

Hobe Sound National Wildlife Refuge

Summary of the Draft Comprehensive Conservation Plan



*Indian River Lagoon
USFWS Photo*



*Scrub
USFWS Photo*

Where is the refuge located?

Hobe Sound National Wildlife Refuge is one among a number of National Wildlife Refuges in Florida with similar wildlife habitats (Figure 1). With the exception of two tracts in St. Lucie County, Hobe Sound Refuge is located in southeastern Martin County, near the town of Hobe Sound, Florida (Figure 2). The refuge is bisected by the Indian River Lagoon/Intracoastal Waterway into two tracts—the 300-acre Mainland Tract and the 735-acre Jupiter Island Tract (Figure 3). Jonathan Dickinson, Atlantic Ridge, Seabranche Preserve, and St. Lucie Inlet Preserve state parks are located in the immediate vicinity of the refuge.

Why is the refuge important?

The Jupiter Island Tract of the refuge contains one of the largest contiguous sections of undeveloped beach in southeastern Florida. This beach is considered one of the most productive sea turtle nesting areas in the southeastern United States. Nesting on the beach are the loggerhead, green, and leatherback sea turtles, which are considered threatened and/or endangered by the State of Florida or the Fish and Wildlife Service.

The Mainland Tract of the refuge contains one of the few remaining publicly owned sand pine scrub communities. Compared with other ecosystems in Florida, scrub habitat is scattered across the landscape with concentrations along coastal and central ridges in peninsular Florida (Figure 4). Due to ever-present development pressures, only remnants of the original distribution of scrub habitat remain. Scrub habitat is vital to at least 40 rare species, including the gopher tortoise, scrub jay, eastern indigo snake and other associated wildlife and plants.

Contiguous with both tracts is the Indian River Lagoon and its associated mangrove communities, which provide habitat for West Indian manatees, numerous aquatic species, and neotropical migratory birds such as the Blackpoll warbler.

How was the refuge established?

The refuge was established in 1969, through the foresight and generosity of Jupiter Island residents, with an approved acquisition boundary of approximately 400 acres. The refuge originated from its designation as the Reed Wilderness Seashore Sanctuary and its National Landmark status in 1967. Most of the refuge was donated by private citizens and The Nature Conservancy primarily for the conservation of threatened and endangered species and preservation of undeveloped vistas.

Why is the comprehensive conservation plan needed?

The purpose of developing the comprehensive conservation plan is to identify a strategy for achieving refuge purposes and the mission of the National Wildlife Refuge System. The plan articulates the Service's management direction (goals, objectives, and strategies) for the next 15 years. The National Wildlife Refuge System Improvement Act of 1997 requires that all national wildlife refuges be managed in accordance with a plan by 2012.

Figure 1. Location of Hobe Sound National Wildlife Refuge in relation to other refuges with similar habitats in Florida.



Figure 2. Location of Hobe Sound National Wildlife Refuge in relation to adjacent state lands.

