandhill Lake	Priority 1	10

Land Cover Type	USFWS Priority Class	Neighborhood Statistic Value
1110 - Upland Hardwood Forest	Priority 2	8
1120 - Mesic Hammock	Priority 2	8
1123 - Live Oak	Priority 2	8
1125 - Cabbage Palm	Priority 2	8
1311 - Mesic Flatwoods	Priority 2	8
1312 - Scrubby Flatwoods	Priority 2	8
1400 - Mixed Hardwood-Coniferous	Priority 2	8
1410 - Successional Hardwood Forest	Priority 2	8
2123 - Floodplain Marsh	Priority 2	8
2200 - Freshwater Forested Wetlands	Priority 2	8
2210 - Cypress/Tupelo(incl Cy/Tu mixed)	Priority 2	8
2211 – Cypress	Priority 2	8
2213 - Isolated Freshwater Swamp	Priority 2	8
22131 - Dome Swamp	Priority 2	8
221312 - Gum Pond	Priority 2	8
22132 - Basin Swamp	Priority 2	8
2215 - Floodplain Swamp	Priority 2	8
2220 - Other Coniferous Wetlands	Priority 2	8
2221 - Wet Flatwoods	Priority 2	8
22211 - Hydric Pine Flatwoods	Priority 2	8
2230 - Other Hardwood Wetlands	Priority 2	8
2232 - Hydric Hammock	Priority 2	8
2233 - Mixed Wetland Hardwoods	Priority 2	8
2240 - Other Wetland Forested Mixed	Priority 2	8
2242 - Cypress/Pine/Cabbage Palm	Priority 2	8
1500 - Shrub and Brushland	Priority 3	5
1670 - Sand Beach (Dry)	Priority 3	5

Land Cover Type	USFWS Priority Class	Neighborhood Statistic Value
183214 - Unimproved/Woodland Pasture	Priority 3	5
2100 - Freshwater Non-Forested Wetlands	Priority 3	5
2112 - Mixed Scrub-Shrub Wetland	Priority 3	5
21121 - Shrub Bog	Priority 3	5
2120 - Freshwater Marshes	Priority 3	5
2121 - Isolated Freshwater Marsh	Priority 3	5
21211 - Depression Marsh	Priority 3	5
21212 - Basin Marsh	Priority 3	5
2124 - Slough Marsh	Priority 3	5
2131 – Sawgrass	Priority 3	5
2140 - Floating/Emergent Aquatic Vegetation	Priority 3	5
2141 – Slough	Priority 3	5
2231 – Baygall	Priority 3	5
22311 - Bay Swamp	Priority 3	5
22312 - South Florida Bayhead	Priority 3	5
2300 - Non-vegetated Wetland	Priority 3	5
3100 - Natural Lakes & Ponds	Priority 3	5
3113 - Flatwoods/Prairie/Marsh Lake	Priority 3	5
4100 - Natural Rivers & Streams	Priority 3	5
4120 - Blackwater Stream	Priority 3	5
8000 - Open Water	Priority 3	5
18211 - Urban Open Land	Priority 4	2
182111 - Urban Open Forested	Priority 4	2
182112 - Urban Open Pine	Priority 4	2
18212 - Low Structure Density	Priority 4	2
182131 – Parks	Priority 4	2
1831 - Rural Open	Priority 4	2

Land Cover Type	USFWS Priority Class	Neighborhood Statistic Value
18311 - Rural Open Forested	Priority 4	2
183111 - Oak - Cabbage Palm Forests	Priority 4	2
18312 - Rural Open Pine	Priority 4	2
1832121 – Sugarcane	Priority 4	2
183213 - Improved Pasture	Priority 4	2
18322 - Orchards/Groves	Priority 4	2
183221 – Citrus	Priority 4	2
183222 - Fruit Orchards	Priority 4	2
18323 - Tree Plantations	Priority 4	2
183232 - Coniferous Plantations	Priority 4	2
3200 - Artificial Lakes & Ponds	Priority 4	2
3211 - Aquacultural Ponds	Priority 4	2
3220 - Artificial Impoundment/Reservoir	Priority 4	2
3230 - Quarry Pond	Priority 4	2
4200 - Canal/Ditch	Priority 4	2
4210 – Canal	Priority 4	2
1832 – Agriculture	Priority 5	1
18321 - Cropland/Pasture	Priority 5	1
183211 - Row Crops	Priority 5	1
183212 - Field Crops	Priority 5	1
18324 - Vineyard & Nurseries	Priority 5	1
183241 - Tree Nurseries	Priority 5	1
183242 - Sod Farms	Priority 5	1
183243 – Ornamentals	Priority 5	1
183251 - Feeding Operations	Priority 5	1
183252 - Specialty Farms	Priority 5	1
1880 - Bare Soil/Clear Cut	Priority 5	1

Land Cover Type	USFWS Priority Class	Neighborhood Statistic Value
7200 – Melaleuca	Priority 5	1
7300 - Brazilian Pepper	Priority 5	1
9100 - Unconsolidated Substrate	Priority 5	1
1821 - Low Intensity Urban	Barrier	No Value
182132 - Golf courses	Barrier	No Value
182135 – Cemeteries	Barrier	No Value
1822 - High Intensity Urban	Barrier	No Value
18221 - Residential, Med. Density	Barrier	No Value
18222 - Residential, High Density	Barrier	No Value
18223 - Commercial & Services	Barrier	No Value
18224 – Industrial	Barrier	No Value
18225 – Institutional	Barrier	No Value
1840 – Transportation	Barrier	No Value
1841 – Roads	Barrier	No Value
1850 – Communication	Barrier	No Value
1860 – Utilities	Barrier	No Value
1870 – Extractive	Barrier	No Value
1873 - Rock Quarries	Barrier	No Value
1877 - Spoil Area	Barrier	No Value
3240 - Sewage Treatment Pond	Barrier	No Value
3260 - Industrial Cooling Pond	Barrier	No Value

Methodology – Alternative Development

Based on landscape scale habitat ranking, location of existing conservation lands (Appendix C, Figure 3), and best professional judgment, we found that the Study Area was easily divided into two main planning areas based upon the distinctly different resource values found in each: (1) Scrub, sandhill, and related habitats and species associated with Lake Wales Ridge; and (2) grasslands, pine forests, extensive wetlands and the species associated with the prairie landscape. Thus, the approximately 1.8 million-acre Study Area was divided ecologically along the Kissimmee River corridor and the center line of the Kissimmee Chain of Lakes. The landscape lying west of this divide is labeled the Ridge Area and those lands lying east of this divide are labeled the Prairie Planning Area.

Real estate parcel data were then overlaid onto the model data to see where existing conservation lands were located, and to identify geographic areas of high-priority habitat for potential acquisition. Species occurrence data for federally listed scrub plants such as Florida ziziphus were also added as an internal check to confirm that the habitats were proper surrogates for, in this case, xeric plants.

For ease of prioritization, each planning area was divided into three units: Ridge North, Ridge Central, Ridge South, Prairie North, Prairie Central, and Prairie South. This division is based on a combination of: (1) The abundance of high-quality conservation lands occurring within a generalized area of the landscape; (2) connectivity to other identified high-quality habitats; and (3) observable linkages between existing conservation lands.

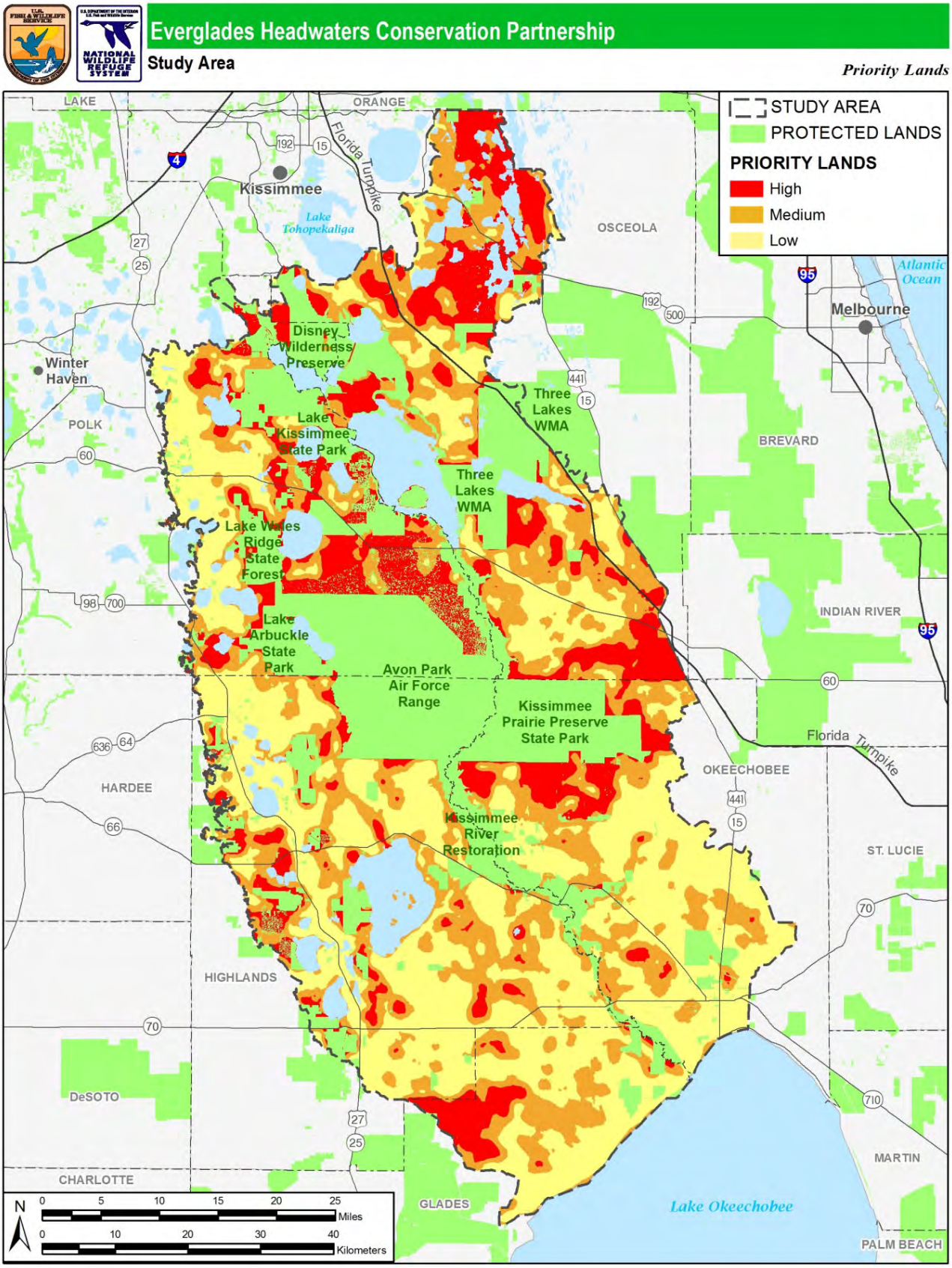
These units became the geographic structure for the development and identification of lands contained in both Alternatives B and C (Appendix C, Figures 4 and 5). The parcels which compose Alternative B's Refuge Acquisition Boundary and Alternative C's Conservation Focal Area were located in highest priority landscapes for ridge and prairie planning areas. For Alternative C, the Conservation Partnership Area and Conservation Focal Area reflect the increase in acreage identified in Alternative C. Landowner interest was used as a final filter in the identification and selection process of which land parcels would be included in the Refuge Acquisition Boundary for Alternative B, and the Conservation Partnership Area and the Conservation Focal Area for Alternative C. This satisfies the second objective set forth in Appendix C.

Methodology – Land Acquisition Prioritization

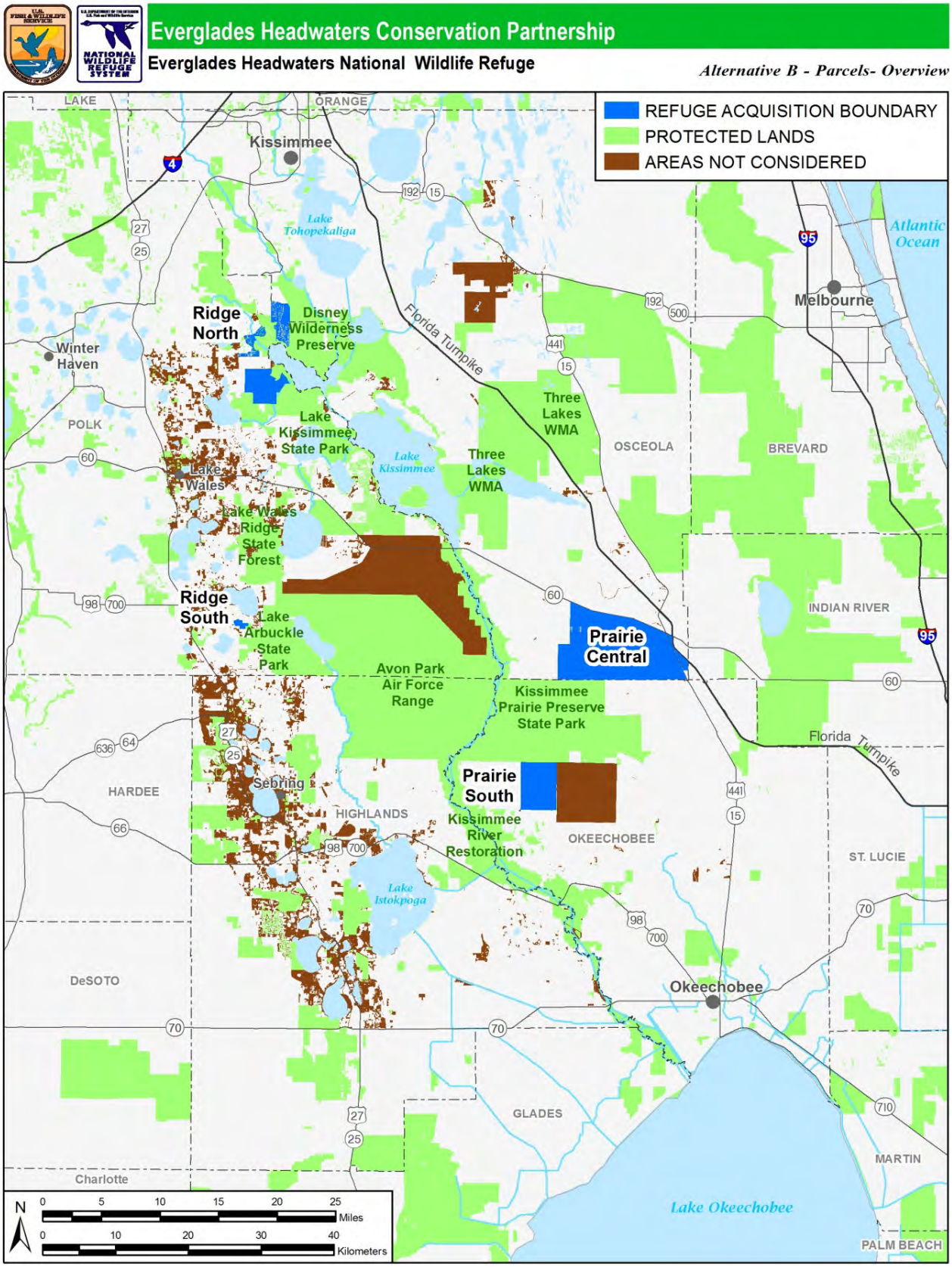
Data represented by Appendix C, Table 1, and Appendix C, Figure 2, were applied to individual parcels identified during the development of Alternatives B and C (Appendix C, Figures 4 and 5). Using the habitat conservation priority model at this finer resolution, we were able to evaluate individual landowner parcels to determine the quantity and quality of habitat that each possesses and to provide a priority rank score for the individual parcel.

The respective acreage of tiers I, II, and III lands per individual parcel was calculated as a percentage, providing a quantitative rank score which represents the suitability of each parcel for acquisition. The specific steps and numerical assessment in this process are as follows: high-priority conservation lands were assigned a score of three points; medium-priority conservation lands were assigned a score of two points; and low-priority conservation lands were assigned a score of point. These point values were multiplied by the respective acreage of each, and then an average for the entire parcel calculated.

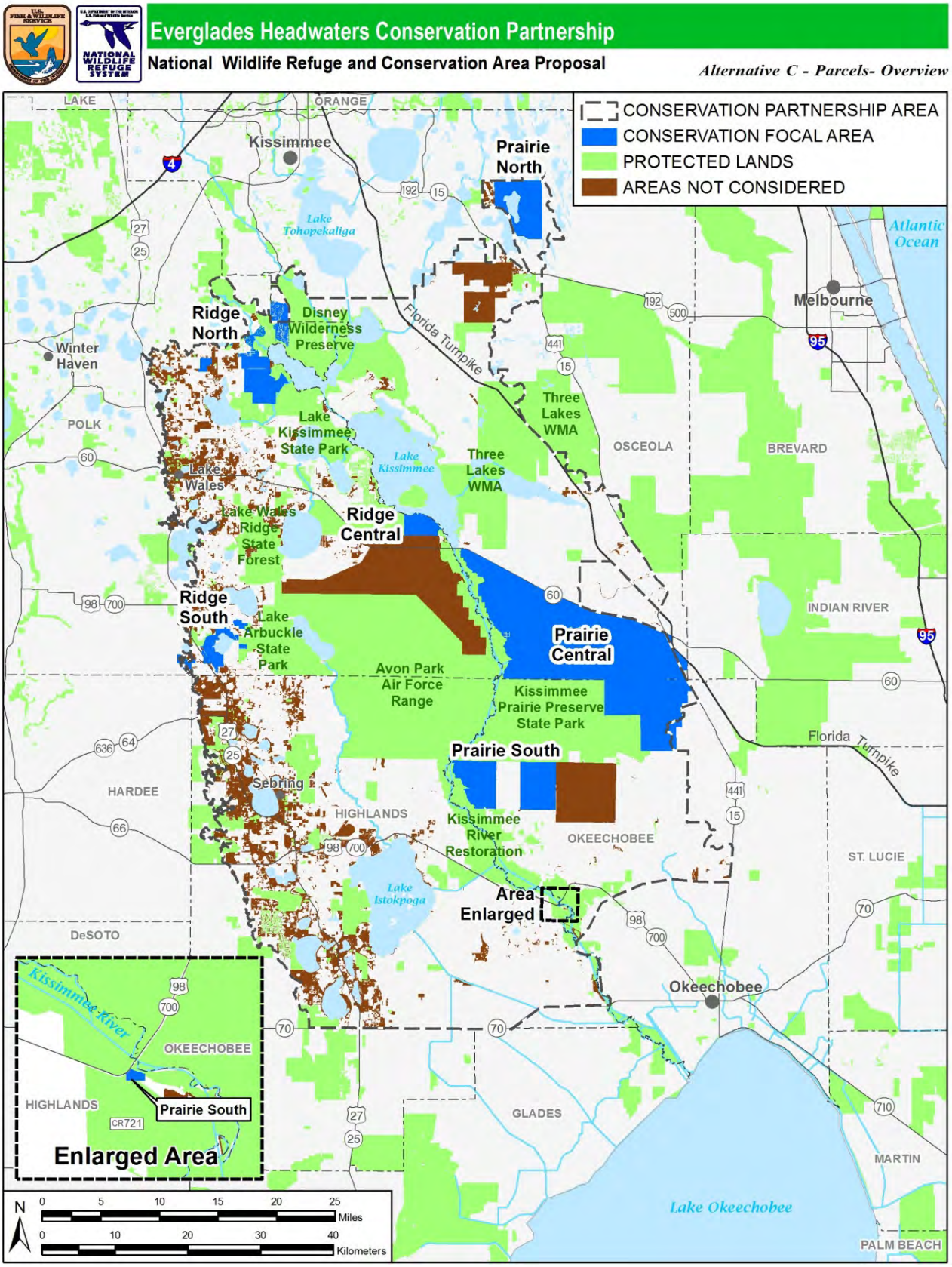
Appendix C. Figure 3. Priority lands with protected lands



Appendix C. Figure 4. Alternative B - planning units



Appendix C. Figure 5. Alternative C - planning units



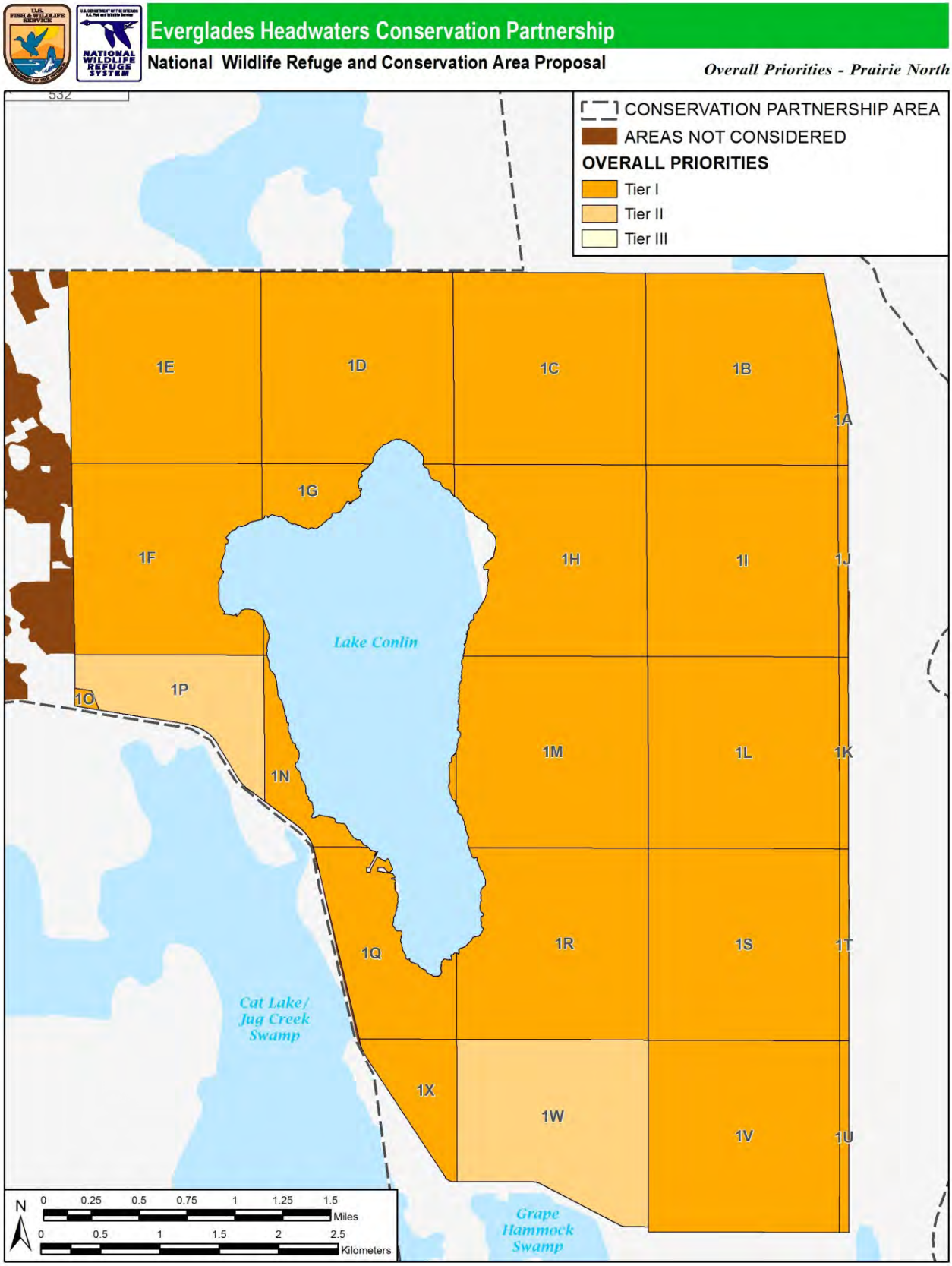
Once all parcels were individually evaluated, an overall priority rank for each landowner was determined (Appendix C, Figures 6 through 11b). Please see Table 4 in the Final LPP for parcel-specific information. This overall priority ranking was then used to categorize the highest priority lands for acquisition. It should be noted that while this land acquisition prioritization methodology can provide a rank list of priority parcels, other considerations, such as availability of funds, landowner interest, changing opportunities over time and restoration opportunity, may alter the ranking of an individual parcel. This calculation satisfies the third objective outlined in Appendix C.

Summary

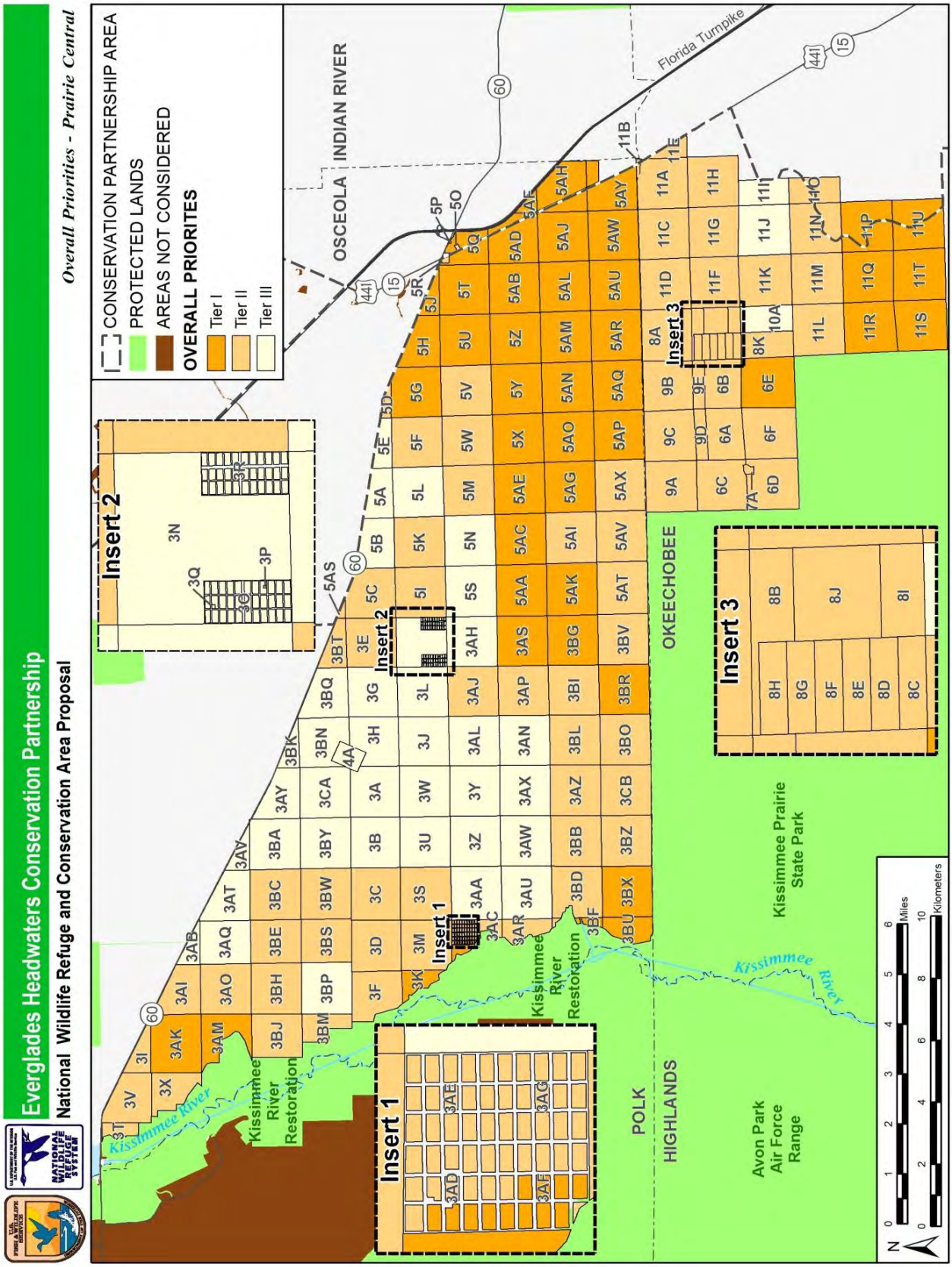
In an effort to prioritize and demonstrate the Service's best interest, a strategic approach was needed to prioritize the highest quality landscape features, as well as provide the Service with the ability to respond to opportunities presented by changing demographics and landowner interest over time. This land acquisition prioritization protocol is used to: prioritize the overall landscape; demonstrate the highest concentration of priority habitats and the greatest habitat connectivity; identify focal areas for conservation during the EA process; and rank individual parcels for acquisition priority. This methodology could be applied over time to identify the most important habitats for conservation that meet changing needs and opportunities for conservation in the project area. While this methodology provides a finite numeric statistic, on-site evaluations, best professional judgment, landowner opportunity and interest, and available funds may alter the priority rank that one parcel may receive over another.

*Note: The Conservation Focal Area under Alternative C depicts an area of approximately 130,000 acres within which the Service will acquire up to approximately 50,000 acres. The justification for the identification of a larger boundary than the acquisition acreage cap is based on the desire to be flexible to changes in landowner interest and availability of parcels of equal, high-quality habitat, over time. The less-than-fee-title Conservation Partnership Area is a general area where the Service will focus interest and effort on acquiring up to 100,000 acres of less-than-fee-title interest. Please see the description of Alternative C in Chapter III and/or Final LPP, Chapters I and III, and Final LPP, Attachment 1, for a more complete explanation.

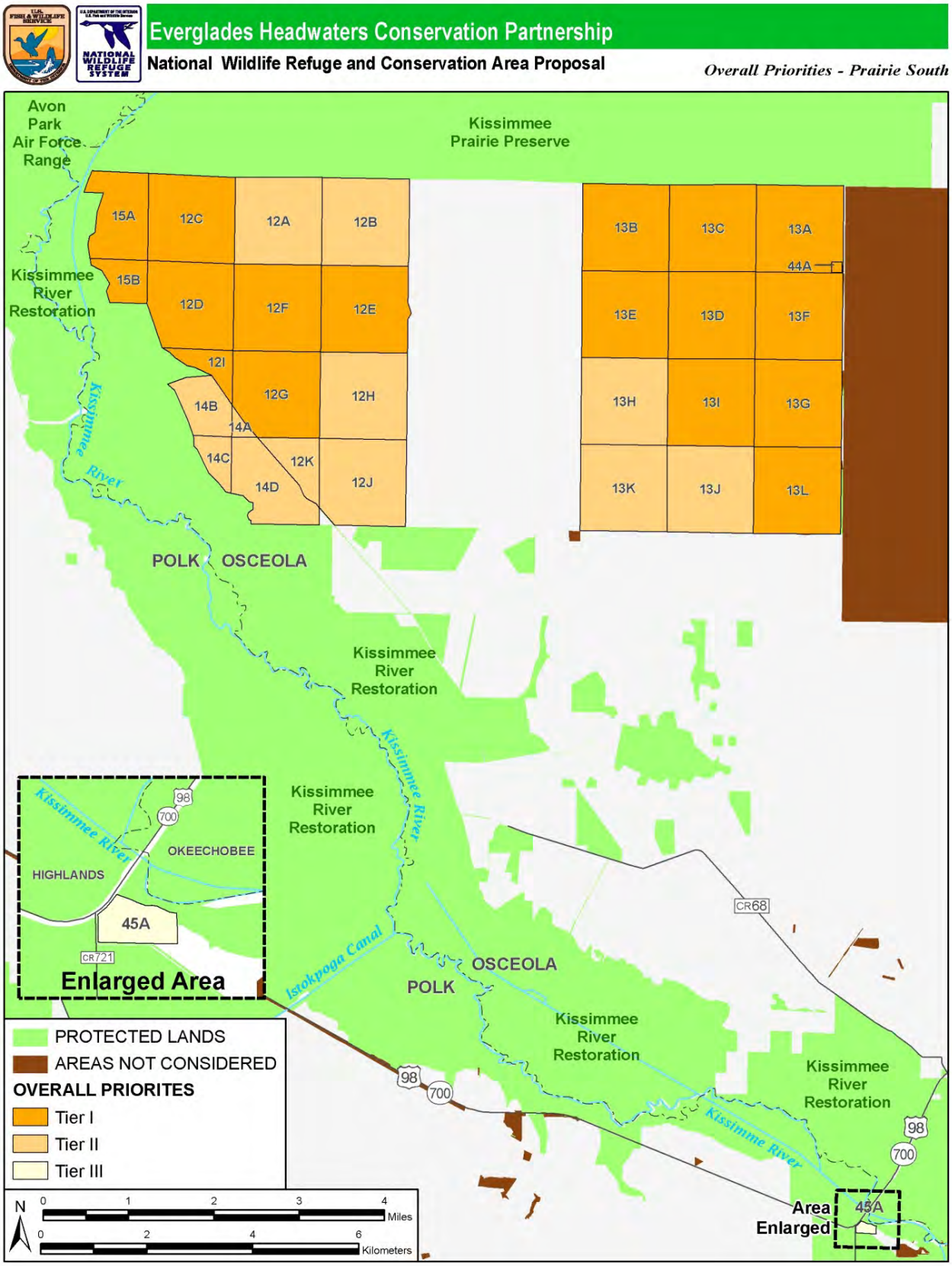
Appendix C. Figure 6. Prairie North overall priorities



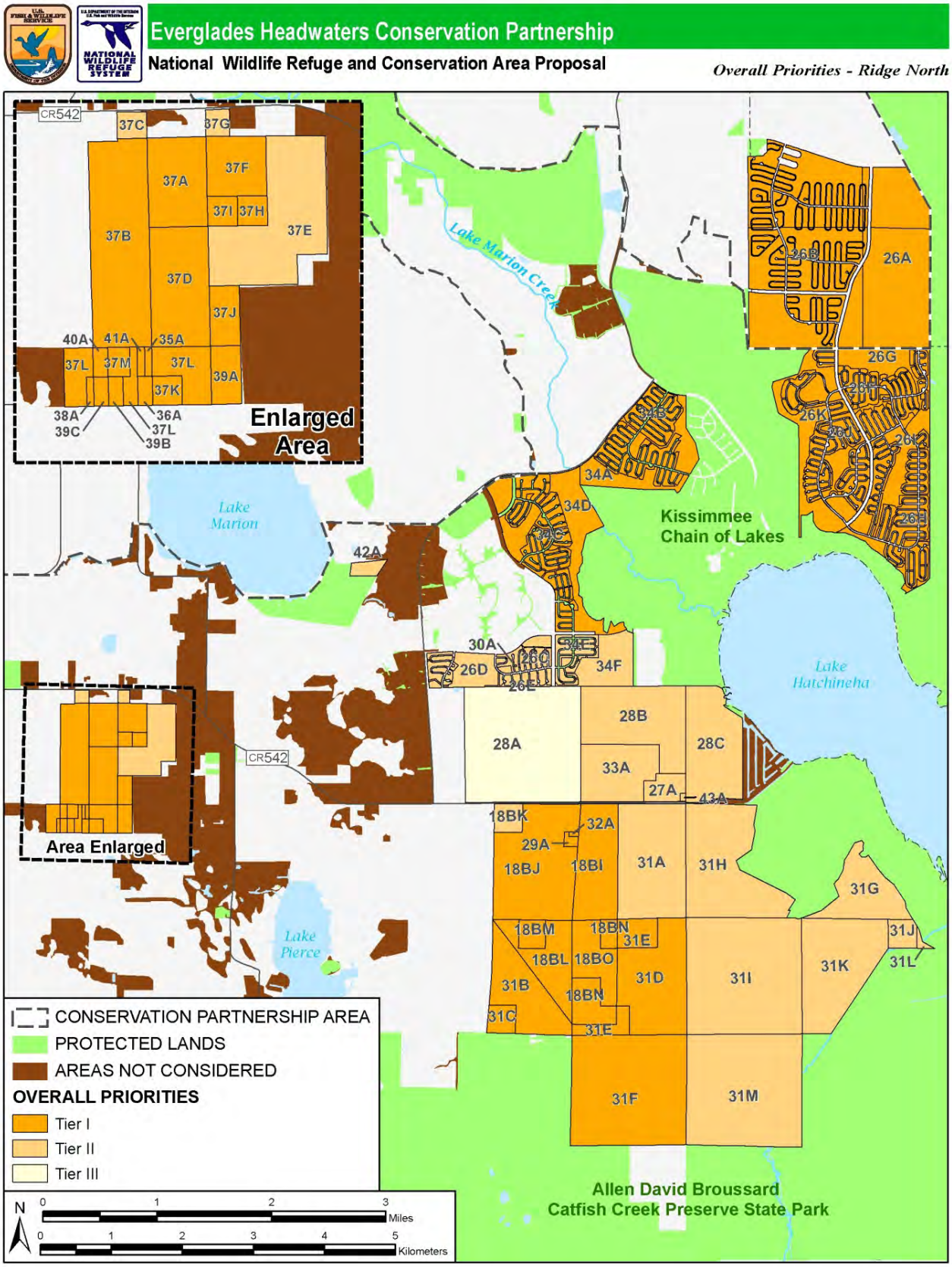
Appendix C. Figure 7. Prairie Central overall priorities



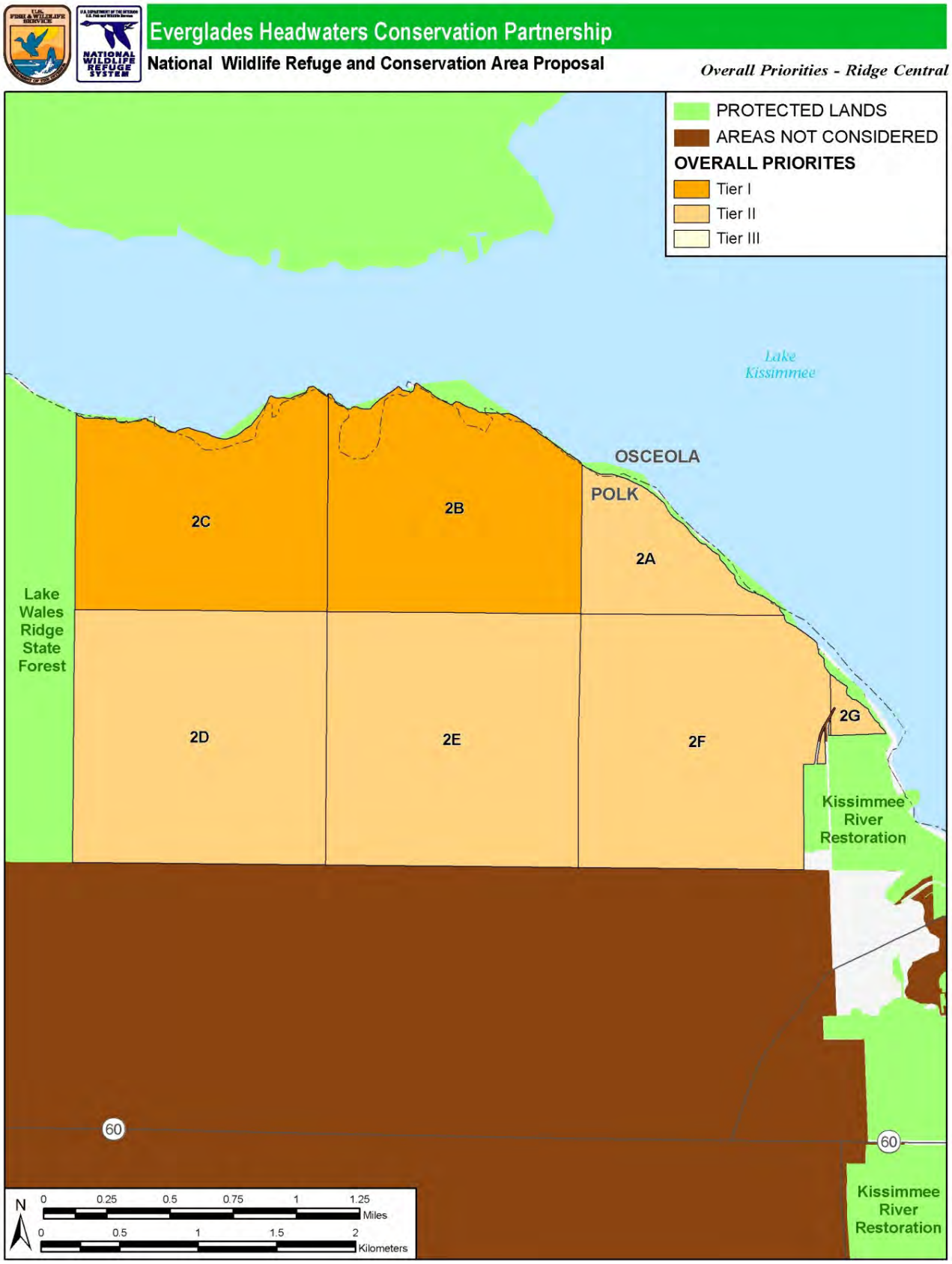
Appendix C. Figure 8. Prairie South overall priorities



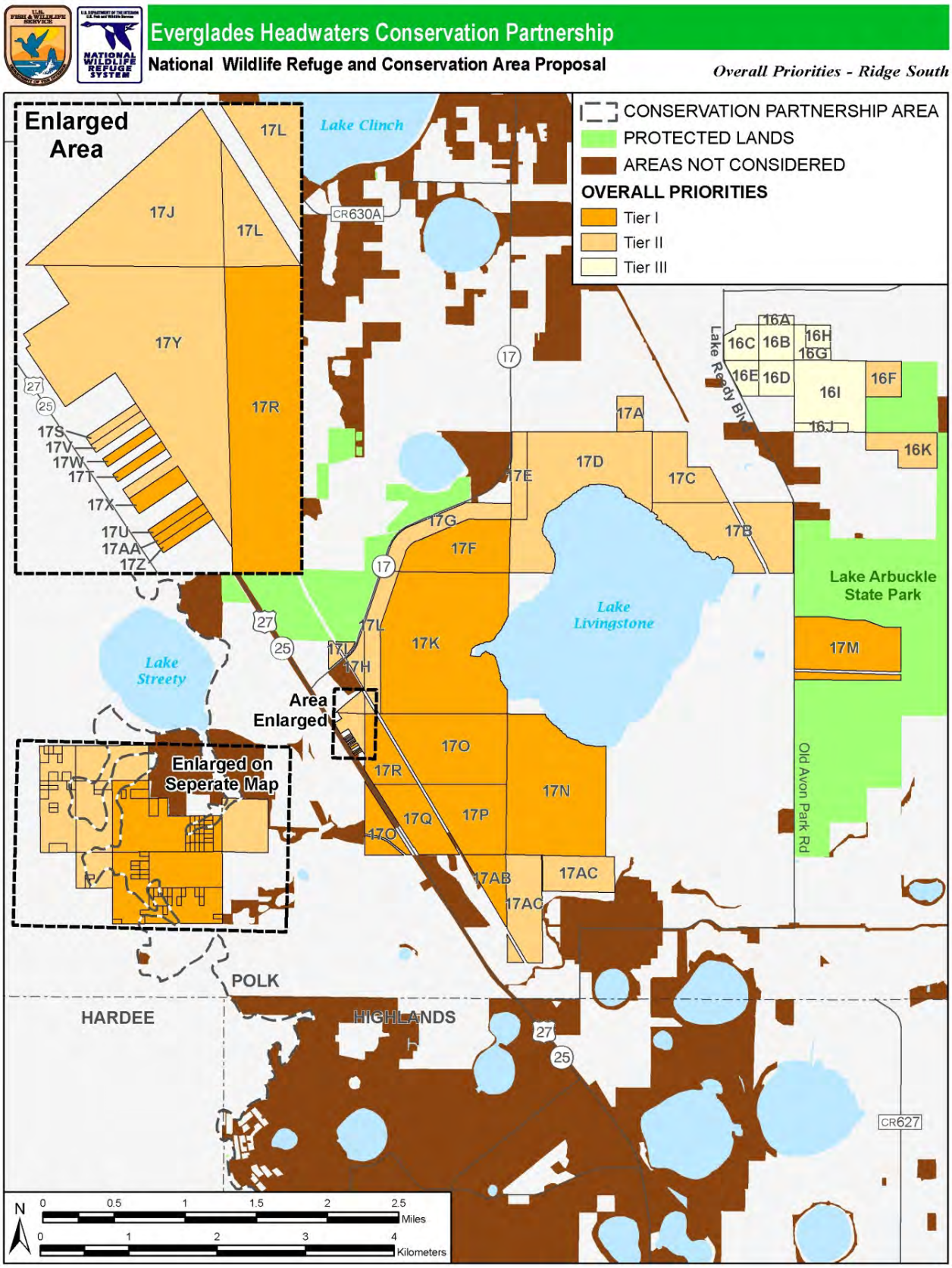
Appendix C. Figure 9. Ridge North overall priorities



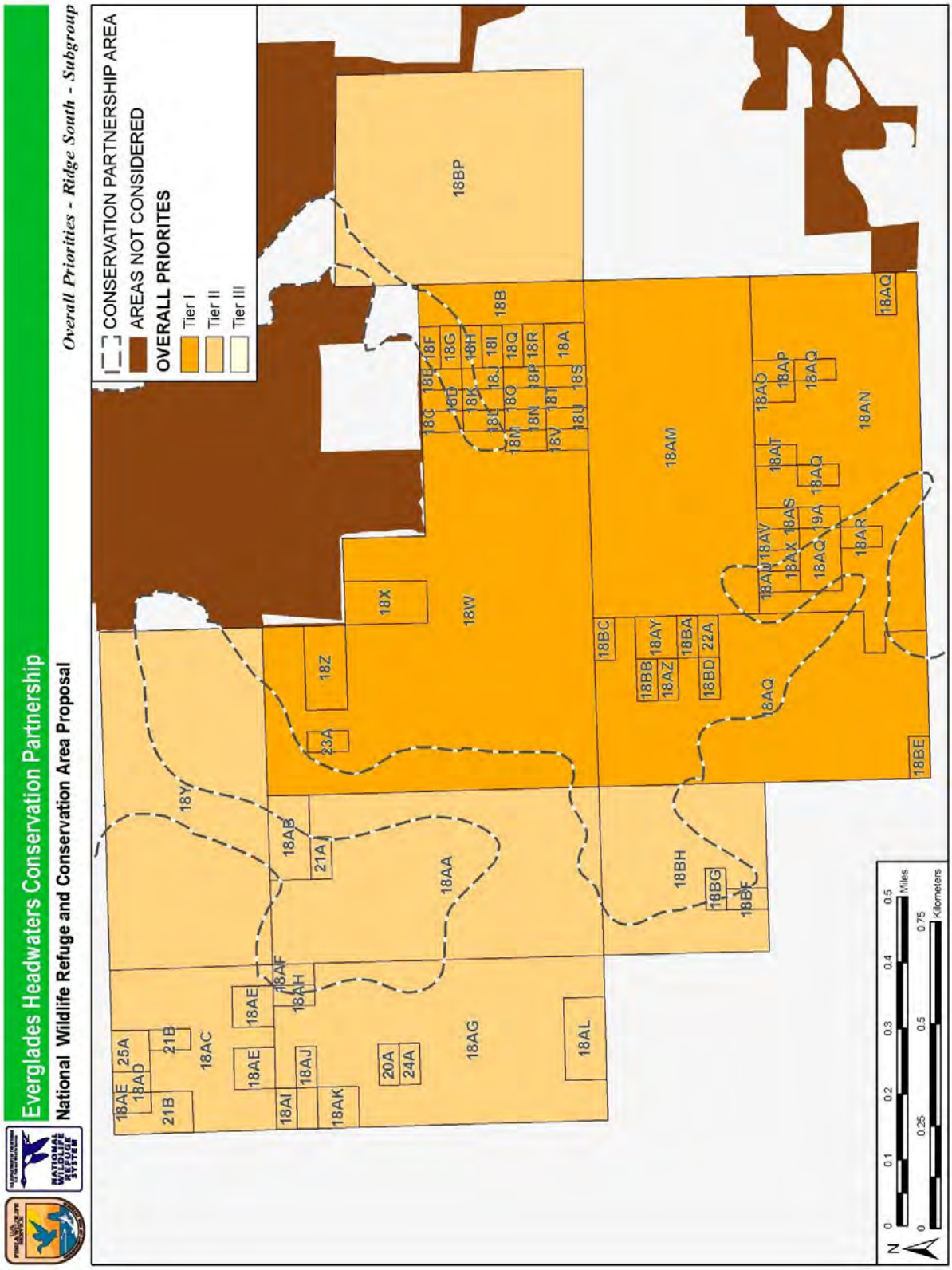
Appendix C. Figure 10. Ridge Central overall priorities



Appendix C. Figure 11a. Ridge South overall priorities



Appendix C. Figure 11b. Ridge South overall priorities



Appendix D. Intra-Service Section 7 Biological Evaluation

Originating Person: Charles Pelizza, Refuge Manager, Pelican Island National Wildlife, Archie Carr National Wildlife Refuge, and Lake Wales Ridge National Wildlife Refuge
Telephone Number: 772-581-5557 **E-Mail:** charlie_pelizza@fws.gov
Date: October 1, 2011

PROJECT NAME (Grant Title/Number): Proposed Everglades Headwaters National Wildlife Refuge and Conservation Area

I. Service Program:

___ **Ecological Services**
___ **Federal Aid**
- ___ **Clean Vessel Act**
- ___ **Coastal Wetlands**
- ___ **Endangered Species Section 6**
- ___ **Partners for Fish and Wildlife**
- ___ **Sport Fish Restoration**
- ___ **Wildlife Restoration**

___ **Fisheries**
__X__ **Refuges/Wildlife**

II. State/Agency: n/a

III. Station Name: Everglades Headwater National Wildlife Refuge, FL

IV. Description of Proposed Action:

The Service is proposing to establish the Everglades Headwaters National Wildlife Refuge and Conservation Area in order to protect or conserve important scrub, sandhill, dry prairie, pine flatwoods, and associated wetlands, and habitat corridors for wide-ranging animal species. The Service is evaluating a proposal to acquire fee-title purchases of up to approximately 50,000 acres within an approximately 130,000-acre Conservation Focal Area and perpetual conservation easements of up to 100,000 acres within the larger Conservation Partnership Area, all from willing sellers. The scope of the Draft Environmental Assessment and Draft Land Protection Plan is limited to the proposed acquisition, in fee-title and in less-than-fee-title, of lands for the establishment of the Everglades Headwaters National Wildlife Refuge and Conservation Area. The Draft Environmental Assessment is not intended to cover the development and/or implementation of detailed, specific programs for the administration and management of those lands. If the refuge is established and the needed lands or interests in lands are acquired, the Service would develop a comprehensive conservation plan, a 15-year management plan and needed step-down management plans (e.g., a step-down plan to address hunting). These plans would be developed and reviewed in accordance with the Departmental requirements of the National Environmental Policy Act. Intra-Service biological evaluations or assessments (under section 7 of the Endangered Species Act) for individual management activities, or groups of activities, would be conducted at the time those activities would be proposed.

