Barrier Island Sanctuary Management Plan

Brevard County Board of County Commissioners
Environmentally Endangered Lands Program
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BARRIER ISLAND SANCTUARY MANAGEMENT PLAN

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I. EXECUTIVE SUMMARY

The Barrier Island Sanctuary is part of the Sanctuary network established by the Environmentally Endangered Lands (EEL) Program in Brevard County. The intent of the EEL Program is to acquire environmentally sensitive lands as a first step "towards long-term protection of essential natural resources, open space, green space, wildlife corridors and maintenance of natural ecosystem functions" (Brevard County EEL Program, Sanctuary Management Manual, 1997). The EEL Program also offers passive recreation and environmental education opportunities on the acquired lands to Brevard County residents and visitors.

The Barrier Island Sanctuary is comprised of seven properties that encompass approximately 34.32 acres, located 14.5 miles south of the Melbourne Causeway (US 192) on State Road A1A and south of the City of Melbourne Beach, Florida. These properties are located to the east and west side of State Road A1A and consist of dune, coastal strand, maritime hammock and tidal swamp habitats. The properties are imbedded amongst and bordered by a mixture of conservation lands and residences. Though portions of the Sanctuary have been disturbed in the past, removal of exotic plants and the restoration of hydrology have greatly improved ecosystem functions.

The primary management goals for the site include the conservation and restoration of ecosystem function, natural communities and native species' habitat. The collection and documentation of natural and cultural resource data are also important management goals. Other management goals include provisions for public access and environmental education.

The Barrier Island Sanctuary provides outstanding opportunities for nature-based outdoor recreation, environmental education, field research and guided or self-guided interpretive tours featuring Central Florida's ecological diversity. Due to the sensitive nature of the resources, access is limited to passive recreation activities, such as hiking, nature study, picnicking, and environmental education. Facilities at the Barrier Island Sanctuary include the Barrier Island Sanctuary Management & Education Center (Barrier Island Center) with parking for vehicles and buses, a trail system available for hiking, fishing and wildlife observation and an adjacent kayak launch. The nature trails feature signs to interpret the Barrier Island Sanctuary's natural resources and to provide information about resource management activities. The Barrier Island Center (BIC) and associated environmental programs are universally accessible. All facilities meet any applicable local, state and federal regulations.

The recreation and education facilities serve local and regional residents as well as tourists to Brevard County. The regional management center and surrounding sanctuaries in the EEL Sanctuary network are promoted as potential venues to support nature-based tourism activities. Public access to the Barrier Island Sanctuary and other Sanctuary properties encourages awareness of the County's natural and cultural assets, fosters a greater understanding of the balance between access and non-consumptive use of the sites' resources, and promotes environmental stewardship, benefiting both the local community and the EEL Program**.**

II. INTRODUCTION

In a 1990 referendum, Brevard County voters approved the Environmentally Endangered Lands (EEL) Program. The EEL Program Vision Statement is as follows:

"The Environmentally Endangered Lands (EEL) Program acquires, protects and maintains environmentally endangered lands guided by scientific principles for conservation and the best available practices for resource stewardship and ecosystem management. The EEL Program protects the rich biological diversity of Brevard County for future generations through acquisition and management. The EEL Program provides passive recreation and environmental education opportunities to Brevard's citizens and visitors without detracting from the primary conservation goals of the program. The EEL Program encourages active citizen participation and community involvement."

The EEL Program established a conceptual framework and funding mechanism to implement an EEL Sanctuary network in Brevard County. The Sanctuary network represents a collection of protected natural areas that form a regional conservation effort focused upon protection of biological diversity. Four management areas are geographically defined within the countywide EEL Sanctuary Network. For each management area, a specific site is identified as a Center for Regional Management. The sites that will function as centers for regional management for the EEL Program are listed:

I. Barrier Island Sanctuary
Regional Management Center for South Beaches

II. Enchanted Forest Sanctuary
Regional Management Center for North Mainland

III. Malabar Scrub Sanctuary
Regional Management Center for South Mainland

IV. Pine Island Conservation Area
Regional Management Center for Central Mainland

These centers provide strategically located hubs for implementing the countywide conservation, passive recreation and environmental education goals of the EEL Program.

As outlined in the Sanctuary Management Manual (SMM), the EEL Program will adopt and implement an ecosystem approach to environmental management. Ecosystem management is defined as an integrative, flexible approach to the management of natural resources, key themes of ecosystem management include:

1. Adaptive Management Natural areas must be managed in the context of the landscape in which they exist and based on scientific knowledge. Resource managers must adapt to continuing advances in the scientific understanding of ecosystems and changing environmental and human influences on the resources.

2. Partnerships Interagency and private sector partnerships are essential to manage and protect ecosystems. Natural resource management is complex and requires multi-disciplinary skills and experiences.

3. Holistic Approach Ecosystem management includes the maintenance, protection and improvement of both natural and human communities. This system's approach to management considers the "big picture" of natural resource protection, community economic stability and quality of life.

Land management issues, such as fire management, protection and restoration of natural hydrologic cycles, threatened and endangered species, and removal of invasive exotics must be integrated with issues, such as provisions for public access and levels of human use. The integration of ecosystem protection and human needs combine to form the foundation of an effective ecosystem management strategy.