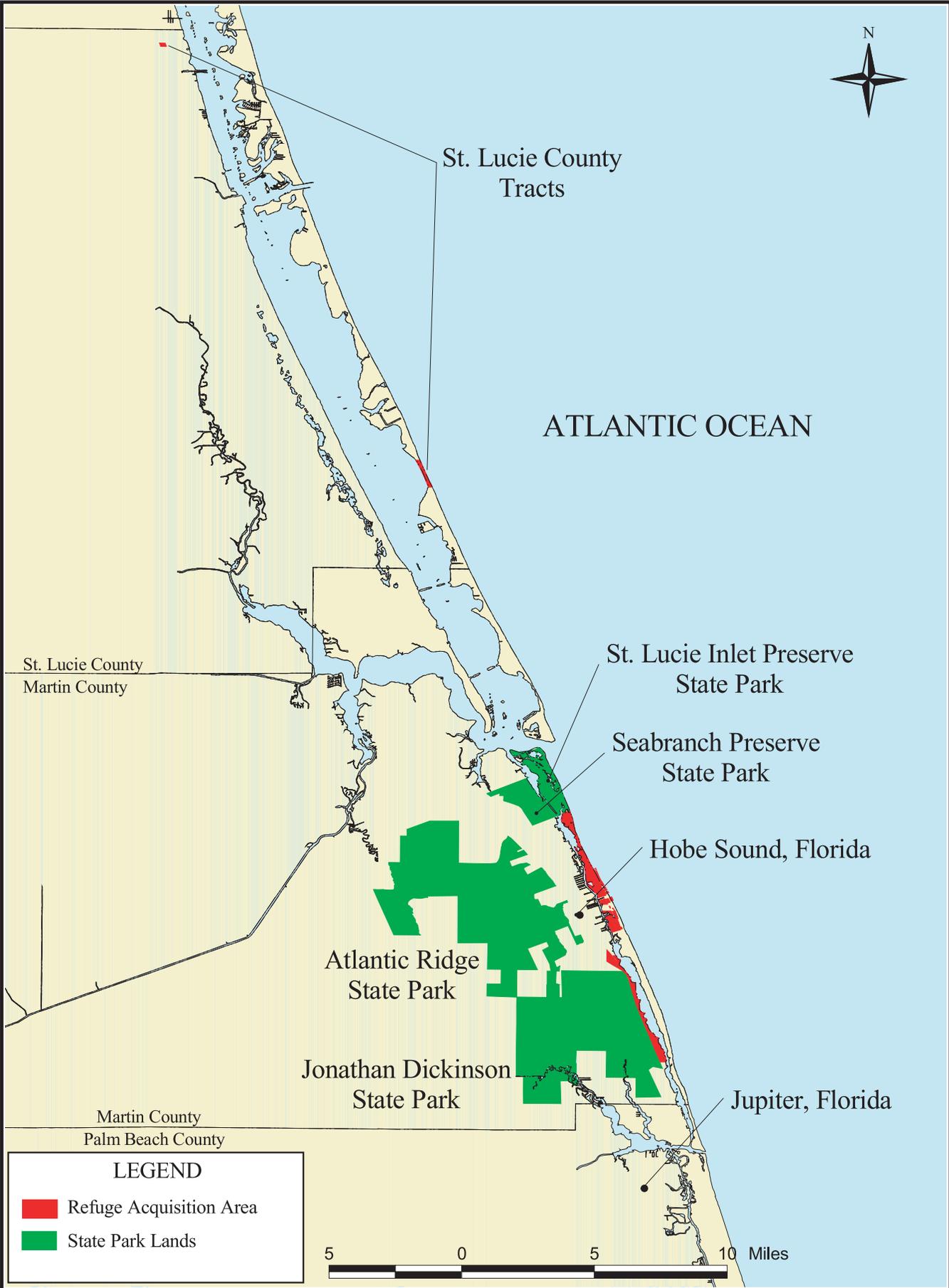
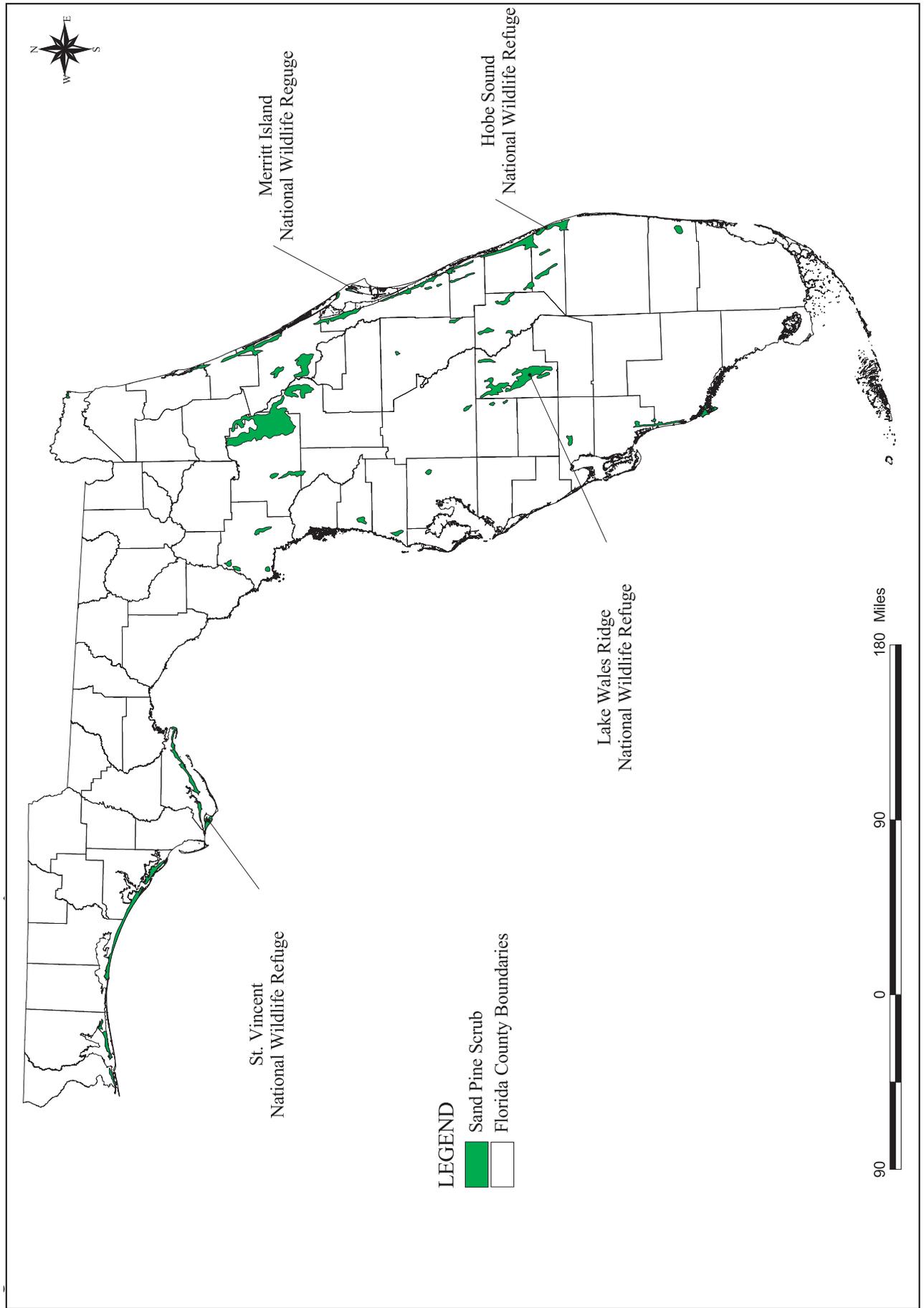


Figure 3. Location of Jupiter Island and mainland tracts of Hobe Sound National Wildlife Refuge in relation to Indian River Lagoon/Intracoastal Waterway..



Figure 4. General distribution of scrub in Florida. Adapted from Davis 1967.



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Hobe Sound Big Sky Beach
USFWS Photo

"I went up there a little while ago. I took friends in the boat up the river, and there's nothing like it. There will be nothing like it ever. It's a wilderness marvel but it'll be really a marvel in fifty years-a hundred years from now. There's so little of that natural world left. Never did Dad make a better decision than that one."

Nathaniel Reed

Who developed the plan?

The plan was developed by a planning team consisting of representatives from: Fish and Wildlife Service, Florida Department of Environmental Protection, Florida Fish and Wildlife Conservation Commission, Town of Jupiter Island, University of Florida, and Florida Atlantic University.

What is the National Wildlife Refuge System and its mission?