V. Pertinent Species and Habitat: The historic landscape of the Kissimmee Valley was comprised of a freshwater marsh which encompassed the Kissimmee River with more expansive wet and dry prairies that occupied slightly higher elevations east and west of the Kissimmee marsh. Pine flatwoods were interspersed and upslope from the prairies, and cypress strands or domes also dotted the valley landscape of the Study Area. Higher in elevation, the ridges were dominated by pinelands and scrub with lesser amounts of hardwoods and open water. Today, the native communities of greatest areal extent within the Study Area are lakes and ponds (7.0 percent), mesic flatwoods (6.0 percent), freshwater marsh (6.0 percent), dry prairie (4.5 percent) and wet prairie (4.4 percent). Table 1 outlines the land cover types within the Conservation Focal Area.

Table 1. Major habitat types and acreages within the Conservation Focal Area

Land Cover	Acres
Dry Prairie	13,414.6
Freshwater Forested Wetlands	9,181.2
High Pine, Florida Scrub, Sandhill	2,176.8
Improved and Unimproved Pasture	63,017.5
Intensive Agriculture	3,814.5
Mesic and Hydric Pine Flatwoods and Scrubby Flatwoods	10,123.4
Mesic Temperate Hammock	1,686.5
Open Water	169.6
Shrub and Brushland	662.9
Urban	627.5
Wet Prairie and Freshwater Marshes	25,233.4
Total	**130,107.9**

There are 18 Federal or State listed (threatened or endangered) wildlife species, 34 Federal or State listed plant species, and three candidate species present in the Study Area (Table 2). The federally listed plant species occur mostly in scrub, though some also occur in high pine (dry, longleaf pine savanna) and flatwoods, or areas that formerly supported these vegetation types but have been converted to pasture. Most of the scrub plants are gap specialists whose populations expand after fire and then decline as clonal oaks and palmettos reclaim dominance. Nearly all of the plant species are adapted to the fires that were once frequent in these habitats. The Okeechobee gourd (*Cucurbita okeechobeensis* ssp. *okeechobeensis*) is the only listed plant species associated with water bodies.

Table 2. Federal and state listed threatened and endangered species and candidate species likely to occur in the project area

Species or Critical Habitat	Scientific Name	Legal Status	
		Federal	State
Invertebrates			
Highlands Tiger Beetle	*Cicindela highlandensis*	C	N
Amphibians and Reptiles			
Bluetail mole skink	*Eumeces egregious lividus*	T	T
Eastern indigo snake	*Drymarchon corais couperi*	T	T
Gopher tortoise	*Gopherus polyphemus*	C	T
Sand skink	*Neoseps reynoldsi*	T	T
Short-tailed snake	*Stilosoma extenuatum*	N	T
Birds			
Bald eagle	*Haliaeetus leucocephalus*	N	T
Crested caracara	*Caracara cheriway*	T	T
Everglade snail kite	*Rostrhamus sociabilis*	E	E
Florida grasshopper sparrow	*Ammodramus savannarum floridanus*	E	E
Florida sandhill crane	*Grus canadensis pratensis*	N	T
Florida scrub-jay	*Aphelocoma coerulescens*	T	T
Red-cockaded woodpecker	*Picoides borealis*	E	T
Southeastern American kestrel	*Falco spaverius paulus*	N	T
Wood stork	*Mycteria americana*	E	E

Scientific Name	Common Name	Legal Status	
		Federal	State
Mammals			
Florida black bear	*Ursus americanus floridanus*	N	T
Florida bonneted bat	*Eumops floridanus*	C	E
Florida panther	*Puma concolor coryi*	E	E
West Indian manatee	*Trichechus manatus*	E	E
Plants			
American Chaffseed*	*Schwalbea americana*	E	E
Ashe's savory	*Calamintha ashei*	N	T
Avon Park harebells	*Crotalaria avonensis*	E	E
Britton's beargrass	*Nolina brittoniana*	E	E
Carter's warea	*Warea carteri*	E	E
Curtiss' milkweed	*Asclepias curtissii*	N	E
Cutthroat grass	*Panicum abscissum*	N	E
Edison's St. John's-wort	*Hypericum edsonianum*	N	E
Florida bonamia	*Bonamia grandiflora*	T	E
Florida perforate cladonia	*Cladonia perforata*	E	E
Florida ziziphus	*Ziziphus celata*	E	E
Garrett's mint	*Dicerandra christmanii*	E	E
Highlands scrub hypericum	*Hypericum cumulicola*	E	E
Lewton's polygala	*Polygala lewtonii*	E	E
Nodding pinweed	*Lechea cernua*	N	T
Okeechobee gourd	*Cucurbita okeechobeensis* ssp *okeechobeensis*	E	E
Papery whitlow-wort	*Paronychia chartacea ssp. chartacea*	T	E
Pine pinweed	*Lechea divaricata*	N	E
Pygmy fringe-tree	*Chionanthus pygmaeus*	E	E

Species or Critical Habitat	Species Name	Legal Status	
		Federal	State
Sandlace	*Polygonella myriophylla*	E	E
Scrub blazing star	*Liatris ohlingerae*	E	E
Scrub bluestem	*Schizachyrium niveum*	N	E
Scrub buckwheat	*Eriogonum longifolium var. gnaphalifolium*	T	E
Scrub lupine	*Lupinus aridorum*	E	E
Scrub mint	*Dicerandra frutescens*	E	E
Scrub pigeon-wing	*Clitoria fragrans*	T	E
Scrub plum	*Prunus geniculata*	E	E
Scrub stylisma	*Stylisma abdita*	N	E
Scrub willow	*Salix floridana*	N	E
Short-leaved rosemary	*Conradina brevifolia*	E	E
Wedge-leaved button snakeroot	*Eryngium cuneifolium*	E	E
Wide leaf warea	*Warea amplexifolia*	E	E
Wireweed	*Polygonella basiramia*	E	E
Yellow star anise	*Illicium parviflorum*	N	E

Key: Federal and State Listings:
E = Endangered, T = Threatened, N = Not Listed, C = Candidate species

*note: likely extirpated from the Study Area

VI. **Location:** The proposed Everglades Headwaters National Wildlife Refuge and Conservation Area is located within Polk, Osceola, Okeechobee, and Highlands Counties, Florida, in the Upper Kissimmee River Basin. It is bounded by the city of Orlando to the north, Lake Okeechobee to the south, on the east by the St. Johns River watershed, and on the west by the Lake Wales Ridge (Figure 1).

VII. Determination of Effects: The Service concurs that the issuance of the Draft Environmental Assessment and Draft Land Protection Plan for the proposed Everglades Headwaters National Wildlife Refuge and Conservation Area is not likely to adversely affect any federally listed species or candidate species. There is no critical habitat within the Study Area for any federally listed species, although critical habitat for the Everglade snail kite occurs immediately adjacent to the Study Area in Lake Okeechobee. We anticipate that a Final Environmental Assessment would be issued in December 2011. Any construction, survey, acquisition, or management activities associated with the proposed refuge will undergo Endangered Species Act consultation when those activities become more clearly defined and the locations are known. In the future, we anticipate that surveys for listed species and chemical contaminants may need to occur on project lands in association with acquisition. We also anticipate that habitat management activities such as brush removal, fire management, nonnative plant removal, etc., would occur and may require Intra-Service consultation. Future construction, outreach, or public use activities may also require Intra-Service consultation.

Signature (originating station) **Date** 10/13/11

Refuge Manager
Title

IX. Reviewing Ecological Services Office Evaluation:

A. Concurrence _X__ Nonconcurrence _____

B. Formal consultation required _____

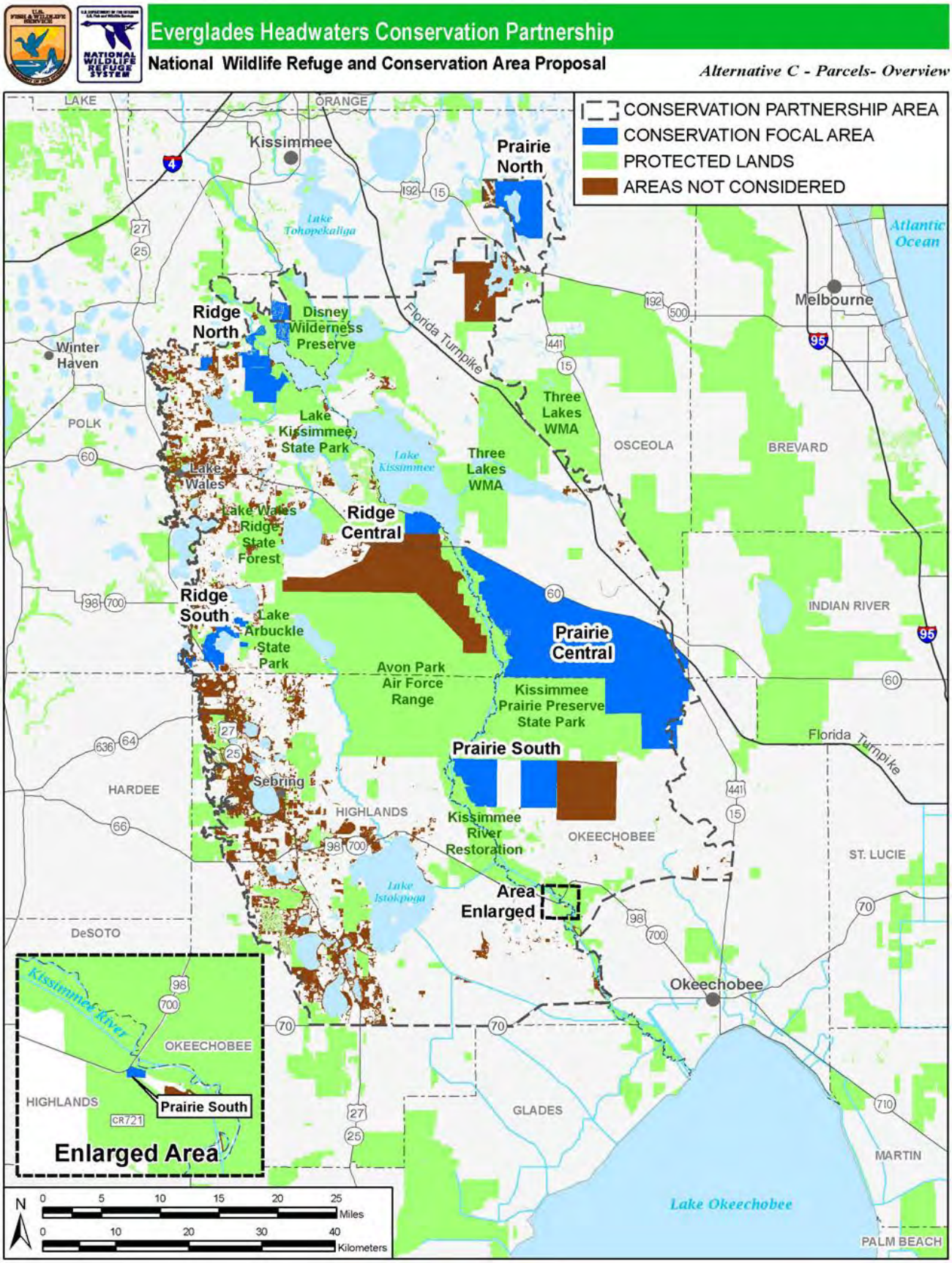
C. Conference required _____

D. Informal conference required _____

E. Remarks:

Signature **Date** 11-9-11

Field Supervisor **South Florida Ecological Services Office**
Title **Office**


Everglades Headwaters Conservation Partnership
National Wildlife Refuge and Conservation Area Proposal
Alternative C - Parcels- Overview
CONSERVATION PARTNERSHIP AREA
CONSERVATION FOCAL AREA
PROTECTED LANDS
AREAS NOT CONSIDERED
Kissimmee
Prairie North
Lake Tohopekaliga
Atlantic Ocean
Melbourne
Ridge North
Disney Wilderness Preserve
Florida Turnpike
Winter Haven
Three Lakes WMA
POLK
Lake Kissimmee State Park
Lake Kissimmee
OSCEOLA
BREVARD
Lake Wales
Lake Wales Ridge State Forest
Ridge Central
Ridge South
Lake Arbuckle State Park
Prairie Central
INDIAN RIVER
Avon Park Air Force Range
Kissimmee Prairie Preserve State Park
Prairie South
HARDEE
Sebring
HIGHLANDS
Kissimmee River Restoration
OKEECHOBEE
ST. LUCIE
Lake Istokpoga
Area Enlarged
DeSOTO
Okeechobee
Kissimmee River
Prairie South
Enlarged Area
GLADES
MARTIN
Lake Okeechobee
PALM BEACH
Miles
Kilometers

Appendix E. At-Risk Species

At-risk species status and occurrence information in this appendix provides a snapshot in time. Animal and plant populations move across landscapes, appearing in areas where conditions are favorable for life history needs to reproduce, grow, and shelter, and disappearing where threats appear. Though we've outlined at-risk species knowledge to date, knowledge and actual species status and occurrence constantly change and evolve over time and space.

A status summary (Table E1) and status and occurrence details (Table E2) are provided for 289 at-risk species documented or with potential to occur within the 5-county, 1.8 million-acre Study Area for the Everglades Headwaters NWR and Conservation Area. The 289 at-risk species assessed include 95 vertebrates (2 amphibians, 72 birds, 9 mammals, and 12 reptiles), 50 invertebrates, and 144 plants identified by one or more of the following: the Service; two state agencies: the FWC and the FDACS; and two Florida conservation entities: the FCREPA and the FNAI referenced in this appendix. No referenced agency or organization has designated any at-risk fish species in the Study Area. Eighty-seven (87) of the 289 at-risk species (30 percent) identified in the Study Area are Florida endemics, meaning they occur only in Florida.

At-risk species are vulnerable to extinction from exposure to one or more threats. Threats include natural disturbances such as storm events or climate change, and human-related disturbances such as habitat changes resulting from development or pollutants. A species' vulnerability is indicated by its status designation(s) and population trends. Federal and state agencies consider listing at-risk species as Endangered (E), Threatened (T), or as a Candidate (C) for listing when scientists document declining population trends.

Appendix E. Table E1. Summary of status designations by taxon for 289 at-risk species in the Everglades Headwaters NWR and Conservation Area Study Area

		Birds							Mammals						Amphibians and Reptiles						Invertebrates								Plants					
	Total Species Designations	Endangered	Threatened	Candidate	Species of Concern	Rare	Status Undetermined	Endemic to Florida	Endangered	Threatened	Candidate	Species of Concern	Rare	Endemic to Florida	Endangered	Threatened	Species of Concern	Rare	Status Undetermined	Endemic to Florida	Endangered	Threatened	Candidate	Species of Concern	Rare	Rare-Status Undetermined	Status Undetermined	Endemic to Florida	Endangered	Threatened	Species of Concern	Rare	Commercially Exploited	Endemic to Florida
Federal	115	5	3	1	28	-	-		2	0	1	4	-		0	3	2	-	-		0	0	1	17	-	-	-		21	4	23	-	-	
Florida	166	4	8	-	17	-	-	4	2	1	-	2	-	2	0	4	4	-	-	4	0	0	-	0	-	-	-	30	77	47	0	-	7	47
FCREPA	133	7	11	-	20	6	4		2	3	-	1	1		1	5	1	2	1		2	11	-	7	13	11	1		8	12	0	3	-	

Federal designations by the U.S. Fish and Wildlife Service. Florida designations by the Florida Fish and Wildlife Conservation Commission and the Florida Department of Agriculture and Consumer Services. FCREPA designations (animals) by the Florida Committee on Rare and Endangered Plants and Animals. Florida endemic species are summarized in the Florida row. A hyphen (-) indicates the agency or entity does not use this designation.

When population evidence is limited, scientists may use additional status designations for species suspected of declining trends such as Species of Concern (SC) or Species of Special Concern (SSC), Rare (R), Status Undetermined (SU), or Rare and Status Undetermined (RSU). Population trends can be difficult to determine in some situations, including, but not limited to newly described species, species with small population numbers, species occurring sparsely over a wide landscape, species that occur in areas inaccessible to researchers, or species difficult to detect or to track over time. In these situations, scientists may also consider species at-risk when the ecological communities in which they occur are declining.

The Study Area includes 40 federal and 161 state listed species (Threatened and Endangered), 3 Candidate species for federal listing, and 33 state Species of Special Concern.

FNAI designations track both the species global and state status in five ranks from 1 – Critically Imperiled to 5 – Demonstrably Secure. This appendix includes additional species tracked by FNAI as state ranked: 1–Critically Imperiled, or 5 or fewer occurrences; 2–Imperiled, or 6 to 20 occurrences; and 3–Rare, restricted, or otherwise vulnerable to extinction. FNAI status designations are provided for 248 species: 67 vertebrates (2 amphibians, 45 birds, 9 mammals, and 11 reptiles), 42 invertebrates, and 139 plants. A summary of FNAI designations is not provided as ranks include in a variety of global and state rank combinations.

Habitat in the five counties in the Study Area support a number of at-risk species: 168 species in Glades County, 221 in Highlands County, 162 in Okeechobee County, 177 in Osceola County, and 218 species in Polk County. The 15 natural ecological communities (Service 1999) in the Study Area also support important communities of at-risk species. At-risk species supported by natural or managed ecosystems are not summarized because habitat associations for a number of at-risk species are unknown.

Federal protection is provided for species listed and critical habitat designated under federal statutes such as the Endangered Species Act of 1973, as amended; the Migratory Bird Treaty Act of 1918; and the Bald and Golden Eagle Protection Act of 1940, as amended. State protections apply to species listed under Florida statutes. Statutory protection may not apply to agency SC, SSC, and CE (Commercially Exploited) designations or to FCREPA and FNAI designations, though these designations provide important information for federal, state, and local agencies and other entities considering species listing and habitat conservation actions.

Life history and habitat use for some at-risk species in this appendix are discussed in more detail in the text of this Final EA. Though life history and habitat details might be less clear for many of the at-risk species summarized here, the information provided covers a larger sample of at-risk species that could benefit from protection, restoration, and management of the Everglades Headwaters NWR and Conservation Area units for species and habitat conservation.

Appendix E. Table E2. Status and occurrence by county and ecological community data for 289 at-risk species in the Everglades Headwaters NWR and Conservation Area Study Area. Eighty-five (85) species Endemic to Florida are also noted. See footnotes at end of the Table for explanation of *Status and Species County and Community **Occurrence codes.

*Status Designations					Species **Occurrence by:	County					Multispecies Recovery Plan Community													
Federal	Florida	FCREPA	FNAI Global / State	Endemic to Florida	***Scientific Name*** **Common Name**	Glades	Highlands	Okeechobee	Osceola	Polk	High pine	Scrub	Scrubby high pine	Beach/Dune	Mesic temperate hammock	Scrubby flatwoods	Mesic pine flatwoods	Hydric pine flatwoods	Dry prairie	Cutthroat grass	Wet prairie	Freshwater marsh	Seepage swamp	Flowing water swamp	Pond swamp
					Amphibians - alphabetical by scientific name																				
			G5 S3		*Desmognathus auriculatus* Southern dusky salamander		x															x	x	x	x
SC	SSC	T	G3 S3		*Rana capito* Gopher frog	x	x	x	x	x	x	x				x	x	x	x			x			
					Birds - alphabetical by scientific name																				
		SSC			*Accipiter cooperi* Cooper's hawk	x	x	x	x	x															
SC					*Aimophila aestivalis* Bachman's sparrow	x	x	x	x	x	x	x					x	x	x						
	SSC	R	G5 S2		*Ajaia ajaja* Roseate spoonbill	x	x	x	x	x								x				x		x	
SC					*Ammodramus henslowii* Henslow's sparrow				x	x									x	x	x				
E	E	E	G5T1 S1	FL	*Ammodramus savannarum floridanus* Florida grasshopper sparrow	x	x	x	x	x									x		x				
T	T F	T	G2 S2	FL	*Aphelocoma coerulescens* Florida scrub-jay	x	x	x	x	x		x				x									
	SSC	SSC	G5 S3		*Aramus guarauna* Limpkin	x	x	x	x	x								x						x	
		SSC	G5 S4		*Ardea alba* Great egret	x	x	x	x	x								x			x	x	x	x	x

*Status Designations					Species **Occurrence by:	County					Multispecies Recovery Plan Community													
Federal	Florida	FCREPA	FNAI Global / State	Endemic to Florida	***Scientific Name*** **Common Name**	Glades	Highlands	Okeechobee	Osceola	Polk	High pine	Scrub	Scrubby high pine	Beach/Dune	Mesic temperate hammock	Scrubby flatwoods	Mesic pine flatwoods	Hydric pine flatwoods	Dry prairie	Cutthroat grass	Wet prairie	Freshwater marsh	Seepage swamp	Flowing water swamp	Pond swamp
		SSC	G5T1 S2		*Ardea herodias occidentalis* Great white heron	x	x	x	x	x								x			x	x	x	x	x
	SSC	SSC	G4T3 S3		*Athene cunicularia floridana, Speotyto cunicularia* Florida burrowing owl	x	x	x	x	x	x								x						
SC					*Bartramia longicauda* Upland sandpiper														x		x				
SC					*Botaurus lentiginosus* American bittern	x	x	x	x	x											x	x	x	x	x
SC		R			*Buteo brachyurus* Short-tailed hawk	x	x	x	x	x	x	x		x	x	x	x	x	x		x	x	x	x	x
C					*Calidris canutus* Red knot																				
E	E	E	GH SH		*Campephilus principalis* Ivory-billed woodpecker	h	h	h	h	h					x							x	x	x	
SC					*Catharus fuscescens* Veery										x			x							
T CH	T	E	G3 S3		*Charadrius melodus* Piping plover									x											
SC		SSC	G5 S2		*Charadrius wilsonia* Wilson's plover									x											
SC					*Chondestes grammacus* Lark sparrow														x						
SC					*Circus cyancus* Northern harrier	x	x	x	x	x									x	x	x	x	x		
SC					*Cistothorus platensis* Sedge wren	x	x	x	x	x										x	x	x			
SC					*Coccyzus americanus* Yellow-billed cuckoo	x	x	x	x	x					x										

*Status Designations					Species **Occurrence by:	County					Multispecies Recovery Plan Community													
Federal	Florida	FCREPA	FNAI Global / State	Endemic to Florida	***Scientific Name*** **Common Name**	Glades	Highlands	Okeechobee	Osceola	Polk	High pine	Scrub	Scrubby high pine	Beach/Dune	Mesic temperate hammock	Scrubby flatwoods	Mesic pine flatwoods	Hydric pine flatwoods	Dry prairie	Cutthroat grass	Wet prairie	Freshwater marsh	Seepage swamp	Flowing water swamp	Pond swamp
SC					*Colaptes auratus* Northern flicker	x	x	x	x	x					x	x	x	x							
SC					*Coturnicops noveboracensis* Yellow rail	x	x	x	x	x									x	x	x	x	x		x
SC					*Dendroica caerulescens* Black-throated blue warbler										x										x
		SU	G5T3 S3	FL	*Dendroica discolor paludicola* Florida prairie warbler	x	x	x	x	x									x						
SC					*Dolichonyx oryzivorus* Bobolink														x			x			
	SSC	SSC	G5 S4		*Egretta caerulea* Little blue heron	x	x	x	x	x								x	x		x	x	x	x	x
SC		R	G4T3 S2		*Egretta rufescens* Reddish egret																				
	SSC	SSC	G5 S3		*Egretta thula* Snowy egret	x	x	x	x	x								x	x		x	x	x	x	x
	SSC	SSC	G5 S4		*Egretta tricolor* Tricolor (=Louisiana) heron	x	x	x	x	x								x	x		x	x	x	x	x
		T	G5 S2		*Elanoides forficatus* American swallow-tailed kite	x	x	x	x	x					x		x	x	x		x	x	x	x	x
		R	G5 S1		*Elanus leucurus* White-tailed kite														x		x	x		x	
	SSC	SSC	G5 S4		*Eudocimus albus* White ibis	x	x	x	x	x							x		x		x	x	x	x	x
		SU	G5 S2		*Falco columbarius* Merlin	x	x	x	x	x		x		x	x	x	x	x	x		x	x	x	x	x
		T	G4 S2		*Falco peregrines* Peregrine falcon	x	x	x	x	x	x	x		x		x	x	x	x		x	x	x	x	x

*Status Designations					Species **Occurrence by:	County					Multispecies Recovery Plan Community													
Federal	Florida	FCREPA	FNAI Global / State	Endemic to Florida	***Scientific Name*** **Common Name**	Glades	Highlands	Okeechobee	Osceola	Polk	High pine	Scrub	Scrubby high pine	Beach/Dune	Mesic temperate hammock	Scrubby flatwoods	Mesic pine flatwoods	Hydric pine flatwoods	Dry prairie	Cutthroat grass	Wet prairie	Freshwater marsh	Seepage swamp	Flowing water swamp	Pond swamp
	T	T	G5T3 S3		*Falco sparverius paulus* Southeastern American kestrel	x	x	x	x	x	x	x					x	x	x						
		T	G5 S1		*Fregata magnificens* Magnificent frigatebird																				
SC					*Gavia immer* Common loon	x	x	x	x	x															x
E/XN	SSC	RX	G1 SNR		*Grus Americana* Whooping crane				x										x		x	x			
	T	T	G5T2T3 S2S3		*Grus canadensis pratensis* Florida sandhill crane	x	x	x	x	x							x	x	x		x	x			
	SSC	SSC	G5 S2		*Haematopus palliates* American oystercatcher									x											
	T	T	G5 S3		*Haliaeetus leucocephalus* Bald eagle	x	x	x	x	x	x		x		x	x	x	x	x		x	x	x	x	x
SC					*Hylocichla mustelina* Wood thrush										x										x
SC	SSC	SSC	G5 S4		*Ixobrychus exilis* Least bittern	x	x	x	x	x												x	x	x	x
SC					*Lanius ludovicianus* Loggerhead shrike	x	x	x	x	x						x	x	x	x	x	x				
SC		R	G4 S2		*Laterallus jamaicensis* Black rail														x			x		x	
SC					*Limnothlypis swainsonii* Swainson's warbler										x			x							x
E	E	E	G4 S2		*Mycteria Americana* Wood stork	x	x	x	x	x								x			x	x	x	x	x
SC					*Numenisus americanus* Long-billed curlew									x											

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	SSC	SSC	G5 S3		*Nyctanassa violacea* Yellow-crowned night-heron	X	X	X	X	X															
	SSC	SSC	G5 S3		*Nycticorax nycticorax* Black-crowned night-heron	X	X	X	X	X															
	SSC	T	G5 S3S4		*Pandion haliaetus* Osprey	X	X	X	X	X								X			X	X	X	X	X
		SU	G5 S3		*Passerina ciris* *Painted bunting*		X																		
	SSC	T	G4 S3		*Pelecanus occidentalis* Brown pelican	X				X															
	SSC	SSC	G5 S3		*Plegadis falcinellus* Glossy ibis	X	X			X															
E	T	E	G3 S2		*Picoides borealis* Red-cockaded woodpecker	X	X	X	X	X	X						X	X							
		SSC	G5 S3		*Picoides villosus* Hairy woodpecker	X	X	X	X	X	X	X	X	X	X	X	X	X					X	X	X
T	T	T	G5 S2		*Polyborus plancus audubonii, Caracara cheriway* Audubon's crested caracara	X	X	X	X	X					X		X	X	X		X				
		SSC	G5 S2		*Recurvivrostra americana* American avocet	X		X		X												X			
E CH	E	E	G4G5T2 S2	FL	*Rostrhamus sociabilis plumbeus* Everglade snail kite	X		X	X	X								X				X			X
	SSC	SSC	G5 S3		*Rynchops niger* Black skimmer	X			X	X				X								X			
		R	G5 S2		*Setophaga ruticilla* American redstart	X	X	X	X	X					X									X	
SC					*Spizella pusilla* Field sparrow	X	X	X	X	X									X		X				

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	T		G4 S3		*Sterna antillarum* Least tern		x	x		x				x								x			
		SSC			*Sterna caspia* Caspian tern	x	x	x	x	x				x											
		SSC	G5 S3		*Sterna maxima* Royal tern	x	x	x	x	x				x											
		SU			*Sterna nilotica* Gull-billed tern					x				x											
		SSC	G5 S2		*Sterna sandvicensis* Sandwich tern					x				x											
SC					*Sturnella magna* Eastern meadowlark	x	x	x	x	x							x	x	x		x				
SC					*Tyto alba* Barn owl	x	x	x	x	x					x				x		x				
SC					*Vermivora pinus* Blue-winged warbler										x										
					Mammals - alphabetical by scientific name																				
SC			G3G4 S2		*Corynorhinus (=Plecotus) rafinesquii* *Rafinesque's big-eared bat*	x	x	x	x	x					x			x					x	x	x
C			G1 S1		*Eumops floridanus* Florida bonneted bat			x		x							x	x	x		x	x			
		R	G5T3 S3		*Mustela frenata peninsulae* Florida weasel		x		x	x	x	x	x			x									
SC			G3 S3		*Neofiber alleni* Round-tailed muskrat	x	x	x	x	x											x	x		x	
	SSC		G3 S3	FL	*Podomys floridanus* Florida mouse		x		x	x	x	x	x			x									

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E	E		G5T1 S1	FL	*Puma (=Felis) concolor coryi* Florida panther	X	X				X	X			X	X	X	X	X		X	X	X	X	X
SC	SSC		G5T3 S3		*Sciurus niger shermani* Sherman's fox squirrel	X	X	X	X	X	X		X			X	X	X							X
E	E		G2 S2		*Trichechus manatus* West Indian manatee	X		X																	
	T		G5T2 S2		*Ursus americanus floridanus* Florida black bear	X	X			X	X	X			X	X	X	X	X			X	X	X	X
					Reptiles - alphabetical by scientific name																				
T S/A	SSC		G5 S4		*Alligator mississippiensis* American alligator	X	X	X	X	X								X			X	X	X	X	X
		R	G5 S3?		*Clemmys guttata* Spotted turtle					X							X	X					X	X	
			G4 S3		*Crotolus adamanteus* Eastern diamondback rattlesnake	X	X	X	X	X															
T	T	SSC	G3 S3		*Drymarchon corais couperi* Eastern indigo snake	X	X	X	X	X	X	X	X		X	X	X	X	X	X		X	X	X	X
T	T	E	G5T2 S2	FL	*Eumeces egregius lividus* Bluetail mole skink		X		X	X	X	X													
	SSC	T	G3 S3		*Gopherus polyphemus* Gopher tortoise	X	X	X	X	X	X	X				X	X	X	X						
			G2 S2		*Heterodon simus* Southern hognose snake				X	X															
		R	G5 S2S3		*Lampropeltis calligaster rhombamaculata* Mole snake						X					X									
T	T	T	G2 S2	FL	*Neoseps reynoldsi* Sand skink		X		X	X	X	X													

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SC	SSC	SU	G4T3 S3		*Pituophis melanoleucus mugitus* Florida pine snake	X	X	X	X	X	X	X				X									
SC		T	G3 S3	FL	*Sceloporus woodi* Florida scrub lizard		X			X	X	X													
	T	T		FL	*Stilosoma extenuatum* Short-tailed snake		X			X	X	X													
					Invertebrates - alphabetic by group, scientific name																				
					Sponges																				
SC			GH SH	FL	*Ephydatia subtilis* Kissimmee sponge																				
					Gastropods (Snails and Allies)																				
		T	G2G3 S2S3	FL	*Praticolella bakeri* Ridge shrubsnail		X			X	X	X													
					Bivalves (Clams and Mussels)																				
			G3 S3	FL	*Villosa amygdale* Florida rainbow					X											X			
					Beetles																				
		RSU			*Acanthocerus aeneus* *Scarab beetle*		X																		
SC				FL	*Anomala exigua* Exiguous anomalan scarab beetle					X	X														
SC				FL	*Anomala eximia* Archbold anomalan scarab beetle		X			X		X													
		E	GNR S3?		*Aphodius aegrotus* Small pocket gopher aphodus beetle		X			X															
		T	GNR S2S3		*Aphodius troglodytes* Gopher tortoise aphodius beetle		X																		

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		RSU		FL	*Ataenius saramari* Scarab beetle				X																
		RSU	GNR S3S5	FL	*Bolbocerosoma hamatum* Scarab beetle	X			X	X															
C			G1G2 S1S2	FL	*Cicindela highlandensis* Highlands tiger beetle		X			X		X													
		R	G3 S3		*Cicindela scabrosa* Scarab beetle		X			X		X													
SC			G2 S2	FL	*Copris gopher* Gopher tortoise copris beetle		X				X	X													
		T	GNR S1S2		*Copris howdeni* Howden's copris beetle		X		X	X															
		RSU	G2 S2	FL	*Diplotaxis spissipes* Red diplotaxis beetle		X			X															
SC			G1G2 S1S2	FL	*Mycotrupes pedester* Southwest Florida microtrupes beetle							X													
		RSU	G1G2 S1S2	FL	*Onthophagus aciculatulus* Sandyland onthophagus beetle		X																		
SC			NRTNR S2S3		*Onthophagus polyphemi polyphemi* Onthophagus tortoise commensal scarab beetle						X	X													
		RSU	G3 S3		*Peltotrupes profundus* Florida deepdigger scarab beetle		X		X	X															
		RSU	G2G3 S2S3	FL	*Phyllophaga elizoria* Elizoria june beetle		X	X		X															
		RSU	G2G4 S2S4	FL	*Phyllophaga elongata* Elongate june beetle		X			X															
		RSU	G2 S2	FL	*Phyllophaga okeechobea* Diurnal scrub june beetle		X	X																	

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		RSU	G1G2 S1S2	FL	*Phyllophaga panorpa* Southern Lake Wakes Ridge june beetle		X			X															
		RSU	G1G3 S2	FL	*Serica delicata* Delicate silky june beetle		X			X															
SC		R	G1G2 S1S2	FL	*Serica frosti* Frost's silky june beetle		X					X													
SC		R	G2G3 S2S3	FL	*Trigonopeltastes floridana* Scrub palmetto flower scarab beetle		X			X		X													
SC		T	GNR S1S2		*Trox howelli* Caracara commensal scarab beetle				X										X						
					Butterflies and Moths																				
SC		R	G2T1T2 S1		*Atrytone arogos arogos* Arogos skipper butterfly	X	X	X	X	X	X						X								
		R	G1 S1	FL	*Atrytonopsis loammi* Loammi skipper butterfly		X	X									X								
SC		SSC	G4 S2		*Eumaeus atala* Atala hairstreak butterfly			X																	
					Euphyes pilatka Palatka skipper butterfly	X	X	X	X	X									X			X			
SC			G2G3 S2S3		*Idia gopher* Tortoise commensal noctuid moth	X	X	X	X	X	X	X													
					Caddisflies																				
SC		SU	GH SH	FL	*Ceraclea floridana* Florida ceraclean longhorn caddisfly				X													X			
		R			*Hydroptila lloganae* Llogan's vari-colored microcaddisfly		X														X			X	
		R	G2G3 S2		*Hydroptila molsonae* Molson's microcaddisfly		X																X	X	

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SC			G2 S2		*Oecetis parva* Little longhorn caddisfly				x																
		T	GHQ SH	FL	*Oecetis pratelia* Little meadow long-horn sedge caddisfly	x																			
		R	G4 S2S3		*Orthotrichia curta* Short orthotrician microcaddisfly		x																		
SC		T	G1G2 S1S2	FL	*Oxyethira florida* Florida cream and brown mottled microcaddisfly																				
					Dragonflies and Damselflies																				
		SSC			*Argiallagma pallidulum* Everglades sprite	x				x															
		SSC	G4 S4	FL	*Didymops floridensis* Maidencane cruiser dragonfly		x			x															
		R	G4 S4		*Gomphaeschna antilope* Sooty darner dragonfly	x	x																		
		SSC			*Gomphus alachuensis* Sandhill clubtail dragonfly		x			x															
		SSC	G3 S3		*Nehalennia pallidula* Everglades sprite dragonfly	x	x														x	x		x	
		SSC	G3 S3	FL	*Progomphus alachuensis* Tawny sanddragonfly	x	x			x															
					Flies																				
SC		R	G1 S1	FL	*Asaphomyia floridensis* Florida asaphomyian tabanid fly		x					x													
					Spiders																				
SC		E	G1 S1	FL	*Sosippus placidus* Lake Placid funnel wolf spider		x			x	x	x													

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		T	G2 S2	FL	*Geolycosa xera* McCrone's burrowing wolf spider		x		x	x															
		SSC	G3G4 S3S4	FL	*Latrodectus bishopi* Red widow spider		x																		
					Millipedes																				
		R	G1G2 S1S2		*Floridobolus penneri* Florida scrub millipede		x			x		x													
					Plants - alphabetical by scientific name																				
	T		G5 SNR		*Acanthocereus tetragonus, Cereus pentagonus* Barbed-wire cactus	p	p	p	p	p															
SC	E		G3 S2		*Agrimonia incise* Incised groovebur	p	p	p	p	vp	x				x										
	T		G3 S3		*Andropogon arctatus* Pinewood bluestem	p	vp	p	vp	vp		x					x	x			x		x		
	T		G2 S2		*Arnoglossum diversifolium, Cacalia diversifolia* Variable-leaved Indian-plantain, Indian-plantain	p	p	p	p	p														x	
	E	T	G3 S3	FL	*Asclepias curtissii* Curtis' milkweed	p	vp	p	vp	vp		x				x									
	E	E	G5 S2		*Asplenium auritum* Auricled spleen-wort	p	p	p	p	p					x								x	x	
	E		G1 S1		*Asplenium verecundum* Delicate spleenwort	p	p	p	p	p															
	T		G3 S3		*Baptisia simplicifolia* Scare-weed				p																
	T		G5? S3		*Bletia purpurea* Pine-pink orchid					vp							x					x		x	x
T	E	T	G3 S3	FL	*Bonamia grandiflora* Florida bonamia	p	vp	p	p	vp	x	x	x												

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SC	E		G5 S1		*Brickellia mosieri* Mosier's false boneset	p	p	p	p	p															
SC	T		G3 S3		*Calamintha ashei* Ashe's savory	vp	vp	p	p	vp		x													
	E		G2G3 S2S3		*Calopogon multi-florus* Many-flowered grass pink orchid	p	vp	vp	vp	vp							x	x		x					
	E		G5 S4		*Campyloneurum latum* Wide strap fern	p	p	p	p	p															
	E		G3 S3		*Carex chapmanii* Chapman's sedge	p	p	p	vp	vp														x	
	E		G5 SNR		*Celosia nitida* West Indian cock's comb	p	p	p	p	p															
	E		G2Q S2	FL	*Centrosema arenicola* Sand butterfly pea	p	vp	p	vp	vp	x					x									
SC	E		G2 S2	FL	*Chamaesyce cumulicola* Sand-dune spurge	p	vp	p	p	p		x													
	E	R	G5 S3		*Cheilanthes microphylla* Southern lip fern	p	p	p	p	p					x										
E	E	E	G3 S3	FL	*Chionanthus pygmaeus* Pygmy fringe-tree	p	vp	p	vp	vp		x	x												
			G2 S2	FL	*Chrysopsis highlandsensis* Highlands goldenaster	p	p			p															
E	E		G1 S1	FL	*Cladonia perforate* Florida perforate cladonia		p			p		x													
T	E	T	G3 S3	FL	*Clitoria fragrans* Pigeon-wings		vp			vp	x	x	x			x									
SC	T		G3 S3		*Coelorachis tuberculosa* Piedmont jointgrass	p	vp	p	vp	vp								x			x	x			