The Sanctuary Management Manual of the EEL Program establishes both a general framework for management of specific sites and establishes ten Principles of Conservation summarized, to achieve the following:

1. Maintain all sites in a natural state and/or restore sites to enhance natural resource values;

2. Protect natural resource values by maintaining biological diversity and using conservation as a primary goal for decision-making;

3. Balance human use with the protection of natural resources;

4. Apply the most accurate scientific principles to strategies for conservation;

5. Collect and use the most accurate data available for developing site management plans;

6. Consider the interests and values of all citizens by using scientific information to guide management policy making;

7. Promote effective communication that is interactive, reciprocal, and continuous with the public;

8. Promote the value of natural areas to Brevard County residents and visitors through the maintenance of the quality of resource values, public services, and visitor experiences;

9. Promote the integration of natural resource conservation into discussions of economic development and quality of life in Brevard County; and

10. Provide a responsible financial strategy to implement actions to achieve long-term conservation and stewardship goals.

Outlined in the Sanctuary Management Manual, this management plan provides specific goals, strategies and actions to guide management of the Barrier Island Sanctuary in terms of the objectives of the EEL Program. The plan is divided into the following 10 sections.

I. *Executive Summary* identifies the location, size, general natural resource features and primary management goals for the site.

II. *Introduction* provides a brief introduction to the EEL Program, as well as a description of the structure of the management plan

III. *Site Description and Location* provides a detailed site location and description.

IV. *Natural Resource Descriptions* includes physical resources (climate, geology, topography, soils, and hydrology), biological resources (ecosystem function, flora, fauna, special concern species, and biological diversity), and cultural (archeological, historical, land-use history, public interest).

V. *Factors Influencing Management* includes natural trends, human-induced trends, external influences, legal obligations and constraints, management constraints, and public access and passive recreation.

VI. *Management Action Plans* include specific goals, strategies and actions.

VII. *Projected Timetable for Implementation* prioritizes activities and provides a timeframe for management plan implementation.

VIII. *Financial Considerations* discusses funding mechanisms and projected management costs.

IX. *Bibliography* cites original research and publications used to develop the Management Plan.

X. *Appendices* include supplemental information.

III. SITE DESCRIPTION AND LOCATION

The Barrier Island Sanctuary is located within the congressional boundaries of the Archie Carr National Wildlife Refuge (the Refuge). The United States Fish and Wildlife Service (USFWS) established the Refuge in 1989 under the Department of the Interior to "protect sea turtle populations and their nesting habitat along the central Atlantic coastline of Florida". The title "Archie Carr Refuge" is commonly used to refer to all conservation lands managed by Federal, State or local (County) agencies located between the Atlantic Ocean and the Indian River Lagoon within the stretch of the barrier island identified within the congressional boundaries.

The Refuge was named after the late Dr. Archie Carr, a pioneer in Florida ecology and sea turtle biology. The 20.5 miles of coastline within the refuge hosts the largest concentration of loggerhead and green sea turtles in the United States. Green turtles nest within the refuge in globally significant numbers. The beaches of Brevard County represent the northern extent of leatherback turtle nesting areas in the United States (Brevard County EEL Program, 1995a).

The Barrier Island Sanctuary (BIS) is comprised of 34.32 acres, and is located 14.5 miles south of the Melbourne Causeway (US 192) and south of the town of Melbourne Beach, Florida (Section 06, Township 30, Range 39), as shown in Figure 1. The Sanctuary is comprised of seven parcels whose tax ID's are 30-39-06-00-00282.0, 30-39-06-00-00264.0, 30-39-06-00-00265.2, 30-39-06-00-00267.0, 30-39-06-00-00265.0, 30-39-06-00-00500.0, and 30-39-07-00-00501.1. The legal descriptions of the parcels are attached as Appendix A. The Richard King Mellon Foundation acquired the seven parcels and donated them to the EEL Program in 1997. All of these BIS parcels are titled to Brevard County.

Three adjoining western parcels (BIS-W) consisting of parcels 30-39-06-00-00265.2, 30-39-06-00-00265.0 and 30-39-06-00-00500.0 are bounded to the east by A1A, and to the west by the Indian River Lagoon. BIS-W is bounded to the north by residential homes and to the south by Archie Carr National Wildlife Refuge Lands. The southern parcel (BIS-S), identified as 30-39-06-00-00501.1, is bounded to the north by Archie Carr National Wildlife Refuge lands and boarded to the south a parcel held by the Richard King Mellon Foundation. BIS-S is bounded to the east by A1A and to the west by the Indian River Lagoon. Four adjoining eastern parcels (BIS-E) is comprised of parcels

Figure 1. Site Location Map of the Barrier Island Sanctuary.

30-39-06-00-00282.0, 30-39-06-00-00264.0, 30-39-06-00-00267.0, and 30-39-06-00-00265.0. The parcel identified as 30-39-06-00-00265.0 is located on the east and west side of AlA and therefore is part of BIS-E and BIS-W. BIS-E is boarded to the north by residential homes and to the south by the County managed Louis Bonsteel III Memorial Park (Figure 2).

Approximately 2.5 miles south of the BIS is Brevard County's Long Point Park, which encompasses 84.5 acres. Long Point Park is bordered to the south by Sebastian Inlet State Park, which protects approximately 800 acres of barrier island habitat.

Figure 2. Barrier Island Sanctuary and adjacent properties.

IV. NATURAL RESOURCE DESCRIPTIONS

This section provides descriptions of natural resources, including physical resources (climate, geology, topography, soils and hydrology), biological resources (ecosystem function, flora, fauna, special concern species and biological diversity) and cultural resource information (archeological, historical, land-use history and public interest).