The Refuge System is the world's largest collection of lands specifically managed for fish and wildlife conservation. Operated and managed by the Fish and Wildlife Service, the Refuge System comprises more than 540 national wildlife refuges with a combined area of over 94 million acres. The majority of refuge lands are in Alaska. The remaining acres are spread across the other 49 states and several island territories.

The mission of the National Wildlife Refuge System, as defined by the National Wildlife Refuge System Improvement Act of 1997, 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."

What is the purpose of the refuge?

As indicated in the legislation authorizing the establishment of the refuge, the conservation of threatened or endangered fish, wildlife, and plants is paramount. Development of fish and wildlife-oriented recreational opportunities must consider this conservation mandate:

"...to conserve (A) fish or wildlife which are listed as endangered species or threatened species... or (B) plants...." 16 U.S.C.1534 (Endangered Species Act of 1973); "...suitable for (1) incidental fish and wildlife-oriented recreational development, (2) the protection of natural resources, (3) the conservation of endangered species or threatened species...." 16 U.S.C. 460K-1 (Refuge Recreation Act of 1962); "...for use as an inviolate sanctuary, or for any other management purpose, for migratory birds." 16 U.S.C. 715d (Migratory Bird Conservation Act of 1929); "...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 of 1966); "...for the development, advancement, management, conservation, and protection of fish and wildlife resources." 16 U.S.C. 742f(a)(4) (Fish and Wildlife Act of 1956).

Refuges will be managed to fulfill the mission of the National Wildlife Refuge System, fulfill the individual purpose of each refuge, and maintain the biological integrity, diversity, and environmental health of the system.

What is the vision for the refuge?

Hobe Sound National Wildlife Refuge serves as a beacon of hope that wild places can still exist in south Florida. It is the reflection of

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*Red Mangrove
USFWS Photo*

the generous and farsighted residents of Jupiter Island who were inspired by its beauty and who sought to protect it from the onslaught of development. As a result, Hobe Sound National Wildlife Refuge is an outstanding example of an Atlantic coastal ridge and barrier island environment.

Through scientifically careful ecosystem management, inspirational environmental education, and creative partnerships, this public asset will be protected, restored, and enhanced. The refuge will someday be a contiguous tract of land that provides safe corridors for native wildlife and plants to flourish, where wildlife abundance and high quality facilities will attract thousands of students and visitors each year.

As the south Florida landscape continues to undergo change through development, Hobe Sound National Wildlife Refuge will serve as a sanctuary for threatened and endangered species, as well as an oasis for people who wish to experience what the early days of Florida were like. The refuge will inspire others to protect other wild places for future generations.

What are the key elements of the plan?

The planning team evaluated four alternatives for managing the refuge, and selected the Ecosystem Emphasis Alternative as the "preferred alternative." The other alternatives evaluated were: Maintain Current Management; Biological Emphasis; and Public Use Emphasis. These alternatives are described in Section B of the "Hobe Sound National Wildlife Refuge Draft Comprehensive Conservation Plan and Environmental Assessment."

In essence, the proposed action will result in increased protection of threatened, endangered, and trust species; increased invasive exotic plant eradication and control; habitat restoration; protection of migratory shorebird and songbird stopover sites; restoration of imperilled scrub habitat; enhanced resident wildlife populations; cultural resource protection; increased compatible wildlife-dependent recreation; and environmental education and interpretation.

The refuge will be managed using an ecosystem approach to maintain natural processes or to mimic those processes of a natural fire regime and natural vegetative succession. Maintaining a healthy sand pine scrub community with successful populations of endemic species is a priority for the refuge. The refuge will work with state and private organizations to implement a sand pine scrub habitat restoration plan for areas along the length of the Atlantic Coastal Ridge.

The refuge will play a greater role in determining compatible uses and management activities on the Indian River Lagoon. It will provide input to agencies involved with managing the seagrass beds, manatee populations, and maintaining the Intracoastal Waterway and its inlets.

The refuge will collaborate with the Florida Inland Navigation District and the Florida Department of Environmental Protection to remove exotic species and manage spoil islands and mounds on the

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*Seedlings following mechanical
treatment burn block 4
USFWS Photo*

mainland and barrier island along the Indian River Lagoon for wildlife. Mangrove wetlands will be restored along the length of the refuge.

Successful dune restoration on the barrier island will require an intensive investigation of dune dynamics and the effects of inlet creation and maintenance. Beach renourishment projects on Jupiter Island will be closely monitored to ensure an appropriate substrate is available for populations of shorebirds and benthic invertebrates, as well as a compatible beach for nesting sea turtles.

Invasive exotic plants and animals will remain the focus of intensive management on the refuge. Contracts will continue to be established with the private sector to remove exotic plants and non-native sea turtle predators; refuge staff will monitor the effects of removal efforts. The refuge will support efforts to reduce and halt the spread of feral cat populations (estimated at 25,000 to 50,000) in Martin County.

Providing quality environmental education and interpretation will also remain a primary focus of the refuge. The partnership with Hobe Sound Nature Center, Inc., will be enhanced to explore new roles in the community and region.

What are the goals, objectives, and strategies to achieve the vision for the refuge?

The goals, objectives, and strategies presented below are the Service's responses to the issues and concerns expressed by the planning team, by the public at the open meeting, and comments submitted by the public.