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E	E		G2Q S2		*Conradina brevifolia* Short-leaved rosemary		p			p	x	x													
	T		G3 S3	FL	*Conradina grandiflora* Large-flowered rosemary				v p			x				x									
E	E		G1 S1	FL	*Crotalaria avonensis* Avon Park harebells		v p			v p		x													
	E		G5 S2		*Ctenitis sloanei* Florida tree fern					v p								x						x	
	E		G5 S1		*Ctenitis submarginis* Brown-hair comb fern	p	p	p	p	p								x						x	
E	E	T	G1 S1		*Cucurbita okeechobeensis* ssp *okeechobeensis* Okeechobee gourd	v p		p														x			x
	E		G4 S4		*Cyperus pedunculatus, Remirea maritime* Beach star		p																		
E	E		G1 S1	FL	*Deeringothamnus pulchellus* Beautiful pawpaw				p								x	x							
E	E		G1 S1	FL	*Dicerandra christmanii* Garrett's mint		v p				x	x	x												
E		T	G1 S1	FL	*Dicerandra frutescens* Scrub mint		v p				x	x	x												
	E			FL	*Dicerandra modesta* Blushing scrub plum					v p	x	x	x												
SC			G1 S1	FL	*Digitaria gracillima* Longleaf finger grass	p	p	p	p	p	x	x													
	T	R	G5 S3		*Drosera intermedia* Water sundew	p	v p	p	v p	v p								x				x	x		
	E		G4? S1		*Eltroplectris calcarata* Spurred neottia		v p																		

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	CE		G4 SNR		*Encyclia tampensis* Butterfly orchid	p	p	p	p	p															
	CE		G4 SNR		*Epidendrum conopseum* Green-fly orchid	p	p	p	p	p															
	E		G4G5 S2		*Epidendrum difforme* Umbelled epidendrum					vp														x	
T	E	T	G4T3 S3	FL	*Eriogonum longifolium* var. *gnaphalifolium* Scrub buckwheat	p	vp	p	vp	vp	x	x	x												
E	E		G1 S1	FL	*Eryngium cuneifolium* Snakeroot		vp					x													
			G1 S1	FL	*Euphorbia rosescens* No common name		p																		
SC			G4T2 S2		*Forestiera segregata var. pinetorum* Florida pinewood privet	p	p	p	p	p								x							
SC			G1Q S1		*Galactia pinetorum* Pineland milk-pea	p	p	p	p	p															
	T		G3G4 S3S4	FL	*Garberia heterophylla* Garberia	p	vp	p	vp	vp		x	x												
	E		G3 S3	FL	*Glandularia maritime* Coastal vervain	p	p	p	p	p							x								
	E		G2 S2	FL	*Glandularia tampensis* Tampa vervain	p	p	p	p	p							x						x		
	T				*Gonolobus suberosus* Angularfruit milkvine, Angle pod	vp				vp															
	E	E	G4G5 S3		*Gossypium hirsutum* Wild cotton	p	p	p	p	p															
			G3 S3		*Gymnopogon chapmanianus* Chapman's skeletongrass	p	p	p	p	p	x	x					x		x						

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	E		G5 S1		*Habenaria distans* Distans habenaria		vp																	x	
	T		G5 S1		*Habenaria nivea, Platanthera nivea* Snowy orchid	p	p	p	vp	vp								x							
	T		GU SNR		*Harrisella filiformis* Threadroot orchid	vp	vp	p	vp	vp								x						x	
SC	T	R	G2 S2		*Hartwrightia floridana* Hartwrightia	p	vp	p	p	vp							x	x		x			x		
			G5T3 S3		*Helianthus debilis ssp. tardiflorus* Late flowering beach sunflower	p	p	p	p	p															
	E		G5T4T5 S3		*Hexalectris spicata* Crested coralroot	p	p	p	p	p															
E	E	E	G2 S2	FL	*Hypericum cumulicola* Highlands scrub hypericum		vp			vp		x													
	E	T	G2 S2	FL	*Hypericum edisonianum* Edison ascyrum	p	vp			vp								x		x	x	x	x		
SC	E		G2 S2		*Illicium parviflorum* Yellow star anise				vp	vp					x								x	x	
	E		G4 S1		*Lantana canescens* Hammock shrub verbena		p		p	p															
SC	T		G2 S2	FL	*Lechea cernua* Nodding pineweed	p	vp	p	vp	vp		x				x									
SC	E		G2 S2	FL	*Lechea divaricata* Pine pinweed	p	vp	p	p	vp	x	x				x									
E	E		G3 S3	FL	*Liatris ohlingerae* Scrub blazing star		vp			vp		x	x			x									
	T		G4 S4		*Lilium catesbaei* Southern red lily	p	vp	vp	vp	vp							x	x	x	x	x		x		

*Status Designations					Species **Occurrence by:	County					Multispecies Recovery Plan Community														
Federal	Florida	FCREPA	FNAI Global / State	Endemic to Florida	***Scientific Name*** **Common Name**	Glades	Highlands	Okeechobee	Osceola	Polk	High pine	Scrub	Scrubby high pine	Beach/Dune	Mesic temperate hammock	Scrubby flatwoods	Mesic pine flatwoods	Hydric pine flatwoods	Dry prairie	Cutthroat grass	Wet prairie	Freshwater marsh	Seepage swamp	Flowing water swamp	Pond swamp
	T		G3 S2		*Listera australis* Southern twayblade	p	p	p	p	v p															
	T				*Lobelia cardinalis* Cardinalflower					v p															
E	E		G1 S1	FL	*Lupinus aridorum* Scrub lupine		p			p		x													
	T	T	G3 S3	FL	*Lupinus westianus* Gulf Coast lupine				v p	v p															
	CE		G5 SNR		*Lycopodiella cernua* Nodding club moss	p	p	p	p	p															
SC	E		G2 S2	FL	*Lythrum flagellare* Lowland loosestrife	v p	p	v p	p	p								x				x	x	x	x
	E		G2 S2		*Matelea floridana* Florida spiny-pod	p	p	p	p	v p					x										
	T		G5 SNR		*Matelea gonocarpos* Angle-pod	p	p	p	p	p															
	E		G3G4 S3S4		*Matelea pubiflora* Sandhill spiny pod	p	v p	p	p	v p															
SC	T		G2Q S2		*Melanthera parvifolia* Small-leaved melanthera	p	p	p	p	p															
SC	T		G3S4		*Myrcianthes fragrans* var. *simpsonii* Twinberry	p	p	v p	p	p															
SC			G3 S3		*Myriophyllum laxum* Piedmont water-milfoil	p	p	p	p	p														x	x
	T		G1 S1		*Najas filifolia* Slender naiad	p	v p	p	v p	p															
SC	E	T	G2 S2	FL	*Nemastylis floridana* Fall-flowering ixia	p	p	p	v p	v p							x	x			x		x		x

*Status Designations					Species **Occurrence by:	County					Multispecies Recovery Plan Community													
Federal	Florida	FCREPA	FNAI Global / State	Endemic to Florida	***Scientific Name*** **Common Name**	Glades	Highlands	Okeechobee	Osceola	Polk	High pine	Scrub	Scrubby high pine	Beach/Dune	Mesic temperate hammock	Scrubby flatwoods	Mesic pine flatwoods	Hydric pine flatwoods	Dry prairie	Cutthroat grass	Wet prairie	Freshwater marsh	Seepage swamp	Flowing water swamp	Pond swamp
	T		G5 S3		*Nephrolepis biserrata* Giant sword fern	p	vp	p	p	p								x						x	
	T	E	G3 S3	FL	*Nolina atopocarpa* Florida beargrass	p	p	p	p	p							x		x						
E	E		G3 S3	FL	*Nolina brittoniana* Britton's beargrass	p	vp	p	vp	vp	x	x	x			x									
			G2 S2		*Nyssa ursine* Bog tupelo	p	p	p	p	p															
	E	E	G4 S2		*Ophioglossum palmatum* Hand fern	p	p	p	p	vp								x							
	T		G4? SNR		*Opuntia stricta* Shell mound prickly-pear	p	p	vp	p	p		x													
	CE		G5 SNR		*Osmunda cinnamomea* Cinnamon fern	p	p	p	p	p															
	CE		G5 SNR		*Osmunda regalis* Royal fern	p	p	p	p	p															
SC	E		G3 S3	FL	*Panicum abscissum* Cutthroat grass	p	vp	p	vp	vp								x	x	x		x	x		
T	E		G3T3 S3	FL	*Paronychia chartacea* Papery whitlow-wort	p	vp	p	vp	vp	x	x													
	E		G5? S1		*Pavonia paludicola* Swampbush	p	p	p	p	p															
	E		G4G5 S2		*Pavonia spinifex* Yellow hibiscus	p	p	p	p	p					x								x		
	E		G5 S2		*Pecluma dispersa* Widespread polypody	p	p	p	p	vp															
	E		G5 S2		*Pecluma plumula* Plume polypody	p	vp	p	vp	vp														x	

*Status Designations					Species **Occurrence by:	County					Multispecies Recovery Plan Community													
Federal	Florida	FCREPA	FNAI Global / State	Endemic to Florida	***Scientific Name*** **Common Name**	Glades	Highlands	Okeechobee	Osceola	Polk	High pine	Scrub	Scrubby high pine	Beach/Dune	Mesic temperate hammock	Scrubby flatwoods	Mesic pine flatwoods	Hydric pine flatwoods	Dry prairie	Cutthroat grass	Wet prairie	Freshwater marsh	Seepage swamp	Flowing water swamp	Pond swamp
	E		G5 S2		*Peperomia humilis* Peperomia	p	p	p	p	p					x								x	x	
	E		G5 S2		*Peperomia obtusifolia* Florida peperomia	p	p	p	p	p															x	
	E		G5? SNR		*Pharus lappulaceus* Creeping leafstalk grass					v p															
	T		G4 S3S4		*Pinguicula caerulea* Blue butterwort	v p	v p	p	v p	v p							x	x	x	x					
	T		G4G5 S3		*Pinguicula lutea* Yellow butterwort	v p	v p	v p	v p	v p							x	x	x	x					
	T		G4G5T4T5 SNR		*Platanthera blephariglottis* White-fringed orchid	p	v p	p	p	v p										x					
SC	T		G5 SNR		*Platanthera ciliaris* Yellow-fringed orchid	p	v p	p	v p	v p										x					
	T		G5 S3S4		*Platanthera cristata* Crested fringed orchid	p	p	p	p	v p										x					
SC	E		G3G4 S3		*Platanthera integra* Yellow fringeless orchid	p	p	p	p	p							x			x	x				
	T		G5 S3S4		*Pogonia ophioglossoides* Rose pogonia	p	v p	p	v p	v p										x					
E	E	E	G3 S3	FL	*Polygala lewtonii* Lewton's polygala		v p		v p	v p	x	x	x												
E	E		G3 S3	FL	*Polygonella basiramia* Wireweed		v p			v p		x													
E	E		G3 S3	FL	*Polygonella myriophylla* Sandlace		v p		v p	v p		x	x												
	E		G3G5 S3		*Polystachya concreta* Pale-flowered polystachya	p	v p	p	p	p														x	

*Status Designations					Species **Occurrence by:	County					Multispecies Recovery Plan Community													
Federal	Florida	FCREPA	FNAI Global / State	Endemic to Florida	***Scientific Name*** **Common Name**	Glades	Highlands	Okeechobee	Osceola	Polk	High pine	Scrub	Scrubby high pine	Beach/Dune	Mesic temperate hammock	Scrubby flatwoods	Mesic pine flatwoods	Hydric pine flatwoods	Dry prairie	Cutthroat grass	Wet prairie	Freshwater marsh	Seepage swamp	Flowing water swamp	Pond swamp
E	E	E	G3 S3	FL	*Prunus geniculata* Scrub plum		v p			v p	x	x	x												
	T		G2G3 S2	FL	*Pteroglossaspis ecristata* Wild coco	p	v p	p	v p	v p		x			x		x		x						
	T		G3 S3		*Pycnanthemum floridanum* Florida mountain-mint	p	p	p	p	p															
	CE	T	G4 S4		*Rhapidophyllum hystrix* Needle palm		p																		
			G3 S2		*Rhynchospora floridensis* Florida white-top sedge		p																		
			G2 S2	FL	*Rhynchospora megaplumosa* Large-plumed beaksedge		p																		
	E	T	G3 S2		*Rudbeckia nitida* St. John's black-eyed-susan	p	p	p	p	p															
	T				*Sacoila lanceolata* Leafless beaked ladiestresses, Leafless beaked orchid	v p	v p	v p	v p	v p															
	T				*Sarracenia minor* Hooded pitcherplant		v p	v p		v p															
	T		G5 S4		*Scaevola plumier* Inkberry	p	p	p	p	p															
SC	E		G1G2 S1S2	FL	*Schizachyrium niveum* Riparian autumngrass		v p		v p	v p	x	x													
E	E		G2G3 S1		*Schwalbea Americana* Chaffseed	p	v p			v p															
	E		G1 S1		*Spiranthes brevilabris* Small ladies'-tresses	p	p	p	p	v p								x							
	T		G1 S1		*Spiranthes floridana* Florida ladies'-tresses	p	p	p	p	p								x							

*Status Designations					Species **Occurrence by:	County					Multispecies Recovery Plan Community													
Federal	Florida	FCREPA	FNAI Global / State	Endemic to Florida	***Scientific Name*** **Common Name**	Glades	Highlands	Okeechobee	Osceola	Polk	High pine	Scrub	Scrubby high pine	Beach/Dune	Mesic temperate hammock	Scrubby flatwoods	Mesic pine flatwoods	Hydric pine flatwoods	Dry prairie	Cutthroat grass	Wet prairie	Freshwater marsh	Seepage swamp	Flowing water swamp	Pond swamp
	T		G4G5 S3S4		*Spiranthes laciniata* Lace-lip ladies' tresses	p	vp	vp	vp	p								x				x			
	T		G3 S3		*Spiranthes longilabris* Long-lip ladies' tresses	p	vp	p	vp	vp							x	x	x						
	T		G5 S3S4		*Spiranthes tuberose* Little pearl-twist	p	vp	p	p	vp															
	E		G5 S1		*Stachys crenata* Mouse's-ear, Shade betony					vp															
	E		G4Q SNR		*Stenanthium densum* Coastal death camas	p	p	p	p	p															
	E		G3 S3	FL	*Stylisma abdita* Scrub stylisma	p	vp	p	p	vp															
	E		G1TX SX	FL	*Tephrosia angustissima* var. *Angustissima* Hoary pea	p	p	p	p	p							x								
	T		G3 S3		*Tephrosia mohrii* Pineland hoary-pea	p	p	p	p	p															
	E		G5 S1		*Thelypteris serrata* Toothed maiden fern	p	vp	p	vp	vp															
	T		G4G5 S3		*Tillandsia balbisiana* Inflated wild-pine	vp	vp	vp	vp	vp		x			x			x						x	
	E		G5 SNR		*Tillandsia fasciculate* Common wild-pine	vp	p	vp	vp	vp		x	x		x			x				x		x	
	T	T	G5 S3		*Tillandsia flexuosa* Twisted air plant	p	vp	p	p	p		x			x			x						x	
	E		G5 S3		*Tillandsia utriculata* Giant wild-pine	vp	vp	vp	vp	vp		x	x					x						x	
	T		G5 S2		*Tillandsia valenzuelana, Tillandsia variabilis* Soft-leaved wild-pine		vp	vp							x			x						x	

*Status Designations					Species **Occurrence by:	County					Multispecies Recovery Plan Community													
Federal	Florida	FCREPA	FNAI Global / State	Endemic to Florida	***Scientific Name*** **Common Name**	Glades	Highlands	Okeechobee	Osceola	Polk	High pine	Scrub	Scrubby high pine	Beach/Dune	Mesic temperate hammock	Scrubby flatwoods	Mesic pine flatwoods	Hydric pine flatwoods	Dry prairie	Cutthroat grass	Wet prairie	Freshwater marsh	Seepage swamp	Flowing water swamp	Pond swamp
SC	E		G1 S1	FL	*Triphora craigheadii* Craighead's nodding-caps		v p								x										
	T		G3G4 S3		*Triphora trianthophoros* Three-birds orchid	p	v p	p	p	p															
E	E		G1 S1	FL	*Warea amplexifolia* Wide-leaf warea				v p	v p	x														
E	E		G3 S3	FL	*Warea carteri* Carter's mustard	v p	v p	p	p	v p	x	x	x			x	x								
	CE		G5 SNR		*Zamia pumila* Coontie	p	p	p	p	p															
	T		G4G5T4 S4		*Zephyranthes treatiae* Treat's zephyr-lily	p	v p	p	v p	v p															
	T		G2G3 S1S3		*Zephyranthes simpsonii* Rain lily	v p	v p	v p	v p	v p															
E	E		G1 S1	FL	*Ziziphus celata* Florida ziziphus		v p			v p	x	x													

**** Status Designations**: Federal designations by the U.S. Fish and Wildlife Service. Florida designations by the Florida Fish and Wildlife Conservation Commission and the Florida Department of Agriculture and Consumer Services. FCREPA designations (animals) by the Florida Committee on Rare and Endangered Plants and Animals. FNAI designations by the Florida Natural Areas Inventory. FDACS designations by Florida Department of Agriculture and Consumer Services.*

E = Endangered; Federal, Florida, and FCREPA
CH = Critical Habitat designated, Federal only
T = Threatened; Federal, Florida, and FCREPA
C = Candidate for Federal listing
SC = Species of Concern (Federal)
SSC = Species of Special Concern (Florida and FCREPA)
EXN/RX = Endangered - non-essential experimental population (Federal) or Recently Extirpated (FCREPA)
R = Rare (FCREPA)
RSU = Rare and Status Undetermined (FCREPA for beetles)
SU = Status Undetermined (FCREPA)
CE = Commercially Exploited (Florida [FDACS] plant designation)
G/S = Global/State ranks (FNAI): 1–Critically Imperiled, 6 or fewer occurrences; 2–Imperiled, 6 to 20 occurrences; 3–Rare, restricted, or otherwise vulnerable to extinction; 4–Apparently secure; 5–Demonstrably secure. Examples of other ranks: G#G#–Range, insufficient data to assign one rank (G2G3), H–Historical occurrence (GH), X-Believed extinct throughout range (GX), U-Unranked due to lack of information (GU), NR-Not yet ranked (GNR), ?-Tentative rank (G?), T-Taxonomic subgroup such as a species or variety ranked (G3T1), Q-Questionable species ranked, though questioned whether entity is a species or subspecies (G2Q).
FL = Species is endemic to Florida, i.e., a native species that occurs only in Florida

*****Occurrence Designations**:*

x = animal documented in the county, species breeds, feeds, or shelters in the ecological community
h = animal historically documented in the county
v = vouchered plant specimen exists for the county
p = potential habitat for the at-risk plant occurs in the county

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Appendix G. Summary of Public Comments on the Draft Land Protection Plan and Draft Environmental Assessment and the Service's Response

Comments on the Draft Land Protection Plan (Draft LPP) and Draft Environmental Assessment (Draft EA) were submitted in a variety of ways (e.g., at a public hearing and by mail, fax, and email). Attendance at the public hearings averaged ~61 per meeting: ~68 in Avon Park and ~54 in Kissimmee. The original deadline for comments was October 24, 2011, however this was extended to November 25, 2011. As of November 25, 2011, the extended deadline for public review comments, over 2,300 commenters submitted comments. Comments were submitted by individuals, businesses, and organizations, as well as by state agencies and Native American Tribes. (For more information regarding public involvement, please see the Public Participation section in Chapter I.)

The Florida State Clearinghouse coordinated State agency review of the Draft LPP and Draft EA (SAI # FL201109065939C) under: Presidential Executive Order 12372; Section 403.061(42), Florida Statutes; Coastal Zone Management Ace, 16 U.S.C. 1451-1464; and the National Environmental Policy Act, 42 U.S.C. 4321-4347. Based on the documents and state agency comments, the proposed federal action was found to be consistent with the Florida Coastal Management Program. The East Central Florida Regional Planning Council found the proposal to be consistent with its goals, policies, and objectives. The Southwest Regional Planning Council found the proposal to be regionally significant and consistent with the Strategic Regional Policy Plan and the State Comprehensive Plan. The State Historic Preservation Officer found the project to be consistent and provided no additional comments. More detailed comments were provided in a letter from FDEP and the SFWMD, in two letters from FWC, and in a letter from the Southwest Regional Planning Council, which are included, along with the entire State Clearinghouse packet, at the end of this appendix.

Under NEPA, the Service must respond to substantive comments. For purposes of this Final EA, a substantive comment is one that was submitted during the public review and comment period which was within the scope of the proposed action (and the other alternatives outlined in the Draft EA), was specific to the proposed action, had a direct relationship to the proposed action, and included reasons for the Service to consider it. (For example, a substantive comment could be that the document referenced 500 individuals of a particular species, but that current research found 600. In such a case, the Service would likely update the Final EA to reflect the 600, citing the current research. While a comment that would not be considered substantive would be: "We love the proposal.") Multiple comments were submitted regarding concerns outside of the purview of the proposal. Comments outside the scope of the proposal were not addressed.

SUMMARY OF CONCERNS AND THE SERVICE'S RESPONSES

Comments were received from individuals, businesses, non-governmental organizations, utility companies, governmental agencies, and the Seminole Tribe of Florida.

Comments were received from representatives of numerous non-governmental organizations and businesses, including those listed.

Adams Ranch
Alabama Ornithological Society
American Forests
Arbuckle Creek Ranch
Arthur R. Marshall Foundation and Florida Environmental Institute, Inc.
Audubon of Florida
Audubon of Martin County
Brazos River Air Boaters
Center for Biological Diversity
Collier County Audubon Society
Conservancy of Southwest Florida
Defenders of Wildlife
Democratic Womens Club of Highlands County
"Ding" Darling Wildlife Society
Ecology Party of Florida
Florida Airboat Association
Florida Defenders of the Environment
Florida Wildlife Federation
Friends of Florida Panther NWR
Friends of the Iroquois NWR
Friends of the Tampa Bay NWRs
Hells Canyon Preservation Council
Highlands County Audubon
Hudson-Mohawk Bird Club
Joiner Consulting, Inc.
Kissimmee Valley Audubon Society
Kissimmee River Valley Sportsmen Association
Latt Maxcy Corporation
Loxahatchee Group, Sierra Club
Miami Chapter, EarthSave International
National Parks Conservation Association
National Wildlife Refuge Association
Northern Everglades Alliance
One More Generation
Palm Beach County Environmental Coalition
Preservation of Natural Florida, Inc.
Rivers Coalition
Safari Club International
South Florida Anglers for Everglades Restoration, Inc.
South Florida Wildlands Association
Texas Airboat Association
The Nature Conservancy
Tiger Cattle Company
The Trust for Public Lands

Three utility companies also submitted *Comments:* Florida Power & Light Company; Gulfstream Natural Gas System, LLC; and Okeechobee Utility Authority.

Comments were received from multiple state governmental agencies, including the Bureau of Historic Preservation, Florida Division of Historical Resources, Florida Department of State; East Central Florida Regional Planning Council; Florida Department of Environmental Protection; Florida Fish and Wildlife Conservation Commission; South Florida Water Management District; and Southwest Florida Regional Planning Council.

The substantive comments were summarized and the comments and associated responses are grouped together under five general topics, as listed.

Wildlife and Habitat
Resource Protection
Recreation
Administration
General/Other Comments

All substantive comments were summarized and categorized under these five general topics, while the original letters from the State Clearinghouse and the Seminole Tribe of Florida appear in their entirety at the end of this appendix, following the comments and responses.

Any page numbers referenced in the comments or responses relate to the original page numbers in the Draft LPP and/or Draft EA released for public review and comment.

Acronyms used in comments and responses are listed.

ADA	Americans with Disabilities Act
ATV	all terrain vehicle
BCNP	Big Cypress National Preserve, NPS; also BICY
BICY	Big Cypress National Preserve, NPS; also BCNP
BLM	Bureau of Land Management
BMP	Best Management Practice
CCP	Comprehensive Conservation Plan (USFWS)
CERP	Comprehensive Everglades Restoration Plan
CLIP	Critical Lands and Waters Identification Project (State of Florida)
Corps	U.S. Army Corps of Engineers, also USACE
DEP	Florida Department of Environmental Protection
DOI	U.S. Department of Interior
EA	Environmental Assessment
EHNWRCA	Everglades Headwaters NWR and Conservation Area, also EHNWR&CA
EHNWR&CA	Everglades Headwaters NWR and Conservation Area, also EHNWRCA
EPA	U.S. Environmental Protection Agency, also USEPA
ERMD	Environmental Resources Management Department, Seminole Tribe of Florida
FAA	Florida Airboat Association
FDACS	Florida Department of Agriculture and Consumer Services
FDEP	Florida Department of Environmental Protection
FDOF	Florida Division of Forestry, FDACS; now called Florida Forest Service (FFS)
FERC	Federal Energy Regulatory Commission
FFS	Florida Forest Service, FDACS; formerly called Florida Division of Forestry
FNAI	Florida Natural Areas Inventory
FPL	Florida Power & Light Company
FRPP	Farm and Ranch Land Protection Program, NRCS

FW	Fish and Wildlife Service Manual
FWC	Florida Fish and Wildlife Conservation Commission
FWS	U.S. Fish and Wildlife Service, also USFWS
GIS	geographic information system
LLC	limited liability company
LPP	Land Protection Plan
LWCF	Land and Water Conservation Fund
MOU	Memorandum of Understanding
NEPA	National Environmental Policy Act
NPS	National Park Service
NRCS	Natural Resources Conservation Service
NWR	National Wildlife Refuge
NWR/CA	National Wildlife Refuge and Conservation Area
NWRA	National Wildlife Refuge Association
ORV	off-road vehicle
SFWMD	South Florida Water Management District
SR	State Road
THPO	Tribal Historic Preservation Officer
US	United States
USC	United States Code
USACE	U.S. Army Corps of Engineers, also Corps
USEPA	U.S. Environmental Protection Agency, also EPA
USFWS	U.S. Fish and Wildlife Service, also FWS
WHIP	Wildlife Habitat Incentives Program, NRCS
WMA	Wildlife Management Area, FWC
WRP	Wetland Reserve Program, NRCS

Wildlife and Habitat

General

Comment:
Mrs. Douglas was such a great caretaker of the Everglades that we cannot let her work be for naught. Species who use the greater Everglades system could disappear forever if we do not continue to be the very best caretakers of this land. This proposal helps protect important habitat to sustain wildlife in this landscape.

Service's Response:
Comment noted.

Comments:
Multiple commenters supported the proposal for its protection of native species, as well as of rare, threatened, and endangered species. Rare plants, birds, and other wildlife abound in the prairies, agricultural lands, and ranches in this unique area. This proposal helps protects these important resources and vistas. Rare, threatened, and endangered species such as the Florida panther, Everglade snail kite, crested caracara, Florida scrub-jay, gopher tortoise, red-cockaded woodpecker, whooping crane, and many more will benefit from this project. This proposal needs to save the maximum native species. Species that were commonly seen in south Florida are much less common. This is a great idea to help protect biodiversity. Let's protect our native species so we do not lose another species to extinction. Significant advances can be made in the recovery of the

grasshopper sparrow, caracara, and Everglade snail kite through this proposal and the invocation of the Endangered Species Act as legal authority for the establishment of this refuge. I believe that the conservation of our local wildlife species must become a higher priority in the face of declining growth management policies in Florida.

Service's Response:
Comments noted.

Comment:
It is time to ban the use of fertilizer in any part of Florida (page 109 in the Draft EA).

Service's Response:
Comment noted. This type of action is beyond the scope of the land protection planning process.

Comment:
Concerning the following statement on page 85 of the Draft EA, "Of the remaining lands, the native communities that make up the greatest extent are freshwater marsh (7.4 percent), lakes (7.2 percent), palmetto prairie (4.5 percent), and wet prairie (4.4 percent). Some of the most important natural communities such as dry prairie and Florida scrub are barely represented with only 5 percent and 2 percent of the overall Study Area acreage respectively." It is important to note that palmetto prairie and dry prairie are just different names for one in the same natural community type. This appears, however, to be corrected in Tables 7 and 8 of the Draft EA.

Service's Response:
This was corrected in the Final EA.

Comment:
As indicated in Table 7 of the Draft EA, are there really 20,172.66 acres of urban lands protected within the Study Area?

Service's Response:
Comment noted. Table 7 consolidated about 130 land cover types into 12 coarse categories. So, things such as parks and military lands that fall under a more developed land cover type and that do not fall under a habitat type were grouped together. Given the consolidation of the land cover types and the large size of the Study Area (1.8 million acres), it was determined that just over 20,000 acres fell into an urban, but protected lumped category.

Comment:
On page 9 of the Draft LPP the following statement is found: "Major habitats located in the Conservation Focal Area consist of pasture (improved and unimproved), wet prairie and freshwater marshes, dry prairie, and forested wetlands…" We wish to point out that there are also considerable areas of Mesic and Scrubby Flatwoods in the Conservation Focal Area, including on such tracts as Destiny/Pine Island Slough, Lost Oak Ranch, Lake Conlin, and Hatchineha Ranch, among others.

Service's Response:
The Final LPP was updated to include mesic and scrubby flatwoods in the list of major habitat types.

Comment:
In Figure 6 of the Draft EA (and on same map on page 10 of the Draft LPP), it appears that some substantial blocks of extant Dry Prairie and Mesic Flatwoods east of the Kissimmee River are missing from the data used to compile the overall land cover map. Alternatively, the same figure may show a

large overestimate of the extent of Cutthroat grass-dominated communities west of the Kissimmee River. Nonetheless, these data are very useful and are good for the purpose intended, but actual land protection strategies and implementation should include ground verification of the extent and quality of the natural communities present on any given ownership.

Service's Response:
Comment noted. The major habitat types came from the most current land use/land cover database available from the state.

Comment:
While we agree that not all occurrences of cutthroat grass are on seepage slopes, the statement on page 119 of the Draft EA that, "Cutthroat grass communities also occur within the community classes of flatwoods, wet prairies, and depression marshes" may be a bit of an overstatement, as we have never seen cutthroat grass within true Wet Prairie or Depression Marsh communities, although this species may certainly occur in the ecotone between communities adjacent to and intergrading with such communities.

Service's Response:
Comment noted. According to FNAI (2010b), cutthroat grass is described as a component of wet flatwood and wet prairie communities. We have corrected the statement in the Final EA to read: "Cutthroat grass communities also occur within the community classes of wet flatwoods and wet prairies (FNAI 2010b)."

Citation:
Florida Natural Areas Inventory. 2010b. Guide to the Natural Communities of Florida: 2010 edition. Florida Natural Areas Inventory, Tallahassee, FL.

Comment:
Excellent section in the Draft EA on Federally Listed Plant Species on pages 122 through 130; on Nonnative and Invasive Plant Species on pages 130 through 134; and on Listed and Candidate Wildlife Species on pages 135 through 141. The same can be said for the section on State Listed Animal Species on pages 141 through 143.

Service's Response:
Comment noted.

Comment:
On page 235 of the Draft EA it states, "Depending on the quality of the habitat, pastures support federally listed species such as crested caracara, Florida grasshopper sparrow, wood stork, eastern indigo snake, and Florida ziziphus (if the proper soil is present)." The Nature Conservancy agrees with that statement in the context of pasture that is interspersed with high-quality habitat for these species. The USFWS should guard against species protection strategies that are predicated on the protection of areas that are predominantly pasture.

Service's Response:
Comment noted. Service acquisition strategies will be based upon the methodology described in Appendix C. In doing so, priority will be given to areas that are predominately high-quality native habitats. Areas that are predominately pasture, specifically non-native or improved pasture will receive a lower priority rank and thus a reduced representation in the areas purchased.

Comment:
What is “semi-native pasture,” as mentioned on page 301 of the Draft EA? While “semi-improved pasture” is commonly used terminology, “semi-native” is not. To avoid confusion, we suggest use of the commonly understood term or definition of this term if it is intended to describe a different condition.

Service’s Response:
Semi-native pasture was changed to native pasture Conceptual Management Plan.

Comment:
On page 302 of the Draft EA – “Work cooperatively with partners and partner programs to secure grassland and forest conservation easements.” The Nature Conservancy would like to assist with such efforts and we appreciate the inclusion of this statement in the Draft EA.

Service’s Response:
Comment noted.

Comment:
Appendix F. Habitat Ranking, Alternative Development, and Land Acquisition Prioritization Methodology – starting on page 349 of the Draft EA – is well done and appears scientifically accurate as far as we have been able to assess. Good data sources were chosen and the priority habitat types selected by USFWS and FWC biologists seem sound, as do the basis for the GIS analysis. We might suggest, however, that all three flatwoods types (Mesic, Hydric and Scrubby) be accorded a Priority 1 rank, as mentioned initially on page 350 of the Draft EA and in Appendix F, Table 1 beginning on page 353 of the Draft EA, rather than Priority 2 ranking. Flatwoods are one of the most under-appreciated, yet biologically diverse, natural community types and are important for numerous rare, imperiled and declining species of plants and vertebrates. In the Study Area, most examples of flatwoods are dominated by longleaf pine. Flatwoods are an extremely important part of any landscape scale conservation effort and are often the major upland (along with Dry Prairie) habitat type in the Study Area and form an important component of most watersheds in peninsular Florida, particularly in the Northern Everglades.

The Priority Land Cover into High, Medium and Low classes – as presented in Appendix F. Figure 2., page 352 of the Draft EA (and mirrored in Figure 3 on page 359) – seems accurate as based on an examination of the data and The Nature Conservancy’s own work in the region, including much direct field analysis and ground truthing, although some areas might be slightly raised in value if the various kinds of flatwoods are accorded an elevated Priority rank as noted directly above.

Service’s Response:
Comment noted. We agree that flatwoods are an extremely important component of the overall landscape. The priority classes were derived using best professional judgment and are a relative rank based upon the priority species and habitats identified in the document. Habitats identified as high-priority were based on a few, select criteria, such as the ability to support Florida grasshopper sparrow. However, because of flatwoods’ close association with dry prairie and other high-priority habitat, often occurring within the same land ownership parcel, the commenter’s concern is met indirectly and flatwoods are afforded priority status.

Comment:
The Planning Units all look good, as presented for Alternatives B and C on pages 360 and 361 of the Draft EA, with the possible exception of the single Prairie North parcel that seems out of place in the landscape and watershed, although we understand that it does support some high-quality natural resources worthy of conservation.

Service's Response:
Comment noted. The Prairie North site lies in the Kissimmee River Basin (Florida Department of Environmental Protection 2004), and conserving lands in this area will contribute to all four goals that would help direct management of the refuge and conservation areas. Specifically, Goal 3 "Enhanced Water Quality, Quantity, and Storage," aims to contribute to improving water quality and quantity in central and south Florida.

Citation:
Florida Department of Environmental Protection. 2004. Water Quality Status Report Kissimmee River and Fisheating Creek. FDEP Division of Water Resource Management. http://waterwebprod.dep.state.fl.us/basin411/kissimmee/status/KissFish.pdf Accessed: November 2011.

Comment:
In Appendix F., Figures 6 – 11b, pages 363 through 369 of the Draft EA – the Overall Priorities section – (and the explanation and criteria for the Tier I, II, III system on pages 26 and 27 of the Draft LPP under Land Protection Priorities), look well-conceived and accurate as to Tier grouping (I, II or III). While we agree with the grouping, we have heard some criticism of low scores for what are predominately large blocks of improved pasture. We have also heard discomfort with inaccuracies in Tier classification of some small areas (e.g. citrus grove). Ground-truthing by qualified biologists familiar with the natural communities and their quality indicators on the Florida landscape should, of course, be undertaken to verify this classification system and we suggest having the Florida Natural Areas Inventory involved in such an analysis because of their long experience with exactly this kind of work and their unbiased perspective.

Service's Response:
Comment noted. We agree that ground-truthing by qualified biologists will be necessary to evaluate inconsistencies in the Tier grouping assignments. A review team of such individuals will be assembled, much like NRCS teams which evaluate Wetland Reserve Program easement properties, and will consider Florida Natural Areas Inventory staff as members of such a team.

Comment:
Appendix H. Table 1. Summary of status designations by Taxon Group for 288 at-risk species in the proposed Everglades Headwaters NWR and Conservation Area Study Area, starting on page 380 and concluding on page 402 of the Draft EA constitutes excellent and useful information for the region and its numerous at-risk species.

Service's Response:
Comment noted.

Comment:
The Service needs to discuss how we get the individual biological evaluations which are represented as being included on each of the parcels that have been selected.

Service's Response:
Comment noted. Appendix C in the Final EA outlines the methodology that was utilized to prioritize the highest quality habitats within the Study Area, identifies lands to be included in the Conservation Focal Area, and ranks individual parcels and groups of parcels under a single ownership.

Everglades Restoration

Comments:
Multiple comments were submitted in relation to Everglades restoration.

Multiple commenters supported the proposal as an element of overall restoration efforts for the Everglades, noting that easements on 100,000 acres and fee-title ownership on an additional 50,000 acres are essential steps towards Everglades restoration. This proposal builds on past efforts and helps move forward to get the Everglades back to health. This proposal is as critical to South Florida as CERP. The proposed refuge meets all CERP Table 5-1 goals and objectives, especially Objective #1: Increase spatial extent of natural area. The Northern Everglades are critical to the overall Everglades and Big Cypress ecosystems. Establish a national wildlife refuge to help protect them. The Everglades area a state and national treasure; they belong to all Americans. The proposal is essential to help keep what remains of the Everglades intact, supporting endangered species. This area (of the proposal) is the lifeblood of the surrounding waters and ecosystems. The Everglades cannot be restored or survive in the future without these types of protected areas at its headwaters. The Everglades need to be restored to what it was in the past, large water storage and cleaning site and nature preserve. The protection of the landscape proposed is critical to the long-term protection of one of the World's most unique watersheds; the long-term success of the current Everglades restoration program and the future of the unique biodiversity dependent upon the extensive, connected habitats within the watershed are paramount to Florida's adaptation to global climate change and to the future maintenance of natural landscapes in the State of Florida. The Everglades is a vast ecosystem that stretches from the southern reaches of Orlando down to Florida Bay; to protect the Everglades, the entire system must be protected.

This whole program should be discontinued at once with the No Action Alternative. The water is going to win every time. You will not prevail over the Everglades. Army Corps of Engineers' projects fail every time. The proposal will not provide any real direct benefit towards cleaning up the Everglades or Lake Okeechobee and will not have any real positive environmental benefit cleaning up any of the waters in south Florida, the Kissimmee River Chain of Lakes watershed or any natural resources downstream, or any benefit to any of the stakeholders who use and enjoy the resources. Let nature take its course and fix itself, just manage the way people use it and stop trying to control nature. Nothing is wrong with the Everglades and nothing needs to be fixed.

Service's Response:
Comments noted. This project is not an engineering project, and hydrological, water quantity and water quality benefits would be achieved primarily through restoring or mimicking natural hydrologic processes. The Service believes that this project will contribute to several of the benefits identified in the Comprehensive Everglades Restoration Plan. These expected benefits are further detailed under "Environmental Consequences."

Comment:
Buried in the USFWS Draft Land Protection Plan is an admission that the Headwaters refuge would have minimal benefit to the true Everglades ecosystem south of Lake Okeechobee. It is unconscionable that proponents of the acquisition would deceive the public and Congress alike by attempting to hang the project on CERP coattails. Not only would it rob desperately needed funding

from CERP projects already languishing due to lack of available funding, but it would also most likely increase the state's 50/50 CERP matching cost-share by a minimum of $350 million for the first phase of the acquisition alone.

Service's Response:
Comment noted. The Service believes that this project will contribute to several of the benefits identified in the Comprehensive Everglades Restoration Plan. These expected benefits are further detailed under "Environmental Consequences." Funding for the refuge and conservation area and CERP projects are not in conflict or competition with each other. Funding for the refuge and conservation area will be primarily derived from the Land and Water Conservation Fund (LWCF). Funding for CERP projects is derived from specific congressional appropriations, which do not derive from the LWCF.

Water Quality and Quantity

Comments:
Multiple commenters supported the proposal as an overall element of improving water quality and quantity in the Kissimmee River Valley and for the Everglades system. The proposal is critical in providing much needed water storage and water quality treatment for the Okeechobee watershed. Further, natural wetlands will be rehydrated. This proposal will help with the water situation, which will become more of a problem in the years to come and water quality and quantity will be adversely affected if we don't take action now. By protecting the watersheds from south of Orlando towards Lake Okeechobee, water quality and quantity for Florida residents and wildlife will be greatly improved. Wetland restoration activities will improve the greater Everglades watershed. My groundwater is safer if the neighbors to the south of me have their own water supply and do not try to pump away our water. This proposal will help restore the Everglades and the life that depends on it, clean up Lake Okeechobee, and protect the water supply for South Florida. Cut off pollution in the Everglades at the source; prevention is so much smarter than remediation after the fact. The restoration of the northern Everglades is of the utmost importance for restoring water quality as it heads southward into the Everglades, or westward into the Caloosahatchee River, or eastward into the St. Lucie River. Further, the proposal will help provide clean water for over six million people. Long term sustainability is critical for the provision of drinking water for Florida's human population, and the proposal and Everglades restoration are important components of this. Land uses along the Kissimmee River and the other tributaries to Lake Okeechobee are furnishing vast amounts of excess phosphorus, far greater tonnage than the lake can assimilate. Our great lake, Lake Okeechobee, home of great bass and crappie fishing, waterfowl hunting, and a vital staging area for millions of birds on their southward and northward migrations is in danger. The Headwaters concept is the first major effort to not only control runoff of agricultural wastes, but open up within the national refuge extensive areas for hunting waterfowl, deer, and hogs. The proposal offers the most important positive step toward restoration of water quality, water flow, and land protection that has ever been conceived. The proposal is an excellent opportunity to improve water quality in receiving bodies of water. The proposal will restore and protect wetlands to support water quality and quantity flowing from the Everglades headwaters to south Florida and help provide clean water for over six million people. The proposal will help with source control of nutrients. More protected land (in this area) means more opportunity to hold and clean water before it reaches Lake Okeechobee. EHNWR/CA goals of reducing additional urban development in the northern Everglades and returning some acreage of improved pasture to natural conditions will help with the water quality challenges.

Service's Response:
Comments noted.

Comment:
The Okeechobee Utility Authority expressed concerns for developed areas and their impacts on water quality and quantity. While it is very important to protect natural areas from development pressure and to place those areas in long-term conservation easements, what is to be done with those areas that have already had some development of land use associated with them that will degrade water quality and quantity? To improve water quality flowing into the Everglades from this proposed refuge and conservation area, the EA and LPP need to address the other land uses within the watershed and the funding mechanisms available to implement the use of BMPs to assist in the attainment of the state goal for the entire contributing watershed area. The Okeechobee Utility Authority currently has a BMP project that, if funded, would help address the Service's goal of improving water quality and quantity.

Service's Response:
Comment noted. The Service understands that water quality and quantity are landscape issues with solutions that span the landscape and may include several governmental and private entities. However, this project is limited to the protection of the outlined 150,000 acres and the improvements those acres could produce for water quality and water quantity in the area and downstream.

Comment:
We believe the proposal offers the potential to advance dispersed water management programs being developed by the South Florida Water Management District and we would like to see more attention to and discussion of the programs in the Draft LPP.

Service's Response:
Comment noted. The Service is proposing to work with conservation partners such as South Florida Water Management District to advance partner activities within the Conservation Partnership Area. The Service would consider assisting the State in their dispersed water management program, especially if the dispersed water management program restores natural hydrology on the landscape.

Comment:
Goal 3. Enhanced water quality, quantity, and storage on page 302 of the Draft EA – "Restore 50 percent of all drained wetlands within 2 years of acquisition of Conservation Area properties." We think this means less than fee/conservation easement lands and it is unlikely that most landowners signing up for an easement under the USFWS program will want to, in effect, be signing up for what amounts to a Wetland Reserve Program (WRP) easement. We do agree, though, that this is a worthy goal, but are just unsure of how this will be received by the ranching community, since we have heard some negative comments about this from some ranchers. We encourage the USFWS to work closely with NRCS and FWC to identify opportunities for balancing the goals of the EHNWR&CA with the objectives of other programs such as WRP that are specifically designed to achieve wetland restoration. In many cases, WRP easements may be utilized for protecting and restoring a degraded portion of the property while USFWS conservation easement funding would be utilized to conserve another portion, often intact upland habitat. The different objectives of these two programs will need to be carefully balanced and closely coordinated to ensure that the long-term conservation objectives for the landscape are met. This further reiterates the importance of engaging the local ranching and agricultural community early and often in the draft conservation easement language to be utilized in negotiating agreements within this important landscape.