A. PHYSICAL RESOURCES

1. Climate

The BIS is located in east central Florida, an isothermal area at the junction of the temperate and sub-tropical climatic zones. Temperature data from representative locations in Brevard County indicate an average annual temperature of approximately 74° F. August is typically the warmest month, averaging 82° F, whereas January is the coolest month, averaging about 62° F (Schmocker, et. al., 1990). Summer temperatures are moderated by frequent afternoon thunderstorms. Periods of extreme cold weather are infrequent due to the site's latitude and proximity to the Atlantic Ocean. The most recent "hard" freeze occurred in the winter of 1989/1990 resulting in the die back of many plants including many red mangroves (Rhizophora mangle) and the exotic Australian Pine (Casuarina equisetifolia). Long-term rainfall data for the area indicate an average of 50 to 52 inches per year in southernmost Brevard County (Schmocker et. al., 1990). Wet and dry seasons are typically well defined, with the wet season occurring between May and October, and the dry season between November and April. Annual and seasonal rainfall is subject to large variation in both amount and distribution.

Prevailing winds are generally from the north to northeast during the dry season (November-April) and from the east-southeast during the wet season (May-October). Climatic change, seasonal variability, and disturbance contribute to species distribution and community composition.

2. Geology

The ecosystems of the barrier island are largely a result of the dynamic geology of the region, which is constantly being sculpted and changed. The following relevant geological information, provided by the EEL Program in the Characterization Report for the Archie Carr National Wildlife Refuge (Brevard County EEL Program, 1995a), is summarized below.

Formation of most North American barrier islands occurred about 7,000 years ago. At the end of the Holocene ice age, 18,000 years before present (YBP), sea level was about 130 meters below its present level. At this time, glacier melting released water to the

oceans creating a rise in sea level. The rise in sea level created flooding and formation of barrier islands along the North American coastline (Parkinson, 1995).

The barrier island in the vicinity of the BIS is believed to be perched on a rise in the underlying coquina rock, or Anastasia Formation. The Anastasia Formation runs from St. Augustine, Florida (St. John's County) south to Boca Raton, Florida (Palm Beach County). This formation is thought to be composed of late Pleistocene sediments that were deposited to the east of the Atlantic Coastal Ridge and lithified in places to form beach rock (Johnson and Barbour, 1990). The Brevard County portion of the barrier island has ridge and swale topography with some ridge elevations in excess of 30 feet (Parkinson and White, 1994; Parkinson, 1995;). Maximum elevations at the Barrier Island Sanctuary are 18 feet above mean sea level.

At present, the coastal processes that lead to the development of the geomorphology at the BIS are unknown. Three processes are possible: 1) wash-over, 2) tidal inlet evolution, and 3) beach ridge progradation. Wash-over fans occur when waves surge over the crest of the dune, depositing sand on the back-barrier of the island. A flood-tidal delta develops when sand flushes through a tidal inlet under rising tide or storm surge conditions. Unlike wash-over events, inlets are transitory features that open, migrate, and close in response to the rate of sea-level rise, sediment supply, wave climate, tidal range, and frequency of storm events. Inlet dynamics, wash-over events and the overall landward retreat of the barrier island have significant impacts on the barrier island ecosystems. Beach ridge progradation occurs when either a large volume of sediment is introduced to the area via long-shore currents and/or sea-level elevation stabilizes or drops. Either process yields a succession of beach ridges separated by low-relief swales. The combination of these processes yields a barrier island ecosystem with a relatively straight sandy seaward shoreline and rugged back-barrier shoreline. The straight seaward shoreline is indicative of erosion and the rugged back-barrier shoreline is indicative of depositions (Parkinson and White, 1994; Parkinson, 1995;).

3. Topography

The BIS has a relatively simple topography with elevations up to 18' according to the National Geodetic Vertical Datum (NGVD) on a ridge located east of A1A at the height of the dune. The land slopes westward towards the lagoon shoreline with a 5-foot elevation contour approximately 1000-ft from the lagoon shoreline (Figure 3). Onsite topography has also been altered somewhat by past land use including salt marsh impounding and canal dredging.