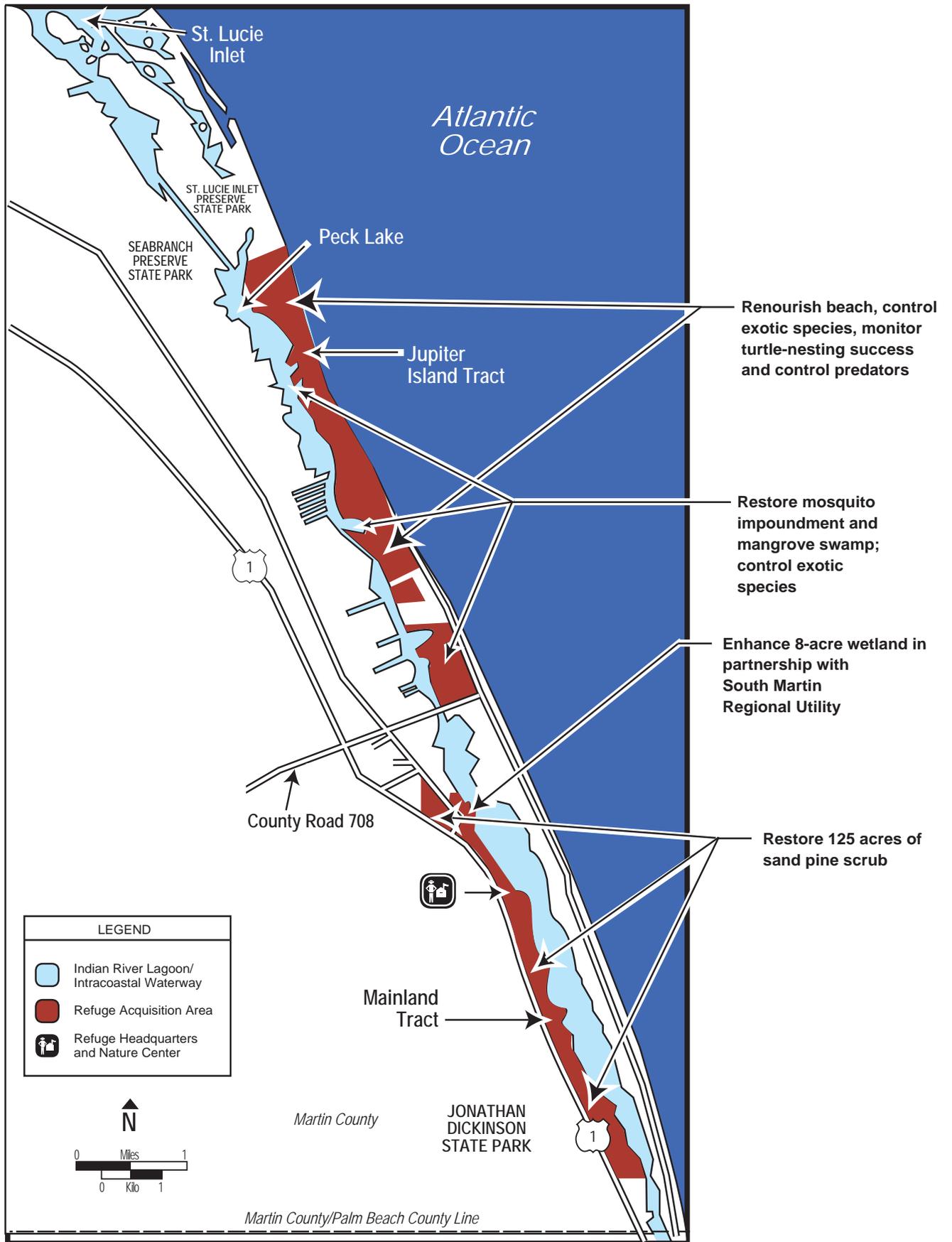
The objectives and strategies reflect the Service's commitment to achieve the mandates of the National Wildlife Refuge System Improvement Act of 1997, the mission of the National Wildlife Refuge System, and the Endangered Species Act of 1973. With adequate staffing and funding, the Service intends to accomplish these goals, objectives, and strategies during the next 15 years.

The overriding consideration reflected in the proposed plan is that fish and wildlife resources have first priority in refuge management, while public use (appropriate wildlife-dependent recreation) is allowed and encouraged as long as it is compatible with, or does not detract from, the refuge purpose and the mission of the National Wildlife Refuge System.

Goal 1. Restore and conserve diverse habitats, species populations, and biological integrity.

Objective 1: Manage 125 acres of sand pine scrub within the Atlantic Coastal Ridge by mimicking the natural fire regime (Figure 5).

Figure 5. Wildlife habitat and population management activities, Hobe Sound National Wildlife Refuge



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Strategies:

- Update the Sand Pine Scrub Habitat Restoration Plan by 2004, and in the same year, begin implementing the revisions. This plan will explore new options of disturbance to mimic the natural fire regime. It will enhance feeding, nesting, and roosting components for scrub community species.
- Monitor the effects of the refuge's sand pine scrub management plan on wildlife and the vegetative community.
- Foster partnerships with the Florida Park Service, The Nature Conservancy, the U.S. Forest Service, the Bureau of Land Management, Martin County, and others to assist with the inventory of scattered sand pine scrub sites; develop plans for fire and mechanical disturbance; and monitor the recruitment of native species and overall habitat response.
- Encourage other state, county, local, and private property owners to use the developed management techniques to treat aging sand pine scrub tracts along the Atlantic Coastal Ridge.
- Actively control invasive exotic species invading from ruderal or disturbed areas.
- Support and implement listed species recovery plans.
- Attempt to maintain a visual screen of U.S. Highway 1 from Jupiter Island using native plants.
- Prevent habitat destruction from all-terrain vehicles through enhanced law enforcement.

Objective 2: Restore 100 acres of the native Atlantic coastal dune system on the Jupiter Island Tract by 2009.