Service's Response:
Comment noted. In this project, the Service will work with willing landowners to acquire less-than-fee-title rights in the Conservation Partnership Area, with an acreage cap of 100,000. The objective, "Restore 50 percent of all drained wetlands within 4 years of acquisition of Conservation Area properties" only applies to those conservation easements which include provisions for wetland restoration. The Service recognizes the importance of engaging the local ranching and agricultural community early and often, working cooperatively with the Natural Resources Conservation Service (NRCS). The Service and NRCS will coordinate efforts and work closely with interested landowners to best achieve conservation goals that are aligned with each agency's mission and programs.

Comment:
The Rivers Coalition believes this project in the Central Everglades through the Everglades Agricultural Area is critical to preserve the water-starved Everglades south of the Tamiami Trail and the Big Cypress area.

Service's Response:
Comment noted.

Comment:
On page 261 of the Draft LPP/EA, it states that "there may be some small water quality benefits by the protection of 50,000 acres of lands, and the 100,000-acre conservation easement, but there would be other opportunities for water quality to be degraded after it leaves Alternative C lands and before it reaches waters occupied by manatees. Why would taxpayers pay $700,000,000?

Service's Response:
Comment noted. Given the size and development potential of the Kissimmee River Valley landscape and given that manatees are largely found 30 miles downstream of the southernmost Alternative C lands, the water quality improvements made upstream by the project would be degraded by the time waters from the project reached waters occupied by manatees.

Comment:
The USFWS and their partners tout that this Headwaters Refuge and Conservation Area are necessary in order to assist restoration of the water quality of the Everglades and assure the cattle ranching heritage survives and can be passed on to future generations. These two goals cannot be met simultaneously due to the fact that if the cattle remain in the Northern Everglades Headwaters region as they have been historically, one of the main water quality problems caused by cattle waste will not be removed by spending the $700,000,000 estimated to fund the first of four phases of land acquisition supposedly required. There will be many more millions required in addition to clean up the mess already caused by the cattle heritage proposed to be saved.

Service's Response:
Comment noted. The Service will work with willing landowners and other agencies such as the U.S. Department of Agriculture, Florida Department of Environmental Protection, and Florida Department of Agriculture and Consumer Services to reduce nutrient loads through the implementation of Best Management Practices, wetland restoration, and other land management activities.

Comment:
This project could contribute considerable capacity to complement the state's program and meet the water storage goal.

Service's Response:
Comment noted.

Comment:
Service has not identified any specific water quality or quantity needs and the Department and District cannot commit to meeting future water quality, quantity, timing, or distribution needs of the proposed Everglades Headwaters NWR, but would collaborate with the refuge, other agencies, and private landowners to work toward strategies supported by all stakeholders.

Service's Response:
Comment noted.

Comment:
The Service is committed to improving water quality and quantity, timing, and distribution of water to downstream users and would participate in reduction strategies identified through the state's Total Maximum Daily Load and Basin Management Action Plan process. Conservation easements would not preclude the ability of the landowner to implement pollutant reduction strategies identified through these processes.

Service's Response:
Comment noted.

Wetlands

Comment:
We encourage the Service to partner with the U.S. Department of Agriculture's Natural Resources Conservation Service (NRCS) to identify and help prioritize high-priority wetland and restoration lands.

Service's Response:
Comment noted.

Comment:
Since there are wet prairies, why hasn't the State of Florida restricted all development in these wetland sites? Aren't they already nationally protected from development? Why are waivers from government agencies going on like USACE, USFWS, etc., to develop them? (pg. 113)

Service's Response:
Comment noted. In the U.S., protecting wetlands is a complex balancing act that includes the need to protect a dwindling natural resource while taking into account the rights of private property owners. The Federal Government aims to protect wetlands through regulations (such as Section 404 of the Clean Water Act), economic incentives and disincentives (for example, tax deductions for selling or donating wetlands to a qualified organization, cooperative programs, and acquisition (Votteler and Muir 2002, U.S. Environmental Protection Agency 2011d). In addition, states and local governments may have additional regulations and zoning to protect wetlands. At the state level, the Florida Department of Environmental Protection's Office of Submerged Lands and Environmental Resources regulates wetlands (FDEP 2011b). This project will help to restore and protect wetlands located in lands acquired by the Service as part of the refuge. It will likely also increase opportunities for the conservation of wetlands located in areas protected through easements.

Citations:
Florida Department of Environmental Protection. 2011b. Wetlands. Office of Submerged Lands and Environmental Resources. http://www.dep.state.fl.us/water/wetlands/index.htm

U.S. Environmental Protection Agency. 2011d. Wetlands Protection. http://water.epa.gov/type/wetlands/protection.cfm Accessed: November 2011.

Votteler, Todd H. and Thomas A. Muir. 2002. Wetland Management and Research Wetland Protection Legislation National Water Summary on Wetland Resources United States Geological Survey Water Supply Paper 2425 http://water.usgs.gov/nwsum/WSP2425/legislation.html Accessed: November 2011.

Florida Panther

Comment:
Stock growing ranchers and Florida panthers have opposing interests. I want to see that there is a fixed mechanism worked out in advance so that ranchers will not have an incentive to shoot and bury panthers. Clearly there needs to be money set aside to compensate ranchers for stock kills. And, should ranchers be required to have taller fences to keep panthers out of fields where smaller stock (such as calves and goats) pasture? Should funds be contributed to help ranchers rebuild their fences? We need some realistic discussions on how we can have panthers and ranchers share the same range.

Service's Response:
Comment noted. While we recognize that Florida panthers do depredate calves, goats, and sheep, the concern and incidence for this behavior is primarily found outside of this project area. Florida panthers are currently found throughout the project area infrequently, but no known breeding population exists north of the Caloosahatchee River. However, the Service's regulatory division, Ecological Services, located in Vero Beach, Florida, is currently working with the ranching community to address this concern and develop adequate remedies.

Comment:
Where appropriate, we need to have fencing to steer panthers from urban cores.

Service's Response:
Comment noted. The fencing that will be required to keep panthers out of urban areas will be very expensive. At the current time, an occasional transient panther will reside in the project area, but the panther density is too low for this to be a significant problem and panthers generally tend to avoid urban areas. However, the Service continues to work with the Florida Department of Transportation and FWC to identify areas where fencing and wildlife underpasses are needed in an effort to protect both wildlife and drivers on Florida's roads.

Comment:
In the Draft EA (pg. 261), the USFWS admits that the aggregate 150,000 acreage total would only house 1 or 2 panthers. One of the goals of the panther recovery plan is to have 240 panthers south of Lake Okeechobee. This is 100% unattainable. It is my strong belief that the proposed refuge and easement lands will be used as dumping ground to rid southwest Florida of overpopulated panthers by USFWS and their partners in the continuing futile effort to attain their physically impossible panther recovery goal. I oppose panther translocation that I suspect this project of supporting without saying it plainly in the Draft LPP/EA.

Service's Response:
Comment noted. The proposal addresses the Kissimmee River Basin, north of Lake Okeechobee and the Caloosahatchee River. There have not been any female Florida panthers or reproduction documented north of this area since 1973. If the 150,000 acres were perfect panther habitat and there were reproducing females north of the Caloosahatchee River, it might support as many as 6-8 individual panthers. While panthers are expected to benefit from the project, numerous other species and benefits are anticipated as outlined in this Final EA.

The four goals of the proposal are: a functional conservation landscape; habitat for fish and wildlife; enhanced water quality, quantity, and storage; and provision of opportunities for wildlife-dependent recreation and education. The Service proposes to protect and manage high pine (dry, longleaf pine savanna), Florida scrub, mesic temperate hammock, hydric and mesic pine flatwoods, dry prairie, cutthroat grass communities, wet prairies and freshwater marshes, and freshwater forested wetlands, as well as landscape connectivity in the basin in Polk, Osceola, Okeechobee, and Highlands Counties, Florida. Further, the project also outlines the key species and habitats of concern for this area, which include Florida grasshopper sparrow, Everglade snail kite, Florida black bear, Audubon's crested caracara, red-cockaded woodpecker, and cutthroat wetlands.

Comment:
Endangered species protection does not apply to hybrids. Charles Fergus the author of "Swamp Screamer" described how panthers studied in the 1990s in Florida have already been hybridized and is not legally qualified for Endangered Species Act funding.

Service's Response:
The degree to which the scientific community has accepted the use of genetics in puma taxonomy is not resolved at this time. The existing Florida panther population represents the last remaining population of *Puma* in the eastern United States, and is therefore important to the genetic representation of pumas in North America. Additional research is needed to understand genetic and morphological similarities and differences of puma across North America. The Florida panther is listed under the ESA and any change in its listing status based on best available science will require completing the formal rulemaking process pursuant to the ESA. The panther and its habitat continue to receive ESA protections.

Wildlife Corridors and Migration

Comments:
Multiple comments were received in support of creating wildlife corridors for connectivity and migration. Creating a mosaic of lands will enable wildlife to migrate and adapt in response to threats to their continued existence. Use this opportunity to link conservation areas along the Florida ecological greenways and CLIP (prioritized conservation areas) GIS data layers maintained by the University of Florida's GeoPlan Center. Protect a mosaic of lands of sufficient size and continuity to enable wildlife to migrate and adapt in response to climate change and other natural and man-made threats. Connectivity will help guard against genetic stagnation and inbreeding. We need a coherent and inviolable wildlife corridor from the Caloosahatchee to the Okefenokee.

Linking the proposed refuge and conservation area with already protected lands reflects the current and future trend of good and necessary conservation planning that supports State and county efforts and that supports the planting of native plants by homeowners. It is all connected: the migrating warbler that rests and feeds in a homeowner's backyard can move through a State WMA and then through the proposed refuge and conservation area on its passage through Florida. The Allen Broussard Conservancy's property, Forever Florida, borders the eastern edge

of the Headwaters area and is a wildlife corridor from that area to the St. Johns watershed. The lands slated for acquisition are located at the convergence of three major river systems that are the backbones of wildlife corridors spanning most of peninsular Florida. Loss of the linkage provided by these corridors will fragment populations of a wide variety of animal species, including many listed species, such as the iconic Florida, that range across vast expanses of land. The proposal will protect a mosaic of lands of sufficient size and continuity to enable wildlife to migrate and adapt in response to climate change and other natural and man-made threats. More protected lands (in this area) means corridors can be formed from the Kissimmee Prairie State Park to the St. Johns headwaters, which travels north to the Ocala National Forest. Wide roaming animals will utilize this corridor for self preservation.

Service's Response:
Comments noted.

Comment:
The Prairie Central planning unit appears in some areas to serve as a wildlife corridor and buffer of protection for the Kissimmee Prairie Preserve State Park and the Avon Park Range.

Service's Response:
Comment noted.

Comment:
The Ridge North planning unit appears to provide additional linkages and buffers for the Disney Wilderness Preserve and Lake Kissimmee State Park.

Service's Response:
Comment noted.

Comment:
The Draft LPP and the Draft EA aim to protect wildlife corridors from these threats and reduce habitat fragmentation by working with rural landowners and Native American tribes to promote good stewardship.

Service's Response:
Comment noted.

Comment:
The Nature Conservancy believes this proposed refuge and conservation area will provide the best opportunity to protect high-quality conservation lands linking Three Lakes WMA with Kissimmee Prairie Preserve State Park, as well as western side of the Chain of Lakes and Lake Kissimmee from the Disney Wilderness Preserve to the Avon Park Air Force Range and this should be the priority of the USFWS.

Service's Response:
Comment noted.

Research

Comment:
This project offers the opportunity for research, especially in relation to restoration projects. Conservation study and implementation need to be a priority in this state.

Service's Response:
Comment noted.

Comment:
Research may not be compatible. The public should examine each application to do research. No blanket approval should be given to research on any nationally owned by taxpayers sites (p. 329).

Service's Response:
Comment noted. Because of strict requirements concerning public use on national wildlife refuges, all commercial and certain other activities, such as research, require special permission from the refuge manager. Permits are also used as a contract between the refuge manager and the permittee. They clearly explain what is expected of the permittee with respect to restrictions, policies, reporting, etc., and they provide a protection to the permittee by explaining what to expect from the Service in terms of support. Further, as outlined in the Interim Compatibility Determinations in Appendix B of the Final LPP, activities provide benefits to the refuge and to the natural resources supported by the refuge. Research conducted on the refuge can lead to new discoveries, new facts, verified information, and increased knowledge and understanding of resource management, as well as track current trends in fish and wildlife habitat and populations to enable better management decisions. Research has the potential to further the purposes and goals of the refuge and the mission of the Refuge System.

Monitoring and Enforcement

Comment:
The Service should plan monitoring and enforcement programs to ensure adequate resource protection is achieved throughout the Everglades Headwaters NWR and Conservation Area. Conservation easements must be regularly monitored to ensure compliance with the easement restrictions. This is particularly important as properties with conservation easements change ownership.

Service's Response:
Comment noted. Monitoring and enforcement of conservation easements will be a primary management program of the Service's efforts. This is reflected in the priority given to hire a law enforcement officer as one of the first staff to be hired for the refuge and conservation area.

Habitat Loss

Comment:
Multiple commenters supported the proposal as a way to help limit the loss of natural habitat. The loss of natural wetlands and other vast tracks of land and sea on our planet is a tragedy that will be measured in extinction of species that ultimately support the higher life forms – like human beings. Every effort must be made to preserve what little is left of what the Earth used to be – a lush and rich world teeming with life and health. Saving the Everglades in total should be a given – not something subject to the vagaries of politics. This measure, though only a token of what truly needs to be done, is at least a start to protecting what will ultimately determine whether life goes on for millions of species – up to and including our own.

Service's Response:
Comment noted.

Climate Change and Sea Level Rise

Multiple comments were submitted regarding climate change and sea level rise. Comments ranged from those that questioned climate change and associated impacts to ones that noted the proposal's planned response to impacts of climate change, including sea level rise.

Comments:
The global climate benefit has no valid scientific argument. Global warming is a hoax; sea levels are falling.

Good job on choosing to conserve some land that will likely still be out of the water in the year 2100, post sea level rise.

If climate change does lead to higher ocean levels, then many animals in the southern part of the Everglades will need to migrate north.

We hope climate change considerations remain a priority throughout the planning process and that the Service will develop a detailed habitat management plan in the years ahead that implements strategies to respond to climate change through sound adaptive management practices.

Defenders of Wildlife appreciates that the Draft LPP/EA for the Proposed Establishment of the Everglades Headwaters National Wildlife Refuge and Conservation Area includes the need to plan for the effects of global climate change as one of the four major goals for the Everglades Headwaters NWR and Conservation Area. We believe that climate change is among the most significant problems affecting plants and animals today, and thus the potential impacts of climate change should remain a central consideration in the finalization of the LPP/EA. The proposed refuge and conservation area would protect important habitat, limit habitat fragmentation, and help to protect and restore corridors that will facilitate wildlife movement in response to climate change. The proposal would help resident and migratory species adapt to the impacts of climate change.

Service's Response:
Comments noted. The Service's official position is that climate change is real and accelerating (FWS 2011b). The Service's climate change strategy, titled "Rising to the Urgent Challenge: Strategic Plan for Responding to Accelerating Climate Change," (FWS 2011a) establishes a basic framework within which the Service will work as part of the larger conservation community to help ensure the sustainability of fish, wildlife, plants, and habitats in the face of accelerating climate change. The plan is implemented through a dynamic action plan that details specific steps the Service will take during the next five years to implement the Strategic Plan. The result of more than 18 months of intensive work and thorough discourse within the agency and input from the public, the plan employs three key strategies to address climate change: Adaptation, Mitigation, and Engagement. One of the objectives outlined in the Strategic Plan in the "Adaptation" section specifically addresses the need to incorporate climate change in the planning process. Objective 2.4 reads, "Incorporate Climate Change in Service Activities and Decisions." This means the Service will consider actual and projected climate change impacts to fish and wildlife populations and their habitats in Service planning. Planning efforts will include resource planning (e.g., comprehensive conservation plans, habitat management plans, recovery plans, habitat conservation plans, fish habitat plans, migratory bird plans, etc. (FWS 2011a).

Citations:
U.S. Fish and Wildlife Service. 2011a. Rising to the Urgent Challenge: Strategic Plan for Responding to Accelerating Climate Change. http://www.fws.gov/home/climatechange/pdf/CCStrategicPlan.pdf Accessed: April and November 2011.

U.S. Fish and Wildlife Service. 2011b. Conservation in a Changing Climate. USFWS Office of External Affairs. http://www.fws.gov/home/climatechange/index.html Accessed: November 2011.

Resource Protection

Land Stewardship

There were multiple comments supporting the ongoing stewardship of ranch owners under the proposal

Comments:
This stewardship supports extensive valuable habitat in the headwaters of the Everglades for a variety of species, including key indicator species such as bald eagle, Everglade snail kite, crested caracara, and grasshopper sparrow. The fact that many ranchers and farmers are willing to put their land under conservation easements demonstrates that even people who stand to profit from development place a high value on Florida heritage and their way of life; they have been excellent stewards of the land and will continue to protect it.

Service's Response:
Comments noted.

Land Acquisition/Protection in General

Comments submitted ranged from those against the proposal and the Federal Government's involvement in acquiring and protecting land to those supporting the acquisition, protection, and management of land under this proposal.

Comment:
If you want to see the best use for the land, just put it in the hands of a rancher. If you want to see disastrous results, put it in the hands of the government. The government has a poor track record in this landscape.

Service's Response:
Comment noted. A minimum of two-thirds of the project includes keeping property in private ownership and conserving it through conservation easements or other less-than-fee-title means. As a conservation land manager in the Kissimmee River Valley, the Service currently manages approximately 2,000 acres in four separate management units as the Lake Wales Ridge NWR and is an example of federal and state cooperative management.

Comment:
This proposal violates the Constitution, Article I, Section 10, line 1 to paragraph 3: "No State shall enter into any treaty, alliance, of confederation..."

Service's Response:
Comment noted. Current Service policy allows this federal action through various types of legislation authorizing our agency to acquire land in fee-title or less-than-fee-title (FWS 1996b). Examples of legislation authorizing the Service to purchase land include, but are not limited to: Refuge Recreation Act of September 28, 1962 (16 U.S.C. 460k-460k-4), as amended; Fish and Wildlife Act of 1956, as amended (16 U.S.C. 742a); National Wildlife Refuge Administration Act of 1966, (16 U.S.C. 668dd); Emergency Wetlands Resources Act of 1986 (16 U.S.C. 3901). (FWS 1996b)

Citation:
U.S. Fish and Wildlife Service. 1996b. Centralized Library of Servicewide Policies, Exhibit 1, 341 FW 1, Legislation Relating to Fish and Wildlife Service Acquisition http://www.fws.gov/policy/E1341fw1.html Accessed: November 2011.

Comments:
The purchase of land by the Federal Government to take private land violates property rights of the Constitution. The government should not be in the real estate business. Once the government owns the land, the people have lost all control over it. Property owners must be protected; this is just Agenda 21 trying to take over the lives of all free Americans. The Federal Government owns 9.9 million acres; 28% of the total land.

Service's Response:
Comments noted. Land interests are acquired from willing sellers only. Any landowner that is within an approved acquisition boundary, even though the surrounding parcels may have been purchased by the Service, retains all the rights, privileges, and responsibilities of private land ownership. This includes, but is not limited to, the right to access, hunting, vehicle use, control of trespass; the right to sell the property to any other party; and the responsibility to pay local real estate or property taxes. It is the Service's policy to work with willing sellers to acquire fee-title or less-than-fee-title interest in property.

Comment:
Gather more conservation lands and restore them all or at least keep them from being built upon.

Service's Response:
Comment noted. The presence of a refuge and conservation areas will not prevent lands from being developed in the entire Kissimmee River Basin, but will offer communities and landowners additional tools for wildlife conservation. It is not the purpose of the refuge and conservation areas to prevent development. Through this partnership effort, the Service hopes to offer the community and nation an opportunity to protect lands and habitats for a host of unique and rare wildlife and to provide associated public uses.

Comments:
Multiple commenters supported the proposal, since it continues conservation work in this area that has already been started by landowners and state and federal agencies. One commenter felt that that the existing lands already provide a good corridor.

Service's Response:
Comments noted. While some of the above-mentioned properties may have conservation easements (e.g., through the Wetland Reserve Program), these properties are private property and are afforded all the rights therein, which may include developing these sites. Under the proposal, the Service will

work with partner agencies and organizations to enhance the functionality of this conservation landscape, including connecting existing conservation lands and providing wildlife migration and dispersal corridors.

Comment:
The EA does not explain why of the 130,000-acres "Conservation Focal Area" only 50,000 acres of land would be acquired in fee simple. We would like to see the Service clarify the reasons for the 50,000-acre cap.

Service's Response:
Comment noted. The Service determined that 150,000 acres would help increase the functionality of this conservation landscape. The justification for the identification of a larger boundary than the acquisition acreage cap is based on the desire to be flexible to changes in landowner interest and availability of parcels of equal, high-quality habitat, over time. Any proposal to expand beyond the authorized 50,000 acres would require an additional planning effort by the Service, including public involvement, in accordance with applicable laws and policies.

Comment:
We feel that fee-simple acquisitions enable the Service to retain the greatest amount of land management flexibility and recreational opportunities while preventing uses that may undermine the vision, purpose, and goals of the refuge.

Service's Response:
Comment noted. Generally, the Service would acquire lands in fee-title where active management would be needed (e.g., restoring wetlands and improved pasture, prescribed burning, planting, managing for the six priority public uses, etc.) as further detailed in Appendix A - Conceptual Management Plan, Final LPP.

Comment:
Regarding fee simple purchases, banking of mitigation credits would not be appropriate, as the Service's goal is to conserve native habitats, extinguish development rights, and conserve wildlife and water resources.

Service's Response:
Comment noted. The goals of this project are to: conserve a functional conservation landscape; provide habitat for fish and wildlife species; enhance the water quality, quantity and storage capacity of the upper Everglades watershed; and provide opportunities for wildlife-dependent recreation. The Service's land acquisition policy does not allow mitigation credits to be sold on land it currently owns. However, Service land acquisition policy does allow the Service to accept or acquire lands which have mitigation credits associated with them.

Comment:
We are concerned that the Service would assume responsibilities in monitoring and management activities that are typically the responsibility of the landowner establishing the mitigation or conservation bank. In some cases, individual landowner agreements in conjunction with conservation easements or other such mechanisms may provide the opportunity for the Service to perform restoration activities without additional acquisition costs or establishment of a bank on the site. As mitigation and conservation banks provide credits for impact to natural resources elsewhere, other tools should be explored to provide the greatest protection of environmentally sensitive lands. If the Service pursues ownership of lands under mitigation or conservation bank, it should ensure that adequate funding for required management activities into perpetuity is provided.

Service's Response:
Comment noted. As part of the negotiation process of acquiring an interest in a mitigation or conservation bank, the Service would require that adequate funding be made available from the bank for management of the property in perpetuity.

Comment:
Land protection, both fee-title and less-than-fee-title, should focus on intact habitats and working lands with the highest percentage of native lands that best accomplish the landscape-scale objectives for the refuge and conservation area. Properties that are highly improved or that do not accomplish landscape connectivity goals should be afforded secondary priority.

Service's Response:
Comment noted. Each planning area was prioritized by: (1) Identification of high-priority ecological value lands that are currently unprotected, and (2) quantifiable connectivity between currently conserved lands.

Comment:
Fee simple acquisition for the refuge lands should focus on the highest quality lands throughout the project area so that public access will be available to many residents of central Florida.

Service's Response:
Comment noted. The 130,000-acre Conservation Focal Area would allow the Service the flexibility to acquire high-quality habitat and to respond to changing landowner interest and acquisition opportunities within the landscape over time.

Comment:
We endorse the stated goals and priorities and need for permanent protection of more lands in the Kissimmee River Basin and endorse the 50,000 acres fee and 100,000 acres less-than-fee (conservation easements) of the proposed EHNWR&CA.

Service's Response:
Comment noted.

Comment:
We endorse the USFWS refinement of the 1.8 million-acre Study Area to encompass a smaller, approximately 816,000-acre area referred to as the Conservation Partnership Area. We also strongly agree that the Service's policy is to work with willing landowners on these protection measures.

Service's Response:
Comment noted.

Comment:
We support the statement, found on page 83 of the Draft EA: "Lands within the Conservation Partnership Area and Conservation Focal Area are not subject to any refuge regulations or jurisdiction unless and until an interest is acquired. Land interests are acquired from willing sellers only. Any landowner that is within an approved acquisition boundary, even though the surrounding parcels may have been purchased by the Service, retains all the rights, privileges, and responsibilities of private land ownership. This includes, but is not limited to, the right to access, hunting, vehicle use, control of trespass; the right to sell the property to any other party; and the

responsibility to pay local real estate or property taxes. It is the Service's policy to work with willing sellers to acquire fee-title or less-than-fee-title interest in property." Such a statement could not make it clearer that the private property rights of all landowners will be respected.

Service's Response:
Comment noted. The habitat ranking and land acquisition prioritization methodology is fully described in Appendix C and provides the mechanism for the priority ranking of intact native habitats. Priorities for habitat quality are reflected in the priority class assigned values, Appendix C. Table 1. Current high-quality habitats such as dry prairie are provided the highest ranking, Priority 1, whereas improved pasture and other forms of agriculture are afforded a lower Priority 4 ranking.

Comment:
On page 235 of the Draft EA – under discussion of Alternative B – the following statements are found: "However, from a restoration perspective, pasture would be much easier to restore to dry prairie or herbaceous wetlands than other more intensive forms of agriculture (row crops or citrus)… . However, all of these pasture types have a high degree of potential for being restored to native grassland and herbaceous wetland ecosystems in 2 to 5 years. Therefore, with implementation of Alternative B, we expect that these 15,070 acres of pasture on the Prairie Central and South Units would be largely restored to a dry prairie and herbaceous wetland mosaic (similar to pre-development conditions)." It must be asserted that the restoration of any natural habitat, much less a complex natural community such as Dry Prairie would not be easy to restore, especially in a 2- to 5-year time frame. Such ecological and community restoration would also be enormously expensive and any funding made available to the USFWS for refuge establishment should initially be spent on land protection measures, not intensive and costly restoration activities. It is the position of The Nature Conservancy that tens of thousands of acres of good to high-quality habitat – as opposed to large blocks of improved pasture – are extant in the region and that the highest quality and most intact natural habitats in the proposed EHNWR&CA be the ones actually targeted first and foremost for the various acquisition, conservation and protection measures. We fully understand that good to high quality habitats are often interspersed with areas of improved or semi-improved pasture, but the habitat mosaic sought for fee acquisition should encompass far more natural and intact habitat, while areas containing more human-altered lands like pasture should remain working landscapes protected by conservation easements.

Service's Response:
The Service recognizes that restoration of native habitats can be a long, intensive, and expensive process. The 2- to 5-year time frame references the time for initiation of restoration activities, not completion of restoration. The Final EA was updated to this effect. The Service also recognizes that high-quality habitats occur throughout the project area. The land prioritization and acquisition methodology described in Appendix C will assure that these high-quality habitats receive greater priority during the land acquisition process.

Comment:
On page 255 – under discussion of Alternative C – in the Draft EA the following statement is found – "All of these pasture types have a high degree of potential for being restored to native grassland and herbaceous wetland ecosystems in two to five years. Therefore, with implementation of Alternative C, there would be up to 63,018 acres of pasture habitat available for restoration. If we wanted to select the planning unit with the greatest amount of pastures, we would select the Prairie Central Unit (47,958 acres). We would expect that the acres of pasture in the Prairie Central and South Units would be largely restored to a dry prairie and herbaceous wetland mosaic (similar to predevelopment conditions) to support primarily Florida grasshopper sparrow, crested caracara, Florida black bear, waterfowl, and wading birds." We do not think this strategy is financially feasible, especially at such a

landscape scale and in the time frame allotted, nor justified given the large amounts of intact habitat throughout the project area. Nor would the USFWS want to essentially invest its fee simple lands funding in a single tract when the opportunity exists to acquire up to 50,000 acres of fee lands containing a variety of habitats throughout the proposed project area. As also mentioned above, such restoration will be extremely costly and The Nature Conservancy recommends that those properties with the highest degree of intact habitat, albeit sometimes habitat mosaics of native and improved portions, be the first acquired and protected. Restoration should be a secondary consideration, especially given the high degree of intact habitats extant in both the Conservation Focal Area and Conservation Partnership Area.

Service's Response:
Comment noted. Habitat ranking and land acquisition prioritization methodologies are fully described in Appendix C of this Final EA. The protocol places greater value on intact high-quality native habitats, which, in turn, provides those properties a higher rank acquisition value over habitats in need of restoration. Working with willing landowners, the Service will seek to acquire those properties with the highest values before lands with a lower rank acquisition value.

Comment:
On page 257 of the Draft EA the following is found – "Conservation Easement Benefits: We expect that pasture habitats would comprise a large part of the 100,000-acre conservation easement component of Alternative C. These areas are largely pasture now, with some native or natural communities interspersed. We anticipate that up to 80 percent of the pasture habitat would remain; but that wetlands would be restored within these pastures and that at least 20 percent of the site would be protected or restored to an appropriate native land cover. However, because the current area for these lands is so vast, it is difficult to make any accurate predictions about the amount or quality of native and natural habitats on these lands under Alternative C other than to expect that we would add an additional 20,000 acres of native habitats (with easements) to the 50,000 acres (with fee simple acquisition). The stipulations of the easement agreement would dictate the resulting quality of the ecosystem (e.g., cattle density, fencing requirements, allowable land uses, management, and nonnative species control)." As stated above, The Nature Conservancy disagrees that pasture habitats should comprise a large part of the 100,000-acre conservation component of Alternative C, nor are most of the best and most desirable properties available for acquisition/protection, "largely pasture now, with some native or natural communities interspersed." Of the 15 willing-seller landowner letters the Conservancy delivered to the USFWS for participation in the refuge, we targeted the highest scoring and most natural suite of lands available and think that these should form the thrust of the protection actions over the coming years to establish the proposed refuge. While we agree that improved pasture is part of the habitat mosaic of almost every ranch in the Kissimmee Valley, some ranches retain far more natural habitat than others and should be accorded priority for protection. We also question whether ranchers will agree to restore up to 20% of their lands back to, "an appropriate native land cover." The Conservancy encourages the USFWS to begin a collaborative process in the near-term to identify issues such as these as well as others that should be addressed in draft conservation easement language for this landscape initiative. This collaborative process should include USFWS Region 5 staff, the local USFWS manager, key landowners and potential third-party conservation easement partners. The Conservancy also believes it will be relatively easy to acquire far more than just 20,000 acres of intact native habitats with easements, although the above statements in the Draft EA could impact rancher/landowner participation. We also believe the last sentence of the above quoted statement will be problematic for many ranchers who will not wish to give up such control of their properties.

Service's Response:
Habitat ranking and land acquisition prioritization methodologies are fully described in Appendix C of this Final EA. The protocol places greater value on intact high-quality native habitats, which in turn provides those properties a higher rank acquisition value over habitats in need of restoration. Working with willing landowners, the Service will seek to acquire those properties with the highest values before lands with a lower rank acquisition value. The Service has worked collaboratively throughout the planning process and will continue to work collaboratively with The Nature Conservancy, landowners, and other third-party conservation partners in the development and implementation of the conservation easement program. The Final EA was updated to read "native and improved pasture."

Comment:
Likewise on page 257 of the Draft EA, we have this statement – Beneficial Connectivity Alternative C provides a similar level of connectivity and creates larger habitat patches as does Alternative B when considering just the 50,000-acre refuge component. However, Alternative C provides much more connectivity than Alternative B and creates larger patches of habitat when the 100,000 acres of conservation easements are included. Besides the additional approximately 20,000 acres of lands to be protected or restored and the approximately 80,000 acres of pasture lands that would be protected from development, the easement agreements should serve to foster a common management strategy across all lands in Alternative C and would give landowners the opportunity to share resources and to learn new management techniques. Having a group of landowners managing different parcels of lands under a set of common objectives could be the difference between having a patchwork of varying, but overall diminishing, quality habitats and a continuum of a highly connected, functioning landscape. Such a statement will likely antagonize elements of the ranching community who value their private property rights and do not wish to be engaged in some cooperative or "common" management regime with their neighbors. These landowners like the way they manage their lands now and their lands are desirable now for permanent conservation because of the way they have been managed for decades. We believe the phrase, "but overall diminishing, quality habitats…" will result in unnecessary opposition from some of the ranching community. Please reword or remove this entire section.

Service's Response:
The section in question was removed from this Final EA.

Comment:
In Table 6 (Protection Priorities for Proposed EHNWR&CA and Recommended Method of Acquisition) beginning on page 39 of the Draft LPP, we see a definite need for scaling back one particular recommended fee simple acquisition. We think that the very large (39,643.1 acre) tract identified as Owner ID Number 3, that begins on page 40 of that Table and is identified in Figure 3d (Proposed Conservation Focal Area, Prairie Central Planning Unit) on page 63 of the same document, should not – in its entirety – be recommended for fee simple acquisition. The Nature Conservancy's ecologists have been on that property on several occasions and know that the majority of it is improved pasture with some areas of semi-improved pasture and smaller areas of intact natural areas/habitat. Fee simple acquisition of this entire tract cannot be justified when so many other areas within the Conservation Focal Area support intact natural resources that will not require incredibly costly habitat restoration of thousands of acres. We would also not classify this same tract with an Overall Priority Ranking of Tier II (as seen on page 40 in Table 6) when nearly half the tract (19,241.2 acres) is accorded a Tier III ranking, 14,726.6 acres are accorded Tier II ranking and only 5,675.3 acres are designated as Tier I (these figures also from page 40 and derived from Figure 4b – Prairie Central Overall Priorities – on page 69). While we realize that habitat and landscape-scale connectivity are important aspects of the recommended acquisition priorities and

strategy, such connectivity between Kissimmee Prairie Preserve State Park and Three Lakes Wildlife Management Area can be achieved with far lesser acreage through other lands that support mostly Tier I natural resources and have willing sellers of a conservation easement over a portion of their lands. We do not support expenditures of federal funds to acquire so much acreage of improved pasture than better quality and intact resources that do not require restoration.

Service's Response:
Comment noted. Habitat ranking and land acquisition prioritization methodologies are fully described in Appendix C. The protocol places greater value on intact high-quality native habitats, which in turn provides those properties a higher rank acquisition value over habitats in need of restoration. Working with willing landowners, the Service will seek to acquire those properties with the highest values before lands with a lower rank acquisition value. It should also be noted that inclusion with a Conservation Focal Area (CFA) provides the opportunity for fee-title acquisition. Acquisition of less-than-fee-title interest within the CFA may also be offered.

Comment:
The Center for Biological Diversity encourages the Service to having fee simple acquisition as the primary means of conserving land and water in the project area, as it is more cost-effectives than purchasing conservation easements. The Service should not limit fee simple acquisitions to just 50,000 acres. Despite costing 75% of what fee simple acquisition costs, just 20% of the land under conservation easements would be dedicated to conservation. The remaining 80% of that land, through supporting minimal native or natural communities, could be protected from development, thereby promoting connectivity. While that is vital, it is only one component of effective conservation. Restoration of natural vegetative associations that support native wildlife is also important, and that can be accomplished at significantly less cost. We further request that you prioritize fee simple acquisition of land and water for the refuge over purchase of partial interest in lands for a conservation area.

Service's Response:
Comment noted. The costs recorded in the Draft LPP are updated in the Final LPP to reflect current market conditions. Fee simple acquisitions are estimated at $4,000 per acre and conservation easement acquisitions are estimated at $2,000 per acre (50 percent of the fee-title price). The current project identifies up to 50,000 acres available for fee-title acquisition. Any expansion beyond this amount will require a future land acquisition planning process, including full NEPA compliance. The Service recognizes the benefits of both fee-title and less-than-fee-title acquisitions. Based on Service land acquisition policy, we are required to use the minimum level of protection needed to meet conservation objectives. Levels of protection range from simple short-term management agreements and leases to full fee-title acquisition. The Service believes the target amounts of 100,000 acres of less-than-fee-title acquisition and 50,000 acres of fee-title acquisition are appropriate for this project at this point in time.

Comment:
This is not simply a proposal to acquire 50,000 acres feel simple and conservation easements for another 100,000 acres. This is a multi-stage scheme for the Department of Interior to ultimately control an astounding 800,000 acres of Florida land from Orlando to Lake Okeechobee.

Service's Response:
Comment noted. The Service will acquire interest in 150,000 acres in the Kissimmee River Basin for the Everglades Headwaters NWR and Conservation Area. The Director of the Fish and Wildlife Service will provide acquisition authority for fee-interest in up to 50,000 acres and for less-than-fee-interest on 100,000 acres.

State Sovereign Lands

Comment:
Land should remain in the hands of the sovereign State of Florida.

Service's Response:
Comment noted. The Service is working with willing landowners to purchase properties for the refuge that are currently held in private ownership and that are not currently open to the general public. The project does not target State of Florida lands and will be a voluntary program that works with willing private landowners. Furthermore, sovereign or state waters that lie in acquisition areas will continue to be under the jurisdiction of the State of Florida, even when surrounding lands become a refuge.

Eminent Domain

Comment:
Numerous commenters opposed the takeover of Florida lands by any federal agency. Quit taking land away from us.

Service's Response:
Comment noted. See response above.

Less-than-Fee-Title Acquisition

Multiple comments were submitted regarding the support for the use of conservation easements and other less-than-fee-title acquisition methods outlined in the proposal.

Comments:
This proposal is another example of how the Service can work with ranch owners and other private property owners to conserve habitat at minimal cost. This proposal will generate a lot of bang for the buck in working with willing landowners. By providing willing ranchers with conservation easements, these multi-generation stewards of the central Florida landscape will be able to keep their lands in ranching for future generations, while providing suitable habitat for much of Florida's wildlife that would otherwise be squeezed out of existence by development. This proposal also supports national food security. This proposal will help ranchers protect their way of life and pass it on to the next generation. Conservation easements in the proposal allow continued farming and ranching, soften the blow to local governments over the loss of ad valorem tax revenue, free the government of land management responsibilities, and protect ecosystems from development.

Service's Response:
Comments noted. Conservation easements are voluntary legal agreements between landowners and government agencies or qualified conservation organizations that restrict the type and amount of development that may take place on a property in the future. Easements can be donated or sold and land use restrictions are tailored to meet specific conservation goals in accordance with the needs of the landowner. Service conservation easement acquisition costs are currently estimated to be approximately 50 percent of the full fee-title value.

Multiple comments were submitted in opposition to the use of less-than-fee-title methods under the proposal.

Comments:
I am against the Federal Government paying landowners not to develop their lands. Such a proposition is ripe for corruption and underhandedness because the public would not be allowed on those lands. Either the Federal Government should own the land or it shouldn't; no in between. I am totally against any kind of project that buys or leases or gives any kind of monies to any private party and then calls this public lands. All this means is that a fence will be erected around the land and the public will not be allowed in. As an example, I cite the rest of the Everglades restoration projects.

Service's Response:
Comments noted. Under this project, only full fee-title lands purchased by the Service will become refuge property with public access and uses allowed where appropriate and compatible as further detailed in the Intermim Compatibility Determinations, Appendix B, Final LPP. Lands that are under conservation easement remain under private ownership, and the landowner(s) retain a variety of rights, including those related to controlling access.

Comment:
Will there be any type of restrictions on farmers who participate in this program as to the kinds of crops that can be grown? Some agricultural activities cause wildlife to be eradicated.

Service's Response:
Comments noted. The land prioritization model employed in the project to help target lands for conservations generally causes row-crops and other intensively managed agricultural areas to be avoided. Therefore, it is unlikely that these types of agricultural lands would be acquired as part of a new refuge or through a conservation easement.

Comments:
Will there be any attempt to identify and protect animal habitat on lands where the State or Federal Government owns the developmental rights? This seems to be a big question as to who in the public can in the future use these lands, and for what purposes.

Service's Response:
Comments noted. The Service will work with willing landowners on the acquisition of less-than-fee-title rights, such as the development rights of the property. The landowner will retain all other rights, including the right of access to the property.

Comments:
Ensure that the project includes strict enough BMPs to serve conservation goals, while helping to preserve our food growing capacity.

Service's Response:
Comments noted. The mission of the Service is to work with others to conserve, protect, and enhance fish, wildlife, and plants and their habitats for the continuing benefit of the American people. However, the Service recognizes that there is value in working with interested landowners, such as those in the agricultural sector, to benefit wildlife, while allowing certain land uses to continue. This partnership is typically achieved through the use of conservation easements. In addition to Service easements, interested landowners may consider applying for conservation agreements with NRCS (i.e., via the Wetlands Reserve Program) or some other entity.

Comment:
The agreements with the landowners must be iron clad so that they will not be tempted to bail out when the developers wave a lot of cash around.

Service's Response:
Comment noted. Service conservation easements are legal, binding contracts for both the landowner and the Service. These are perpetual easements, meaning that the terms defined in the easement document would remain constant despite changes in refuge personnel.

Comment:
For less-than-fee-simple acquisitions, we would prefer that the Service rely primarily on tools such as conservation easements, and turn to mitigation banks only where there is not already other means to conserve those parcels (i.e. local land use programs, agricultural or conservation easements, etc), as well as a documented history of success, strict monitoring and management requirements, and significant agency oversight.

Service's Response:
Comment noted. Conservation easements are the primary management tool of this project. Fully two-thirds of the project is dedicated to working with willing landowners through conservation easements. Management, monitoring, and enforcement of conservation easements are a priority. Mitigation and conservation banks are protected by conservation easements when they are established, so they are already conserved. What is contemplated is a change in the easement holder.

Comment:
On page 303 of the Draft EA – "Additionally, the Service would assure that all conservation easements would provide specific language that would allow the placement of structures and practices which are part of the state's Total Maximum Daily Load and Basin Management Action Plan process." While a very admirable goal, this statement may also be seriously questioned by the ranching community. We encourage the Service to work with the State of Florida in identifying the need for this language within the draft conservation easement language, as well as engage the ranching community in the long-term goals that this language identifies. Without buy-in from the local community to draft conservation easement language, the success of the easement program within this landscape will be lacking.

Service's Response:
Comment noted.

Comment:
The 100,000-acre Conservation Area has the potential to contribute to and complement the many existing federal, state, regional, local and tribal conservation programs including the state's Florida Forever Program, Kissimmee River Restoration Project, and the Northern Everglades and Estuaries Protection Program. Specifically, some of the proposed Everglades Headwaters NWR and Conservation Area lands are likely targeted for acquisition by Florida Forever. If the Service protects these lands, it would allow Florida Forever to direct its limited resources to other sites needing protection. As detailed management plans are developed, it will be important to ensure that they are compatible with, and where possible, complementary to, existing restoration efforts.

Service's Response:
Comment noted.

Comment:
We think ecologically you have selected the right properties. I'm familiar with the ranches and the working lands, and they have a lot of wildlife value. They could still produce food and fiber for people, but when you guys buy easements you give them an option either to make some money off development rights but protect their ranch, keep it a ranch for the future.

Service's Response:
Comment noted.

Comment:
There are examples of conservation easements in this landscape that have not been successful.

Service's Response:
Comment noted. The Service would work with any easement holders to ensure that conditions of the easements are met, including through inspections of the properties.

Comment:
Specific language should be included for conservation easements so that the public has a good perspective on how you intend to restrict the properties.

Service's Response:
Comment noted. Conservation easements will be negotiated between the seller and the Service, tailored to meet the needs of both parties. The Service is currently working to develop template easement language which will be used in the acquisition of easements for this project.

Comment:
Some of the cattle ranching community appreciates that conservation easements ensure a continued way of life in the business.

Service's Response:
Comment noted.

Boundary for the Proposed Refuge and Conservation Area

Comment:
Numerous property owners submitted written comments and verbal comments at the public hearings about the inclusion of their properties in the proposal. Also, approximately 14,000 acres were improperly included in the Conservation Partnership Area boundary.

Service's Response:
In most cases, the comments were simply recognition of how a particular property related to the proposal (i.e., eligible for conservation easement or other less-than-fee-title acquisition or eligible for fee-title acquisition). However, a few mapping errors were discovered and corrected in the final documents. The Service used a GIS model to depict and select parcels, based upon key criteria. One property was surrounded by and incorrectly included with a megaparcel, where the megaparcel was removed from consideration. This was corrected and the surrounded property is now included in the larger Conservation Partnership Area and will be eligible for consideration for a conservation easement or other less-than-fee-title agreement. Approximately 14,000 acres were removed from the Conservation Partnership Area boundary, since this property is contained primarily within the St. Johns River watershed, not in the Kissimmee River Basin.