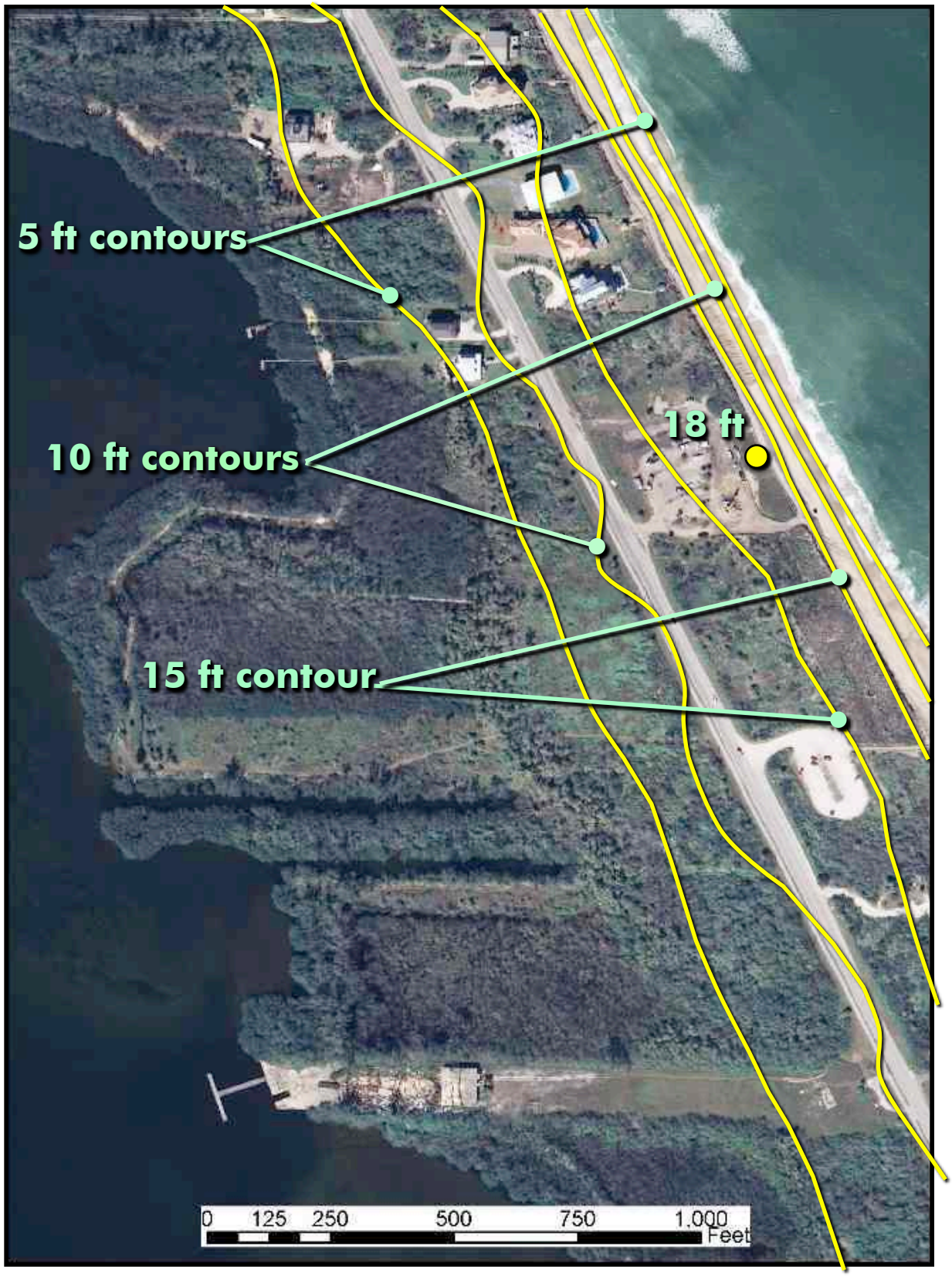

Figure 3. Barrier Island Sanctuary Topography.

4. Soils

The Natural Resource Conservation Service (formerly the Soil Conservation Service) describes the soils within the BIS (Figure 4) as listed:

Coastal Beaches (Ck)
Palm Beach Sand (Pb)
Canaveral Complex (Ca)
Tidal swamp (Ts)
(Source: Huckle et al., Soil Survey of Brevard County, Florida, 1974)

Coastal Beaches (Ck) consist of nearly level or gently sloping sand, along the Atlantic Ocean. Consisting primarily of quartz sand and shell fragments, this area is partially covered during high tides. It is subject to reworking by wave and wind action. This soil is represented within the Sanctuary as a thin strip of BIS-E.

Palm Beach sand (Pb) is classified as a nearly level to gently sloping, excessively drained soil on dune-like ridges that are approximately parallel to the Atlantic Ocean. The soil is composed of mixed sand and shell fragments. Palm Beach is a young, alkaline soil with abundant shell fragments. The water table is usually at a depth of more than 9 ft. This soil is the dominant soil found east of A1A and as such dominates BIS-E.

Canaveral complex (Ca) consists of nearly level, well-drained sandy soil on broad ridges interposed with long narrow sloughs. The water table is usually at a depth of 10 to 40 inches during the wet season and below 60 inches during the dry season. The soil is composed of sand and shell fragments. This soil is primarily located to the west of A1A.

Tidal Swamp (Ts) also classified as Bessie Muck-Tidal consists of nearly level areas that are near sea level and are generally covered with mangroves or other marsh vegetation. The soils may be composed of mixed sand and shell fragments along with organic matter. This soil is located west of the Canaveral complex and extends to the shoreline of the Indian River Lagoon.

Dredged Spoil generated by the impoundment of salt marshes and dredging of two canals, is located along the western shoreline of the Indian River Lagoon and the southern portion of BIS-W respectively.