Strategies:

- Draft a coastal dune habitat management plan by 2007, to include appropriate restoration techniques, exotic species control, renourishment, and revegetation.
- Remove and control invasive exotic plant species on the Atlantic coastal dune system, including Australian pine, beach naupaka, Brazilian pepper, Old World climbing fern, and other Category I and II species (Figure 5).
- Install sand fencing compatible with sea turtle nesting, in appropriate areas, for dune restoration.
- Continue supporting beach renourishment efforts until a more effective alternative is developed.
- Monitor the effects of beach renourishment on sea turtle nesting, shorebird usage, native vegetation, benthic invertebrates, erosion, near-shore habitat, and public use. (Future management decisions about renourishment will be based on this information.)
- Use partnerships and volunteers to implement an aggressive management plan that will encourage historical native species diversity.
- Develop and support volunteers in restoration efforts.
- Maintain and foster partnerships with St. Lucie Inlet Preserve

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*Least Terns
USFWS Photo*

- State Park and adjacent private landowners to prevent reinfestation of all exotic plants on the foredune.
- Support and implement listed species recovery plans.

Objective 3: Restore and conserve 300 acres of mangrove and hammock systems by 2016.

Strategies:

- Develop a mangrove swamp restoration plan by 2004. This plan will restore the three mosquito control impoundments through partnerships with Jupiter Island, Martin County, and private landowners (Figure 5). Water levels should be managed for native fish and bird species, invasive exotic species control, and biting insect control.
- Foster partnerships and volunteers to promote healthy mangrove, wetland, and hammock communities on the barrier island.
- Draft and implement an exotic pest plant removal plan by 2008. The plan will identify sensitive habitats such as hammocks and trust species to prioritize exotic plant removal efforts. The plan will emphasize the aggressive treatment and removal of all of the exotic vegetation within 15 years, with the ultimate goal of maintenance level control that encourages native species recruitment.
- Convert dredge spoil sites to natural communities by 2016 with partnerships from Jupiter Island, the Florida Inland Navigation District, Army Corps of Engineers, Martin County Mosquito Control, and others.
- Restore 50 percent of the degraded mangrove habitat along the Indian River Lagoon.
- Explore methods to mitigate impacts of the boat wakes on the mangrove shoreline.
- Support and implement listed species recovery plans.
- Explore avenues to reduce boat speeds near the refuge.

Objective 4: Monitor, map, and inventory all federal trust and state listed species, populations, and habitats by 2008, to provide a basis for refuge management actions, to measure accomplishments, and to implement adaptive management.

Strategies:

- Create a comprehensive biological community inventory and monitoring plan by 2008. Follow standardized inventorying and monitoring protocols for all trust species, when available. Implement regionally used inventory and monitoring protocols in case standardized methods are not established.
- Compile historic data and establish a continuous data collection and analysis program.
- Develop a geographic information system capability at the refuge. This capability will enable the refuge to map biotic and

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*Leatherback and loggerhead
hatchlings*

USFWS Photo

abiotic attributes and monitor changes in these attributes in response to management scenarios.

- Assess the demographic characteristics of scrub community flora and fauna, as well as trust species.
- Monitor changes in wildlife, fish, and habitat, and implement adaptive management techniques as appropriate.
- Support the Partners-in-Flight initiative by implementing appropriate migratory bird surveys.
- Collaborate with area universities and other research facilities to enhance the recovery of trust species, natural communities, and native species, as well as to control exotics.

Objective 5: Provide conditions for sea turtle nesting to achieve a 75 percent hatchling survival rate from nests to ocean waters. (Strategies to achieve this objective will contribute to sea turtle recovery plans.)

Strategies:

- Implement and monitor the effects of an active predator control plan, which seeks to reduce nest predation levels at or below 10 percent (Figure 5).
- Reduce beach erosion to provide a sufficient amount of habitat for nesting sea turtles.
- Increase partnerships with other law enforcement agencies to prevent human nest predation.
- Control exotic plants, especially Australian pines on the foredune.
- Continue participation in the Statewide Index Nesting Beach Survey monitoring program, which results in data essential to enhancing sea turtle nesting success.
- Monitor turtle hatchling success by evaluating: (1) a minimum of 20 percent of the loggerhead nests or 100 nests, whichever is greater; and (2) all endangered sea turtle nests (e.g., green and leatherback sea turtles).
- Continue participation in the sea turtle stranding and salvage network, which provides information on turtle survival.
- Advance knowledge about and contribute to sea turtle biology by reporting results of refuge efforts in peer-reviewed journals.

Objective 6: Provide favorable feeding, nesting, and roosting habitat for trust species on 75 percent of the refuge.

Strategies:

- Enhance habitats of trust species through habitat management techniques such as prescribed fire, exotic plant control, and restoration.
- Ensure that wildlife requirements are met in the context of multi-species management.
- Provide data and perform analysis to update the Multi-Species Recovery Plan for South Florida.

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- Enhance nesting success for migratory songbirds and shorebirds by reducing human disturbance and providing quality nesting, roosting, and foraging habitat.
- Implement appropriate management actions, including temporary beach closures to reduce the impacts of visitor use to shorebirds.
- Participate in, contribute to, and attend meetings of Partners-In-Flight, Shorebird Network, Manatee Working Groups, Exotic Pest Plant Council, Scrub Jay Recovery Team, Native Plant Society, and other professional organizations.

Goal 2. Conserve natural and cultural resources through partnerships, protection, and land acquisition.

Objective 1: Establish cooperative agreements and memorandums of understanding, and pursue joint funding opportunities with government agencies and non-government organizations to protect the ecosystem and promote public awareness and use.

Strategies:

- Develop a memorandum of understanding with the town of Jupiter Island's Public Safety Department, Martin County Sheriff's Office, the Florida Fish and Wildlife Conservation Commission, and the Florida Park Patrol to enhance the protection of natural and cultural resources, the visiting public, and the facilities of the Jupiter Island and Mainland tracts.
- Develop new and continue existing partnerships for research and monitoring of exotic and invasive species with the Florida Exotic Pest Plant Council, the Treasure Coast Upland Invasive Plant Working Group, and the Florida Department of Environmental Protection's Bureau of Invasive Plant Management.
- Promote the development of a non-profit facility to propagate native plants to be used for restoration efforts on the refuge and in the surrounding communities.
- Actively pursue grants and funding opportunities with regard to environmental and cultural education, exotic plant control, spoil site restoration, mangrove wetland restoration, and sand pine scrub management.
- Partner with the Service's Office of Ecological Services and the Florida Fish and Wildlife Conservation Commission to identify areas within the Indian River Lagoon that have high manatee mortality, as well as to establish and enforce appropriate protection zones, educate the public, and host public meetings.
- Explore the development of a partnership with organizations such as the Marine Life Center, Juno Beach Florida, to aid in the rehabilitation of selected species of marine life.
- Collaborate with the Hobe Sound Nature Center, Inc., to enhance both on- and off-refuge curriculum and an in-service training for teachers.