Comment:
The area under the proposal should be extended to include Shingle Creek to its headwaters.

Service's Response:
Comment noted. Although it is the headwaters of the Everglades, Shingle Creek is north and outside of the project area, which is limited to Polk, Osceola, Highlands, and Okeechobee Counties.

Comments:
Multiple comments were submitted regarding connecting the Everglades Headwaters area to the north.

I strongly recommend that the federal parties involved in negotiating with landowners to acquire key Everglades Headwaters NWR and Conservation Area tracts include substantive discussions with Deseret Ranch (the Mormon Church, which owns ~300,000 strategic agricultural acres in central Florida), including for the 17,150-acre Econlockhatchee River headwaters tract. Without securing any land in the area of the headwaters of the Econlockhatchee River, the migration corridor north will be blocked, severing the system.

Please study the possibility of connecting the Everglades Headwaters NWR to the St. Johns River Basin by using a mix of public and private conservation lands within the Econlockhatchee River Basin. Sweeping northeast, it would stretch from eastern Orange County to Seminole County. There are many land types present, including: mesic flatwoods, oak hammocks, blackwater streams, longleaf pine forests, scrub oak forests, sandhills, and prairies. Animals in this area include gopher tortoises, Sherman's fox squirrels, and sandhill cranes. Florida scrub-jays were reported in the early 1990s. Red-cockaded woodpeckers exist on lands in the Econ Basin and Florida panthers have also been sighted moving through this area over the last 20 years (e.g., photos have been taken at Seminole Ranch).

Service's Response:
Comment noted. Lands of the refuge and conservation area are limited to the Kissimmee River Basin, which does not extend to the north to the Econlockhatchee River. Any further action on the part of the Service in working outside of the project boundary will necessitate a future land acquisition proposal and associated NEPA documents.

Comment:
Future Service planning for land protection within the Everglades region should include conservation easements and a wildlife corridor along the east side of Lake Okeechobee. This would link over 100,000 acres of already protected lands in Martin and western Palm Beach Counties to the Everglades Headwaters Conservation Area.

Service's Response:
Comment noted.

Comment:
The property owners of lots in Suburban Estates are not and will never be interested in selling our property.

Service's Response:
Comment noted. Suburban Estates is not included in the project and was specially removed from consideration.

Comment:
Defenders commends the Service for removing the River Ranch area of Polk and Highlands Counties from the study area of the proposed refuge and conservation area. Efforts will be better spent on conserving larger tracts of contiguous lands.

Service's Response:
Comment noted.

Comment:
I do suggest the Conservation Focal Area be expanded to the northeast to encompass the critical connection between the Kissimmee and St. Johns River wildlife corridors. Three Lakes, Triple N, and Bull Creek WMAs already conserve a good portion of this link. However, there are still breaks that could sever the link if developed. The ranchland between Three Lakes WMA and the headwaters of Bull Creek, and Bull Creek itself from its headwaters to its entry into the Bull Creek WMA, need to be placed into conservation (either fee simple of using easements) to conserve the wildlife corridor.

Service's Response:
Comment noted. The Service recognizes the corridor linkage between the Kissimmee and St. Johns River, especially in the vicinity of Three Lakes, Triple N, and Bull Creek WMAs, and the threats created by gaps left between them. By definition of this project, the project boundary was defined by the watershed of the Kissimmee Basin. Exceptions to this definition include logistics related to using major roadways, such as U.S. 441, as logical boundaries rather than a nondescript boundary in the middle of a pasture. Other corridors between the two watersheds occur throughout the eastern project boundary. Any further action on the part of the Service in working outside of the project boundary will necessitate a future land acquisition proposal and NEPA action.

Comments:
The McDaniel's Ranch/McDaniels Reserve should be included in the Everglades Headwaters proposal. Virtually the entire property is within the primary panther zone; it is critically necessary habitat for the Florida panther. The site drains directly into the Big Cypress basin and the watershed for Everglades National Park. It includes a wealth of species. The site is also threatened with the development of the largest fossil fuel electrical generating plant in the country. Do not allow Florida Power and Light's purchase of approximately 3,000 acres of primary Florida panther habitat in the Big Cypress basin on a piece of land known as McDaniel's Ranch to stand.

Service's Response:
Comments noted. The property in question is located in south Florida in Hendry County, near Florida Panther NWR; it is outside of the area under consideration for the Everglades Headwaters NWR and Conservation Area. Any further action on the part of the Service in working outside of the project boundary will necessitate a future land acquisition proposal and associated NEPA documents. Further, any permitting associated with the proposed Next Generation Clean Energy Center in Hendry County is a process completely separate and apart from the establishment of the Everglades Headwaters NWR and Conservation Area.

Comments:
The complete Panther Glades should be included in the Everglades Headwaters proposal.

Service's Response:
Comments noted. The area in question is located in south Florida in Hendry County, near Florida Panther NWR; it is outside of the area of the Everglades Headwaters NWR and Conservation Area.

Comments:
Acquire all panther lands to protect the nearly extinct Florida panther.

Service's Response:
Comments noted. The Service is working with a variety of public and private partners to protect the Florida panther and key habitats. Although it is anticipated to provide benefits to the Florida panther, the refuge and conservation area are located in Polk, Osceola, Highlands, and Okeechobee Counties. This area is known to support individual transient panthers, but not known to support a breeding population. Most lands currently recognized as breeding panther habitat lie outside of this project boundary, thus are not included in this project.

Comments:
Multiple commenters believe the Service should focus on the expansion of the Florida Panther NWR. The Headwaters project is Phase 1 or 4 phases of the Greater Everglades Strategic Habitat Conservation Initiative. The Service should reorder its priorities to place the expansion of the Florida Panther NWR instead of the Headwaters project. If not, then the Headwaters project should be broadened to incorporate the Panther Glades area, including a buyout of the property recently purchased by Florida Power and Light for a proposed power plant.

Service's Response:
Comments noted. The Everglades Headwaters NWR and Conservation Area is limited to Polk, Osceola, Highlands, and Okeechobee Counties. Expansion of Florida Panther NWR will be a land protection planning process separate and apart from the current project.

Comment:
This project should include the eastern and northern shores of Lake Toho, which would significantly add to the positive effect on the water flow to the Everglades and improve the entire waterflow through the proposed WMA.

Service's Response:
Comment noted. The project area does not extend as far north as Lake Tohopekaliga.

Greater Everglades Strategic Habitat Conservation Initiative

Comment:
Defenders of Wildlife advocates for the conservation and restoration of landscape-level wildlife habitat through public-private partnerships. The economic downturn has provided unprecedented opportunities to acquire lands from willing sellers and conservation easements from landowners who wish to retain and manage their lands in perpetuity. Defenders of Wildlife strongly supports Alternative C - Conservation Partnership Approach to establish Everglades Headwaters NWR and Conservation Area as the first step of the Greater Everglades Strategic Habitat Conservation Initiative.

Service's Response:
Comment noted.

Cultural Resources/History

Comment:
As noted in the Draft Land Protection Plan and Draft Environmental Assessment, there are significant cultural resources adjacent to the action area including green corn dance sites, cemeteries, villages, battlefields, and camps. In addition, there is a high probability of unknown cultural/archaeological sites that have yet to be identified. It is our understanding that at some point in time the Service will conduct archaeological surveys to identify unknown and known sites, and will assess the sites under Section 106 of the National Historic Preservation Act. Ultimately, the Service will develop a cultural

resources management plan. The Seminole Tribe requests that, before any action is taken, the Service consult with the Seminole Tribe's Tribal Historic Preservation Officer (THPO) regarding these action items including the development of survey/research protocols.

Additionally, it is clear that the Service plans to allow outdoor recreation opportunities within the refuge. In order to prevent impacts to cultural resources, it is critical that the Service complete the necessary surveys in order to identify those areas that need protection from human disturbance before implementing/allowing the planned recreational activities. It is equally important that the surveys are conducted before the design and implementation of any water diversion or restoration project in order to assess and avoid any potential impacts to cultural resources. Please note that any coordination or consultation with the Seminole Tribe's Environmental Resources Management Department (ERMD) will not be considered consultation under the National Historic Preservation Act where cultural resources are concerned. Please consult simultaneously with both THPO and ERMD with regards to the proposed refuge and conservation area. For any correspondences directed to the Seminole Tribe's Chairman or Tribal Council, please copy both THPO and ERMD.

Further, the Draft Land Protection Plan refers to interpretive and educational opportunities for the public in connection with cultural resources. These cultural resource sites have significant religious and cultural value to the Seminole Tribe and the Service has the trust obligation to consult with the Seminole Tribe THPO before implementing any such interpretive or educational programs.

Finally, the Draft Land Protection Plan states the proposed action will protect cultural resources providing a positive benefit. We request that the Service consult with the Seminole Tribe to discuss the details of how cultural sites should be identified and protected. We would also like to consult with the Service concerning how cultural sites will be treated in connection with the restoration activities and other management activities.

Service's Response:
Comment noted. The Service is currently in formal consultation with the Seminole Tribe of Florida to address issues of concern of the tribe. As the Service acquires lands for the inclusion in the refuge, we will consult with the Seminole Tribe pursuant to the National Historic Preservation Act, Executive Order 13175 – Indian Sacred Sites, and Executive Order 13175 – Consultation and Coordination with Indian Tribal Governments. The tribe's participation and input are critical to the identification, evaluation, interpretation, and protection of the refuge's historic properties.

Undertakings on the refuge, such as wetland restorations, habitat management prescriptions, and recreational use, require compliance with Section 106 of the National Historic Preservation Act. An integral and critical component of the Section 106 process is consultation with any Indian tribe that attaches religious and cultural significance to historic properties that may be affected by an undertaking. Our Regional Archaeologist routinely consults with the Seminole Tribe's Tribal Historic Preservation Office on Service's undertakings that occur though out the Tribe's area of interest in the Southeast. This practice will continue.

The Service realizes that a number of historic properties in this area, as well as the cultural landscape, have significant religious and cultural value to the Seminole Tribe. We will not only consult with the tribe, but actively seek their participation and knowledge, as cultural resource and habitat management plans are being developed. Interpretation and protection of historic properties will greatly benefit from consultation and collaboration between the tribe and the Service.

Specific historic property types, such as green corn dance sites and cemeteries, will be incorporated into the refuge's interpretive and education program only with the permission and input of the Tribe. Site locations are confidential pursuant to Section 470w-3.a of the National Historic Preservation Act and Section 9 of the Archaeological Resources Protection Act. The Service will consult with the Seminole Tribe about best management practices to protect such historic properties. We will negotiate with the tribe to ensure continued access to such historic properties.

Comment:
The Seminole Tribe utilizes the area for its green corn dances, which are sacred ceremonies. We respectfully request that the Service coordinate in advance its bum plans and vegetative management activities to ensure they do not interfere with the green corn activities.

Service's Response:
Comment noted. The Service is currently in formal consultation with the Seminole Tribe of Florida to address issues of concern of the tribe. The Service recognizes the important of this landscape to the Seminole Tribe. The Service commits to coordinating in advance of prescribed fire and vegetative management activities on the refuge to minimize any impacts to green corn activities, while also meeting refuge goals and objectives.

Comment:
The Miccosukee Tribe of Indians of Florida expressed issues of concern regarding future management activities inundating (e.g., through major hydrological projects) cultural resource sites, especially burial sites.

Service's Response:
Comment noted. The Service is currently in formal consultation with the Miccosukee Tribe of Indians to address issues of concern of the tribe. The Service recognizes the important of this landscape to the Miccosukee Tribe. The goals of the refuge and conservation area are to enhance connectivity across the landscape; enhance water quality, quantity, and storage; provide habitat for wildlife; and provide opportunities for outdoor recreation. While restoration of wetlands and hydrologic regime will be potential future management actions, major hydrological projects are not contemplated for the refuge. The Service recognizes the importance of this issue and will continue to work with the Miccosukee Tribe on this and other issues of concern related to the refuge and conservation area. Pursuant to Section 106 of the National Historic Preservation Act, the Service will consult with the Miccosukee Tribe on any undertaking or management action that has the potential to adversely affect historic properties that possess cultural, historic, and/or religious significance to the tribe.

Comment:
This Draft LPP has failed to comply with Sections 106 and 110 of the National Historic Preservation Act as amended in 2000 by not analyzing this plan's impact to Traditional Cultural Properties of the Gladesmen Culture or the culture that has been formally identified and studied in depth by the U.S. Army Corp of Engineers (USACE) in relation to its Comprehensive Everglades Restoration Plan's (CERP), Master Recreation Plan (MRP). The study I am referring to states there are more significant sites throughout the CERP region that need to be analyzed at the appropriate time - the past 6 months or more of Everglades Headwaters NWR Draft LPP development was that time. This link leads to the USACE Gladesmen Ethnographic study
www.evergladesplan.org/pm/progr_master_rec_plan_gladesmen.aspx
I would suggest downloading the entire study for future reference, because it may not be housed at this link forever. Another suggestion if this process proceeds would be to immediately initiate a detailed study as to this proposal's impact upon the Gladesmen Culture and any Traditional Cultural

Properties as well as historical sites of any kind located within USFWS's study area for all 4 phases that have been mentioned to date. I hereby volunteer to assist USFWS in any such endeavor as I assisted the USACE in their study.

Service's Response:
Comment noted. The USACE's thematic study of the "Gladesmen Culture" became available shortly after the writing of the Draft LPP and Draft EA. The USACE study, as well as supporting documentation, is currently being reviewed by the Service's Regional Historic Preservation Officer/Regional Archaeologist. The thematic study indicates the "Gladesmen Culture" is a subset of Florida's Cracker Culture present in the Everglades and Big Cypress Swamp during the late 19th century to the early 20th century. It remains unclear whether this culture actually is a definable "living community" or simply a historical and/or chronological designation that describes subsistence and settlement patterns present in southwest Florida prior to the creation of the national parks in this part of south Florida and the state's water control and drainage projects that began in the 19th century. The study also extends the "Gladesmen Culture" north of Lake Okeechobee into the Kissimmee River watershed, an area occupied by the Seminoles, Miccosukees, and American cattlemen. The extension appears to be made simply on the fact that this watershed is part of the larger Everglades ecosystem. Of the 13 identified properties, only two were located near the Study Area for the Everglades Headwaters NWR and Conservation Area: Camp Mack River Resort (PO07201) and the Fisheating Creek Wildlife Management Area (WMA) (GL00443). The resort is a commercial fishing camp; the WMA is delineated as a 60-mile-long pristine waterway. Most of the remaining properties fall into one of three broad categories: commercial properties; camps associated with modern hunting, fishing, and airboat groups; and transportation routes (e.g., waterways, roads, and trails). Smith, Perlman, and Reed (2011) stated that their investigations were an "introductory study"…"not intended to be a complete historical treatment of Gladesmen…." Extending the status of a "living community" with traditional cultural properties to a modern, often self-identified group or collection of individuals is premature. However, the "Gladesmen Culture" appears to be a valid chronological or historic period useful for evaluating late 19th century to early 20th historic properties, trails, and resource extraction locations in the Everglades of southwest Florida.

The Draft LPP and the Draft EA are integral parts of the Service's compliance with NEPA for the establishment of a refuge and conservation area. These documents are intended to provide the relevant state and federal agencies, Native American Tribes, and the public, which includes "interested parties" such as the Gladesmen, an opportunity to review and provide input to the Service. The National Historic Preservation Act (NHPA), specifically Section 106, becomes applicable following the formal authorization of the refuge. Information regarding historic properties provided to the Service during the NEPA process by the Florida Department of Historical Resources, the tribes, the public, and interested parties, such as the Gladesmen, will aid the Service to comply with the NHPA's Section 106 process for future projects or "undertakings" on the refuge. Section 110, which directs federal agencies to inventory and subsequently evaluate the National Register eligibility of historic properties on their lands, only becomes relevant following fee-title acquisition of lands for the refuge.

One of the actions identified in the Conceptual Management Plan (Appendix A, Final LPP) is the development of a cultural resource management plan. The cultural resource management plan will include, but is not limited to, identification of relevant historic contexts, reviews of the Florida Master Site Files, and available technical literature, oral history interviews, Phase I archaeological and historical surveys of lands acquired in fee-title by the Service, and follow-up testing of identified historic properties to ascertain their eligibility for inclusion on the National Register of Historic Places.

Citation:
Smith, Greg C., Susan Perlman, and Mary Beth Reed. 2011. "You Just Can't Live Without It": Ethnographic Study and Evaluation of Traditional Cultural Properties of the Modern Gladesmen Culture, Comprehensive Everglades Restoration Plan, Southern Florida. New South Associates Technical Report 1688. Prepared for the U.S. Army Corps of Engineers, Jacksonville District under Contract No. W912EP-10-0018, Task Order 0003.

Wilderness

Comments:
Multiple commenters expressed that under the No Action Alternative, the Service would not have the ability to designate Wilderness.

Service's Response:
Comments noted. The Service determined that no potential units of the refuge met the criteria and intent of the Wilderness Act and that the area was not suitable for Wilderness designation.

Comment:
I believe wilderness makes more sense than FWS management.

Service's Response:
Comment noted. The Service determined that no potential units of the refuge met the criteria and intent of the Wilderness Act and that the area was not suitable for Wilderness designation.

Recreation

General

Comment:
I would like to see horseback riding trails and camping facilities on the lands that the Federal Government does purchase.

Service's Response:
Comment noted. In Appendix B of the Final LPP, Interim Compatibility Determinations were prepared for the uses of horseback riding and camping. Both uses are compatible with stipulations as further detailed in Appendix B.

Comment:
Will some areas be set aside for specific uses – such as Florida panther habitat, hiking, fishing, hunting, camping, biking, horseback riding, and other uses?

Service's Response:
Comment noted. The primary role of the refuge is to provide habitat for native plants and wildlife. Generally, public uses are allowed on national wildlife refuges, where deemed appropriate and compatible. Public uses for this refuge include hunting, fishing, environmental education and interpretation, wildlife observation and photography, research, ORV use (on designated roads and trails in support of research and hunting), camping, hiking, horseback riding, bicycling, and grazing. The Service will work with FWC to establish a Wildlife Management Area on designated fee lands to offer hunting and fishing opportunities. Public use opportunities will be developed so as to have the least impact on native habitats and wildlife. Additional details regarding the stipulations placed on these uses can be found in Appendix B of the Final LPP, Interim Compatibility Determinations.

Comment:
Will biking and hiking asphalt paths be constructed along with restrooms?

Service's Response:
Comment noted. It is possible. However, the types of facilities and their locations are currently unknown (for additional details refer to the "Facilities" section of Appendix A of the Final LPP, Conceptual Management Plan.

Comment:
This area is so big that you can have a few trails so far apart that everyone can have a true out in the wilds experience without interfering with the farming or animal protection – if the planning is incorporated into the final vision of the proposal. Such a network would need to be tastefully done, of course; old time Florida, but with modest restroom facilities.

Service's Response:
Comment noted. As stated in the "Facilities" section of Appendix A of the Final LPP, Conceptual Management Plan, it is not possible at this stage to develop detailed plans regarding the types of public use facilities and their locations. A comprehensive conservation plan (CCP) will be developed for the refuge to provide more specific management guidance, including public use. The CCP planning process includes opportunities for public input. The Conceptual Management Plan, as well as Service policies, will provide interim guidance regarding public uses until a CCP is developed.

Comments:
Several commenters addressed the use of airboats, ORVs, ATVs, and marsh buggies, both in support of allowing them and in support of not allowing them on the proposed refuge. Comments ranged from not allowing these types of vehicles to heavily restricting them to not restricting them at all.

Service's Response:
Comments noted. The project will not impact legal activities on existing public lands and state sovereign waters (e.g., airboating activities on state sovereign waters will continue under applicable rules and regulations). Any newly acquired lands will be opened for public use activities, but will not include areas for off-road/off-trail marsh buggy use. Although ORV use was mentioned in the Interim Compatibility Determinations for both hunting and research, an ORV Interim Compatibility Determination was developed to provide clarification. Further, one appropriate use form for ORVs was updated, since, in error, both were checked "not appropriate." The appropriate use was updated to allow ORV use on designated roads and trails in support of hunting and research. General ORV use was determined to be not appropriate for the refuge. (See the Interim Compatibility Determinations for hunting, research, and ORV use for clarification.)

Comments:
Multiple commenters expressed that under the No Action Alternative, customary and traditional uses of and means of accessing remote areas of the region would be assured.

Service's Response:
Comments noted. The Service only evaluated action alternatives that included public access and use. As outlined in this Final EA in Alternatives B and C, and in Appendixes A and B of the Final LPP, the refuge will provide for public access to designated properties that were previously not open to the general public for uses such as hunting, fishing, environmental education and interpretation, wildlife observation and photography, research, ORV use (on designated roads and trail in support of research and hunting), camping, hiking, horseback riding, bicycling, and grazing. The project will not impact legal activities on existing public lands and state sovereign waters (e.g., airboating and other boating

activities on state sovereign waters will continue under applicable rules and regulations). Although ORV use was mentioned in the Interim Compatibility Determinations for both hunting and research, an ORV Interim Compatibility Determination was developed to provide clarification. Further, one appropriate use form for ORVs was updated, since, in error, both were checked "not appropriate." General ORV use was determined to be not appropriate for the refuge. (See the Interim Compatibility Determinations for hunting, research, and ORV use in the Final LPP for clarification).

Comment:
The purposes of the Headwaters (proposal) and current precautionary policies and anti-hunting animal rights groups that litigate using any reason to stop hunting and to further their agenda assure sportsmen that there will be no hunting and most likely no fishing (i.e., Florida Panther NWR has no fishing, even though there is a great lake on it that we once fished). The USFWS must change the purposes of the Headwaters NWR to include a statement that clearly articulates that hunting and fishing will continue, will take place as soon as the USFWS obtains ownership of the property by changing the stated purposes of the Headwaters NWR to include "the unit's purpose is to increase the opportunity for the public to hunt, fish, and camp in the Headwaters NWR." Anything else is not acceptable.

Service's Response:
Comment noted. Hunting and fishing are two of the six priority public uses established in the National Wildlife Refuge System Improvement Act of 1997. As stated in Appendix A of the Final LPP: Conceptual Management Plan: "The Service will open newly acquired lands for hunting and fishing in accord with the state's regulations after reviewing and evaluating the biological, ecological, and human safety impacts. Newly acquired lands that traditionally have provided hunting and fishing opportunities will remain open, at their current level, under interim compatibility determinations, until the Service completes the planning process to formally open the refuge, no later than 3 years from acquiring lands suitable to sustain these opportunities. To this end, the Service continues discussion with FWC to designate any acquired fee-title lands as units of the state's WMA program through a Memorandum of Understanding. If possible, the Service will provide Americans with Disabilities Act (ADA)-compliant hunts and youth hunting and fishing opportunities."

Comments:
Multiple commenters expressed that the proposed refuge would provide for increased opportunities for outdoor recreation, including hunting and fishing. People need more places like this to get away from all the development in Florida.

Conversely, multiple commenters expressed concern about the proposal taking away access and recreational use. Multiple commenters were concerned that the plan would limit their abilities to enjoy the traditional Gladesmen lifestyle and traditions. Many of us still enjoy hunting and fishing and demand that this right not be restricted. Keep this land open for recreation use and accessible by all means, including motorized vehicles, ATVs, buggies, and airboats in a safe and lawful manner. The Florida Headwaters should be for recreational use, not made into a refuge.

Service's Response:
Comments noted. The Service only evaluated action alternatives that included public access and use. As outlined in this Final EA in Alternatives B and C, and in Appendixes A and B of the Final LPP, the refuge will provide for public access to designated properties that were previously not open to the general public for uses such as hunting, fishing, environmental education and interpretation, wildlife observation and photography, research, ORV use (on designated roads and trails in support of research and hunting), camping, hiking, horseback riding, bicycling, and grazing. The project will not impact legal activities on existing public lands and state sovereign waters; airboating and other boating activities on state sovereign waters will continue under applicable rules. Although ORV use

was mentioned in the Interim Compatibility Determinations for both hunting and research, an ORV Interim Compatibility Determination was developed to provide clarification. Further, one appropriate use form for ORVs was updated, since, in error, both were checked "not appropriate." General ORV use was determined to be not appropriate for the refuge. (See the Interim Compatibility Determinations for hunting, research, and ORV use in the Final LPP for clarification.)

Comments:
Several commenters expressed that there should be some language guaranteeing allowances affecting sportsmen who enjoy camping, hunting, airboating, four-wheeling, swamp buggies, mudders, and other activities to preserve their interests and rights to public domains. Many of us older citizens are no longer capable of paddling a canoe or hiking miles of swamps that would be necessary for use to enjoy and appreciate this remarkable landscape without motorized access.

Service's Response:
Comment noted. The project will not remove existing public lands from public access, but will increase lands open to the public. The Service only evaluated action alternatives that included public access and use. As outlined in this Final EA in Alternatives B and C, and in the Conceptual Management Plan and Interim Compatibility Determinations (Appendix A and B of the Final LPP, respectively), the refuge will provide for public access to designated properties that were previously not open to the general public for uses such as hunting, fishing, environmental education and interpretation, wildlife observation and photography, research, ORV use (on designated roads and trails in support of research and hunting), camping, hiking, horseback riding, bicycling, and grazing. This project will not impact legal activities on public lands and state sovereign waters; airboating and other boating activities on state sovereign waters will continue under applicable rules and regulations. Although ORV use was mentioned in the Interim Compatibility Determinations for both hunting and research, an ORV Interim Compatibility Determination was developed to provide clarification. Further, one appropriate use form for ORVs was updated, since, in error, both were checked "not appropriate." General ORV use was determined to be not appropriate for the refuge. (See the Interim Compatibility Determinations for hunting, research, and ORV use in the Final LPP for clarification). Hunting and fishing are two of six priority public uses that the Service has determined to be priorities when managing and allowing public access. The Service is currently working with FWC on a Memorandum of Understanding to allow the state to manage hunting and fishing on any acquired lands as part of its WMA program.

Comment:
Page 82 (in the Draft EA): "The Service would commit to working with the FWC to facilitate public use activities, specifically hunting and fishing." The word "commit" does not provide any assurances that the Service will allow the new refuge to be managed by the FWC and for the FWC to be able to use its well proven state approved process to develop hunting regulations and public uses of the property. These words have to be changed to other words like "shall authorize the FWC to facilitate public use activities, specifically hunting, fishing, camping, and access following their established processes." Anything less than this makes the document and idea unacceptable. Weasel words are no longer acceptable when seeking support.

Page 207 (in the EA): "Generally, the Service would allow hunting, based on state hunting seasons and consistent with the refuge's comprehensive conservation plan and hunt plan (once developed). The Service would continue discussions to designate the proposed refuge as a state-managed wildlife management area(s). Fishing would be allowed, where accessible and compatible. Youth fishing opportunities would be encouraged." The term "Generally" has to be removed from the document because this does not provide language that is iron clad assurance that the new refuge will have hunting based on the FWC regulator and management authority under state processes.

Page 209 (in the EA): "…refuge as state-managed wildlife management area(s). Fishing would be allowed, where accessible, and the refuge may be able to support fishing derbies for children." The phrase "where accessible" has to be removed as this places discretionary authority in the hands of the federal agency that could say that area is not accessible and thus no fishing is allowed. The phrase and idea already provides assurance language that the Service is not going to allow the FWC to do their job and manage fish/wildlife via state processes.

Page 295 (in the Conceptual Management Plan): "The Service would continue discussions to designate proposed refuge lands as a state-managed wildlife management area(s). Fishing would be allowed where accessible and compatible. Youth fishing opportunities would be encouraged." The following words, phrase, has to be removed, "continue discussion to designate proposed refuge lands as state-managed wildlife management area(s)". This language already establishes the Service's intent to not allow the FWC to manage these lands as state-managed wildlife management lands. The document must be changed to provide iron clad assurance language that these lands will be managed as state-managed wildlife management area(s) by the FWC. Suggested language change could be, "these new lands shall be managed by the FWC as state-managed wildlife management area(s)." With this wording, there is no doubt what will happen. If this change is not included/removed from the draft document as it becomes the final EA document, then the entire project cannot be supported.

Page 300 (in the Conceptual Management Plan): "…Service is discussing with FWC the opportunity to identify and manage lands that the Service might acquire as wildlife management areas (WMAs). As the lead state agency for administering hunting programs, FWC has the expertise, experience, and established protocol for managing WMAs and the Service would look into the opportunity of entering into a cooperative agreement with FWC for the management of Service-owned lands as WMAs." In this sentence, the Service has established its intent not to truly do what it has implied and attempted to lead folks to believe. While the Service wants people to think it is going to allow the new refuge to be managed by the FWC as state-managed wildlife management lands, the above language clearly states the Service is only going to discuss this with the FWC. The language has to change to state that the Service has determined that all lands and waters in the Headwaters NWR shall be managed by the FWC as state-managed wildlife management area(s) under the FWC processes. This change in wording will allow the Service to continue developing its dialog with the FWC, but the end results must be that the lands are regulated and managed solely by the FWC.

Page 305 (in the Conceptual Management Plan), Appendix A, Table 1 excerpt:

Public Use Activity	Would this use be provided during the interim phase?
Public Hunting	Yes, limited by available hunting areas and potentially by wildlife management area restrictions.
Public Fishing	Yes, limited by available access and potentially by wildlife management area restrictions.

The above wording clearly establishes the Service's ability to double speak. To say what they think people want to hear while at the same establishing the foundation to do something else. By saying above as they have they are allowing for no continued uses during the interim period of time from purchase to final management plan being approved. Weasel words such as limited and potentially have to be removed and replaced with shall and must.

Page 322 (in the Hunting Compatibility Determination in the appendices): "However, the Improvement Act also provides for the opportunity for existing public uses to continue, at the same level of activity as occurred when acquired, during an interim period until such time that a detailed plan is developed [e.g., Hunt Plan and/or Comprehensive Conservation Plan (CCP)]. This would provide additional opportunities for a priority recreational activity. Big game hunting potential may consist of refuge-sponsored or state-managed wildlife management area (WMA) hunts for deer, wild turkey, and feral hogs. Upland game (e.g., gray squirrels, rabbits, and raccoons) and waterfowl (e.g., ducks, coots, and geese) hunting may consist of refuge-sponsored or state-managed WMA hunts. Any or all hunt programs may be administered as part of the WMA program and would be in accordance with state regulations." The weasel words have to be removed: may, etc., replaced by shall, will, and must. By including words like may it clearly leaves room for the Service to deny these uses as established in the Improvement Act. The Service has to define what are and are not priority recreational activities. I think you mean appropriate, therefore this terms needs to be defined, too. You need to list the activities that the Service deems as acceptable and not acceptable. Make a list.

This document has opened the door to why the DOI/NPS/BICY has denied hunters access and continued uses of all the Big Cypress National Preserve Addition Lands under the Improvement Act. Does this mean the NPS has been violating not only the BICY Amendment Act, but also the Improvement Act for 30 plus years?

Service's Response:
Comment noted. The Service has a long tradition of providing hunting and fishing opportunities and values partnerships with hunters and anglers. The Service is working with FWC to designate acquired lands as units of the State WMA programs through a Memorandum of Understanding. The refuge will remain part of the National Wildlife Refuge System and will be required to meet applicable laws, regulations, and policies, regardless of the managing entity. Discussions with FWC are specific to the designation of WMAs and development of hunting and fishing programs. The refuge will be managed by the Service with cooperative management by FWC. Hunting and fishing activities within one or more future designated WMA(s) will be managed by FWC, but in accordance with Service requirements. The Interim Compatibility Determinations, Appendix B of the Final LPP, outline the uses that were determined to be compatible for the interim period, that time between purchase of a property and the development of an appropriate management plan (i.e., comprehensive conservation plan). The public uses determined to be compatible for the refuge are: hunting, fishing, environmental education and interpretation, wildlife observation and photography, research, ORV use (on designated roads and trails in support of research and hunting), camping, hiking, horseback riding, bicycling, and grazing (Appendix B, Final LPP). The Improvement Act mentioned in the comment is the National Wildlife Refuge System Improvement Act from 1997. This Act is nearly 15 years old, specific to the National Wildlife Refuge System; and does not apply to units of the National Park Service.

Comment:
The plan should clearly outline what uses should or should not be allowed on fee-title acquisitions and easements and what kind of access will be permitted. And given the importance of management on wildlife refuges, the plan will need to identify activities that will be required as well as the entity responsible for carrying these out (e.g., FWS, FWC, private landowner).

The sporting and off-road vehicle communities are skeptical of promises of continued access and opportunities made by other bureaus of the Department of the Interior in light of such promises not being fulfilled at all or in a timely manner in the Big Cypress National Preserve and in particular the Addition Lands.

Service's Response:
Comment noted. As outlined in this Final EA in Alternatives B and C, in the Conceptual Management Plan (Appendix A, Final LPP), and in the Interim Compatibility Determinations (Appendix B, Final LPP), the refuge will provide for public access to designated properties that were previously not open to the general public for uses such as hunting, fishing, environmental education and interpretation, wildlife observation and photography, research, ORV use (on designated roads and trails in support of research and hunting), camping, hiking, horseback riding, bicycling, and grazing. Although ORV use was mentioned in the Interim Compatibility Determinations for both hunting and research, an ORV Interim Compatibility Determination was developed to provide clarification. Further, one appropriate use form for ORVs was updated, since, in error, both were checked "not appropriate." General ORV use was determined to be not appropriate for the refuge. (See the Interim Compatibility Determinations for hunting, research, and ORV use in the final documents for clarification.) Off-road vehicle use will continue under existing rules and regulations where it is currently legally allowed. The Service will evaluate the pre-existing types of uses on the property, the resources of concern on the property, and other factors to determine which specific uses are appropriate and compatible. For example, if hunting occurred on the property prior to acquisition, under the Interim Compatibility Determination for hunting, hunting on that property under state rules and regulations will continue. The Service is currently working with the FWC to develop a Memorandum of Understanding to address the designation of a State Wildlife Management Area on the Everglades Headwaters NWR. Further, once sufficient properties are acquired, a comprehensive conservation plan (15-year management plan) and/or step-down management plan(s) will be prepared (e.g., a Visitor Services Plan or a Hunt Plan). These planning processes will include a public involvement component to engage interested individuals, organizations, and Native American tribes, as well as local, state, and federal agencies.

Comment:
I believe the figures in this report on spending for recreational use are completely fake and made up and may reflect 2007.

Service's Response:
Comment noted. Recreational use figures were developed from the 2006 U.S. Fish and Wildlife Service and U.S. Census Bureau report which was the best available information during the development of the Draft LPP/EA.

Citation:
U.S. Fish and Wildlife Service and U.S. Census Bureau (U.S. Department of Commerce). 2006 National Survey of Fishing, Hunting, and Wildlife-Associated Recreation for Florida. http://library.fws.gov/pubs/nat_survey2006_final.pdf. Accessed: November 2011.

Comment:
Off-road vehicles cause air pollution, noise pollution, and erosion.

Service's Response:
Comment noted. Although ORV use was mentioned in both the Interim Compatibility Determinations for both hunting and research, an ORV Interim Compatibility Determination was developed to provide clarification. Further, one appropriate use form for ORVs was updated, since, in error, both were checked "not appropriate." (See the Interim Compatibility Determinations for hunting, research, and ORV use in the Final LPP for clarification). General off-road vehicle use will continue under existing rules and regulations where it is currently legally allowed. The project will not impact legal activities on public lands and state sovereign waters.

Comment:
Ban all trapping.

Service's Response:
Comment noted. Trapping for the purpose of obtaining furbearing species is not proposed for this refuge. Public uses for this refuge include hunting, fishing, environmental education and interpretation, wildlife observation and photography, research, ORV use (on designated roads and trail in support of research and hunting), camping, hiking, horseback riding, bicycling, and grazing.

Comment:
The Nature Conservancy supports the USFWS' ongoing efforts to work with the State of Florida and Florida Fish and Wildlife Conservation Commission to balance resource management with the opportunities that exist through this proposal to identify new opportunities for wildlife-dependent recreational access within this conservation landscape.

Service's Response:
Comment noted.

Comment:
FWC staff appreciates the USFWS' cooperation to agree to develop a Memorandum of Understanding allowing the FWC to manage fee simple acquisition lands as part of the state's WMA program, thereby allowing hunting, fishing, and other nature-based recreational use. We envision the execution of such an MOU as giving the FWC responsibility for establishing hunting and fishing programs, seasonal limits, amount of harvest allowed, and for determining related public access for activities on lands acquired fee simple. The MOU is to accommodate any and all hunting programs administered by the FWC as part of the WMA program in accordance with state regulations. As with other fee-simple lands in the WMA program, all of these activities will be developed under the FWC's established process for setting regulations on other WMAs in Florida. We also strongly encourage the FWS to address sportsmen's requests to remove any conditional language from the LPP that implies hunting access on suitable fee simple lands may be restricted. Additionally, we are pleased that the FWS has recognized that the lands to be included as a national wildlife refuge and conservation area do not qualify for the designation of "wilderness," thereby further assuring us that they have no plans to restrict current levels of access for hunting, fishing, and other nature-based recreation. Finally, we appreciate the FWS's determination that interim hunting at previous levels will continue as soon as feasible on any lands that may be acquired under the provisions of the National Wildlife Refuge System Improvement Act of 1997. Moreover, if any fee-simple acquisitions are executed, we strongly encourage the FWS to expedite the inclusion of such lands into the State's WMA system so suitable public access can be provided as quickly as possible.

Service's Response:
Comment noted.

Comment:
According to the Draft EA, the 50,000-acre NWR would allow for public uses including hunting, fishing, environmental education and interpretation, wildlife conservation and photography, research, camping, hiking, horseback riding, bicycling and grazing. In addition, other uses and activities supporting these activities would also be considered depending on the specifics of a particular property acquired, such as all-terrain vehicle use on existing roads and trails, primitive camping to support hunting and research activities, motorized and non-motorized boating to support fishing

activities, and facilities to support any of the approved uses. Public uses in the proposed 100,000-acre Conservation Area would be limited and be subject to the terms and conditions of easement agreements and other instruments used for less-than-fee-title acquisition.

Service's Response:
Comment noted.

Comment:
Opposition from my organization is not limited to concerns for preserving our members' hunting and fishing traditions. We are concerned for all Floridians and visitors who enjoy our state's natural areas, be it from an airboat gliding across a marsh, or hikers, picnickers, birdwatchers, or nature photographers. It is for this reason we consistently promote concurrent multi-use recreation on state and federal lands and waters. However, experience has proved to us that under Department of Interior control--specifically in this case USFWS control--Americans who own the public lands are draconically restricted from using them (e.g., Lake Wales Ridge NWR and Loxahatchee NWR).

Service's Response:
Comment noted.

Comment:
When you come up with a plan that includes ALL recreation (e.g., hunting, fishing, camping, and ORV use), then maybe I'll listen. I strongly disagree with this land grab to restrict access. We do not need more land locked up and shelved to where we are not able or permitted to use it.

Service's Response:
Comment noted. The Service is working with willing landowners to purchase properties for the refuge that are currently held in private ownership and that are not currently open to the general public. The Service's project will not remove lands from public access, but increases lands open to the public. The Service only evaluated action alternatives that included public access and use. As outlined in this Final EA and in the Final LPP (Appendices A and B), the refuge will provide for public access to designated properties that were previously not open to the general public for uses such as hunting, fishing, environmental education and interpretation, wildlife observation and photography, research, ORV use (on designated roads and trails in support of research and hunting), camping, hiking, horseback riding, bicycling, and grazing. Although ORV use was mentioned in the Interim Compatibility Determinations for both hunting and research, an ORV Interim Compatibility Determination was developed to provide clarification. Further, one appropriate use form for ORVs was updated, since, in error, both were checked "not appropriate." General ORV use was determined to be not appropriate for the refuge. General ORV use will continue under existing rules and regulations where it is currently legally allowed.

Hunting

Multiple comments were received in support of and in opposition to allowing hunting on the proposed refuge.

Comment:
Multiple commenters did not support hunting on the proposed refuge. I do not understand hunting being allowed in a wildlife refuge – seems illogical. I am not in favor of allowing hunting in the refuge. It will disturb protected species like the panther and the black bear and will open the door to illegal poaching and the use of ATVs and other negative activities. Ban all hunting.

Multiple commenters supported hunting on the proposed refuge. Increase access and opportunities for hunting. I support the proposal; sportsmen should be able to hunt in properly managed areas.

Further, multiple commenters supported the establishment of a WMA on the proposed refuge. There is wisdom is establishing a partnership between the Service and FWC. Co-designating the area as a NWR and a State WMA will lead to additional hunting and fishing opportunities for the public.

Service's Response:
Comments noted. The Service has a long tradition of hunting on national wildlife refuges. The National Wildlife Refuge System Improvement Act of 1997 states that "compatible wildlife-dependent recreation is a legitimate and appropriate general public use of the Refuge System." The overarching goal of the Service's wildlife-dependent recreation policy is to enhance wildlife-dependent recreation opportunities, such as hunting, and access to quality visitor experiences on refuges while managing refuges to conserve fish, wildlife, plants, and their habitats. Although ORV use was mentioned in the Interim Compatibility Determinations for both hunting and research, an ORV Interim Compatibility Determination was developed to provide clarification. Further, one appropriate use form for ORVs was updated, since, in error, both were checked "not appropriate." The appropriate use was updated to allow ORV use on designated roads and trails in support of hunting and research. General ORV use was determined to be not appropriate for the refuge.

The Service also recognizes that it shares this hunting tradition with FWC, and agrees that co-designation as a national wildlife refuge and state wildlife management area will benefit both agencies. The Service and FWC are currently drafting a Memorandum of Understanding to allow designated lands purchased for the refuge to be administered by FWC as a unit of their WMA program.

Comments:
Multiple commenters expressed concern that the proper wording is not included that will allow hunting for generations to come. The headwaters concept is the first major effort to not only control runoff of agricultural wastes, but open up within the national refuge extensive areas for hunting waterfowl, deer, and hogs. The proposal should emphasize in legally binding terms the fact that sports hunting will be allowed under proper control.

Service's Response:
Comments noted. The Service has a long hunting tradition with over 327 units of the National Wildlife Refuge System, and at least 85 refuges in the Southeast Region are open to hunting. The Service is working with the FWC to develop a Memorandum of Understanding to manage designated lands acquired for this project to be administered as a unit of the state's wildlife management area program. The Service only evaluated action alternatives that included hunting. Alternatives B and C in the Final EA and the Conceptual Management Plan (Appendix A, Final LPP) in the appendices include opening newly acquired designated lands of the refuge to hunting. Further, the Hunting Interim Compatibility Determination (Appendix B, Final LPP) also outlines that the Service will continue hunting activities.

Comment:
Do you think that anyone who knows the past history of DOI divisions involved in this process actually believe that hunting will ever be allowed in this refuge?

Service's Response:
Comment noted. The Department of Interior (DOI) includes several agencies such as the Bureau of Indian Affairs, Bureau of Land Management, National Park Service, Fish and Wildlife Service, and U.S. Geological Survey, among others. Each agency has its own mandates and guidance. The

Service has a long hunting tradition with over 327 units of the National Wildlife Refuge System and 85 refuges in the Southeast Region that are opened to hunting. The Service is currently working with the FWC to develop a Memorandum of Understanding to address the designation of a State Wildlife Management Area on the Everglades Headwaters NWR. The Service only evaluated action alternatives that included hunting. Alternatives B and C in this Final EA and the Conceptual Management Plan (Appendix A, Final LPP) include opening newly acquired designated lands of the refuge to hunting. Further, the Hunting Interim Compatibility Determination (Appendix B, Final LPP) also outlines that the Service will continue hunting activities.

Comment:
Wildlife watcher numbers are growing exponentially while hunters are declining (70% decline in last 10 years).

Service's Response:
Comment noted. The 2011 National Survey of Fishing, Hunting, and Wildlife-Associated Recreation and will not be available to the public until March 2012. By comparing the hunter numbers from the 1991 and 2006 reports, hunter numbers declined 39 percent from 348,000 (USFWS and U.S. Census Bureau 1991) to 214,000 (USFWS and U.S. Census Bureau 2006). Wildlife watchers grew 40 percent from 1991 to 2006, from nearly 3 million (USFWS and U.S. Census Bureau 1991) to 4.2 million (USFWS and U.S. Census Bureau 2006).

Citations:
U.S. Fish and Wildlife Service and Bureau of the Census (U.S. Department of Commerce). 1991. National Survey of Fishing, Hunting, and Wildlife-Associated Recreation. http://www.census.gov/prod/1/gen/interior/fhw91-fl.pdf Accessed: November 2011.

U.S. Fish and Wildlife Service, and U.S. Census Bureau (U.S. Department of Commerce). 2006 National Survey of Fishing, Hunting, and Wildlife-Associated Recreation for Florida. http://library.fws.gov/pubs/nat_survey2006_final.pdf. Accessed: March and November 2011.