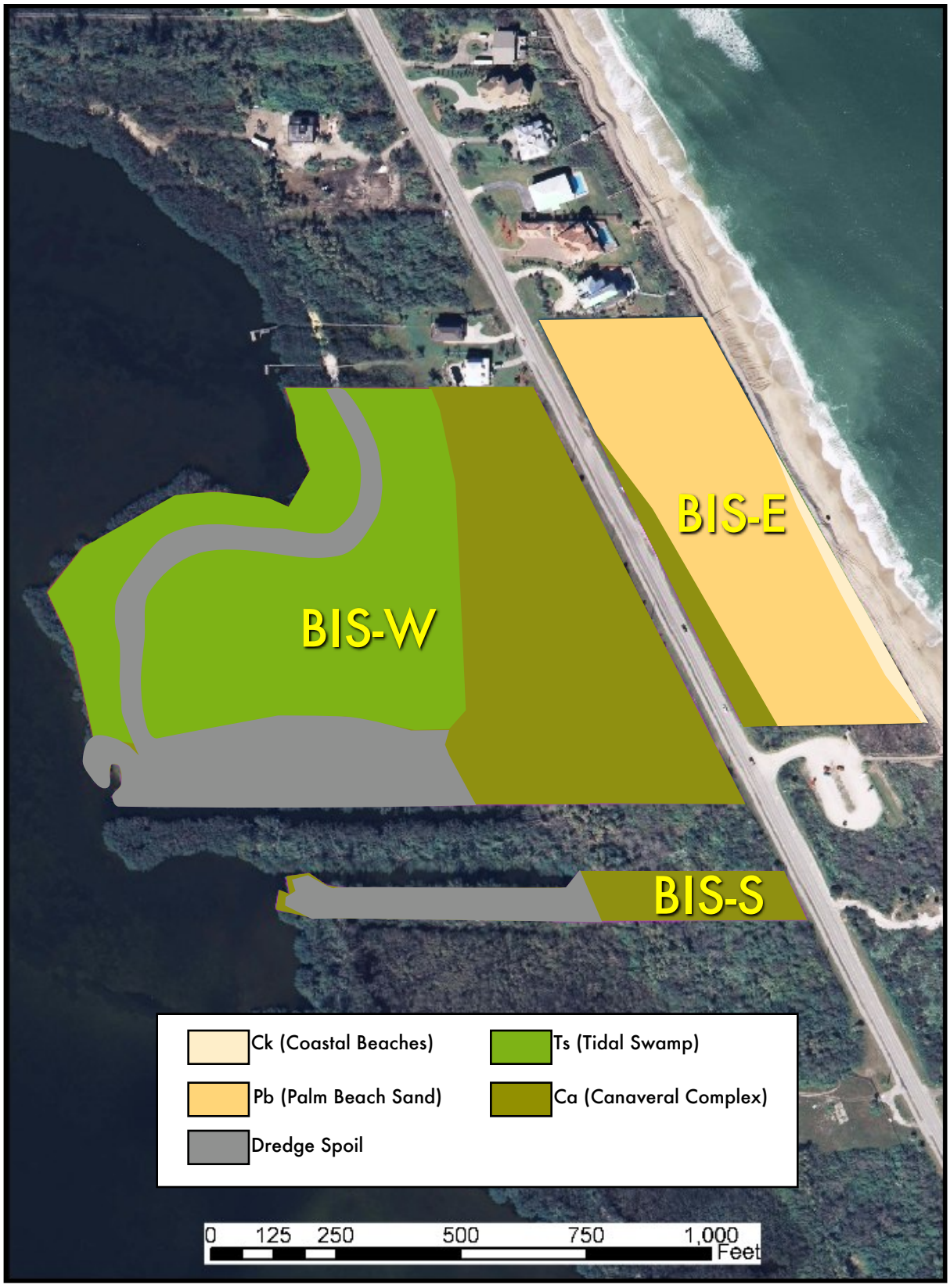

Figure 4. Barrier Island Sanctuary Soil Classifications.

5. Hydrology

Ground infiltration of precipitation is the primary mechanism for recharge of the surficial aquifer, which is a source of freshwater in the South Beaches. Preservation of the properties composing the BIS conserves valuable water recharge areas for this region.

In addition to the hydrologic impacts due to SR A1A, the hydrology of the parcels have also been altered by the impoundment of salt marshes for mosquito control, and the dredging of two large canals. In 1958 mosquito impoundments were constructed around the salt marshes on BIS-W along the shoreline of the Indian River Lagoon. These impoundments were continuously flooded using portable pumps to prevent mosquito egg deposition. Between 1973 and 1974 two canals were dredged directly south of BIS-W and north of BIS-S. The canal located south of BIS-W was presumably dug to allow boat access for a planned residential project. Spoil from these canals were deposited on the southern portion of BIS-W and northern portion of BIS-S. The impacts to the flora and fauna from mosquito control measures undertaken on these parcels are discussed in the Biological Resources sections below.

In an effort to restore the hydrology of the impounded wetlands, the EEL Program sought funds through the National Fish & Wildlife Foundation (NFWF) Five Star Restoration Challenge Grant. Working with the Marine Resources Council, Brevard County Mosquito Control, the Florida Institute of Technology and the St. Johns River Water Management District, plans were developed to install two 40 foot long, 36" diameter metal culverts through the impoundment dike with the work beginning in October 2001. For the northern culvert, a trench was cut on the northern portion of BIS-W along the Indian River Lagoon shoreline into the impoundment dike. The culvert was placed in the trench and covered with soil. The southern culvert, located along the southern side of BIS-W, needed to be placed through an area of dredged spoil created by the dredging of the adjacent canal to avoid impacting a strip of mangroves located along the shoreline to the west. A pond and creek were created to bridge the 60 foot distance beyond which the culvert could reach from the canal to the impounded salt marsh (Figure 5).

All of the BIS parcels are within the 100-year flood zone (Federal Emergency Management Agency, FEMA). The entire barrier island system of Brevard County is however, expected to be inundated in the event of a Category 3 or greater hurricane event (Brevard County Planning, 1991).

Figure 5. Barrier Island Sanctuary culvert installations.

B. Biological Resources

1. Ecosystem Function

The BIS consists of Dune and Coastal Strand habitats located east of A1A. Maritime Hammock habitat is located west of AlA and grades westward into Tidal Swamp along the Indian River Lagoon(Figure 6). These habitat types are typical for a barrier island ecosystem in a tropical environment that grades from the ancient dune to the Indian River Lagoon. The site has been disturbed in the past 60 years, including land clearing, survey trails, illegal dumping, exotic plant introduction, the installation of a mosquito control impoundment and the dredging of two canals.

2. Flora

In the fall of 2008, Nichole Perna, Assistant Land Manager for South Beach Region, conducted a plant survey of the BIS (Appendix B). The installation of the the mosquito impoundments in the late 1950's, dredging of the canals in the 1970s and land clearing adjacent to the former Chuck's Steakhouse restaurant on BIS-E led to the proliferation of exotic plant species throughout the Sanctuary. The primary invasive exotic plants on these sites were Brazilian pepper (Schinus terebinthifolius), Australian pine (Casuarina equisetifolia), Wild papaya (Carica papaya) and Torpedo grass (Panicum repens).