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- Enhance cooperation and communication with the Florida Department of Environmental Protection; Martin County; and the Hobe Sound Nature Center, Inc., to improve sea turtle interpretive programs and to develop marine mammal and other natural resource related programs.
- Coordinate with the Florida Department of Transportation and the Florida Turnpike Commission to erect directional signs for the refuge along Interstate 95, the Florida Turnpike, and U.S. Highway 1.

Objective 2: Work with partners to improve aquatic habitats bordering the refuge that are essential to manatees, fish, and other species.

Strategies:



*Visitors fishing on beach
USFWS Photo*

- Partner with state and county agencies to enhance and restore seagrass and hard bottom habitats, and to conduct research projects to assess and monitor impacts from boating, dredging, and freshwater releases.
- Coordinate with agencies such as Florida Department of Environmental Protection; National Estuary Program; Florida Inland Navigation District; Martin County; Army Corps of Engineers; South Atlantic Fishery Management Council; Atlantic States Marine Fisheries Commission; National Marine Fisheries Service; South Martin Regional Utility; and South Florida Water Management District for the restoration and enhancement of the Indian River Lagoon and nearshore Atlantic habitats.

Objective 3: Work with adjacent communities to protect and enhance neighboring lands for native wildlife and plants.

Strategies:

- Promote greenway development, exotic free buffer zones, and wildlife corridors to connect natural land tracts, where appropriate.
- Encourage neighboring residents to maintain a healthy buffer along the refuge's boundary.
- Promote communication with adjacent landowners to restore and maintain native habitats on their properties.
- Recruit volunteers with botanical skills to assist with preparing landscape plans for refuge neighbors. These plans would focus on elimination of exotics and encourage the use of native plants.
- Encourage the town of Jupiter Island and Martin County to adopt and enforce an ordinance that requires homeowners to remove all Category I invasive exotic plants from their yards within 5 years.
- Develop a partnership with the Jupiter Island Garden Club and the town of Jupiter Island to promote, through an educational program to residents, the use of native plants in the landscaping of new homes, as well as in subdivisions and other large scale developments nearby.

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*Lichen
USFWS Photo*

- Partner with current adjacent landowners to manage inholdings for optimal plant and wildlife habitat.

Objective 4: Enhance and develop partnerships with other agencies to protect natural resources, both on and adjacent to the refuge.

Strategies:

- Establish and/or update memorandums of understanding with neighboring law enforcement agencies.
- Pursue the possibility of joint training programs with law enforcement agencies.
- Cooperate with other agencies in support of their efforts to control and regulate vessel traffic and speed in the Intracoastal Waterway.
- Cooperate with other agencies to identify and report contaminants on roadways and near-shore waters to assure cultural and natural resource protection.
- Partner with other agencies to minimize sea turtle poaching.
- Increase law enforcement patrols to prevent unpermitted removal of resources such as saw palmetto berries and Cladonia lichens.
- Pursue mitigation from those parties responsible for causing beach erosion, mangrove destruction, and other damage.
- Minimize species exposure to contaminants on the refuge by implementing current spill plans.

Objective 5: Enhance mechanisms for cultural resource protection by 2006.

Strategies:

- Write and implement a Cultural Resources Protection Plan by 2006.
- Comply with federal and state historic preservation mandates.
- Continue to partner with the National Park Service and the South East Florida Archaeological Society to inventory and assess the refuge's cultural resources.
- Work with local law enforcement agencies to eliminate looting and vandalism of cultural resource sites.
- Determine the significance of known cultural resources (i.e., site limits, activity areas, chronology, and integrity of archaeological deposits).
- Develop and implement procedures for obtaining input from Native American tribes regarding management, public use, and interpretive activities.
- Stabilize appropriate sites as needed to avoid further damage.
- Develop partnerships, including local universities and archaeological groups, to provide tours to the public, while protecting cultural resources.

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*Scrubtrail stairs
USFWS Photo*

Goal 3. Develop appropriate and compatible wildlife-dependent recreation, environmental education, and interpretive programs that lead to enjoyable experiences and a greater understanding of fish, wildlife, and habitat conservation by the public.