Comment:
The Conservancy supports the statement on page 306 of the Draft EA regarding hunting and believes this statement appropriately addresses the concerns raised by various sportsmen groups who want access and hunting opportunities on new refuge lands. The Conservancy encourages the USFWS to move forward with a Memorandum of Understanding with FWC to formalize this short-term and long-term process for wildlife-dependent recreation on potential new fee-title lands conserved through this proposal. We also understand the USFWS has met recently with the local sportsmen community. We encourage such continued interactions to address this community's concerns and access interests. We also support the other sections included in the Draft EA identifying the importance the other five compatible uses of the refuge system.

Service's Response:
Comment noted. The Service is currently working with the FWC to develop a Memorandum of Understanding (MOU) to address the designation of a State Wildlife Management Area on the Everglades Headwaters NWR.

Comment:
The Safari Club International (SCI) supports many of the goals of the acquisition in principal, but opposes the plan due to the absence of a variety of safeguards to protect the continuation of hunting and the interests of the hunting community. Hunting does not receive adequate attention or protection and the plan does not provide concrete steps to prevent competing interests from

interfering with existing hunting opportunities. SCI will continue to oppose the proposal until the Service makes the necessary plans, disclosures, and concrete commitments to prevent the loss of any of these opportunities. SCI strongly recommends that the Service designate that the Headwaters refuge's purpose be, at least in significant part, to protect, sustain and enhance those hunting opportunities. Hunting should be given a higher priority if there is a conflict or competition between hunting uses and other wildlife-dependent recreational activities.

Service's Response:
Comment noted. The Service has a long tradition of hunting on national wildlife refuges. The National Wildlife Refuge System Improvement Act of 1997 states that "compatible wildlife-dependent recreation is a legitimate and appropriate general public use of the System." The overarching goal of the Service's wildlife-dependent recreation policy is to enhance wildlife-dependent recreation opportunities, such as hunting, and access to quality visitor experiences on refuges while managing refuges to conserve fish, wildlife, plants, and their habitats. The Service is committed to hunting on designated tracts acquired for the refuge. The Service is currently working with the FWC to develop a Memorandum of Understanding to address the designation of a State Wildlife Management Area on the Everglades Headwaters NWR.

Fishing

Comments:
Multiple commenters supported increasing access and opportunities for fishing.

Service's Response:
Comments noted. Over 272 units of the National Wildlife Refuge System are open to fishing. The Service will open newly acquired designated lands for fishing in accordance with the state's regulations as part of the state's WMA program. Youth fishing opportunities will be encouraged.

Education

Comment:
Preserve this area as an educational treasure for future generations.

Service's Response:
Comment noted. Management Goal 4 (Wildlife-dependent Recreation and Education) outlined in Appendix A of this Final LPP, aims to provide environmental education opportunities as well as other public uses.

Airboat Use

Comment:
We, as Texas airboaters who visit the area, believe the proposal will hurt the funds that visitors bring in, since we will be going elsewhere like Louisiana.

Service's Response:
Under this project, the Service will not close public areas currently legally opened to airboating. Airboat use will continue to be allowed in state sovereign waters in accordance with Florida's rules and regulations.

Comment:
Do not pass a bill to restrict airboat usage.

Service's Response:
Comment noted. The project does not involve a bill to restrict airboat use. Airboat use will continue to be allowed in state sovereign waters in accordance with Florida's rules and regulations.

Comment:
Airboats are expensive to operate and maintain, making a sizeable contribution to Florida's economy. They cause little damage to the ecosystem. Marsh lands on which to operate them diminish yearly.

Service's Response:
Comment noted. Under this project, the Service will not close public areas currently legally opened to airboating. Airboat use will continue to be allowed in state sovereign waters in accordance with Florida's rules and regulations.

Comment:
I am greatly opposed to any group, law, or concern that would limit access to any public land or waterway via an airboat.

Service's Response:
Comment noted. Airboat use will continue to be allowed in state sovereign waters in accordance with state rules and regulations. Under the project, the Service is working with willing landowners to purchase properties for the refuge that are currently held in private ownership and that are not currently opened to the general public. The Service's project does not remove lands from public access, but increases lands open to the public.

Access

Comments:
Numerous comments were submitted that addressed access in general. The Federal Government has designated some land as off limits to all. The Federal Government uses taxpayer money to purchase land, then makes it off limits to the taxpayers.

Service's Response:
Comment noted. To acquire lands in fee-title or conservation easements, the Service intends to use funds available through the Land and Water Conservation Fund, which are derived from royalties resulting from oil and gas exploration offshore. In some cases, the Service will accept donations to acquire parcels. No general tax revenues will be used to acquire lands or easements, and our expectation is that it will take some time to achieve our collective conservation goals within the basin working with willing sellers and partners. As the land manager, the Service will have the responsibility to manage public access and uses on the refuge. The Improvement Act of 1997 mandates the Service to provide wildlife-dependent public uses on refuges, where appropriate and compatible. The lands within the Conservation Focal Areas are currently under private ownership and not open to the public. The Service believes that this project will result in additional lands becoming available for the public to enjoy.

Comment:
This land has been used for years by the people of Florida for hunting, fishing, and boating of all kinds and now you want to take it all away. Lots of people feed their families with fish and game from these lands. Some people cannot afford to drive for miles to fish, hunt, and use their boats.

Service's Response:
Comment noted. The Service is working with willing landowners to purchase properties for the refuge that are currently held in private ownership and are not currently open to the public. This project will not remove lands from public access, but will instead help increase the amount of lands opened to the public. The Service only evaluated action alternatives that included public access and use. As outlined in this Final EA in Alternatives B and C, in the Conceptual Management Plan (Appendix A of the Final LPP), and in the Interim Compatibility Determinations (Appendix B of the Final LPP), the refuge will provide for public access to designated properties that were previously not opened to the public for uses such as hunting, fishing, environmental education and interpretation, wildlife observation and photography, research, ORV use (on designated roads and trails in support of research and hunting), camping, hiking, horseback riding, bicycling, and grazing. Management of existing conservation areas and waterways opened to the public will continue under applicable rules and regulations (e.g., Avon Park Air Force Range, Three Lakes Wildlife Management Area, and state sovereign waters of the Kissimmee River). These areas are not part of the 50,000-acre refuge.

Comment:
The USFWS's identification of public access opportunities within the Everglades Headwaters NWR and Conservation Area – consistent with the compatible uses of the Refuge System and in close coordination with the State of Florida and local communities – is an important objective to ensure the long-term success of this landscape initiative.

Service's Response:
Comment noted.

Administration

Funding/Budget

Comments:
Multiple comments were submitted regarding funding for the proposal.

Multiple commenters questioned the proposal in light of the current debt situation of the United States. The debt is $14.7 trillion to $15.75 trillion and growing. The funding for this project should be used to slow the debt, not to buy easements and land. Tax dollars (offshore drilling fees are a tax) are being used without congressional approval. The $700 million cost for the proposal is a huge waste of money that we don't have to spend. This is just another land and money grab by the Federal Government which leads to excessive government control and waste of tax payers' diminishing personal funds. We should not spend a single dime of taxpayers' money to purchase land from Florida landowners. At a time when Americans are out of work and each dollar is precious, no trust fund or other source of money should be tapped to fund even a portion of this program. The Federal Government doesn't have the resources to manage the property it now has and is charging fees to use all of the parks. Instead of purchasing more property, the Federal Government should be selling property back to private individuals, or use what little money is available to maintain and complete projects that are already in the works.

Multiple commenters supported the proposal and the use of Land and Water Conservation Fund monies to fund it. I support Land and Water Conservation Fund money being used strictly for projects such as this, which demonstrates conservation at a regional scale.

Service's Response:
The Service will work with willing sellers only. Several landowners in the basin have expressed interest in donating lands for this project, which would of course reduce the overall cost.

Given the fluctuation in land values, it is difficult to say at this time what the appraised values for land acquisition and easements from willing sellers will be at the time we enter into the transactions. Considering these unknowns, the Service will annually seek funds from the Land and Water Conservation Fund to acquire a combination of lands and conservation easements. We expect it will take several years for the Service and our partners in the Greater Everglades Partnership Initiative to complete this project

The Service intends to use funds available through the Land and Water Conservation Fund, which are derived from royalties resulting from oil and gas exploration offshore. No general tax revenues will be used to acquire lands or easements and our expectation is that it will take some time to achieve our collective conservation goals within the basin working with willing sellers and partners.

The Service will manage the refuge under the Pelican Island National Wildlife Refuge Complex, using mostly existing staff resources. The Service may add up to three employees. Operational costs will cover salary, habitat restoration and prescribed fire activities, facility maintenance, inventorying and monitoring of habitat and species, and invasive species control. During the course of several years, as the refuge becomes more fully operational, the budget will likely increase and this refuge will be managed as a stand-alone refuge as noted in the Final LPP.

Due to declining real estate market values, both fee-title and less-than-fee-title estimates have decreased since the development of the Draft LPP and Draft EA, and the total acquisition costs have also been decreased to account for the increase in expected donations. The estimated cost has been decreased from $625 million to $398 million. This change is reflected in this Final EA and in the Final LPP.

50,000-acre Everglades Headwaters NWR. All fee-title lands acquired will primarily be ranchland. We used a median estimated price of $4,000 per acre for ranchland, based on current estimates of cost per acre in this area. Thus, the cost of acquiring all the ranchland in the project area will be: 50,000 acres multiplied by $4,000/acre = $200,000,000. Please note any properties that are donated or transferred will lower this estimated total. Table 6 of the Final LPP includes properties that are expected to be donated by private interests or transferred by the Federal Government to the refuge, lowering the total by an estimated $2,036,000 and making the total acquisition estimate for the refuge just under $198 million.

100,000-acre Conservation Area. The Service will target the use of conservation easements as the primary tool for the Conservation Area. All conservation easements will total about 100,000 acres. Based on the Service's knowledge of acreage values for the area and based on the target of the acquisition of development rights for these easements, the median price of $2,000/acre is estimated for these easements. Hence, the cost of acquiring the available conservation easements will be 100,000 acres multiplied by $2,000/acre = $200,000,000.

Our total estimated cost will be the costs of fee simple lands plus conservation easements or $198,000,000 + $200,000,000 = $398,000,000 to purchase whole or partial interest in the 150,000 acres in the project area.

Comment:
The project is another great waste of state funds.

Service's Response:
Comment noted. This project is a federal project that will use funding from sources such as the Land and Water Conservation Fund, not state funding.

The authority for the use of these funds for land acquisition is the National Wildlife Refuge System Administration Act; Endangered Species Act of 1973; Emergency Wetlands Resources Act of 1986; The Migratory Bird Conservation Act of 1929; Fish and Wildlife Act of 1956; and Refuge Recreation Act (16 U.S.C. 460k-460k-4), as amended.

Comment:
The funding should go to things like restricting development.

Service's Response:
Comment noted. As outlined in the project documents, two-thirds of the project (i.e., 100,000 acres) will use less-than-fee-title acquisition methods (e.g., conservation easements) to conserve key properties. The minimum bar will be the purchase of development rights.

Comment:
DEP is hopeful that the use of funds for the Everglades Headwaters NWR will not impact other federal commitments to ongoing restoration projects such as CERP or Modified Water Deliveries.

Service's Response:
Comment noted.

Comment:
The Florida Airboat Association contends it is doubtful USFWS will ever have necessary funding in order to do the multiple NEPA planning requirements to open the land to the public. (Provide examples like Lake Wales Ridge of un-opened USFWS lands). It is evident that Congress has kept the purse strings tight regarding USFWS and will continue to do so.

Service's Response:
Comment noted. The Service is working with FWC to develop a Memorandum of Understanding to manage refuge lands as part of the State WMA program. Further, the Interim Compatibility Determinations (Appendix B of the Final LPP) outline numerous recreational uses for the refuge: hunting, fishing, environmental education and interpretation, wildlife observation and photography, ORV use (on designated roads and trails in support of research and hunting), camping, hiking, horseback riding, and bicycling.

Comment:
You are using taxes from offshore drilling to accomplish your mission, which is a distortion of the truth.

Service's Response:
Comment noted. To acquire lands in fee-title or conservation easements, the Service intends to use funds available through the Land and Water Conservation Fund, which are derived from royalties resulting from oil and gas exploration offshore. In some cases, the Service will accept donations to acquire parcels. No general tax revenues will be used to acquire lands or easements, and our expectation is that it will take some time to achieve our collective conservation goals within the basin working with willing sellers and partners

Property Taxes/Refuge Revenue Sharing Payment

Comments:
Multiple commenters supported the No Action Alternative, since it would maintain the full tax base for the counties within the project area.

Service's Response:
Comments noted. Under this project, any lands that are purchased through a conservation easement or other similar less-than-fee-title methods will remain in private ownership and on the local tax rolls.

Through the Refuge Revenue Sharing Act, counties and local governments may be compensated for lost revenues from the 50,000-acre refuge purchased in fee-title by the Service. The Refuge Revenue Sharing Act (16 U.S.C. 715s), as amended, allows the Service to offset the tax losses by annually paying the county or other local unit of government an amount that often equals or exceeds that which would have been collected from taxes if in private ownership. The source of funds for refuge revenue sharing payments are derived from the net receipts collected from the sale of various products or privileges from all refuge lands, such as grazing leases or timber sales, plus additional appropriated funds. The Refuge Revenue Sharing Act provides a formula to share economic use receipts to offset the loss of land within the counties' or local governments' tax bases. Specifically, the law requires that the revenue sharing payments to counties or local government for our purchased land will be based on the greatest of: (a) 3/4 of 1 percent of the market value; (b) 25 percent of the net receipts; or (c) 75 cents per acre. Fair market value is based on appraisals that are to be updated every 5 years. All lands administered solely or primarily by the Service – not just refuges – qualify for revenue sharing payments.

The revenue sharing appraisal is based upon current fair market values of the various land types in the county or counties where the refuges are located. This appraisal values the refuge land by comparing it to the same, or similar, sales of land in the local area. As a result, refuge land is valued at its highest economic potential based on the surrounding real estate market. That means refuge land is valued on a variety of potential uses, including commercial property, beachfront development, timberland, and farmland. The revenue sharing appraisal compiles all the values found on each refuge to produce an overall per-acre-value for that refuge.

By way of example, in south-central Florida, Lake Wales Ridge NWR comprises both lakefront and non-lakefront lots that have the potential for residential development, and as such are valued at a much higher price than nearby agricultural lands. The refuge contains 1,689 and 172 acres, respectively, in Highlands and Polk Counties, which are two of the same counties within the Everglades Headwaters NWR area. The revenue sharing payments to these counties in 2010 were $16,406 to Highlands County and $1,605 to Polk County. This equates to an average Revenue Sharing Payment of $9.52 per acre (data are provided by the Service's Finance Center and represents the actual payments made to the individual counties). By comparison, the privately owned Hatchineha Ranch in Polk County generated less than $2 per acre in property taxes in 2010.

In addition to potential gains from revenue sharing payments, refuges are economic boons for their neighboring communities, generating roughly $4 for every $1 of federal investment, according to a Service analysis entitled Banking on Nature 2006: The Economic Benefits to Local Communities of National Wildlife Refuge Visitation. That study found that refuge visitors generated $1.7 billion of annual sales to local economies, of which 87 percent was spent by travelers from outside the local area. The ripple effect from these visitors created over 27,000 jobs and more than $543 million in employment income.

Comment:
The Revenue Sharing Act needs revision. With so much development, the fact that you have saved protected land near you adds to the value of your home, doesn't take away its value.

Service's Response:
Comment noted. Refuge Revenue Sharing Act was amended in 1978. Important changes were made as a result of the 1978 amendments, including: Congress can appropriate funds to make up any shortfall in the revenue sharing fund, all lands administered solely or primarily by the Service (not just refuges) qualify for revenue sharing payments, and the payments to units of local governments can be used for any governmental purpose. The Refuge Revenue Sharing Act utilizes a formula which is comparable to taxes imposed on private landowners for similar land types. In some cases, particularly in rural areas, the revenue sharing payment for Service-owned agricultural lands may exceed the anticipated tax revenue generated by privately owned agricultural lands.

Comment:
Concerned citizens and representatives of affected county governments were deliberately deceived by members of USFWS staff when they promised federal reimbursement of lost property tax revenue. Clarification was repeatedly sought at all four public meetings, often by educated citizens and county commissioners hoping to get the disturbing truth on public record. Yet, only at the first public meeting were questioners able to ferret out the truth that USFWS representatives were withholding, that there are no reimbursement funds available.

Service's Response:
Comment noted. The Refuge Revenue Sharing Act of June 15, 1935, as amended (16 U.S.C. 715s), requires the Service to make payments to local taxing authorities, typically counties, to offset the loss of local tax revenues due to federal ownership. The Service makes annual payments to local taxing authorities, based on the estimated values of lands that the Service owns located in those jurisdictions. Money for these payments comes from the sale of oil and gas leases, timber sales, grazing fees, the sale of other Refuge System resources, and from congressional appropriations, which are intended to make up the difference between the net receipts from the Refuge Revenue Sharing Fund and the total amount due to local taxing authorities. The actual Refuge Revenue Sharing payment does vary from year-to-year, because Congress may or may not appropriate sufficient funds to make full payment. For the nearby Lake Wales Ridge NWR, 2009 Refuge Revenue Sharing payments were $23,252 for 1,685 acres in Highlands County and $2,278 for 172 acres in Polk County, while 2010 Refuge Revenue Sharing payments were $16,406 for 1,689 acres in Highlands County and $1,605 for 172 acres in Polk County. The Service will make similar payments for the fee-title lands.

Comment:
Payments in lieu of taxes seem minuscule and certainly not assured. I would suggest you provide a table that clearly defines what you've been paying and how you devised those payments. I would like to see a tax impact table for each of the parcels, assigning how much they will be in the 2011 tax year.

Service's Response:
Comment noted. The Service pays Refuge Revenue Sharing payments for properties owned in fee-title. These payments vary from year-to-year and depend on the total acreage per county. Since the Service does not know which properties might be purchased in fee-title at any given time, it is impossible to know what the Refuge Revenue Sharing payments will be for the four counties involved in the projects area. However, for the nearby Lake Wales Ridge NWR, 2009 Refuge Revenue Sharing payments were $23,252 for 1,685 acres in Highlands County and

$2,278 for 172 acres in Polk County, while 2010 Refuge Revenue Sharing payments were $16,406 for 1,689 acres in Highlands County and $1,605 for 172 acres in Polk County. The Service will make similar payments for the fee-title lands.

Management

Comment:
Manage the lands properly with frequent fire for the benefit of native fire-dependent species.

Service's Response:
Comment noted. For lands that the Service may come to own in fee-title, prescribed fire will be used to remove excess vegetation and restore native plant communities.

Comment:
This project will become a wildlife wasteland with few wild creatures living there in 15 to 20 years. I offer Big Cypress National Preserve (BCNP) as an example. Due to improper management, BCNP has deteriorated drastically since it was established. The over-ambitious endangered species protection and enhancement program has been the death sentence for almost every other form of wildlife that lives in the BCNP. Due to an inadequate prescribed burning program and their continuing effort to put out every lightning strike fire, the natural grass prairies in the BCNP are a fraction of what they were 40 years ago.

Service's Response:
Comment noted. Big Cypress National Preserve is a unit of and is managed by the National Park Service and it is outside of the Everglades Headwaters NWR and Conservation Area. As outlined in the Conceptual Management Plan (Appendix A, Final LPP) for the project, the Service will conduct landscape-scale strategic habitat conservation for the important resources found within the Kissimmee River Basin region. This will be accomplished through partnerships between the Service, partnering agencies and organizations, and with the support of the ranching and agricultural interests of this working rural landscape. We will protect and enhance habitat corridors, link existing conservation lands, and implement other wildlife adaptation strategies to help buffer the impacts of climate change. Further, this project will help protect and enhance habitats for federal trust species and species of management concern, with special emphasis on federal and state listed species; protect and restore the headwater wetlands, groundwater recharge, and watershed of the upper Everglades watershed; provide opportunities for hunting, fishing, wildlife observation, wildlife photography, and environmental education and interpretation, while promoting activities that complement the purposes of the refuge and other protected lands in the region; protect historic properties; facilitate archaeological and historical investigations regarding human occupation, land use, and paleoecology; and interpret the region's history and culture.

Comments:
Multiple commenters expressed that FWC should be the managing agency for recreational use of any such project. It is only fitting that the agency with day-to-day contact with all sportsmen's groups be the lead. Defenders of Wildlife urges the Service to develop a management agreement with the FWC for hunting and fishing activities that are compatible with the conservation of biological diversity. We also recommend that FWS and FWC make ensuring a healthy prey base for the endangered Florida panther and other predators a management priority as part of managing for overall native biological diversity in the refuge. The management agreement should incorporate adaptive management strategies when new information becomes available and in the event that conditions on the ground

change. It is essential that agencies manage hunting, fishing, and related recreational activities within the refuge to ensure that these activities do not adversely affect wildlife, ecological integrity, or visitor experience for the non-hunter.

Multiple commenters expressed that FWC should be the only agency leading/managing the lands, including access and hunting. Let FWC manage it, that way airboaters, hunters, and other sportsmen will be able to enjoy the ecosystems we are trying to protect. If such a plan were implemented, it should be fully under the direct jurisdictional control of FWC for all areas of management concern, including all policy mandates of the resource and all enforcement measures in pursuit of such policy mandates. FWC should manage the refuge without any outside interference.

Service's Response:
Comment noted. The Service is working with FWC to designate one or more state wildlife management areas on the refuge through a Memorandum of Understanding. That said, the refuge will be a part of the National Wildlife Refuge System and will be required to meet applicable laws, regulations, and policies, regardless of the managing entity. Discussions with FWC are specific to the designation of wildlife management areas and do not include complete and total management of the refuge by FWC. As such, the refuge will be managed by the Service. Hunting and fishing within future designated wildlife management area(s) will be managed by FWC as a unit within their wildlife management area program, but in accord with Service requirements. The project will not impact legal activities on public lands and state sovereign waters (e.g., airboating and other boating activities on state sovereign waters will continue under applicable rules and regulations). The Interim Compatibility Determinations (Appendix B, Final LPP) outline the uses that are determined to be compatible for the interim period, that time between purchase of a property and the development of an appropriate management plan (i.e., comprehensive conservation plan).

Comment:
Use only passive management.

Service's Response:
Comment noted. The majority of habitats within the project area are fire-dependent habitats; they evolved with and are maintained by regular fire. Florida has a large amount of wildland and urban interface, making the management of fire, whether by natural or man-made means, highly important to maintain natural habitat conditions, while also minimizing the potential for catastrophic fire. Passive management will be insufficient to address these and other needs (e.g., the control of invasion and spread of non-native species that negatively impact native species and habitats). Little if any of these lands is currently passively managed.

Comment:
Staff of FDEP requests that the conceptual fire management plan be closely coordinated with the Florida Department of Agriculture and Consumer Services' Florida Forest Service and the FDEP Florida Park Service to address both the response to wildfire management and planning for prescribed burns. In addition, the conceptual plan does not address the management of exotic or invasive plants or animals. Staff recommends that the plan consider the establishment of partnerships with state, regional, and local entities for the management of exotic or invasive plants and animals.

Service's Response:
The Service is committed to working with the partners to address shared management concerns such as invasive species and fire. Although Table 5 in the Draft LPP outlined funding for invasive species control, it was inadvertently left out of the Conceptual Management Plan. The Conceptual Management Plan has been updated to add a discussion element about invasive species

management. Also, the objectives under Goal 2 were updated to add two new bullets: monitor and initiate control activities for invasive plants and animals upon acquisition and continue Service participation on the Lake Wales Ridge Ecosystem Working Group and Heartland Cooperative Invasive Species Management Area.

In relation to fire management activities, the Service currently has memoranda of understanding (MOUs) and cooperative agreements with other federal and state agencies and non-governmental organizations. Specifically for Florida, a current Memorandum of Understanding (which expires in 2013) includes the Florida Forest Service (formerly Florida Division of Forestry); the United States Department of Interior, U.S. Fish and Wildlife Service, Southeast Region; and the National Park Service, Southeast Region. The Service also has existing cooperative agreements with The Nature Conservancy and other state agencies. The Service is committed to continuing these MOUs and agreements in the future. The Service plans to develop a Fire Management Plan for the refuge. The Fire Management Plan will be a step-down plan from the Comprehensive Conservation Plan and will be developed in association with the Habitat Management Plan, which will include specific elements of a fire management program. In accord with Service policy, a Fire Management Plan must be prepared for all refuge lands that have burnable vegetation.

Management Plans

Comment:
The Draft Land Protection Plan references the development of management plans for the refuge and Conservation Area. We respectfully request that the Service consult with the Seminole Tribe early on in the development process, especially in connection with any comprehensive management plans, recreational management plans, hunting management plans, restoration plans, and water control plans. As the term "Headwaters" implies, the management of the action area will have profound impacts (positive or negative) to lands south of the refuge and Conservation Area including Seminole Tribe of Florida, Brighton Seminole Indian Reservation, and other lands. Therefore, it is important that the Service continue meaningful consultation with the Seminole Tribe during the early development stages and not simply submit draft plans for our comments. The Service's trust obligation to the tribe requires early consultation that affords tribal participation before and beyond simple commenting.

Service's Response:
Comment noted. The Service is currently in formal consultation with the Seminole Tribe of Florida to address issues of concern to the tribe. Recognizing the importance of this landscape and its management to the Seminole Tribe, the Service commits to continuing meaningful consultation with the Seminole Tribe, including early coordination in the development of management plans such as a Comprehensive Conservation Plan, Hunt Plan, Visitor Services Plan, Habitat Management Plan, or other such refuge management plan.

Comment:
Prescribed burning is polluting air/water and soil and should not be conducted.

Service's Response:
Comment noted. Prescribed burning is a valuable habitat management tool for several habitats of the refuge. As further detailed in the Environmental Consequences section of the Final EA, the primary gases released during prescribed fire include CO_2, CO, and water vapor, with other gases present in trace amounts (EPA 2011). Most of these are greenhouse gases. However, it has been shown that prescribed fires can decrease the risk of wildfires, which typically release greater amounts of greenhouse gases (National Science Foundation 2010). Wildfires tend to

burn entire habitats including mature trees, whereas prescribed fires are aimed at reducing groundcover and low-growing shrubs. The amount of greenhouse gases contributed to the atmosphere as a result of prescribed fires is expected to be minimal.

Citations:

Environmental Protection Administration. 2011. Prescribed Burning. http://www.epa.gov/ttn/chief/ap42/ch13/final/c13s01.pdf Accessed: November 2011.

National Science Foundation. 2010. Prescribed Burns May Help Reduce U.S. Carbon Footprint. Press Release 10-041. http://www.nsf.gov/news/news_summ.jsp?cntn_id=116626 Accessed: April and November 2011.

Comment:

The Conceptual Management Plan under Goal 2 (Habitat for Fish and Wildlife) states: "Complete baseline inventory and document degraded and high-quality habitat necessary for trust species on all refuge and easement lands within 1 year of acquisition." This may be very difficult to achieve given the size and scope of the lands under consideration, but will also depend upon how much land is actually protected in any given year. The Nature Conservancy would also very much like to be involved in assisting on any such activities.

Service's Response:

Comment noted. The objective or target level for achieving this component of Goal 2 is to complete the baseline inventory within one year of acquisition. For conservation easement purchases, this baseline inventory will need to be completed prior to closing of the real estate transaction. For fee-title purchases, much of the baseline information will be required to be collected during the land acquisition priority ranking phase of the project. Further refinement of the baseline inventory will be targeted shortly thereafter.

Comment:

The Conceptual Management Plan under Goal 2 (Habitat for Fish and Wildlife) states: "Initiate restoration activities (e.g., modified grazing rotation, native planting) on all dry prairie and cutthroat wetland habitat within 2 years of acquisition on less-than-fee-title lands" and "Initiate restoration activities (e.g., native planting, timber harvest) within 3 years on all other habitats on less-than-fee-title lands." Many ranchers/private landowners with whom we have worked with over the past 20+ years may question these kinds of actions on their properties. We have already heard negative comments about these statements from several ranchers. We encourage the USFWS to revise this section to include language that highlights the need for and importance of a collaborative process with local landowners, to identify the potential for areas where restoration activities could occur within the landscape. This also points to the importance of the USFWS carefully negotiating draft conservation easement language with local landowners within the ranching and agricultural community covered by this project, as well as other partners involved within this landscape. Additionally, a number of key partners for restoration efforts within this landscape will include the NRCS, FWC, The Nature Conservancy, and other conservation organizations, as well as the USFWS's Partners for Fish and Wildlife Program. The Final LPP and Final EA should include these partners in any references to restoration potential within the landscape as well as identify potential funding sources for restoration efforts – the NRCS conservation programs (i.e., FRPP, WRP, WHIP), North American Wetlands Conservation Act Grant Program, National Fish Habitat Action Plan, and the Partners for Fish and Wildlife Grant Program, among others.

Service's Response:
Comment noted. The reference to restoration of habitats on less-than-fee-title land will only apply to lands where willing landowners agree to restoration activities at the time of the conservation easement acquisition. The document was modified to reflect this clarification.

Comment:
In the Draft EA, there is mention of a "needed step-down" management plan – especially focusing on hunting during the first 3 years. We encourage the Service to work closely with the FWC on this through a Memorandum of Understanding (MOU) with the state agency. We recommend this MOU, with a focus on resource management of fee-title areas within the proposed EHNWR&CA, be completed as expeditiously as possible. The Conservancy believes this MOU is an important component of the USFWS's implementation of the EHNWR&CA proposal and ensuring that long-term resource conservation is balanced with identifying new opportunities within this landscape for recreational access opportunities, including both wildlife-dependent activities and other compatible uses of the Refuge System. To this end, we recommend that USFWS include a complete explanation and more details on next steps for what a step-down plan for hunting and other management activities may entail, to clarify the public process for these planning efforts.

Service's Response:
Comment noted. The Service is currently developing an MOU with FWC for the management of hunting and fishing programs on any fee-title lands acquired as part of the refuge to be managed as part of FWC's Wildlife Management Area program.

Comment:
We appreciate the mention of The Nature Conservancy's Lake Wales Ridge Fire Strike Team in the Draft EA and would welcome continued cooperation on this important and vital land management strategy. Note that the Conservancy now uses the terminology "Central Florida Ecosystem Restoration Team."

Service's Response:
The Conceptual Management Plan (Appendix A of the Final LPP) was updated to reflect the new terminology.

Facilities

Comment:
Commenter disagrees with building a refuge headquarters for the employees.

Service's Response:
Comment noted. The refuge will need a facility for employees to administer and manage these resources. Such a facility could include a new structure or rehabilitation of an existing structure, or could be co-located with one of the partners.

Partnerships

Comments:
Multiple commenters supported the use of partners and interagency coordination for the refuge and conservation area. It is essential that private landowners, government agencies, and conservation groups collaborate on solutions for conserving natural areas. This is a great cooperative solution. This is an innovative and collaborative conservation initiative with a wide array of partners. Defenders of Wildlife is pleased that the Draft LPP/EA acknowledges the importance of working with

partners and identifies many diverse entities and programs. The importance of establishing lasting partnerships cannot be overemphasized as it helps maximize organizational resources (e.g., funding, expertise, land management operations, personnel) and avoids duplication. For example, the Service and USDA's NRCS should coordinate closely in the Northern Everglades Watershed to strategically identify and secure protection and restoration of important uplands and wetlands to achieve the greatest possible conservation gains in the study area. The Nature Conservancy supports USFWS's broad vision to contribute and collaborate with a long list of current agencies, organizations, and local community partners already coordinating with the Northern Everglades working landscape to identify the best and most cost-effective ways to achieve conservation across the region. The FDEP and SFWMD encourage the USFWS to continue to coordinate closely with the agencies working on Everglades restoration (e.g., FDEP, SFWMD, Florida Department of Agriculture and Consumer Services, and U.S. Army Corps of Engineers). This will help ensure compatibility between the refuge and Conservation Area and ongoing efforts to restore the Everglades and improve the hydrology and water quality in Lake Okeechobee and other lakes and wetlands in the Kissimmee River Basin.

Service's Response:
Comments noted.

Comment:
In the Draft EA, the USFWS identifies key conservation partners that have a long tradition of working in the Basin landscape, including the NRCS, Avon Park Air Force Range, U.S. Air Force; FWC; Florida Department of Agriculture and Consumer Services (FDACS); Florida Division of Forestry (FDOF) (now called Florida Forest Service, FFS), FDACS; FDEP; Florida Division of State Lands, FDEP; SFWMD; and The Nature Conservancy. The Conservancy encourages the Service to include language in relevant sections throughout the Final EA and Final LPP, recognizing the important efforts of local landowners representing the ranching and agricultural communities within this landscape to conserve their own working lands and the importance of these landowners in the conservation vision for this Basin landscape and the EHNWR&CA.

Service's Response:
Comment noted.

Utilities

Comment:
In the proposal, the Service expresses a desire to restrict development in these areas and provide habitat for a variety of plants and animals. Florida Power and Light Company (FPL) notes that certain uses, both necessary for the public good and compatible with the proposal's overall conservation mission, should not be restricted in the proposed conservation areas. These uses include, but are not limited to, aboveground linear utility facilities, such as transmission lines; underground linear utility facilities, such as natural gas pipelines and water pipelines; and energy production facilities. If the Service moves forward with the proposal, it should make it clear that these compatible uses will not be restricted in the areas proposed for conservation.

FPL is committed to providing reliable service to its customers, and safe, well-maintained, and fully operational aboveground linear utility facilities, such as transmission lines, are crucial to this mission. Transmission line development and operation is also well-matched to the Service's conservation mission in the proposal. Transmission corridors are conducive to use by local wildlife and do not interfere with the overall connectivity of natural habitats. In fact, transmission line rights-of-way can provide valuable corridors for wildlife. While initial construction may lead to the temporary

displacement of individual plant and animal species from the immediate right-of-way area and a decline in habitat use due to noise and human presence, these displaced species typically re-inhabit the right-of-way area after construction.

After initial construction, transmission lines have a negligible impact on habitat and wildlife. Vegetation in the rights-of-way must be maintained to ensure the safe, reliable operation of the linear facilities, and FPL does this by a variety of methods, including trimming, mowing, and the minimal use of approved growth regulators and herbicides, targeting species that are incompatible with the safe access and operation and maintenance of the transmission system. This removal is minimized and encourages a broad diversity of vegetation growth to remain on the right-of-way, which enhances wildlife use. FPL's right-of-way maintenance program is specific to each location, and a maintenance prescription is often detailed down to the individual spans between poles, allowing location-specific consideration of sensitive areas. In fact, the open effect creates habitat attractive to certain raptors, songbirds, and small mammals, and the lower growing vegetation provides forage for deer and a multitude of other species. The long-term effects of transmission lines and the necessary associated maintenance should not adversely affect regional populations of listed species, and through a carefully planned vegetation maintenance program and proper design of access roads and transmission pads, both existing habitat and hydrology can typically be maintenance, providing for ongoing wetland vegetation and species habitat.

Not only are transmission line rights-of-way compatible with the overall conservation goals of the proposal, they can also be compatible with the public uses envisioned by the Service for the conservation area. Agricultural operations such as grazing and recreational uses such as hiking/biking trails can be compatible with transmission rights-of-way, as long as the activities do not interfere with FPL's full use of the right-of-way and the safe, reliable function of the linear facilities. In the Draft EA, the Service identified only one negative impact of transmission lines in the Conservation Area, related to the visual effect of high-power electrical transmission corridors. However, the Service also admitted that the benefits from restricting these tall structures would be minimal, since much of the landscape has already been altered. Thus, transmission lines necessary for the public good are compatible with the proposal.

Underground linear utility facilities, such as natural gas pipelines and water pipelines, are also a necessary component to energy generation for the benefit of the public and are compatible with the conservation goals in the proposal. Natural gas pipelines provide fuel to FPL power plants in south and central Florida, and water pipelines provide water, including reclaimed water, used in the power production process. As with aboveground linear facilities, during initial construction of underground facilities, there may be some species displacement; however, these areas typically re-vegetate, allowing species to return to the area. In fact, wetlands and grasslands, which are two habitats of importance to the Service, can re-inhabit these areas.

After construction, there is minimal long-term impact to habitat and wildlife, because pipelines are located underground, with only a few metering stations and other associated facilities aboveground. These long rights-of-way with virtually no aboveground structures provide excellent wildlife corridors to connect habitats and conservations areas, which is a goal of the proposal. As with transmission line rights-of-way, vegetation must be managed in pipeline rights-of-way to allow access for inspection and maintenance activities, and to ensure there is no structural risk to the underground facilities. For pipeline right-of-way maintenance activities, FPL employs many of the same methodologies used for the maintenance of transmission line rights-of-way. Vegetation pruning is minimized, herbicide use is limited, and maintenance and/or inspection activities are performed only as necessary. Thus, the potential impacts to wildlife, habitat, and water quality are minimal. In fact,

many pipeline inspections are done remotely because the inspection occurs inside the pipeline itself, further reducing impact in the right-of-way. The design of access roads and associated aboveground facilities also enables much of the existing habitat to be retained or to re-vegetate naturally.

As Florida's population continues to grow, the demand for power production and delivery will only increase, and FPL is committed to meeting this demand with reliable, cost-effective clean energy solutions. The availability of aboveground and underground linear utility facilities is necessary for both the production and supply of energy across Florida, and it is imperative that any actions involving land in the state take these considerations into account. Because Florida is isolated with its only neighboring states to the north, energy and fuel must travel long distances through the peninsula to reach different areas within the state, and linear utility facility routes cannot be obstructed. In addition, clean energy production, especially renewable energy options, should not be precluded in or around the conservation areas. Companies must be encouraged to meet Florida's growing energy demand by developing renewable energy facilities that have negligible environmental impacts, not only on local habitat and wildlife, but also on air and water resources.

If the Service moves forward with the proposal, it should be clarified that transmission lines, natural gas pipelines, and water pipelines are compatible uses in the proposed Conservation Area of otherwise restricted development due to both their minimal environmental impacts and the public benefit provided by these facilities. In order to ensure an ongoing ability to meet customer service obligations, FPL must be allowed to acquire easements for the construction, maintenance, and operation of transmission lines and pipelines, as well as the rights of ingress and egress to the rights-of-way, on the areas outlined in the proposal. Agreements with landowners must be tailored to allow for such uses of the land. FPL requests that the Service record this in the final LPP. FPL also requests that the Service recognize the importance of and opportunities for future clean energy development in and around the proposed area to meet inevitable future energy needs while protecting local resources. Not only do these uses provide a benefit to the public, but they are also compatible with the overall mission of the Service to connect existing conservation lands, further protect watershed and wildlife corridors, and enhance the overall ecological functioning of the Kissimmee River Basin.

Service's Response:
Comment noted. The authority for the Service to consider requests for rights-of-way is the National Wildlife Refuge System Improvement Act [16 USC 668dd(d)]. Requests are subject to appropriate use policy (603 FW 1), compatibility policy (603 FW 2), and the National Environmental Policy Act. The Service will acquire fee-title or conservation-easement interests with existing utility easements in place. If a utility company requests a modification to an existing utility easement subsequent to the time the Service acquires fee-title ownership or a conservation easement on a particular property, the refuge will consider the request on a case-by-case basis. If a utility company requests a new utility easement on refuge property or over a conservation easement held by the Service, the biological impact of the utility easement will be determined by the refuge manager. For conservation easements, a final decision will be made by the refuge manager and the underlying fee owner, also on a case-by-case basis. There is no national policy for granting or refusing a utility easement over and across pre-existing Service conservation easements.

Comment:
The Draft Environmental Assessment acknowledges the presence of Gulfstream's pipeline but does not discuss how Gulfstream and the proposed Everglades Headwaters NWR and Conservation Area will co-exist. We want to ensure that Gulfstream will continue to have access to the pipeline and its rights-of-way for operations, repairs, and maintenance. Gulfstream must also have access and the ability to expand the pipeline in the future, as necessary and as approved by FERC, to serve the growing demand for natural gas in Florida, including expanding its existing rights-of-way, as necessary.

Gulfstream notes that the exact property parcels that will be included in the Everglades Headwaters NWR and Conservation Area have not yet been determined and will only be known after the property rights are acquired by FWS. Gulfstream's pipeline lies within the study area of the lands potentially to be included in the refuge. Gulfstream, therefore, reserves the right to submit further comments related to this proposal when Gulfstream can fully access the impacts the proposal may or may not have on its pipeline system. Gulfstream respectfully requests that the FWS consider Gulfstream's ongoing operations and future expansions.

Service's Response:
Comment noted. The authority for the Service to consider requests for rights-of-way is the National Wildlife Refuge System Improvement Act [16 U.S.C. 668dd(d)]. Requests are subject to appropriate use policy (603 FW 1), compatibility policy (603 FW 2), and the National Environmental Policy Act. The Service will acquire fee-title or conservation-easement interests with existing utility easements in place. If a utility company requests a modification to an existing utility easement subsequent to the time the Service acquires fee-title ownership or a conservation easement on a particular property, the refuge will consider the request on a case-by-case basis. If a utility company requests a new utility easement on refuge property or over a conservation easement held by the Service, the biological impact of the utility easement will be determined by the refuge manager. For conservation easements, a final decision will be made by the refuge manager and the underlying fee owner, also on a case-by-case basis. There is no national policy for granting or refusing a utility easement over and across pre-existing Service conservation easements.

General/Other Comments

Water Rights of the Seminole Tribe of Florida

Comment:
The Seminole Tribe's water rights have been formalized in The Water Rights Compact of 1987, ratified by both the United States Congress and the Florida Legislature. The Compact sets forth water entitlements to the Seminole Tribe including to the Brighton Seminole Indian Reservation. Based on the Land Protection Plan and Environmental Assessment, it appears that the United States Fish and Wildlife Service is planning on restoring or mimicking natural hydrological/ecological processes. This goal includes the restoration of approximately 8,846 acres of wetlands acquired in fee-title and exploring opportunities for the restoration of 237,000 acres of wetlands with the Conservation Partnership Area. In addition to the water demands for restoration, the proposed Everglades Headwaters NWR and Conservation Area will have water demands to support their desired ecological/hydrological functions. The Service has acknowledged in the Environmental Assessment that it does not yet know how much water will be needed to achieve its stated goals. We are concerned that the water demands for both may impact the Seminole Tribe's water entitlements, especially during drought conditions. We therefore request that the Service continue its consultation with the Seminole Tribe to further discuss its water demands.

Service's Response:
Comment noted. The Service is currently in formal consultation with the Seminole Tribe of Florida to address issues of concern of the tribe. Protection and restoration within the Everglades Headwaters NWR and Conservation Area will contribute to the protection of the Seminoles Tribe's water rights, particularly during dry and drought conditions. As detailed below, the project will protect existing function of lands and restore function of degraded land which attenuate peak flood flows and extend flow from runoff and soil storage into dry and drought conditions. The project calls for restoring natural periods of wet and dry conditions on the land. It is therefore desirable for acquired and managed lands to become naturally dry during drought conditions. No added use of water during drought conditions to maintain wetter than natural conditions on these lands is proposed.

The isolated wetlands that characterize those found in wet and dry prairies of the Kissimmee River range from those that are ephemeral which might lose all surface water within days of being flooded, to seasonal wetlands that will hold water seasonally, to ones that persist annually. Hence, during years of normal rainfall, one would expect to find a range of wetlands across a hydrologically intact landscape. Rainfall is the primary source of water for the isolated wetlands in the Kissimmee River Basin. In naturally functioning wetlands, water is lost through evaporation and seepage. A component of the water that seeps into the ground travels through sub-surface features (i.e., aquifers), which lessens drought impacts by recharging the Surficial aquifer. This groundwater can also end up in waterways such as the Kissimmee River. During periods of high rainfall, wetlands absorb water until filled, at which point most of the excess becomes surface runoff. In a sense, wetlands can be viewed as a "porous storage system" that absorb water and gradually release water to down-hill areas during periods of low rainfall.

Existing drainage ditches act to lower the water table and decrease the time water spends on the surface and in soils. This can result in the loss of many of the shallower wetlands and increase the likelihood that deeper wetlands run dry every year or during drought years. Hence, the natural water-storage ability of the wetlands is compromised in these altered systems. At the basin level, a growing network of drainage systems, an increase in the area of impervious surfaces, and other factors has had a profound effect on the hydrologic functioning of the Kissimmee River watershed. According to a study conducted by USACE, the flow regime in this basin has undergone a major shift and is now predominantly surface runoff with increased volume discharged at a faster rate during flood events (USACE 1991) which leaves less volume available to support base drought flow of streams, and for groundwater recharge. These flood waters either end up in Lake Okeechobee as storage, or more often than not, end up being rapidly discharged to the estuaries, causing harm.