In August 2001, the EEL Program was awarded a grant by the Bureau of Invasive Plant Management for the removal of both Brazilian pepper and Australian pine from the BIS. Dense areas of larger Brazilian pepper and smaller Australian pines were mechanically removed using a Brontosaurus mower. During Phase I, approximately 5.95 acres of Brazilian pepper on BIS-W and 0.297 acres on BIS-E were mulched on site using the Brontosaurus mower. In December 2002, (Phase II) approximately 0.81 acres of Brazilian pepper on BIS-W and 1.52 acres BIS-E was removed from the sites (Figure 7). Herbicide treatment using a combination of basal bark application of Garlon 4 and JLB oil (10-20% solution depending on the size of the individual plants) was used to treat Brazilian peppers that were inaccessible to the Brontosaurus mower on BIS-W, BIS-E and on all of BIS-S which did not receive mechanical treatment.

Between October 2001 and January 2002, the first stage (Phase I) of Australian pine removal was performed along the southern portion of BIS-W. This phase consisted of felling the Australian pines and herbiciding the stumps followed by a controlled burn of the felled pines (Figure 8). Larger Australian pines along the canal or on the mosquito control dike that were adjacent to mangroves were not included in this phase for fear of damaging the adjacent mangroves.

In December 2001, sea oxeye daisy (Borrichia frutescens), sea pickle (Sesuvium portalacastrum) and chord grass (Spartina patens) were planted on the southeastern

Figure 6. Barrier Island Sanctuary Natural Communities.

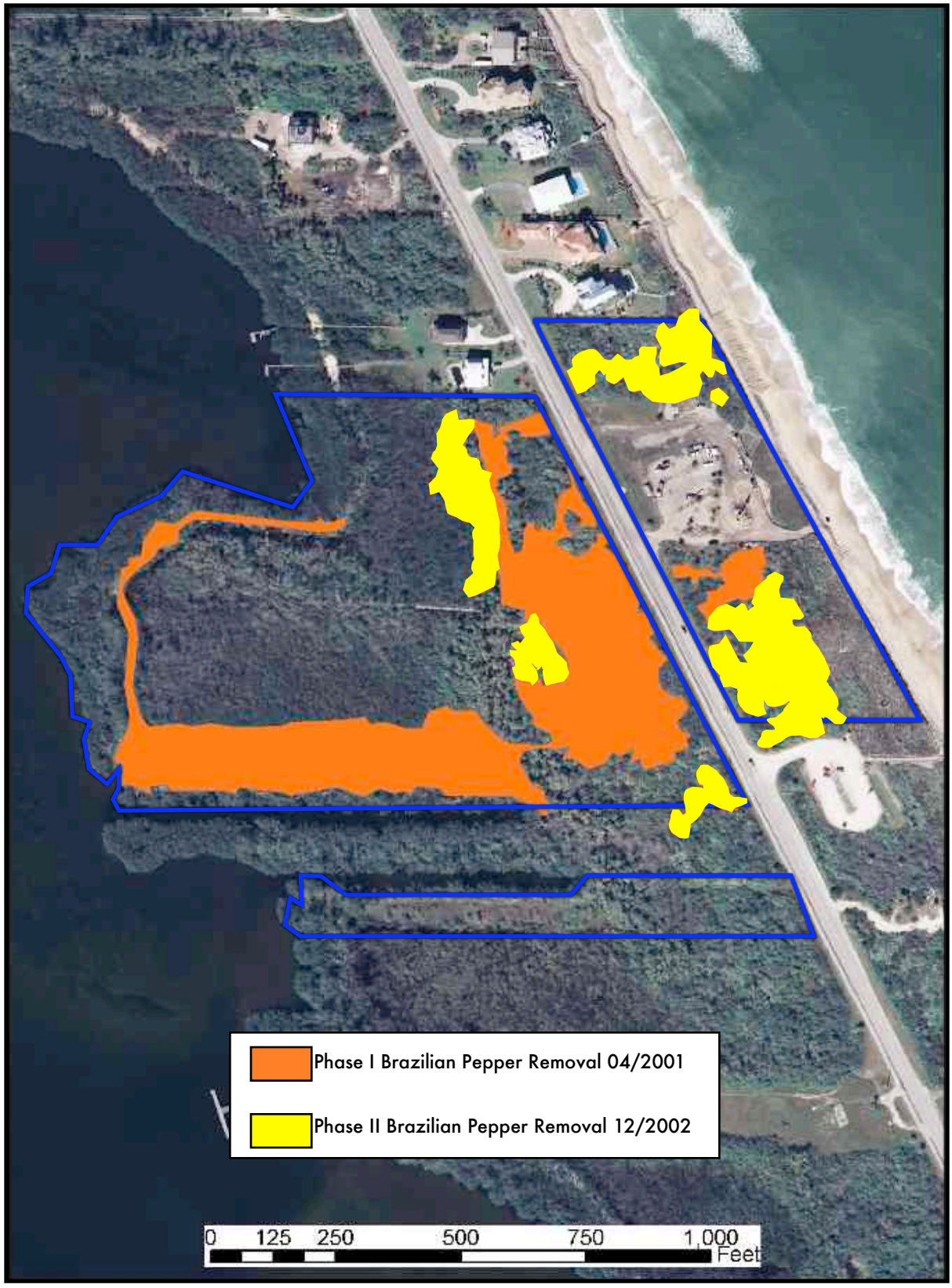

Figure 7. Barrier Island Sanctuary Phase I and Phase II Brazilian Pepper Removal.

Figure 8. Barrier Island Sanctuary Phase I Australian Pine removal.

portion of BIS-W on spoil generated from the creation of the pond and creek associated with the southern culvert.