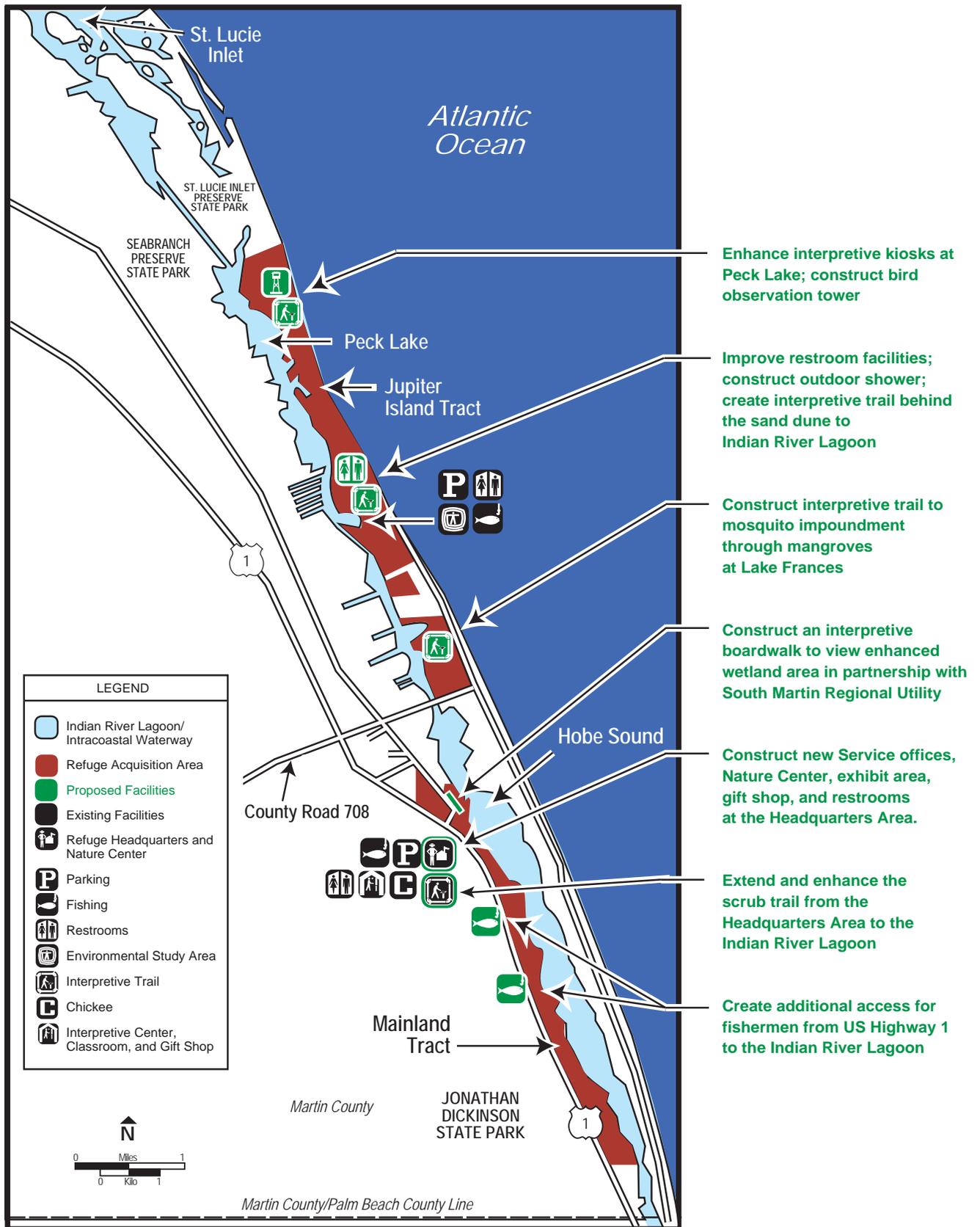
Objective 1: Increase public accessibility to new areas of the refuge by 20 percent and enhance other opportunities by 50 percent for fishing, wildlife observation, and wildlife photography, as long as these opportunities do not conflict with wildlife needs.

Strategies:

- Enhance interpretive kiosks at Peck Lake. Construct an elevated bird observation tower with a fixed mounted telescope on the beach trail (Figure 6).
- Explore the feasibility of extending a water line to the refuge's beach parking lot to enable the development of a rinsing shower and a drinking fountain.
- On the Jupiter Island Tract, improve restroom facilities, construct outdoor shower, and create interpretive trail behind the sand dune to Indian River Lagoon.
- Create a new trail (up to 3 miles) on the Jupiter Island Tract. The trail will begin at the beach parking lot; wind through the coastal strand, mangroves, and mosquito impoundments; and end at the Indian River Lagoon.
- Construct an interpretive trail to the mosquito impoundment through the mangroves at Lake Francis.
- In partnership with the town of Jupiter Island, explore the feasibility of creating a parking area at the old Coast Guard Station or near Lake Francis to provide access for fishermen and others to a trail system for wildlife viewing and photography.
- Construct an interpretive boardwalk to view an enhanced wetland area in partnership with South Martin Regional Utility.
- Construct new Service offices, Nature Center, exhibit area, gift shop, and restrooms at the headquarters area.
- Extend and enhance the scrub trail from the headquarters area to the Indian River Lagoon.
- Create two additional access points for fishermen from U.S. Highway 1 to the Indian River Lagoon by converting firebreaks to trails.
- Install monofilament recycling box at each new access area.
- Increase interpretive signs on all trails throughout the refuge.

Objective 2: Expand our partnership with the Hobe Sound Nature Center, Inc., and explore the development of new environmental education opportunities, both on and off the refuge, targeted toward students beyond the elementary school level and toward adults.

Figure 6. Location of existing and proposed recreational and administrative facilities. Hobe Sound National Wildlife Refuge.



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*Nature center; kids summer camp
USFWS Photo*

Strategies:

- Develop an environmental education curriculum which is focused on biotic communities (e.g., sand pine scrub, barrier island, and Indian River Lagoon) common to the refuge, St. Lucie Inlet Preserve State Park, Jonathan Dickinson State Park, and the Blowing Rocks Preserve.
- Develop an environmental education program which uses volunteers as roving guides.
- Coordinate satellite downlinks with the Service and area schools and create a downlink site when the new learning center comes on-line.
- Develop an interactive web site to provide current information about ongoing and new refuge projects and Nature Center activities and program schedule with links to supporting sites.
- Create a video that showcases refuge biological systems, visitor facilities, and Nature Center environmental education and interpretation programs.
- Address, in the lecture series, key issues of concern to the refuge and the Service.
- Promote a "leave no trace" ethic through education and appropriate signage.
- Use environmental education, targeted toward homeowners and builders, to promote the use of native plants in landscaping.