Alternative C states approximately 23,065.4 acres of non-functioning wetlands could potentially be restored. This wetlands acreage is derived from the 130,000-acre Conservation Focal Area, of which only 50,000 acres would become fee-title refuge lands. Thus, the 23,065.4-acre value represents a high approximation, and the eventual wetlands acreage available for restoration will be less, based on the actual parcels purchased. In general, restoration of wetlands will primarily be conducted through filling or plugging ditches or placing stop log riser water control structures. Mitigating some of the sources of water loss caused by ditches will help the targeted wetlands store rain longer, regaining some of their hydrological functions such as improved water quality, groundwater recharge, and contribution to drought flow. As such, this project does not include plans to divert water to restore wetlands by changing existing water management actions to keep wetlands supplied with water during drought years.

Citation:
U.S. Army Corps of Engineers. 1991. Final Integrated Feasibility Report and Environmental Impact Statement, Environmental Restoration, Kissimmee River, Florida. U.S. Army Corps of Engineers. Jacksonville, Florida. http://www.saj.usace.army.mil/Divisions/Operations/Branches/SFOO/KRR/DOCS/kiss_re_study.pdf Accessed: November 2011.

Grazing Rights of Seminole Tribe Members

Comment:
As the Draft LLP acknowledges, the action area is heavily utilized as grazing pasture. The Service's trust obligation to the Seminole Tribe requires the Service to support the Seminole Tribe's economic opportunities. Therefore, the Service should preserve any grazing rights that Seminole Tribal members may have within the action area.

Service's Response:
Comment noted. The Service is currently in formal consultation with the Seminole Tribe of Florida to address issues of concern of the tribe. The Service recognizes the potential for tribal members of the Seminole Tribe of Florida to have grazing leases in this landscape - either in the past, currently, or in the future. For properties upon which the Service will acquire a conservation easement, pre-existing or future grazing leases between tribal members and private landowners will continue at the discretion of the private landowner. The Service will hold no easement right to control grazing leases on lands encumbered with a conservation easement.

For those properties that the Service will acquire in fee-title, the Service will evaluate whether or not grazing will continue on those lands in order to meet refuge management goals and objectives. If grazing is continued on a particular property, the pre-existing landowner will have the right of first refusal to obtain the grazing lease to that particular property. The second right of refusal will be for any pre-existing leaseholder, including any tribal member who held the lease at the time of title transfer. If neither the former landowner nor leaseholder is interested in obtaining the grazing lease to said property, the grazing lease will be publically offered. If grazing is discontinued on a particular property, the Service will work with the pre-existing owner or lease holder, to develop a timetable for the removal of cattle and any associated equipment or materials.

Economy and Socio-economic Benefits

Comments:
Multiple comments were submitted claiming that the proposal would support new jobs and local economies or that the proposal would threaten new jobs and local economies.

Multiple commenters supported the proposal and its positive impact on local economies. This area is a major tourist area, both American and International. People come from all over the world to see the Everglades and southwest Florida. The Everglades is a national treasure that attracts millions of visitors each year. The proposal helps protect water quality and wildlife, thus protecting this element of the economy. Without water and wildlife, the eco-tourists will leave the state, negatively impacting our economy. The current news is "We need jobs, we need jobs." One of the largest money makers in Florida is the tourist business because it feeds a lot of businesses. Are we considering any compatible land uses for this project that will stimulate tourists to come here? How about a network of nature paths for use by bird watchers and wheelchair-bound nature lovers? And bicyclists and serious hikers – perhaps with some campgrounds along the way? The proposed easements help cattle ranches stay in business and protect ranching jobs. Local economies will benefit from

increased outdoor activities associated with new areas acquired for the proposed refuge, which may include hunting, fishing, wildlife observation, photography, interpretation, and education, as deemed appropriate in each area. We wish to preserve the heritage of our region, and in the process protect the jobs that go along with commercial agriculture and outdoor pursuits; we endorse the vision and goals of the proposal. The proposal would be a tremendous benefit to those whose livelihoods depend on Florida's natural areas and abundant wildlife. If leaders make the wrong decision and not approve projects such as the Everglades Headwaters proposal, it will jeopardize the tourist industry; silt runoff from the Everglades system is killing out coral reefs; this will end Florida's scuba diving and fishing industry, which will account for billions in lost revenue and potentially millions of jobs. The proposal will sustain Florida's ranching economy and way of life by bringing conservation dollars to bear – thus maintaining private land ownership and delivering conservation benefits. The proposal would have a good economic impact on the area and would allow opportunities for new eco-tourism business to develop in the area. Parks, preserves, and wildlife management areas bring people with money and with that come jobs. Despite the recent downturn in migration, baby-boomers will retire to Florida, bringing development pressure and opportunity; counties near large preserves will certainly be a draw for people looking to retire and have easy access to parks.

Multiple commenters expressed that the proposal would not support local economies. Under the No Action Alternative, job creation would be greatly enhanced by the USFWS and the partners losing their ability to use headwaters as a tool to block and escalate costs of necessary highway construction or enhancements and green energy production (e.g., wind and solar). Under the No Action Alternative, local rural cultures would be assured by current economic conditions and cessation of speculative land purchases leading to over development. If you can't graze cattle, cut hay, grow sod, and conduct other activities under these conservation easements, what do you think is going to happen to your local hardware stores, local tractor supply stores, local parts store, gas stations, feed stores, grocery stores, and the like? Does anyone think that the conservation easements will create jobs; jobs where money earned in Highlands County will be spent in Highlands County? Given the condition of the economy and the marginal nature of the actual improvements anticipated, I request that you select the No Action Alternative.

Consider the economic impact of the proposal to the people who rely on the waters and lands for their well being.

Multiple commenters supported the No Action Alternative, since it did not threaten future federal actions that would devalue private property and make private properties less useful for the purposes for which they were acquired.

Service's Response:
Comments noted. Benefits to the local economies are expected under Alternative C.

Recreational use on national wildlife refuges generated almost $1.7 billion in total economic activity during Fiscal Year 2006, according to the Service's *Banking on Nature 2006: The Economic Benefits to Local Communities of National Wildlife Refuge Visitation* report (Carver and Caudill 2007). According to the Banking on Nature study, nearly 35 million people visited national wildlife refuges in 2006, supporting almost 27,000 private sector jobs and producing about $543 million in employment income (Carver and Caudill 2007). In addition, recreational spending on refuges generated nearly $185.3 million in tax revenue at the local, county, state, and federal levels (Carver and Caudill 2007). An estimated 87 percent of refuge visitors travel from outside the local area (Carver and Caudill 2007).

Comment:
We would like to see additional information included about the economic benefits refuges provide to local communities.

Service's Response:
Comment noted. Recreational use on national wildlife refuges generated almost $1.7 billion in total economic activity during Fiscal Year 2006, according to the Service's *Banking on Nature 2006: The Economic Benefits to Local Communities of National Wildlife Refuge Visitation* report (Carver and Caudill 2007). According to the Banking on Nature study, nearly 35 million people visited national wildlife refuges in 2006, supporting almost 27,000 private sector jobs and producing about $543 million in employment income (Carver and Caudill 2007). In addition, recreational spending on refuges generated nearly $185.3 million in tax revenue at the local, county, state, and federal levels (Carver and Caudill 2007). An estimated 87 percent of refuge visitors travel from outside the local area (Carver and Caudill 2007).

Ecosystem Services

Comment:
The Arthur R. Marshall Foundation and Florida Environmental Institute, Inc., submitted detailed calculations valuing ecosystem services for the proposal. Based on benefits transfer using the Costanza Synthesis of 130.8 million acres over 40 years, the Ecosystem Services Value is calculated conservatively as $109.1 billion. Further, cost avoidance is not included in this value, which would increase this value. A recent release (White House, July 2011), Report to the President – Sustaining Natural Capital – Protecting Society and the Economy, recommends that the Department of Interior, U.S. Army Corps of Engineers, National Oceanic and Atmospheric Administration, U.S. Department of Agriculture, and other federal agencies adopt a rigorous approach to ecosystem services valuation. Detailed benefits analysis reveals the total economic value to be in the mega-billions, with Benefit/Cost ratios exceeding 20:1.

Service's Response:
Comment noted.

Comment:
Defenders of Wildlife feels that the Final LPP and Final EA should include more analysis of the ecological, recreational, and economic benefits of ecosystem services in determining cost-effectiveness of establishing the Everglades Headwaters NWR and Conservation Area. In our scoping comments, we called the following to your attention: "According to Service policy, an 'LPP should indicate the most cost-effective approach to solving the problem and meeting the objectives…The alternative selected is the one that provides the minimum level of protection needed and is a cost effective means of achieving project objectives (U.S. Fish and Wildlife Service, 341 FW 2 Land Acquisition Planning, 1996). In its assessment of cost-effectiveness, the Service should consider the value of ecosystem services such as soil stabilization, water filtration, nutrient cycling, carbon sequestration, pollination, and insect pest control. Protecting these naturally provided services supports wildlife populations, as well as human health and welfare. Without protection, these services may need to be artificially replaced at high costs to governments and taxpayers. The Final LPP and Final EA should include an assessment of how the relative value of ecosystem services will be affected by the various alternatives and land acquisition methods (e.g., fee-title or conservation easement).

The public derives a multitude of benefits (e.g., drinking water, clean air, nutrient cycling, and carbon sequestration) from ecosystem services provided by conservation and ranch lands within the proposed national wildlife refuge and conservation area. The economic benefits of these ecosystem services are not well recognized and often undervalued by the public and decision-makers. The Final LPP and Final EA should explain in more detail the tremendous cost-savings and contributions to local economies that are generated from healthy natural and working lands. Information on benefits to human and ecological health would demonstrate the advantages to working with public and willing private landowners to establish the Everglades Headwaters NWR and Conservation Area.

Service's Response:
Comment noted. The Service has evaluated the alternatives and selected the one that provides the minimum level of protection needed and is a cost-effective means of achieving project objectives. Selection of Alternative C and its reliance on conservation easements for a majority of the project's land acquisition objectives demonstrates the minimum level needed in the most cost-effective means available to the Service. The Service is currently evaluating ecosystem services values, which can be used as a measure to document the benefits of the project to human and ecological health.

Comment:
The FDEP and SFWMD encourages the USFWS to continue to emphasize the importance of the economic value of ecosystem services provided by the lands acquired, as natural storage of water on these lands may reduce the need for costly infrastructure.

Service's Response:
Comment noted.

Future Generations

Comments:
Numerous commenters supported the proposal for future generations. I want to see the entire Everglades system alive and thriving for my grandchildren and their children. It is imperative that the health and beauty of our state be preserved, not only to maintain the natural balance of nature, but so that it may be enjoyed by many future generations to come. This area is a treasure and conservation of its water resources, habitat, wildlife, and natural beauty will be a gift to future generations. We owe the future a chance to experience authentic Florida and not a facsimile. The region being considered is without doubt the last extent of relatively undeveloped land in this state, and even this remote area is severely threatened by human development pressures and by the introduction of exotic flora and fauna. We must make every effort to save it for future generations while there is still the opportunity. This proposal is an investment in Florida's future. I relish this opportunity to leave a legacy that is both environmentally sound and necessary for the next generation to enjoy usable water. The cost to do this project will seem small in the future as all future generations will benefit from it.

Service's Response:
Comments noted.

Public Health

Comments:
Multiple comments were submitted in support of the proposal to help support healthy humans. We need to improve the quality of our lands through conservation areas such as in the proposal so that we keep our children healthy. A healthy environment means healthy humans, too.

Service's Response:
Comment noted.

Development Patterns/Pressure

Comments:
Multiple commenters expressed concerns over the impact of development and development pressures and the need for the proposal. With the encroachment of urban development in this area, maintaining the remaining habitat for wildlife is essential. This proposal helps do that. Protection of these habitats and wetlands become more important as more wetlands are turned into housing developments. Once these lands are gone they can never be re-claimed. Uncontrolled population growth, rather than conservation, in these areas would drain this precious water source, causing shortages elsewhere. If there is any hope for Florida, it will be in these small conservation areas. Most waterways in Florida are a disaster. Wildlife has seriously decreased. Human pollution is rampant. And an outdoor lifestyle that many people previously enjoyed is slowly declining. I support this proposal to help address these concerns. Florida has changed dramatically since the 1950s. Citrus, cattle, and fishing were replaced by an economic engine that rendered orange groves into subdivisions; working ranches into cities; and fish camps into exclusive condos with private docks. Urban sprawl devoured old Florida and replaced it with a homogeneous tedium of identical strip malls and subdivisions with names that had no historical or cultural association with the land they covered. The Kissimmee River Basin is one undeveloped area that should be protected. We have seen other parts of Florida grow and develop in ways that are not sustainable, and in the process, lost the specialness of their landscapes. We do not want that to happen in the Kissimmee River Valley. We endorse the vision and goals of the proposal. Urban development has already taken or reduced many environmentally important areas in Florida. The proposed refuge and conservation area will connect habitats, provide more opportunities for recreation, and improve water quality and quantity. We need more land under conservation to begin to balance the extreme development that has ruined water quality, the amount of farmland available for growing food, and the pollutants from sugar plantations. Conservation efforts should have preserved and protected more land before development occurred; this proposal may be our last chance to preserve land that is critical to our future water sources, as well as to healthy Everglades ecology.

Service's Response:
Comments noted.

Comment:
I doubt that Florida's population will double by 2060. I believe Zwick used strange methods of this estimate. (pg. 79)

Service's Response:
Comment noted. The Zwick and Carr (2006) Florida 2060 study was a population distribution scenario study for the State of Florida. The Florida 2060 study used population projections derived from data from the Bureau of Economic and Business Research.

Vision and Goals

Comment:
We support the vision and goals of the proposal, but not every word or concept in the Draft LPP and Draft EA, since they will likely need refinement. The proposal offers the best and perhaps last hope of saving what remains of "Old Florida" in this part of our state.

Service's Response:
Comment noted.

Comment:
The proposed Vision is well stated and we strongly support it.

Service's Response:
Comment noted.

Alternatives

Comment:
Numerous comments were received in support of either Alternative A (No Action Alternative; i.e., no refuge) or Alternative C (Conservation Partnership Approach, Proposed Action; i.e., proposed refuge and conservation area).

Service's Response:
Comments noted. The Draft EA analyzed the impacts associated with the three alternatives, determining that Alternative C best met the shared long-term vision and goals for this landscape and that Alternative A would have an adverse impact to the area's valuable wildlife and habitats.

Comment:
The Nature Conservancy strongly supports Alternative C - the Conservation Partnership Approach (Proposed Action) - as the proposed action as detailed and justified in the Draft EA and stated in the Draft LPP

Service's Response:
Comment noted.

Comment:
Section III of the Draft EA – Alternatives is well done and excellent justification is ultimately presented for recommending that Alternative C (the Conservation Partnership Approach – Proposed Action) be adopted and implemented. The four major Goals are well stated and are consistent with what has been long discussed at numerous meetings, public hearings, etc. The section on how the Alternatives were formulated seems accurate and scientifically valid in terms of priority habitats and connectivity concerns. Throughout the long section describing and analyzing the three Alternatives, the text was complete and compelling and the maps were extremely helpful.

Service's Response:
Comment noted.

Comment:
Section IV of the Draft EA – the Environmental Consequences section – seems well done and justified. The analysis of Beneficial vs. Adverse impacts for all Alternatives for a suite of environmental factors and animal and plant species seems compelling and thoroughly crafted and documented. A specific example from page 221 of the Draft EA will suffice as illustrative of the kinds of information and analysis discussed in this section: "As a result, there is a real possibility the selection of the No Action Alternative would promote the extinction of the Florida grasshopper sparrow or the extirpation of the species from the wild (with only captive specimens remaining)." Such statements really drive home the point of the unacceptability of Alternative A, the No Action Alternative.

Service's Response:
Comment noted.

Comment:
Alternative C includes much more diverse habitat than Alternative B. Alternative C in the future will greatly benefit hunters and fishermen. With Florida's population growth, Alternative C will be good for farmers and ranchers interested in easements for future agriculture and conservation.

Service's Response:
Comment noted.

Comment:
The FWC finds the proposed alternative to be consistent with our authorities under the Coastal Zone Management Act/Florida Coastal Management Plan. The FWC continues to appreciate the opportunity to comment on the FWS's conservation efforts in the south-central Florida region.

Service's Response:
Comment noted.

Planning Process

Comment:
This plan should be an EIS.

Service's Response:
Comment noted. NEPA requires that decisions be made with public involvement in a transparent way and provides us three different venues through which we can make those decisions: categorical exclusion from further NEPA documentation with an Environmental Action Statement, environmental assessment and Finding of No Significant Impact where impacts are determined to not be significant, or an environmental impact statement and a record of decision to analyze significant impacts. We believe we have fully complied with NEPA and considered a reasonable range of alternatives in accordance with the Service's Land Acquisition Policies [e.g. 341 FW 1 and 341 FW 2].

Comment:
The entire process for this proposal is unconstitutional as it violates the 10th amendment.

Service's Response:
Comment noted. Refuge lands can be acquired under various legislative and administrative authorities for specified purposes. Establishment of and land acquisition for the proposed Everglades Headwaters NWR and Conservation Area would be authorized by the National Wildlife Refuge System Administration Act, Endangered Species Act, Emergency Wetlands Resources Act, Migratory Bird Conservation Act, Fish and Wildlife Act, and Refuge Recreation Act. The purposes of a refuge are derived from legislative authorities that established the refuge.

Comment:
The Service should continue to engage all interested members of the public throughout the planning process. This includes encouraging broad involvement in planning discussions as well as actively working to educate concerned groups about the objectives and elements of the proposal.

Service's Response:
Comment noted. The Service extended the public review and comment period from 6 weeks to 10 weeks to provide additional time for the public. Further, the Service has offered and has been providing informational presentations about the proposal throughout the public review and comment period with over 15 presentations given in addition to the two open house and public hearing events.

Comment:
Outreach to Florida residents took place but outreach to national taxpayers was minimal to absent.

Service's Response:
Comment noted. A notice of intent was published in the *Federal Register* on January 12, 2011, announcing the intent to develop a Land Protection Plan and associated NEPA documents. A notice of availability of the Draft LPP and Draft EA was published in the *Federal Register* on September 8, 2011. A notice of comment extension was posted in the Reading Room at 8:45 a.m. on October 24, 2011, and published in the *Federal Register* on October 26, 2011. Further, numerous news articles appeared in local and national media outlets. For additional information, please see the public participation section in this Final EA.

Comment:
I object to The Nature Conservancy and National Wildlife Refuge Association attending the November meeting and acting as agents of USFWS. These groups are not at all representative of the general American public and should never be allowed to be stand ins.

Service's Response:
Comment noted. These groups were not acting as representatives for the American public, but were serving as contractors and thus an agent of the Service. The Service contracted with the National Wildlife Refuge Association (NWRA) to assist in the development of the planning documents, since NWRA has much experience with land protection planning efforts of the Refuge System across the country. NWRA then subcontracted with The Nature Conservancy, due to its expertise in this landscape.

Comment:
The bibliography is almost 20 years old minimum and some much older than that. Certainly not the latest and greatest in planning information.

Service's Response:
Comment noted. The list of references includes historic information to current data, ranging from 1887 to 2011.

Comment:
The Draft EA contains substantial important information on the Study Area for the proposed Everglades Headwaters NWR and Conservation Area and we appreciate the enormous effort by the Service to assemble such a document. Both the Draft LPP and Draft EA are clear and easy to understand and their organization is excellent. The data compiled in the Draft EA will be useful to many biologists for decades to come.

Service's Response:
Comment noted.

Comment:
The purpose of the new Everglades Headwaters NWR and Conservation Area is well stated, as are the threats to the ecological integrity and biological diversity of the Kissimmee Valley Basin.

Service's Response:
Comment noted.

Comment:
The well-documented timeline of the public input process is very well done and should help deflect any criticism that this was not a well-announced and/or publicized process with ample opportunity for everyone concerned to provide comments.

Service's Response:
Comment noted.

Comment:
The enumeration of various conservation programs, partners, and planning initiatives is well done. Either within or separate to the Green Horizons Land Trust section, the Conservancy encourages the Service to recognize the efforts of other conservation organizations within the landscape partnership effort.

Service's Response:
Comment noted.

Comments:
NEPA-required public meetings: The Service claims the refuge proposal was put together by members of the public. But the Florida sportsman's organizations were never asked about this proposal and it wasn't put together by sportsman's organizations of the local general public. Representatives of the major Florida sportsman's organizations were certainly not invited to participate in early planning discussions, possibly because local sportsmen have extensive experience with Department of Interior activities and procedures, and they are renowned in Florida for thoroughly scrutinizing land acquisition and management proposals.

The Service held four public meetings earlier this year and citizen participants, approximately 80 percent, vehemently opposed the concept of establishing a federal refuge. Yet the proposal continued to move forward anyway, but at least with the comment period extended at sportsmen's request.

Service's Response:
Comments noted. Although between 200 and 665 people attended the four public scoping meetings early in 2011, over 38,500 comments were received on the proposal during the public scoping period. Further, during the public review and comment period on the proposal, the two public hearings had 68 and 54 attendees and over 2,300 comments were received.

Comment:
Two of the public hearings on the final plan were "coincidentally" timed for back-to-back weekends for which it was widely known that major sportsman events were scheduled, virtually assuring that the segment of the public most able to discern bureaucratic slight of hand on this issue would not be able to turn out in large numbers. But, by this time, concerns expressed earlier by sportsmen had started to get out, and despite sportsmen being unable to attend, public support and opposition were evenly split at both meetings--not an overwhelming mandate for a project of this magnitude.

Service's Response:
Comment noted. The dates of the two public hearings during the public review and comment period were selected based on the desire to accommodate attendees expressed desire to have meetings not on a week night, and based upon the availability of venues of appropriate size to accommodate the anticipated high numbers of attendees, given the high interest during the scoping period. Further, the public hearing dates were selected to occur around the middle of the public review and comment period to allow interested parties time to review the materials before the hearings and time to compile comments before the end of the public review and comment period. In response to requests for an extension, the Service subsequently extended the public review and comment deadline from October 24, 2011 to November 25, 2011, to provide additional time for the submission of comments on the proposal.

Comment:
The Florida Airboat Association is greatly disturbed that the establishment of a federal land unit so massive and so enormously expensive (a conservative $700 million in the first phase alone) could even be possible without the safeguards and oversight of congressional authorization. It is hard to believe, but what is happening before our eyes is the creation through incremental expansions not authorized by Congress of the largest national wildlife refuge in the State of Florida.

Service's Response:
Comment noted. The cost estimates from the Preliminary Project Proposal were conservative estimates made at a preliminary stage in the planning process before detailed planning began. The cost estimates have since been updated with the development of the draft and final documents. The final cost estimate is now $398 million, based on current market values.

Comment:
Your staff told me that it would be half a century. Put a table in there or a schedule of what you intend to do.

Service's Response:
Comment noted. The timing of acquisitions would be dependent upon a variety of factors so variable that a timetable would be meaningless. Factors influencing acquisitions would include market conditions, available funding, and willingness of sellers.

Florida Panther NWR

Comment:
As the Everglades Headwaters NWR and Conservation Area proposal moves toward implementation, it is very important that the Service recognize the vital need to prioritize expansion of the Florida Panther NWR. Failing to secure the panther in its occupied range and facilitate northward expansion across the Caloosahatchee River diminishes the ecological significance of the habitat and linkages in the northern Everglades project area. Moving forward with expansion of the Florida Panther NWR is critical to the entire Greater Everglades Partnership Initiative, because of the keystone nature of the panther's habitat. With a large number of willing landowners, critical Florida panther recovery needs, landscape level restoration opportunities, and the chance to invest in the economic future of Florida ranch lands, this expansion would be a strategic next step in the Partnership Initiative.

Service's Response:
Comment noted. The potential expansion of Florida Panther NWR is a planning process separate and apart from the planning process for the proposed Everglades Headwaters NWR and Conservation Area. If a proposed expansion were to move forward for Florida Panther NWR, it would have a separate notification and planning process.

Comment:
We believe that far greater attention will need to be paid in securing less disturbed and more ecologically intact, prime panther habitat during the development of future phases of the Greater Everglades Partnership Initiative (i.e., expansion of the Florida Panther Refuge).

Service's Response:
Comment noted.

General

Comment:
This is a special interest refuge without citizen's rights to choose.

Service's Response:
Comment noted.

Comment:
As the State of Florida continues to dissolve public watchdog of development like the Department of Community Affairs and roll back regulatory oversight, the role of the Federal Government to achieve a balance between growth and conservation has never been greater. The people of Florida support conserving the land that is left for imperiled species, ecosystem integrity, and future generations of Floridians.

Service's Response:
Comment noted.

Comment:
This is a bold initiative that serves as a model for achieving conservation results that benefit wildlife and people throughout the country.

Service's Response:
Comment noted.

Comments:
Multiple commenters expressed that Florida's elected officials' oaths of offices would be upheld under the No Action Alternative.

Service's Response:
Comments noted. The proposal is a federal proposal, not a local or state proposal.

Comments:
Multiple commenters expressed that under the No Action Alternative, the ability of environmental organizations to litigate over federal land management issues would be prevented/reduced, since those lands would remain in private ownership. Federal ownership and jurisdiction opens the door widely for these opportunistic/predatory lawsuits.

Service's Response:
Comments noted.

Comment:
The proposal is supported by the writings and work of the late Arthur R. Marshall, the late Johnny Jones, the late Dr. Larry D. Harris, and writer Richard Louv, as well as by Teddy Roosevelt, a U.S. President who fully understood the need to conserve natural resources.

Service's Response:
Comment noted.

Comments:
Multiple comments expressed that the proposal supports military readiness by creating buffer areas around strategic training grounds.

Service's Response:
Comments noted. The Service continues to work closely with Avon Park Air Force Range to support common goals and objectives.

Comments:
We understand that for agriculture to be viable it must have critical mass. We understand that for there to be fish to catch and animals to hunt there must be sufficient water and land to support sustainable populations. We understand that for those engaged in nature study there must be enough undeveloped land for ecosystems to function. And, most important, we understand that in order for Floridians to co-exist with each other and with nature there must be water of sufficient quality and quantity. The Draft LPP/Draft EA would go a long way towards achieving these necessities.

Service's Response:
Comments noted.

Comment:
Allowing Florida's habitats and waterways to connect and flow naturally will make our state more beautiful, abundant, and safe for its people and wildlife alike.

Service's Response:
Comment noted.

Comment:
Our quality of life will benefit from this refuge.

Service's Response:
Comment noted.

Comment:
The Service must open hunting on the national wildlife refuges it currently owns in south Florida and get past the litigations that will for sure follow any decision to open hunting on these refuges (i.e., Florida Panther NWR and Loxahatchee NWR). Until the Service makes needed changes to the purposes for the proposal and opens hunting on refuges in south Florida, and until the anti-hunting attacks are resolved in the Big Cypress National Preserve, I cannot support the Headwaters NWR and recommend that the Service put their plans on hold until we see what happens with the above issues.

Service's Response:
Comment noted.

Comment:
Multiple commenters suggested that a new refuge was not needed and that the enforcement of existing laws would be sufficient.

Service's Response:
Comment noted. The Draft EA outlined that negative impacts to a variety of resources would be anticipated under the No Action Alternative.

Comment:
Lake Okeechobee is practically the only area remaining for airboaters in Palm Beach County. Conservation Area 1 has been closed since the early 1960s and areas 2 and 3 are continually threatened.

Service's Response:
Comment noted.

Comment:
These lands belong to Indians.

Service's Response:
Comment noted. Although both the Seminole Tribe of Florida and the Miccosukee Tribe of Indians of Florida have interest in the Kissimmee River Valley landscape, properties within the Conservation Partnership Area are owned by a variety of entities, including individuals, businesses, corporations, and organizations, as well as state and federal governments. Further, the Service is in formal consultation with the Seminole Tribe of Florida and with the Miccosukee Tribe of Indians of Florida to consult on issues of concern in this landscape.

Comment:
Many of the areas on the map are already protected.

Service's Response:
Comment noted. The Service aims to work with the conservation partners in this landscape to increase connectivity between existing conservation lands.

Comment:
We applaud the efforts to establish this refuge concept in the headwaters of the Kissimmee River as well as the commitment to allowing the ranching community to continue while setting up mechanisms to preserve natural communities in this critical area of the state. We believe that it will complement similar protective measures that have been established for the nearby Green Swamp, which is the headwaters for the Withlacoochee, Hillsborough, and Peace Rivers, as well as the Kissimmee River.

Service's Response:
Comment noted.

Comment:
I think the Service should encourage the State of Florida to use its tax dollars to buy up some of this land.

Service's Response:
Comment noted.

Comment:
The proposal will support military readiness by creating buffer areas around strategic training grounds.

Service's Response:
Comment noted. The Service is working with the Avon Park Bombing Range and other partners in the Kissimmee River Basin to serve common goals and increase the functionality of this important landscape.

Comment:
This is a bold initiative that serves as a model for achieving conservation results that benefit wildlife and people throughout this country.

Service's Response:
Comment noted.

Comment:
We do not need the Federal Government telling us how to manage our lands.

Service's Response:
Comment noted. The Service will work with willing sellers. Those who are not willing are not required to participate in the Everglades Headwaters NWR and Conservation Area.

Comment:
There is too much room for the Service to alter interpretations of any agreements on farming, ranching, and recreational or traditional uses.

Service's Response:
Comment noted. Any conservation easements would be negotiated with the willing landowner where both the Service and the landowner agree on the conditions. Further, the Service is working with FWC to develop a Memorandum of Understanding to include the refuge in the state's WMA program. And, the Interim Compatibility Determinations in Appendix B of the Final LPP outline a variety of recreational uses for the refuge: hunting, fishing, environmental education and interpretation, wildlife observation and photography, ORV use (on designated roads and trails in support of research and hunting), camping, hiking, horseback riding, and bicycling.

Comment:
Based on the information contained in the Draft LPP/Draft EA and agency comments, the state has determined that the proposed federal action is consistent with the Florida Coastal Management Program (FCMP). To ensure the project's continued consistency with the FCMP, the concerns identified by our reviewing agencies must be addressed prior to project implementation. 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.

Service's Response:
Comment noted.

Comment:
The four overarching goals for the proposed Everglades Headwaters NWR and Conservation Area do not appear to be in conflict with the state's Everglades restoration efforts. The goals are to restore habitat connectivity and ecological integrity, maintain and restore habitat for listed and more common

species, contribute to water quality and quantit and water storage capacity of the Northern Everglades watershed to support the Everglades restoration goals and objectives and water quality and supply for central and south Florida, and provide for compatible recreational opportunities.

Service's Response:
Comment noted.

Comment:
It is important for all to understand that support for the refuge proposal is coming primarily from large landowners who stand to profit, but who do not understand how challenging it is to partner with the Department of Interior. It is also supported by certain national environmental groups whose long-term goal is to eventually create Wilderness Areas throughout America's core into which access by human beings is virtually prohibited. The acquisition does not have the support of the general public, especially by those familiar with the big picture.

Service's Response:
Comment noted.

Comment:
We appreciate the efforts of the Service staff to meet with landowners to explain the goals of the program, the intended outcomes or the hoped for outcomes, and to work cooperatively with landowners. We don't see that as a threat to private landownership, and we very much appreciate the unusual initiative. There was great outreach.

Service's Response:
Comment noted.

Comment:
Areas not considered are not defined in the plan; please add those areas.

Service's Response:
Comment noted.

Comment:
We are asking that our lands be given a safe harbor from any flora and fauna that is introduced into the wild by any government agency or conservation group.

Service's Response:
Comment noted. Safe Harbor Agreements are a regulatory process and are not part of the land protection planning process. In a Safe Harbor Agreement, the landowner agrees to maintain, create, restore, or improve habitat for threatened or endangered species. Safe Harbor Agreements are voluntary agreements between the Service and cooperating non-federal landowners. They are designed to benefit federally listed threatened and endangered species by giving landowners assurances that at no future time would the Service impose restrictions on its land as a result of conservation actions. In other words, these agreements essentially relieve landowners of liability under the Endangered Species Act if conservation practices on their land attract and/or perpetuate federally listed species.

Thus, at the time of a conservation action by the Service, an adjacent landowner to the refuge could apply for a Safe Harbor Agreement (under Section 10 of the Endangered Species Act), if the landowner and the Service think that restoration activities on the refuge may result in listed species eventually occupying the landowner's property. The Service will not undertake any such conservation actions within the project area until after project approval and lands are acquired.

Comment:
The Florida Airboat Association's belief is that until substantial changes to the Endangered Species Act are accomplished, the Everglades Headwaters NWR would only provide a gateway for extremist environmental organizations to further abuse the original intent of the law (provide examples like Panther Refuge, which provides no hunting opportunities on Service lands).

Service's Response:
Comment noted.

Appendices

Comment:
Overall, the Appendices are very helpful. It might be good, however, to list the ownership (and/or manager) of the public lands. Also, in the title to the table, it states Public Lands, when there are numerous tracts of private lands included. Perhaps it would just be easier to use Conservation Lands, rather than Public Lands, or a term in wide usage within Florida – Managed Areas.

Service's Response:
The titles of the appendix and table were changed to state: Known Conservation Lands in the Study Area by County (Appendix B and Appendix B, Table 1).

Typographical Corrections

Comment:
In the Draft LLP and Draft EA, Disney's Wilderness Preserve is mentioned among the currently conserved lands of the region. That should be changed to the correct name: "Disney Wilderness Preserve."

Service's Response:
Corrections were made to reflect the correct name throughout both documents.

Comment:
In the Draft LLP and Draft EA, St. Johns River is misspelled as St. John's River.

Service's Response:
Corrections were made in both documents.

Comment:
In the Draft EA, the following statement is found – "The largest concentration of dry prairie within the Study Area is at the Kissimmee Prairie State Preserve, Avon Park AFR, and Three Lakes Wildlife Management Area." While this is a true statement, the correct name of the first managed area mentioned is the Kissimmee Prairie Preserve State Park. Similar mischaracterizations of the name for this managed area are found at several other places throughout the Draft EA.

Service's Response:
Corrections were made throughout the document.

Comment:
Everglades is misspelled in Section G (Related Resources) of the Draft EA.

Service's Response:
Corrections were made in the document.

Comment:
In the Draft LPP, the scientific name of the Florida scrub lizard (*Sceloporus woodi*) is not italicized.

Service's Response:
Correction made.

Comment:
In the Draft LPP, the Florida Division of Forestry is mentioned (as a partner), but their name has recently been changed to the Florida Forest Service. The initials FDOF are also found in the Draft LPP (and likely this same organization is also mentioned by their old name in the Draft EA).

Service's Response:
Corrections were made throughout the document to reflect this name change.

Comment:
In the Draft LPP (under Land Protection Strategy), the acreage figures in Table 3 (7). Land use/land cover in the Study Area, have some definite problems with commas to more accurately define the actual acreages under question. It is also unlikely that these same acreage figures need to be carried out by up to eight decimal points. These figures should be corrected, and rounded to probably no more than a single decimal, as they are confusing as currently provided.

Service's Response:
Table 7 was updated to include only two decimal points.

Comment:
In the Draft LLP and Draft EA, *Conradina brevifolia* is misspelled.

Service's Response:
Corrections made.

Comment:
In the Draft EA, the following statement is found – "We anticipate that a Final Environmental Assessment would be issued in September 2011." Since it is now October 2011, shouldn't this statement be changed to better reflect the actual month that the Final EA may be issued (and especially given the possibility of a 30-day extension to the public comment period)?

Service's Response:
The anticipated date in the Section 7 was updated to December 2011, but is now expected to be January 2012.

LETTERS FROM STATE CLEARINGHOUSE, SEMINOLE TRIBE OF FLORIDA, AND MICCOSUKEE TRIBE OF INDIANS OF FLORIDA

Although addressed above, the letters from the State Clearinghouse and Seminole Tribe of Florida are included here in their entirety. The State Clearinghouse packet includes letters and comments from the East Central Florida Planning Council, Florida Fish and Wildlife Conservation Commission, Florida Department of State (State Historic Preservation Officer), Florida Department of Environmental Protection, South Florida Water Management District, Florida Fish and Wildlife Conservation Commission, and Southwest Florida Regional Planning Council.

Florida Department of
Environmental Protection
Marjory Stoneman Douglas Building
3900 Commonwealth Boulevard
Tallahassee, Florida 32399-3000

Rick Scott
Governor

Jennifer Carroll
Lt. Governor

Herschel T. Vinyard Jr.
Secretary

November 9, 2011

Ms. Cheri M. Ehrhardt, AICP
Merritt Island NWR Complex
U.S. Fish and Wildlife Service
P.O. Box 2683
Titusville, FL 32781-2683

RE: U.S. Fish and Wildlife Service – Draft Land Protection Plan/Environmental Assessment (LPP/EA) for the Proposed Establishment of the Everglades Headwaters National Wildlife Refuge (NWR) and Conservation Area – Polk, Osceola, Highlands and Okeechobee Counties, Florida.
SAI # FL201109065939C (Reference Previous SAI # FL201101195612)

Dear Ms. Ehrhardt:

The Florida State Clearinghouse has coordinated a review of the Draft LPP/EA 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 Florida Department of Environmental Protection (DEP) and South Florida Water Management District (SFWMD) concur that the establishment of an Everglades Headwaters NWR and Conservation Area offers a potential opportunity to protect natural and cultural resources for the future. It also provides an opportunity to collaborate with private landowners and a variety of organizations with resource management interest to develop a cost effective way to acquire and manage the NWR and Conservation Area for compatible public use, research and enjoyment. The DEP and SFWMD encourage the U.S. Fish and Wildlife Service (USFWS) to continue to coordinate closely with the agencies working on Everglades restoration (e.g., DEP, SFWMD, Florida Department of Agriculture and Consumer Services, U.S. Army Corps of Engineers). This will help ensure compatibility between the NWR and Conservation Area and ongoing efforts to restore the Everglades and improve the hydrology and water quality in Lake Okeechobee and other lakes and wetlands in the Kissimmee River Basin. It will also assist with avoiding duplication of effort and ensuring that that any required regulatory and proprietary authorizations have been acquired. Additionally, the USFWS should continue to emphasize the importance of the economic value of ecosystem services provided by the

Florida State Clearinghouse

lands acquired, as natural storage of water on these lands may reduce the need for costly infrastructure.

Staff requests that the conceptual fire management plan (page 299) be closely coordinated with the Florida Department of Agriculture and Consumer Services' Florida Forest Service and the DEP Florida Park Service to address both the response to wildfire management and planning for prescribed burns. In addition, the conceptual plan does not address the management of exotic or invasive plants or animals. Staff recommends that the plan consider the establishment of partnerships with state, regional and local entities for the management of exotic or invasive plants and animals. Please refer to the enclosed memorandum and contact Mr. Greg Knecht, Ecosystems Director, at (850) 245-2088 or Greg.Knecht@dep.state.fl.us for additional information and assistance.

Although the Florida Fish and Wildlife Conservation Commission (FWC) is supportive of the overall conservation benefits of a new national wildlife refuge, staff had expressed strong concerns during the scoping phase of the LPP/EA regarding the lack of an explicit commitment to continue to allow public access on lands that would be acquired fee simple. The possibility that some of these lands would be designated as *wilderness* with severely limited public access was of particular concern. The FWC has since discussed their concerns with the USFWS, which has recognized that the current management of wildlife management areas (WMAs) by the FWC is fully consistent with the USFWS' management responsibilities and mandates. The USFWS has agreed to develop a Memorandum of Understanding allowing the FWC to manage fee simple acquisition lands as part of the state's WMA program, thereby allowing hunting, fishing and other nature-based recreational use, if the project proceeds. This agreement is to accommodate any and all WMA hunting programs administered by the FWC in accordance with state regulations. FWC staff appreciates the USFWS' cooperation and encourages the USFWS to expedite the inclusion of any fee simple land acquisitions into the state's WMA system so suitable public access can be provided as quickly as possible. For further details, please see the enclosed FWC letters and contact Mr. Dennis David, Northeast Regional Director, at (352) 732-1225 or Dennis.David@MyFWC.com.

Based on the information contained in the Draft LPP/EA and enclosed agency comments, the state has determined that the proposed federal action is consistent with the Florida Coastal Management Program (FCMP). To ensure the project's continued consistency with the FCMP, the concerns identified by our reviewing agencies must be addressed prior to project implementation. 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.

Florida State Clearinghouse

Thank you for the opportunity to review this proposal. Should you have any questions regarding this letter, please contact Ms. Lauren P. Milligan at (850) 245-2170.

Yours sincerely,

Sally B. Mann

Sally B. Mann, Director
Office of Intergovernmental Programs

SBM/lm
Enclosures

cc: Greg Knecht, DEP, OEP
Ernie Marks, DEP, OEP PCRS
Dianne Hughes, DEP, Southeast District
Tom Butler, DEP, DSL
Deborah Oblaczynski, SFWMD
Joe Walsh, FWC
Nichole Gwinnett, SWFRPC

Florida State Clearinghouse

Florida
Department of Environmental Protection

"More Protection, Less Process"

Categories

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Project Information	
Project	FL201100085030C
Comment Due Date	10/12/2011
Letter Date	11/16/2011
Description	U.S. FISH AND WILDLIFE SERVICE - DRAFT LAND PROTECTION PLAN/ENVIRONMENTAL ASSESSMENT (LPP/EA) FOR THE PROPOSED ESTABLISHMENT OF THE EVERGLADES HEADWATERS NATIONAL WILDLIFE REFUGE AND CONSERVATION AREA - POLK, OSCEOLA, HIGHLANDS AND OKEECHOBEE COUNTIES, FLORIDA
Applicant	USFWS - DLPP/EA EVERGLADES HEADWATERS NAT. WILDLIFE REFUGE & CONSERVATION AREA
CFDA	15.633

Agency Comments

E. CENTRAL FL RPC - EAST CENTRAL FLORIDA REGIONAL PLANNING COUNCIL

The East Central Florida Regional Planning Council has not identified any significant or adverse effects to regional resources or facilities, nor have any extra-jurisdictional impacts been identified that would adversely affect neighboring jurisdictions. The proposed project is found to be consistent with the goals, policies and objectives of the East Central Florida Regional Planning Council. Should there be any questions concerning this review, please contact Mr. Matt Seager, Planner II and ICR Coordinator, at (407) 262 7772.

CENTRAL FL RPC - CENTRAL FLORIDA REGIONAL PLANNING COUNCIL

AGRICULTURE - FLORIDA DEPARTMENT OF AGRICULTURE AND CONSUMER SERVICES

No comments at this time.

FISH and WILDLIFE COMMISSION - FLORIDA FISH AND WILDLIFE CONSERVATION COMMISSION

Although the FWC is supportive of the overall conservation benefits of a new national wildlife refuge, staff had expressed strong concerns during the scoping phase of the LPP/EA regarding the lack of an explicit commitment to continue to allow public access on lands that would be acquired fee simple. The possibility that some of these lands would be designated as wilderness with severely limited public access was of particular concern. The FWC has since discussed their concerns with the USFWS, which has recognized that the current management of wildlife management areas (WMAs) by the FWC is fully consistent with the USFWS management responsibilities and mandates. The USFWS has agreed to develop a Memorandum of Understanding allowing the FWC to manage fee simple acquisition lands as part of the state's WMA program, thereby allowing hunting, fishing and other nature-based recreational use, if the project proceeds. This agreement is to accommodate any and all WMA hunting programs administered by the FWC in accordance with state regulations. FWC staff appreciates the USFWS' cooperation and encourages the USFWS to expedite the inclusion of any fee simple land acquisitions into the state's WMA system so suitable public access can be provided as quickly as possible. For further details, please see the enclosed FWC letters and contact Mr. Dennis David, Northeast Regional Director, at (386) 758-1225 or Dennis.David@MyFWC.com.

RTATP - FLORIDA DEPARTMENT OF RTATP

No Comments/Concurrence

ENVIRONMENTAL PROTECTION - FLORIDA DEPARTMENT OF ENVIRONMENTAL PROTECTION

The DEP and SFWMD concur that the establishment of an Everglades Headwaters NWR and Conservation Area offers a potential opportunity to protect natural and cultural resources for the future. It also provides an opportunity to collaborate with private landowners and a variety of organizations with resource management interest to develop a cost effective way to acquire and manage the NWR and Conservation Area for compatible public use, research and enjoyment. The DEP and SFWMD encourage the USFWS to continue to coordinate closely with the agencies working on Everglades restoration (e.g., DEP, SFWMD, FDACS, USACE). This close coordination will help to ensure compatibility between the NWR and Conservation

Area and ongoing efforts to restore the Everglades and improve the hydrology and water quality in Lake Okeechobee and other lakes and wetlands in the Kissimmee River Basin. It will also assist with avoiding duplication of effort and ensuring that that any required regulatory and proprietary authorizations have been acquired. Additionally, the USFWS should continue to emphasize the importance of the economic value of ecosystem services provided by the lands acquired, as natural storage of water on these lands may reduce the need for costly infrastructure. Staff requests that the conceptual fire management plan (page 299) be closely coordinated with the FDACS Florida Forest Service and the DEP Florida Park Service to address both the response to wildfire management and planning for prescribed burns. In addition, the conceptual plan does not address the management of exotic or invasive plants or animals. Staff recommends that the plan consider the establishment of partnerships with state, regional and local entities for the management of exotic or invasive plants and animals. Please refer to the enclosed memorandum and contact Mr. Greg Knecht, Ecosystems Director, at (850) 245-2088 or Greg.Knecht@dep.state.fl.us for additional information and assistance.
SOUTH FLORIDA WMD - SOUTH FLORIDA WATER MANAGEMENT DISTRICT
Please see the Florida Department of Environmental Protection's Memorandum dated October 21, 2011, for the compiled comments from both the Department and the District.
ST. JOHNS RIVER WMD - ST. JOHNS RIVER WATER MANAGEMENT DISTRICT
The SJRWMD does not have any comments on this proposal.