In April 2003, Michelle Bliss Parr, a graduate student at the Florida Institute of Technology, conducted a four month study to better understand exotic and nuisance plant species in a previously cleared area located on southeastern portion of BIS-W. The goal of the study was to determine which management techniques were the most effective in removing Brazilian pepper, papaya and nuisance vines from BIS-W with minimal adverse affects to adjacent vegetation. Five management techniques were applied to the Brazilian pepper and papaya plants. Two manual removal techniques, hand pulling and stabbing, and three herbicide removal techniques, foliar, basal, and hack and squirt applications were investigated. The nuisance vines that were smothering the native vegetation were manually pulled or treated with herbicide. Three two-meter replicate plots of each of the five treatments were set up for the Brazilian pepper and papaya for a total of 15 plots used for each species. Six plots were set up for the vine treatments. Four of the five treatment techniques were 100% successful in causing Brazilian pepper and papaya mortality. The hack and squirt method was the least damaging to surrounding native vegetation and is recommended to control Brazilian pepper and papaya. Manual and herbicide vine removal were both 100% effective. Manual vine removal was less damaging to surrounding vegetation but was more labor intensive. Management recommendations for vine control include manual removal of vines and herbicide treatment to freshly cut vines.

In the Fall of 2005, the second stage (Phase II) of Australian pine removal was performed along the southern portion of BIS-W. Advances in the Brontosaurus mower and funding from the Bureau of Invasive Plant Management (BIPM) allowed for the mulching of the remaining larger pines without impact to the adjacent mangroves(Figure 9).

The EEL Program is dedicated to the long-term removal of invasive exotic plants from within the BIS and will work with adjacent property managers to ensure the success of this program. Plans are currently underway to assess the extent of the other invasive exotic plant species on the Sanctuary and to develop specific plans for their removal.

Figure 9: Barrier Island Sanctuary Phase II Australian Pine Removal.

3. Fauna

In the spring of 2007, a gopher tortoise survey was conducted throughout the BIS and one burrow was found immediately south of the Barrier Island Center. Additional faunal surveys are an initial goal of the EEL Program for the BIS. Raymond Mojica, Land Manager for EEL's, has visually observed river otters within the impounded salt marsh located on BIS-W and signs of bobcats (scat, prints) have also been noted within the Sanctuary. Pygmy rattlesnakes have also been seen along the dune on BIS-E (Raymond Mojica, personal communication).

4. Designated Species

Animals

Animals observed onsite or recorded in the vicinity by the Natural Areas Inventory include American alligator, (Alligator mississippiensis), and Wood Stork, (Mysteria americana). Several species of wading birds are known to utilize the habitat in this area, particularly along the Indian River Lagoon. These birds include, the (Little Blue Heron (Egretta caerulea), Snowy Egret (Egretta thula), White Ibis (Eudocimus albus), Brown Pelican (Pelecanus occidentalis) and Roseate Spoonbill (Ajaia ajaja). Active gopher tortoise (Gopherus polyphemus) burrows have also been observed predominately on BIS-E. In addition, the endangered Green (Chelonia mydas) and Loggerhead (Caretta caretta) and Leatherback (Dermochelys coriacea) sea turtles are known to nest on the beach adjacent to the Sanctuary.

Plants

A native plant survey conducted in October 2005 by Dr. Paul Schmalzer mapped the erect Florida Shrubverbena (Lantana depressa var. floridana) and Coastal Mock Vervain (Glandularia maritima) on the previously disturbed southeastern portion of BIS-E. This land area was previously cleared in December of 2002 during the Phase 2 Brazilian pepper removal *(Schmalzerr, P.A. and T.E. Foster. 2005. Multi-species scrub plant survey in Brevard County, Florida, for occurrence of Federally listed endangered or threatened scrub plant species. Final report to Brevard County Natural Resources Management Office. Dynamac Corporation, Kennedy Space Center, Florida. 79p.)* (Figure 10) . The Florida Natural Areas Inventory (Appendix C) also recorded the erect Florida Shrubverbena, Coastal Mock Vervain, and Terrestrial Peperomia (Peperomia humilis) in the vicinity of the BIS. The next step will be to generate a more detailed map illustrating plant size and a photographic series detailing the extent of coverage of the designated species followed by careful resource monitoring. Once a baseline has been established, additional management goals (e.g. replanting) can be addressed. Continued efforts to remove invasive exotic plants will allow for the natural progression of native species.