Objective 3: By 2005, assist the Nature Center to expand experiences to 100,000 visitors per year and guarantee a healthy work environment for staff and volunteers. To accommodate the planned annual visitation and to also attract a greater spectrum of the community, the center will set lengthier and more convenient hours of operation, provide staff on the weekends, and accommodate multiple school and meeting groups.

Strategies:

- Work with the Hobe Sound Nature Center's Board of Directors to showcase the center's vision, generate community interest, and raise funds.
- Develop new partnerships to promote development of the center.
- Design the learning center to be aesthetically pleasing to the community and to fit into the sand pine scrub landscape.
- Provide a classroom/meeting area for presentations and to show videos.
- Provide adequate work space for a growing volunteer force and staff.
- Develop a library containing current and historic documents pertaining to refuge management, research, inventory, and monitoring projects.
- Provide space for wildlife art exhibits and contests.

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*Chickee
USFWS Photo*

- Develop exhibits to display the ecology and management of natural communities (e.g., dune dynamics, biodiversity of tropical hardwood hammocks, and healthy sand pine scrub management).

Objective 4: Expand opportunities for environmental interpretation.

Strategies:

- Create, replace, and maintain interpretive/educational signs.
- Initiate ranger-guided and self-guided tours to explain the ecology of the South Florida Ecosystem.
- Initiate annual photo and art contests.
- Collaborate with the Southeast Florida Archaeological Society and the Hobe Sound Nature Center to develop and implement a cultural resource interpretive program.

Objective 5: By 2005, add 50 volunteers to assist with resource protection, environmental education, and interpretive programs.

Strategies:

- Explore opportunities for greater public investment in the refuge.
- Expand the volunteer force to increase the number and frequency of beach clean-ups, exotic vegetation removal, and native plantings.
- Explore the feasibility of creating an "adopt-a-beach" program within the community.
- Train roving volunteer interpreters.

Goal 4. Implement appropriate management regime for the refuge and improve infrastructure; add support staff to meet the needs of an expanding visitor public and to facilitate responsible biological, maintenance, and law enforcement programs.

Objective 1: The refuge will add 6 key positions to its staff to achieve the goals, objectives, and strategies of this plan.

Strategies:

- Create a management structure that offers greater flexibility in meeting funding and staffing needs.
- Develop a permanent staff to achieve the vision, goals, and objectives of this plan.

Objective 2: Replace the existing administrative headquarters building, Nature Center, and maintenance shop with a facility that is safe, efficient, and worthy of a national wildlife refuge.

Strategies:

- Work with the Nature Center to raise funds for a replacement facility.

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*Shorebirds
USFWS Photo*

- Ensure that Refuge Operating Needs System (RONS) and Maintenance Management System (MMS) projects submitted to the Service's Regional Office are well designed and appropriately prioritized.

Objective 3: Procure and maintain safe equipment to facilitate maintenance of grounds, buildings, and facilities, and provide appropriate equipment to conduct proposed biological inventories and monitoring.

Strategies:

- Replace faulty and old equipment.
- Bring all quarters and building structures up-to-code.

What projects, staffing, and funding will be needed to fulfill the plan?

To achieve the proposed management plan, the refuge will carry out 18 projects. The projects and their associated costs are shown in Figure 7. A description of each project can be found in Section A of the "Hobe Sound National Wildlife Refuge Draft Comprehensive Conservation Plan and Environmental Assessment."

The refuge currently has three permanent positions: a refuge manager; refuge law enforcement officer; and a maintenance worker. An additional temporary maintenance worker, and two seasonal fee clerks are also presently employed. The annual cost for the refuge including the salary of these six positions is approximately \$200,000. With the additional support from A.R.M. Loxahatchee National Wildlife Refuge, its parent refuge, this annual cost is actually closer to \$350,000.

For the refuge to realize its full potential as a community leader in environmental education and threatened and endangered species management, it will need 6 additional staff: a refuge operations specialist or assistant refuge manager; an office assistant; a wildlife biologist; a refuge ranger; a heavy equipment operator; and a maintenance helper. The annual operating cost, including staff costs, annual fixed costs, and repair and maintenance costs after this plan is fully implemented will be \$708,800.

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Figure 7. Summary of project costs for Hobe Sound National Wildlife Refuge

PROJECTS	INITIAL PROJECT COST	RECURRING BASE COST
1. Control Invasive Exotic Plants	\$280,000	\$180,000
2. Monitor Habitat and Wildlife Populations	75,000	20,000
3. Implement Sand Pine Scrub Management Plan	30,000	30,000
4. Restore and Monitor Mangrove Wetland Impoundments (3 total)	375,000 <i>(125,000 per impoundment)</i>	30,000 <i>(10,000 per impoundment)</i>
5. Restore and Monitor Coastal Dune System	25,000	25,000
6. Control Shorebird and Sea Turtle Predators	15,000	15,000
7. Conserve Indian River Lagoon	150,000	25,000
8. Control Beach Foredune Erosion	250,000	50,000
9. Protect and Interpret Cultural Resources	150,000	25,000
10. Acquire Land to Protect Unique Plant and Wildlife Habitats	15,000,000	---
11. Develop Beach/Lagoon Trails and Observation Platforms	125,000	25,000
12. Expand and Enhance Sand Pine Scrub Trail	125,000	25,000
13. Develop and Install Informational Signs	100,000	10,000
14. Provide Running Water and Restroom Facilities at the Beach Access Area	100,000	25,000
15. Step Into the Computer Age	20,000	10,000
16. Develop New Environmental Learning Center and Headquarters Facility	1,200,000	50,000
17. Meet/Fulfill Heavy Equipment Needs	75,000	25,000
18. Renovate Shop	250,000	10,000
<i>Grand Totals:</i> without land acquisition	\$3,345,000	\$580,000
with land acquisition	\$18,345,000	

Hobe Sound
National Wildlife Refuge

**Summary of the Draft
Comprehensive
Conservation Plan**