For more information or to submit comments, please contact the Clearinghouse Office at:

3900 COMMONWEALTH BOULEVARD, M.S. 47
TALLAHASSEE, FLORIDA 32399-3000
TELEPHONE: (850) 245-2161
FAX: (850) 245-2190

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Memorandum

TO: Florida State Clearinghouse

FROM: Greg Knecht, Director
Office of Ecosystem Projects

DATE: October 21, 2011

SUBJECT: U.S. Fish and Wildlife Service – Draft Land Protection Plan/ Environmental Assessment for the Proposed Establishment of the Everglades Headwaters National Wildlife Refuge and Conservation Area – Polk, Osceola, Highlands and Okeechobee Counties.

SAI #: FL201109065939C (Reference Previous SAI # FL201101195612)

This memorandum serves as a compilation of comments from both the Florida Department of Environmental Protection (Department) and the South Florida Water Management District (District).

Background:

The U.S. Fish and Wildlife Service (Service) intends to establish the Everglades Headwaters National Wildlife Refuge (NWR) and Conservation Area consisting of less than fee title in up to 100,000 acres and fee title interest in up to 50,000 acres. However, the Service is willing to work with willing sellers to use less than fee or fee simple in either area.

The vision for the proposed Everglades Headwaters NWR and Conservation Area is to: conserve, protect, and manage one of the great grassland and savanna landscapes of eastern North America for current and future generations, protecting the important wildlife and habitat of the working rural landscape of central Florida's Kissimmee River Basin that is home to abundant fish and wildlife resources; that is vital to restoration and protection of the water quality and quantity for the Everglades ecosystem; and that offers outdoor recreational opportunities important to the region's economy.

This proposed action is the result of a collaborative effort between other federal, state, regional, local, tribal and non-governmental interests to seek collaborative and cost-effective ways to conserve the land, water and wildlife resources in central and south Florida. The Service seeks to work with willing landowners to secure a legacy of

conservation land for future generations to enjoy. The proposal aims to address threats to habitat fragmentation from urban development, altered ecological processes, and impacts from global climate change.

During the planning process, the 1.8 million-acre general area of interest of the Kissimmee River Basin was refined to an approximately 816,000-acre area referred to as a Conservation Partnership Area, wherein the Service proposed to acquire less than fee title interest in up to 100,000 acres. These lands would be referred to as the Conservation Area. Any proposal to expand beyond the 100,000 acres would require an additional publicly vetted planning effort by the Service. The proposal also includes an approximately 130,000-acre Conservation Focal Area within which the Service would be authorized to acquire up to 50,000 acres in fee title interest. These would be the lands for the proposed NWR.

The scope of the draft land protection plan and environmental assessment (EA) only covers the proposed acquisition of land in either fee or less than fee title within the Conservation Partnership Area, including the Conservation Focal Area, and defers the development and/or implementation of a detailed management plans until a comprehensive conservation plan and compatibility determination are developed. However, the draft EA includes a conceptual management plan and interim compatibility determinations that will guide management and public use on the established refuge and conservation area until a comprehensive plan can be implemented.

General Comments:

1. According to the draft EA, the 50,000-acre NWR would allow for public uses including hunting, fishing, environmental education and interpretation, wildlife conservation and photography, research, camping, hiking, horseback riding, bicycling and grazing. In addition, other uses and activities supporting these activities would also be considered depending on the specifics of a particular property acquired, such as all terrain vehicle use on existing roads and trails, primitive camping to support hunting and research activities, motorized and non-motorized boating to support fishing activities, and facilities to support any of the approved uses. Public uses in the proposed 100,000-acre Conservation Area would be limited and be subject to the terms and conditions of easement agreements and other instruments used for less than fee title acquisition.

2. The four overarching goals for the proposed Everglades Headwaters NWR and Conservation Area do not appear to be in conflict with the State's Everglades restoration efforts. The goals are to restore habitat connectivity and ecological integrity, maintain and restore habitat for listed and more common species, contribute to water quality and quantity and water storage capacity of the Northern Everglades watershed to support the Everglades restoration goals and objectives and water quality and supply for central and south Florida, and provide for compatible recreational opportunities.

3. The 100,000-acre Conservation Area has the potential to contribute to and complement the many existing federal, state, regional, local and Tribal conservation programs including the State's Florida Forever Program, Kissimmee River Restoration Project, and the Northern Everglades and Estuaries Protection Program. Specifically, some of the proposed Everglades Headwaters NWR and Conservation Area lands are likely targeted for acquisition by Florida Forever. If the Service protects these lands, it would allow Florida Forever to direct its limited resources to other sites needing protection. As detailed management plans are developed, it will be important to ensure that they are compatible with, and where possible, complementary to, existing restoration efforts.

4. The Service has developed its land protection priorities based on landscape connectivity and wildlife corridors, priority habitats for listed species, restoration of wetlands and water quality in the Everglades watershed, and opportunities for wildlife dependent recreation and education. The Service used GIS-based land prioritization analysis to create three tiers or categories [high (Tier I), medium (Tier II), and low (Tier III)] to help establish acquisition priorities.

The Service will use the following options to implement the Land Protection Plan:

- management or land protection by others
- less than fee title acquisition by the Service
- fee title acquisition by the Service

When land is needed to achieve fish and wildlife conservation objectives, the Service seeks to acquire the minimum interest necessary to meet those objectives, and acquire it only from willing sellers.

5. Funding for the Everglades Headwaters NWR and Conservation Area is anticipated to come from the Land and Water Conservation Fund or the North American Wetlands

Conservation Act depending upon the upland or wetland character of the land. Estimated cost of acquisition (fee and less than fee) of 150,000 acres is $625 million. Additional funds would be needed for construction, operation and maintenance of facilities. We are hopeful that the use of funds for the Everglades Headwaters will not impact other federal commitments to ongoing restoration projects such as CERP or Modified Water Deliveries.

6. Lands within the proposed Conservation Focal Area have been reviewed by the Service for inclusion in the National Wilderness Preservation System according to criteria set forth in the Wilderness Act of 1964. Based on the Service's assessment, the proposed Everglades Headwaters NWR was found not to be suitable for wilderness designation.

7. As expressed in the documents, the Service has not identified any specific water quality or quantity needs and the Department and District cannot commit to meeting future water quality, quantity, timing, or distribution needs of the proposed Everglades Headwaters NWR, but would collaborate with the refuge, other agencies, and private landowners to work toward strategies supported by all stakeholders.

8. The Service is also committed to improving water quality and quantity, timing, and distribution of water to downstream users and would participate in reduction strategies identified through the state's Total Maximum Daily Load and Basin Management Action Plan process. Conservation easements would not preclude the ability of the landowner to implement pollutant reduction strategies identified through these processes.

Specific Comments on the Conceptual Management Plan:

9. The conceptual fire management plan (page 299) should be closely coordinated with the Florida Forest Service and the Florida Park Service to address both the response to wildfire management and planning for prescribed burns.

10. The conceptual plan does not address the management of exotic or invasive plants or animals. We suggest that the conceptual management plan address how partnerships with state, regional, and local entities will be established for the management of exotic or invasive plants and animals.

Summary:

The establishment of an Everglades Headwaters NWR and Conservation Area offers a potential opportunity to protect natural and cultural resources for the future. It also offers the opportunity to collaborate with private landowners and a variety of organizations with resource management interest to develop a cost-effective way to acquire and manage the NWR and Conservation Area for compatible public use, research and enjoyment.

The Department and District encourage the Service to continue to coordinate closely with the agencies working on Everglades restoration (e.g., Department, District, Florida Department of Agriculture and Consumer Services, U.S. Army Corps of Engineers). This close coordination will help to ensure compatibility between the NWR and Conservation Area and ongoing efforts to restore the Everglades and improve the hydrology and water quality in Lake Okeechobee and other lakes and wetlands in the Kissimmee River Basin. It will also assist with avoiding duplication of effort and ensuring that that any required authorizations (i.e., regulatory, etc.) have been acquired. In addition, the Service should continue to emphasize the importance of the economic value of ecosystem services provided by the lands acquired, as natural storage of water on these lands may reduce the need for costly infrastructure.

Florida Fish and Wildlife Conservation Commission

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Kathy Barco
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Vice Chairman
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Executive Staff
Nick Wiley
Executive Director

Greg Holder
Assistant Executive Director

Karen Ventimiglia
Chief of Staff

Office of the
Executive Director
Nick Wiley
Executive Director

(850) 487-3796
(850) 921-5786 FAX

Managing fish and wildlife resources for their long-term well-being and the benefit of people.

620 South Meridian Street
Tallahassee, Florida
32399-1600
Voice: (850) 488-4676

Hearing/speech-impaired:
(800) 955-8771 (T)
(800) 955-8770 (V)

November 4, 2011

Ms. Lauren P. Milligan
Florida State Clearinghouse
Florida Department of Environmental Protection
3900 Commonwealth Boulevard, M.S. 47
Tallahassee, FL 32399-3000
Lauren.Milligan@dep.state.fl.us

Re: Draft Land Protection Plan/Environmental Assessment for Proposed Establishment of the Everglades Headwaters National Wildlife Refuge and Conservation Area, SAI #FL201109065939C, Multiple Counties

Dear Ms. Milligan:

Staff of the Florida Fish and Wildlife Conservation Commission (FWC) has reviewed the Draft Land Protection Plan/Environmental Assessment (LPP/EA) for Proposed Establishment of the Everglades National Wildlife Refuge and Conservation Area, and provides the following input in accordance with the National Environmental Policy Act (NEPA) and the Coastal Zone Management Act/Florida Coastal Management Program.

Staff had previously participated in the scoping phase of this proposed action, and submitted comments (March 14, 2011, letter; enclosed) that recognized the overall conservation benefits, but which also expressed strong concerns about the lack of an explicit commitment to continue to allow public access on lands that would be acquired fee simple. Of particular concern was the possibility that some of these lands would later be designated as "wilderness," a classification that would severely limit public access to lands acquired fee simple by the Federal Government. We encouraged the U.S. Fish and Wildlife Service (FWS) to consider developing a cooperative agreement with the FWC to establish fee simple acquisitions as state-led wildlife management areas (WMAs) that allow hunting, fishing, and other forms of nature-based recreational access. Furthermore, we recommended that the FWS become familiar with and make use of existing programs that have already identified this area as a high priority for conservation, while respecting the rights of private landowners.

Of the three alternatives that are examined in the draft EA, FWS selected the Conservation Partnership Approach as the preferred alternative. This approach commits to working cooperatively with landowners, private organizations, state agencies, municipalities, and other federal agencies toward meeting a common goal of conservation. Furthermore, since the scoping phase of the NEPA process, FWC staff has had discussions with FWS staff, during which they have recognized that the current management of WMAs by the FWC is fully consistent with the FWS's management responsibilities and mandates. We are pleased their staff has agreed to develop a Memorandum of Understanding (MOU) allowing the FWC to manage lands acquired fee simple as part of the State's WMA program if this project proceeds. The FWC currently has MOUs with other agencies holding public lands in Florida, and we believe that these memoranda serve as a model for developing a comparable interagency MOU between the FWS and the FWC. As such, we envision the execution of such an MOU as giving the FWC responsibility for establishing hunting and fishing programs, seasonal limits,

amount of harvest allowed, and for determining related public access for activities on lands acquired fee simple. The MOU is to accommodate any and all hunting programs administered by the FWC as part of the WMA program in accordance with state regulations. As with other fee-simple lands in the WMA program, all of these activities will be developed under the FWC's established process for setting regulations on other WMAs in Florida. We also strongly encourage the FWS to address sportsmen's requests to remove any conditional language from the LPP that implies hunting access on suitable fee simple lands may be restricted. Additionally, we are pleased that the FWS has recognized that the lands to be included as a national wildlife refuge and conservation area do not qualify for the designation of "wilderness," thereby further assuring us that they have no plans to restrict current levels of access for hunting, fishing, and other nature-based recreation. Finally, we appreciate the FWS's determination that interim hunting at previous levels will continue as soon as feasible on any lands that may be acquired under the provisions of the National Wildlife Refuge System Improvement Act of 1997. Moreover, if any fee-simple acquisitions are executed, we strongly encourage the FWS to expedite the inclusion of such lands into the State's WMA system so suitable public access can be provided as quickly as possible.

The FWC finds the preferred alternative to be consistent with our authorities under the Coastal Zone Management Act/Florida Coastal Management Plan. The FWC continues to appreciate the opportunity to comment on the FWS's conservation efforts in the south-central Florida region. Please contact our Northeast Regional Director, Dennis David, by telephone at 352-732-1225 or by email at Dennis.David@MyFWC.com if you have questions or for future coordination regarding FWC's participation.

Sincerely,

Nick Wiley
Executive Director

nw/map
ENV 1-3-2
Greater Everglades Partnership Initiative_3490_102111
Enclosure
cc: Ms. Cynthia Dohner, FWS, Atlanta (Cynthia_Dohner@fws.gov)
Mr. Mark Musaus, FWS, Atlanta (Mark_Musaus@fws.gov) (LPP/EA)

Florida Fish and Wildlife Conservation Commission

Commissioners
Rodney Barreto
Chairman
Miami

Richard A. Corbett
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Jacksonville

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Kenneth W. Wright
Winter Park

Brian S. Yablonski
Tallahassee

Executive Staff
Nick Wiley
Executive Director

Greg Holder
Assistant Executive Director

Karen Ventimiglia
Deputy Chief of Staff

Office of the
Executive Director
Nick Wiley
Executive Director

(850) 487-3796
(850) 921-5786 FAX

Managing fish and wildlife resources for their long-term well-being and the benefit of people.

620 South Meridian Street
Tallahassee, Florida
32399-1600
Voice: (850) 488-4676

Hearing/speech impaired:
(800) 955-8771 (T)
(800) 955-8770 (V)

MyFWC.com

March 14, 2011

Ms. Lauren P. Milligan
Florida State Clearinghouse
Florida Department of Environmental Protection
3900 Commonwealth Boulevard, M.S. 47
Tallahassee, FL 32399-3000
Lauren.Milligan@dep.state.fl.us

Re: Scoping Notice: Greater Everglades Partnership Initiative, SAI #FL201101195612, Multiple Counties

Dear Ms. Milligan:

Florida Fish and Wildlife Conservation Commission (FWC) staff participated in the scoping meetings for the referenced Initiative, and provides the following comments and recommendations in accordance with the National Environmental Policy Act (NEPA).

The U.S. Fish and Wildlife Service (Service) is proposing to establish the Everglades Headwaters National Wildlife Refuge and the Everglades Headwaters Conservation Area under a new partnership effort, the Greater Everglades Strategic Habitat Conservation Initiative (Initiative), in south-central Florida. The purpose of this Initiative is to conserve land, water, and wildlife resources while maintaining the area's rural farming and ranching land uses. Lands would be acquired through a combination of fee title and less-than-fee title interests in cooperation with willing landowners. To facilitate planning and implementation among the Service, its partners, and the public, the area to be addressed by the Initiative has been divided into three Study Areas. The Service has proposed that the first Study Area, the Everglades Headwater, be developed under the NEPA process that has already started with scoping this past January and that would end in a final plan in the August – September 2011 timeframe.

We are supportive of the conservation benefits and expanded opportunities for public hunting that a new national wildlife refuge could bring to the area, provided the major concerns expressed by Florida's hunting community can be addressed. Hunters continue to tell us that one of the biggest reasons that hunting is declining in Florida is the lack of access to quality public hunting opportunities. Florida is no longer in a financial position to acquire large tracts of public lands for establishing new wildlife management areas, so the proposed Initiative presents an alternative opportunity to open more public lands for public hunting. We note that some of the national wildlife refuges in Florida do provide quality public hunting. In addition, private landowners are some of the best stewards of fish and wildlife resources, so we are supportive of federal funding for conservation easements that would allow them to continue their farming and ranching practices while gaining long-term conservation assurance.

To that end, we call the Service's attention to the following key points that we strongly believe must be acted upon in order for this proposal to be successful in Florida.

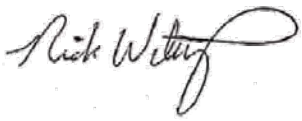
- The scope and scale of the Initiative is large and ambitious. The proposed timeline does not appear to allow for adequate FWC and partner input and participation. The importance of a thoughtful and thorough vetting of issues among the potential partners cannot be overemphasized, and we believe we can help communicate and advocate for the issues that are central to fish and wildlife conservation and are important to Florida's hunters and anglers.
- Of paramount concern is the level of public access that would be allowed on lands that would be acquired fee simple. The FWC strongly advocates for them to be opened to public hunting with access similar to that which we provide on wildlife management

areas (WMA) in this region of Florida. We encourage the FWS to consider developing a cooperative agreement with the FWC to establish fee simple acquisitions as WMAs, whereby FWC would have the lead responsibility for determining and implementing appropriate public uses and be provided resources necessary for administering those uses including hunting. We strongly encourage the FWS to develop a Public Hunting Plan as a component of the Land Protection Plan so as to accommodate opening of fee simple lands to public access, including hunting as soon as possible after acquisition. We urge the FWS to incorporate this into their preferred alternative for this Initiative.

- We have heard the concern of some stakeholders that the lands within the new wildlife refuge or Initiative boundary could eventually be designated as "primitive backcountry" or even "federal wilderness," similar to the recent proposal for the Big Cypress Addition Lands. Similarly, we have heard the concern that the state-owned public lands within the Study Area boundary may be placed into federal management that would result in public restrictions or even closures. The FWC would be adamantly opposed to any of these actions.
- The FWC strongly supports private landowners' rights and would oppose any action that would impose land-use restrictions that are not willingly agreed upon by participating landowners.
- The FWC and its partners already have many programs that identify this area as a high conservation priority, and we have a long history of working to conserve it. We recommend that the Service take the adequate time to become familiar with these efforts so the Initiative can make the best use of conservation benefits that they already provide. Example programs include:
    - Landowner Assistance Programs;
    - State Wildlife Action Plan;
    - Cooperative Conservation Blueprint and regional pilot work;
    - Florida Landscape Conservation Cooperative effort;
    - Regional visioning initiatives such as the Heartland 2060 effort;
    - Natural Resources Conservation Service's programs and focus;
    - County resources through their comprehensive development planning process; and
    - Florida Forever land acquisition programs and assessments.

The FWC appreciates the opportunity to comment on the Service's continued efforts to conserve the south-central Florida region through the Greater Everglades Partnership Initiative. We look forward to working with Service staff as this project moves forward. Please contact our Northeast Regional Director, Dennis David, by telephone at 352-732-1225 or by email at Dennis.David@MyFWC.com if you have questions or for future coordination regarding FWC's participation.

Sincerely,



Nick Wiley
Executive Director

nw/map
ENV 1-3-2
Greater Everglades Partnership Initiative_3199_031411
cc: Ms. Cynthia Dohner, USFWS, Cynthia_Dohner@fws.gov
Mr. Mark Musaus, USWFS, Mark_Musaus@fws.gov

Southwest Florida Regional Planning Council
Serving Charlotte, Collier, Glades, Hendry, Lee and Sarasota Counties
1926 Victoria Ave, Fort Myers, Florida 33901-3414 (239) 338-2550 FAX (239) 338-2560 www.swfrpc.org

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OCT 26 2011
DEP Office of Intergov'l Programs

October 24, 2011

Ms. Cheri M. Ehrhardt
Natural Resource Planner
US Fish & Wildlife Service
PO Box 2683
Titusville, FL 32781-2683

RE: Draft Environmental Assessment for the Proposed Establishment of the Everglades Headwaters National Wildlife Refuge and Conservation Area, *Polk, Osceola, Okeechobee, and Highlands Counties*

Dear Ms. Ehrhardt:

The staff of the Southwest Florida Regional Planning Council reviews various proposals, Notifications of Intent, Pre-applications, permit applications, and Environmental Impact Statements for compliance with regional goals, objectives, and policies, as determined by the Strategic Regional Policy Plan. The staff reviews such items in accordance with the Florida Intergovernmental Coordination and Review Process (Chapter 291-5, F.A.C.), and adopted regional clearinghouse procedures.

These designations determine Council staff procedure in regards to the reviewed project. The four designations are:

Less Than Regionally Significant and Consistent- No further review of the project can be expected from Council.

Less Than Regionally Significant and Inconsistent- Council does not find the project of regional importance, but will note certain concerns as part of its continued monitoring for cumulative impact within the noted goal area.

Regionally Significant and Consistent- Project is of regional importance, and appears to be consistent with Regional goals, objectives, and policies.

Regionally Significant and Inconsistent- Project is of regional importance and does not appear to be consistent with Regional goals, objectives, and policies. Council will oppose the project as submitted, but is willing to participate in any efforts to modify the project to mitigate the concerns.

TO: Ms. Cheri M. Ehrhardt
PAGE: 2
DATE: October 24, 2011

The Southwest Florida Regional Planning Council (SWFRPC) has reviewed the U.S. Fish and Wildlife Service – Draft Environmental Assessment for the Proposed Establishment of the Everglades Headwaters National Wildlife Refuge and Conservation Area and has the following comments.

The Service proposes to acquire, protect, and manage important natural resources of this landscape through fee title purchases, leases, donations, conservation easements, mitigation and conservation banks, and/or cooperative agreements from willing sellers. All lands and waters acquired would be managed by the Service as the Everglades Headwaters NWR and Conservation Area. The overall objectives of the proposed Everglades Headwaters NWR and Conservation Area would be to provide connectivity of habitat between existing natural areas and opportunities for species to adapt to the impacts from global climate change; restore wetland and upland habitats for a wide range of imperiled species; and provide opportunities for wildlife-dependent outdoor interpretation, education, and recreation. It is anticipated that funding for this proposal would be provided primarily through the Land and Water Conservation Fund and the Migratory Bird Conservation Fund. The authority for the use of these funds for land acquisition is the National Wildlife Refuge System Administration Act; Endangered Species Act of1973; Emergency Wetlands Resources Act of 1986; The Migratory Bird Conservation Act of 1929; Fish and Wildlife Act of 1956; and Refuge Recreation Act (16 U.S.C. 460k-460k-4), as amended.

The Southwest Florida Regional Planning Council finds the proposal to be **regionally significant and consistent** with the Strategic Regional Policy Plan and the State Comprehensive Plan. If you have specific questions about the content of this letter, please contact Mr. Jim Beever directly at (239) 338-2550 ext 224, e-mail jbeever@swfrpc.org.

Sincerely,
SOUTHWEST FLORIDA REGIONAL PLANNING COUNCIL

Elizabeth Donley
Interim Executive Director

Cc; Mr. Charlie Pelizza
Refuge Manager
Pelican Island, Archie Carr; and Lake Wales Ridge NWR
P.O. Box 2683
Titusville, Florida 32781-2683

Ms. Lauren P. Milligan
FDEP - Florida State Clearinghouse
3900 Commonwealth Boulevard, M.S .47
Tallahassee, Florida 32399-3000

2011 4027

COUNTY: ALL
SCH-106-USFW-EA

DATE: 9/2/2011
COMMENTS DUE DATE: 10/12/2011
CLEARANCE DUE DATE: 10/24/2011
SAI#: FL201109065939C
REFER TO: FL201101195612

MESSAGE:

STATE AGENCIES	WATER MNGMNT. DISTRICTS	OPB POLICY UNIT	RPCS & LOC GOVS
AGRICULTURE	SOUTH FLORIDA WMD		
ENVIRONMENTAL PROTECTION	ST. JOHNS RIVER WMD		
FISH and WILDLIFE COMMISSION			
X STATE			

The attached document requires a Coastal Zone Management Act/Florida Coastal Management Program consistency evaluation and is categorized as one of the following:

_ **Federal Assistance to State or Local Government (15 CFR 930, Subpart F). Agencies are required to evaluate the consistency of the activity.**

X **Direct Federal Activity (15 CFR 930, Subpart C). Federal Agencies are required to furnish a consistency determination for the State's concurrence or objection.**

_ **Outer Continental Shelf Exploration, Development or Production Activities (15 CFR 930, Subpart E). Operators are required to provide a consistency certification for state concurrence/objection.**

_ **Federal Licensing or Permitting Activity (15 CFR 930, Subpart D). Such projects will only be evaluated for consistency when there is not an analogous state license or permit.**

Project Description:

U.S. FISH AND WILDLIFE SERVICE - DRAFT LAND PROTECTION PLAN/ENVIRONMENTAL ASSESSMENT (LPP/EA) FOR THE PROPOSED ESTABLISHMENT OF THE EVERGLADES HEADWATERS NATIONAL WILDLIFE REFUGE AND CONSERVATION AREA - POLK, OSCEOLA, HIGHLANDS AND OKEECHOBEE COUNTIES, FLORIDA.

To: Florida State Clearinghouse

AGENCY CONTACT AND COORDINATOR (SCH)
3900 COMMONWEALTH BOULEVARD MS-47
TALLAHASSEE, FLORIDA 32399-3000
TELEPHONE: (850) 245-2161
FAX: (850) 245-2190

EO. 12372/NEPA

- [x] No Comment
- [ ] Comment Attached
- [ ] Not Applicable

Federal Consistency

- [x] No Comment/Consistent
- [ ] Consistent/Comments Attached
- [ ] Inconsistent/Comments Attached
- [ ] Not Applicable

From:
Division/Bureau: Division of Historical Resources, Bureau of Historic Preservation

Reviewer: Katie Peterson

Date: 10/12/11

Lane A. Kammerer
Deputy SHPO
10/13/2011

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SEMINOLE TRIBE OF FLORIDA

TELEPHONE
(954) 967-3900

FAX
(954) -967-3463

WEBSITE:
www.seminoletribe.com

6300 STIRLING ROAD
HOLLYWOOD,
FLORIDA 33024

Tribal Officers:

James E. Billie
Chairman

PRISCILLA D. SAYEN
Secretary

MICHAEL D. TIGER
Treasurer

October 14, 2011

Cynthia K. Dohner, Regional Director
Southeast Region
U.S. Fish and Wildlife Service
1875 Century Boulevard Northeast, Suite 400
Atlanta, GA 30345

Re: Everglades Headwaters National Wildlife Refuge and Conservation Area

Dear Ms. Dohner:

The Seminole Tribe of Florida ("Seminole Tribe") appreciates the opportunity to review and comment on the *Draft Land Protection Plan and Environmental Assessment for the Proposed Establishment of the Everglades Headwaters National Wildlife Refuge and Conservation Area*. The Seminole Tribe has been a long time partner with the State of Florida and the Federal Government in connection with Everglades restoration, and we look forward to continuing that relationship in connection with the proposed Refuge and Conservation Area. In March of this year, the Seminole Tribe provided initial comments on the proposal. Please accept the following as additional comments for your consideration and our request for further formal consultation.

I. Water Rights

As we noted in our previous comments, the Seminole Tribe's waters rights have been formalized in The Water Rights Compact of 1987, ratified by both the United States Congress and the Florida Legislature. The Compact sets forth water entitlements to the Seminole Tribe including to the Brighton Seminole Indian Reservation. Based on the Land Protection Plan and Environmental Assessment, it appears that the United States Fish and Wildlife Service

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("Service") is planning on restoring or mimicking natural hydrological/ecological processes. This goal includes the restoration of approximately 8,846 acres of wetlands acquired in fee title and exploring opportunities for the restoration of 237,000 acres of wetlands with the Conservation Partnership Area. In addition to the water demands for restoration, the proposed Refuge and Conservation Area will have water demands to support the desired ecological/hydrological functions of both the Refuge and Conservation Area. The Service has acknowledged in the Environmental Assessment that it does not yet know how much water will be needed to achieve its stated goals. We are concerned that the water demands for the proposed Refuge and Conservation Area may impact the Seminole Tribe's water entitlements, especially during drought conditions. We therefore request that the Service continue its consultation with the Seminole Tribe to further discuss the water demands of the proposed Refuge and Conservation Area.

II. Cultural Resources

As noted in the Draft Land Protection Plan and Environmental Assessment, there are significant cultural resources adjacent to the action area including green corn dance sites, cemeteries, villages, battlefields and camps. In addition, there is a high probability of unknown cultural/archeological sites that have yet to be identified. It is our understanding that at some point in time the Service will conduct archeological surveys to identify unknown and known sites, and will assess the sites under Section 106 of the National Historic Preservation Act. Ultimately, the Service will develop a cultural resources management plan. The Seminole Tribe requests that, before any action is taken, the Service consult with the Seminole Tribe's Tribal Historic Preservation Officer ("THPO") regarding these action items including the development of survey/research protocols.

Additionally, it clear that the Service plans to allow outdoor recreation opportunities within the Refuge. In order to prevent impacts to cultural resources, it is critical that the Service complete the necessary surveys in order to identify those areas that need protection from human disturbance before implementing/allowing the planned recreational activities. It is equally important that the surveys are conducted before the design and implementation of any water diversion or restoration project in order to assess and avoid any potential impacts to cultural resources. Please note that any coordination or consultation with the Seminole Tribe's Environmental Resources Management Department ("ERMD") will not be considered consultation under the National Historic Preservation Act where cultural resources are concerned. Please consult simultaneously with both THPO and ERMD with regards to the proposed Refuge and Conservation Area. For any correspondences directed to the Seminole Tribe's Chairman or Tribal Council, please copy both THPO and ERMD.

00029133-1

Tribal Historic Preservation Officer

Willard Steele, Director
Tribal Historic Preservation Office
Big Cypress Reservation
34725 W. Boundary Road
Clewiston, Fl 33440Tel (863) 983-6549
Fax (863-902-1117
Cell (863) 228-1584

Environmental Resources Management Department

Craig Tepper, Director
Environmental Resource Management Department
6300 Stirling Road, Suite 109
Hollywood, FL 33024
(954) 965-4380

Further, the Draft Land Protection Plan refers to interpretative and educational opportunities for the public in connection with cultural resources. These cultural resource sites have significant religious and cultural value to the Seminole Tribe and the Service has the trust obligation to consult with the Seminole Tribe THPO before implementing any such interpretative or educational programs.

Finally, the Draft Land Protection Plan states the proposed action will protect cultural resources providing a positive benefit. We request that the Service consult with the Seminole Tribe to discuss the details of how cultural sites should be identified and protected. We would also like to consult with the Service concerning how cultural sites will be treated in connection with the restoration activities and other management activities.

III. Management Plans

The Draft Land Protection Plan references the development of management plans for the Refuge and Conservation Area. We respectfully request that the Service consult with the Seminole Tribe early on in the development process especially in connection with any comprehensive management plans, recreational management plan, hunting management plans, restoration plans, and water control plans. As the term "Headwaters" implies, the management of the action area will have profound impacts (positive or negative) to lands south of the Refuge and Conservation Area including Seminole Tribe of Florida Brighton Seminole Indian Reservation and other lands. Therefore, it is important that the Service continue meaningful consultation with the Seminole Tribe during the early development stages and not simply submit draft plans for our comments. The Service's trust obligation to the Tribe requires early consultation that affords Tribal participation before and beyond simple commenting.

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IV. Grazing Rights

As the Draft Land Protection Plan acknowledges, the action area is heavily utilized as grazing pasture. The Service's trust obligation to the Seminole Tribe requires the Service to support the Seminole Tribe's economic opportunities. Therefore, the Service should preserve any grazing rights that Seminole Tribal members may have within the action area.

V. Vegetation and Fire Management/Green Corn Dance

The Seminole Tribe utilizes the area for its green corn dances, which are sacred ceremonies. We respectfully request that the Service coordinate in advance its burn plans and vegetative management activities to ensure they do not interfere with the green corn activities.

Again, the Seminole Tribe has been a long time partner in Everglades restoration. We request that the Service continue its formal consultation on the foregoing issues so our history of cooperation between our respective governments can continue. We look forward to your response and to discussing the proposed Refuge and Conservation Area with you in the near future.

Sincerely,

Craig D. Tepper

Craig D. Tepper, Director, ERMD
Seminole Tribe of Florida

c: James E. Billie, Chairman of the Tribal Council
Jim Shore, General Counsel
Stan Rodimon, Chief Community Planning & Development Officer
Willard Steele, Director, THPO
Stephen Walker, Lewis, Longman & Walker, P.A.
James Charles, Lewis, Longman & Walker, P.A.

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Appendix H. Finding of No Significant Impact

INTRODUCTION

The U.S. Fish and Wildlife Service will protect and manage certain fish and wildlife resources in Polk, Osceola, Highlands, and Okeechobee Counties, Florida, through the establishment of the Everglades Headwaters National Wildlife Refuge (NWR) and Conservation Area. A Draft and Final Environmental Assessment (Final EA) were prepared to inform the public of the possible environmental consequences of implementing the Final Land Protection Plan (Final LPP) for Everglades Headwaters NWR and Conservation Area. A description of the alternatives, the rationale for selecting the preferred alternative, the environmental effects of the preferred alternative, the potential adverse effects of the action, and a declaration concerning the factors determining the significance of effects, in compliance with the National Environmental Policy Act of 1969, are outlined below. The supporting information can be found in the Final EA for the establishment of the Everglades Headwaters NWR and Conservation Area as outlined in the Final LPP.

ALTERNATIVES

In developing the Final LPP for Everglades Headwaters NWR and Conservation Area, the Service evaluated three alternatives with different approaches to conservation within the Kissimmee River Basin landscape.

Alternative A – No Refuge and No Conservation Area (No Action Alternative)
Alternative B – Refuge Only Approach
Alternative C – Conservation Partnership Approach (Preferred Alternative)

The different management focuses of the action alternatives (i.e., B and C) represent different philosophies and approaches to conservation in the Kissimmee River Basin. The Service also identified areas within the larger Kissimmee River Basin that were not considered in the development of the alternatives. These areas were determined to not meet the Service's criteria for additional conservation or protection, including incorporated and developed areas.

The Service adopted Alternative C, the Preferred Alternative, as detailed in the Final LPP and the supporting documents, including the Conceptual Management Plan and the Interim Compatibility Determinations, to guide establishment, acquisition, and management of the Everglades Headwaters NWR and Conservation Area. Management of the refuge would continue under this guidance until the development of a comprehensive conservation plan and/or step-down management plan(s) (e.g., Hunt Plan) for the refuge. The overriding goals for the establishment of the Everglades Headwaters NWR and Conservation Area are: functional conservation landscape; habitat for fish and wildlife; enhanced water quality, quantity, and storage; and wildlife-dependent recreation and education. Wildlife-dependent recreational uses (i.e., hunting, fishing, wildlife observation, wildlife photography, and environmental education and interpretation) will be emphasized and encouraged.

ALTERNATIVE A. NO REFUGE AND NO CONSERVATION AREA (NO ACTION ALTERNATIVE)

The No Action Alternative required by NEPA serves as a baseline to which the other alternatives are compared. Alternative A represents no change from current conservation in this landscape. In this alternative the Service would not create a new refuge, no designated acquisition boundary would be developed, and no conservation area would be created. Habitat protection and management would

continue by existing organizations and government programs. The landscape within the Study Area boundary currently contains approximately 421,000 acres of conservation lands protected by agricultural easements; private conservation organizations; and municipal, state, and federal ownership and management. The Service would pursue no new opportunities for refuge-based wildlife-dependent public uses, partnerships, or scientific research.

ALTERNATIVE B. REFUGE ONLY APPROACH

This alternative proposes an acquisition boundary of up to 50,000 acres containing portions of the priority habitats identified in the proposal; focuses the bulk of the proposed refuge within mostly contiguous areas; and complements existing municipal, state, and federal conservation within this landscape. The Service would use a suite of conservation tools to protect land, including fee-title acquisitions and conservation easements. This alternative would protect important wildlife habitat within the landscape, serving both common and rare wildlife species. It would offer opportunities for wildlife management, compatible wildlife-dependent public uses, and new refuge-based partnerships and scientific research. Public use opportunities under this alternative would include hunting and fishing, as well as wildlife observation, photography, environmental education, and interpretation.

ALTERNATIVE C. CONSERVATION PARTNERSHIP APPROACH (PREFERRED ALTERNATIVE)

Alternative C is the Service's Preferred Alternative; the alternative recommended for implementation. Where Alternative B protects up to 50,000 acres in this landscape, Alternative C protects 150,000 acres with up to 100,000 acres conserved through conservation easements or other less-than-fee-title methods and up to 50,000 acres conserved through fee-title and less-than-fee-title means by working with willing landowners. Specific ranking criteria will be used to identify and prioritize all lands for acquisition. The Preferred Alternative, Alternative C, is considered to be the most effective management action for serving the outlined vision, purposes, and goals to enhance conservation in this Kissimmee River Basin landscape. It will conserve up to 150,000 acres of priority habitats identified in this project. To best complement existing municipal, state, and federal conservation within this landscape, the Service identified: (1) A Conservation Focal Area of approximately 130,000 acres within which the Service will have the authority to acquire up to 50,000 acres for the refuge, and (2) a Conservation Partnership Area within which the Service will have the authority to acquire less-than-fee-title interest of up to 100,000 acres as a Conservation Area. The Preferred Alternative will protect and meet the needs of both rare and common wildlife, provide wildlife corridors linking existing conservation lands, and restore additional wetlands and wetland functions, as well as provide opportunities for wildlife-dependent public use activities and help maintain the cultural ranching heritage of the area. Public use opportunities under the Preferred Alternative will include hunting and fishing, as well as wildlife observation, wildlife photography, and environmental education and interpretation.

SELECTION RATIONALE

Alternative C is selected for implementation because it directs the development of programs in coordination and consultation with our partners and the public to best achieve the vision, purposes, and goals, which are detailed in the Final LLP and outlined in the Final EA. At the same time, these management actions provide balanced levels of compatible public use opportunities consistent with existing laws, Service policies, and sound biological principles. They provide the best mix of program elements and coordination across the landscape to achieve desired long-term conditions in the Kissimmee River Basin.

Under this alternative, all lands under the management and direction of the Everglades Headwaters NWR and Conservation Area will be protected, maintained, and enhanced to best achieve national, ecosystem, and refuge-specific goals and objectives within anticipated funding and staffing levels. In addition, the action positively addresses priority issues and concerns expressed by the public, including governmental partners and Native American tribes.

ENVIRONMENTAL EFFECTS

Through the establishment of the Everglades Headwaters NWR and Conservation Area, as described in Alternative C, the Service will be able to fully participate with other conservation partners in the management and protection of the wildlife and habitats within the project area. Connectivity between existing conservation lands will be enhanced; movement corridors will be protected; and threatened, endangered, and other at-risk species will receive additional management attention. Important habitats in this landscape will be protected, including high pine (dry, longleaf pine savannah), Florida scrub, mesic temperate hammock, hydric and mesic pine flatwoods, dry prairie, cutthroat grass communities, wet prairies and freshwater marshes, and freshwater forested wetlands. Water quality, quantity, and storage benefits are also anticipated. Opportunities for wildlife-dependent recreational activities will be increased, and the existing rural working landscape will receive further protection from development pressure. Further, any cultural resources found within the Everglades Headwaters NWR and Conservation Area will be afforded protection by the Service. Although the anticipated environmental effects of implementation of the Preferred Alternative are beneficial, there may be minor negative impacts to soils, water quality, air quality, cultural resources, and habitats due to necessary operations and public use activities. However, these negative impacts are anticipated to be minor, discrete in location and/or time, and not significant.

COORDINATION

The management action has been thoroughly coordinated with all interested and/or affected parties. Parties contacted include those listed.

All landowners within the Conservation Focal Area
Congressional representatives
Seminole Tribe of Florida
Miccosukee Tribe of Indians of Florida
Seminole Nation of Oklahoma
Muscogee (Creek) Nation
Poarch Band of Creeks
Natural Resources Conservation Service, U.S. Department of Agriculture
Avon Park Air Force Range, U.S. Air Force
Governor of the State of Florida
Florida Fish and Wildlife Conservation Commission
Florida State Historic Preservation Officer
Florida Department of Environmental Protection
South Florida Water Management District
Florida Forest Service, Florida Department of Agriculture and Consumer Services
Florida Department of Agriculture and Consumer Services
Southwest Florida Regional Planning Council
East Central Florida Regional Planning Council
Polk County
Osceola County
Highlands County

Okeechobee County
Area ranchers and landowners
Interested citizens and local businesses
Conservation organizations
State-wide media

FINDINGS

It is my determination that the management action does not constitute a major federal action significantly affecting the quality of the human environment under the meaning of Section 102(2)(c) of the National Environmental Policy Act of 1969 (as amended). As such, an environmental impact statement is not required. This determination is based on the listed factors (40 CFR 1508.27), as addressed in the Final LLP and Final EA for the establishment of the Everglades Headwaters NWR and Conservation Area.

1. Both beneficial and adverse effects have been considered and this action will not have a significant effect on the human environment. (Chapter IV, Environmental Consequences)

2. The actions will not have a significant effect on public health and safety. (Chapter IV, Environmental Consequences)

3. The project will not significantly affect any unique characteristics of the geographic area such as proximity to historical or cultural resources, wild and scenic rivers, or ecologically critical areas. (Chapter IV, Environmental Consequences)

4. The effects on the quality of the human environment are not likely to be highly controversial. (Chapter IV, Environmental Consequences)

5. The actions do not involve highly uncertain, unique, or unknown environmental risks to the human environment. (Chapter IV, Environmental Consequences)

6. The actions will not establish a precedent for future actions with significant effects nor do they represent a decision in principle about a future consideration. (Chapter IV, Environmental Consequences)

7. There will be no cumulatively significant impacts on the environment. Cumulative impacts have been analyzed with consideration of other similar activities on adjacent lands, in past action, and in foreseeable future actions. (Chapter IV, Environmental Consequences, Cumulative Effects)

8. The actions will not significantly affect any site listed in, or eligible for listing in, the National Register of Historic Places, nor will they cause loss or destruction of significant scientific, cultural, or historic resources. (Chapter IV, Environmental Consequences)

9. The actions are not likely to adversely affect threatened or endangered species, or their habitats. (Chapter IV, Environmental Consequences)

10. The actions will not lead to a violation of federal, state, or local laws imposed for the protection of the environment. (Chapter IV, Environmental Consequences)

SUPPORTING REFERENCES

U.S. Fish and Wildlife Service. 2011. Draft Environmental Assessment for the Proposed Establishment of the Everglades Headwaters National Wildlife Refuge and Conservation Area, Polk, Osceola, Highlands, and Okeechobee Counties, FL. U.S. Department of the Interior, Fish and Wildlife Service, Southeast Region, Atlanta, GA.

U.S. Fish and Wildlife Service. 2011. Draft Land Protection Plan for the Proposed Establishment of the Everglades Headwaters National Wildlife Refuge and Conservation Area, Polk, Osceola, Highlands, and Okeechobee Counties, FL. U.S. Department of the Interior, Fish and Wildlife Service, Southeast Region, Atlanta, GA.

U.S. Fish and Wildlife Service. 2012. Final Environmental Assessment for the Proposed Establishment of the Everglades Headwaters National Wildlife Refuge and Conservation Area, Polk, Osceola, Highlands, and Okeechobee Counties, FL. U.S. Department of the Interior, Fish and Wildlife Service, Southeast Region, Atlanta, GA.

U.S. Fish and Wildlife Service. 2012. Land Protection Plan for the Proposed Establishment of the Everglades Headwaters National Wildlife Refuge and Conservation Area, Polk, Osceola, Highlands, and Okeechobee Counties, FL. U.S. Department of the Interior, Fish and Wildlife Service, Southeast Region, Atlanta, GA.

DOCUMENT AVAILABILITY

The Draft Land Protection Plan and Draft Environmental Assessment for the establishment of the Proposed Everglades Headwaters National Wildlife Refuge and Conservation Area were developed from information gathered during public scoping from January 12, 2011 through March 31, 2011, and were made available for public review and comment from September 8, 2011 to November 25, 2011. Comments from the Seminole Tribe of Florida were received on October 21, 2011. Comments from the State of Florida were received from the State Clearinghouse on November 9, 2011. The Final Environmental Assessment and the Final Land Protection Plan were revised, based on input received during public review and comment. Additional copies of the final documents are available by writing: Refuge Manager, Everglades Headwaters National Wildlife Refuge and Conservation Area, 1339 20th Street, Vero Beach, FL 32960.

Cynthia K. Dohner
Regional Director

12/9/2011
Date