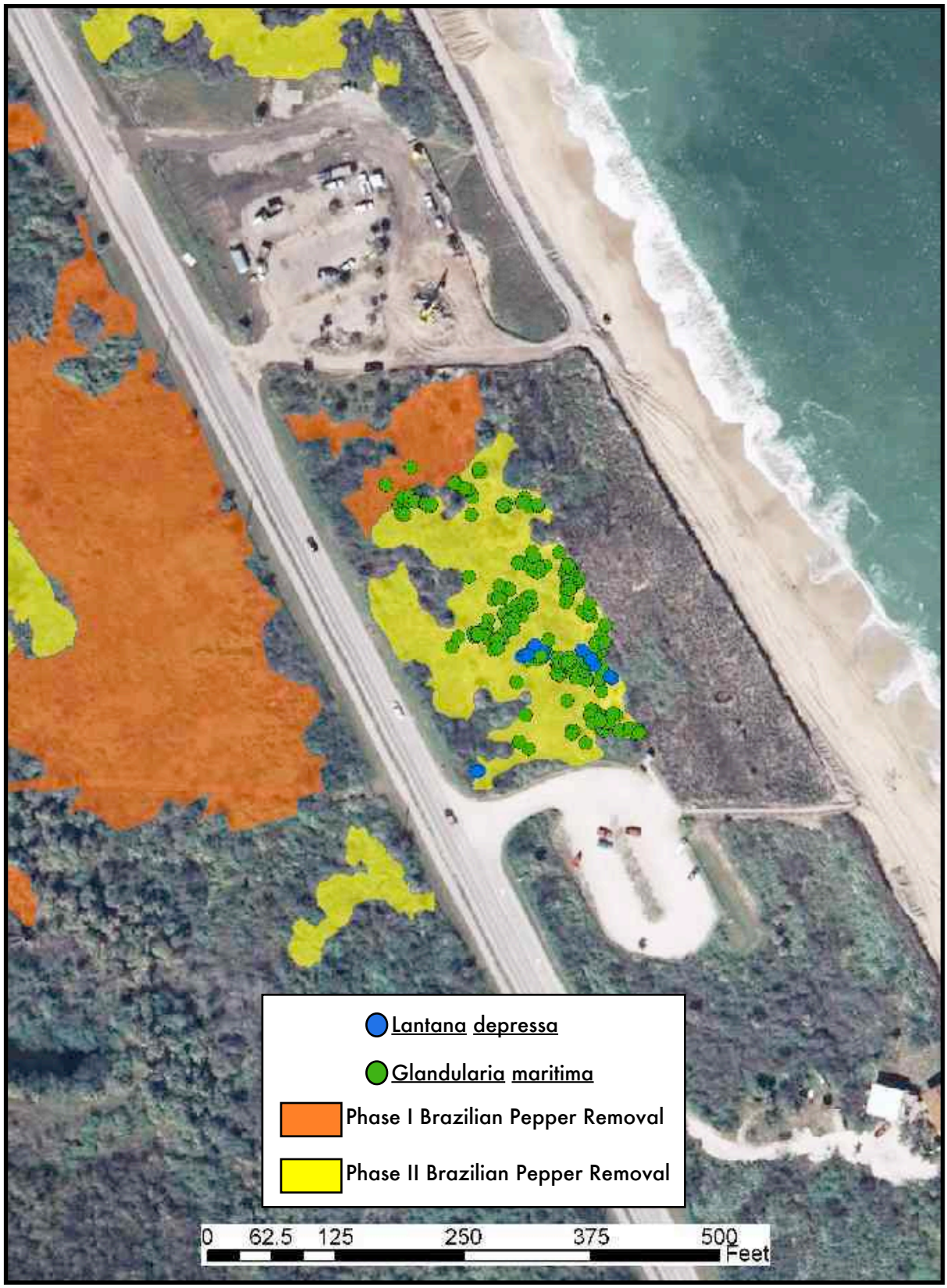

Figure 10. Barrier Island Sanctuary Native Plant Survey.

5. Biological Diversity

Aside from the limited plant surveys described above, no work has been conducted with an eye towards assessing biological diversity. Additional data will need to be collected in order to assess the biological diversity (both richness and evenness) so that changes in diversity can be tracked over time. Methodologies will need to be established for all of the relevant taxonomic groups and researchers and staff tasked to address this particular need.

C. CULTURAL

1. Archaeological

In August of 2003, Thomas Pender and Associates conducted an archeological site survey for the BIS. The entire project area was systematically surface surveyed along south to north and west to east grids. A total of 22 shovel tests were excavated within the impact areas and all tests were negative. According to the Florida Master Site File, no archaeological resources are listed within the BIS (A summary of this report is attached in Appendix D).

2. Historical

The following information is summarized from the Characterization Report for the Archie Carr National Wildlife Refuge (Draft, October 1995):

Ais Indians (1000 BC – 1500 AD)

The first people to inhabit Florida arrived about 12,000 years ago, from the central and southern areas of the North American continent, at the end of the last ice age. At this time much of the North American continent was still covered by glaciers. Sea level was 200 feet below the current level and much of the earth's fresh water was stored in glaciers (Brown, 1994).

At the time of European contact in the 16th century, the Ais ("Eyes") Indians were known to inhabit the barrier island in the Brevard County area. The Ais did not exhibit the nomadic existence of other Native Americans, as the semi-tropical climate provided for their needs without having to travel great distances.

Twenty-six shell middens and four burial sites have been recorded on the Barrier Island within the Archie Carr Refuge.

Turn of the Century to Present

During the late 1800s and early 1900s, naturalists were the primary visitors to Brevard County. Notable scientists came to this species rich, semi-tropical region to collect specimens for natural history museums. These specimens included rare bird life such as the Carolina parakeet (Conuopsis carolinensis), which is now extinct. Many of these visitors stayed at Mrs. Latham's Oak Lodge located on the barrier island in the current location of the Aquarina subdivision (Austin, 1967).

In the early 1900s, people came to Brevard County from around the country via the Florida East Coast Railway. There was an increase in settlement and development of towns brought about by the creation of railroads and canals. At that time, Melbourne Beach was accessible by the Melbourne Beach Improvement Company's motor train (Shofner, 1995).

The increase in population was also the result of the 1916 Drainage Acts of Florida and the establishment of Mosquito Control measures beginning in 1927. The Drainage Acts rerouted drainage patterns that permanently lowered water tables in areas where standing water naturally existed for six or more months each year. Mosquito control (pesticide spraying and mosquito impoundments) lowered the mosquito population to acceptable levels (Barille, 1988).

In the 1920s, improved roads such as the Dixie Highway (U.S. 1) brought more cars and people to Brevard County. In 1921, a bridge was built over the Indian River Lagoon from Melbourne to Indialantic and hotels and casinos were established. Air conditioning was introduced, and Florida became known as the residential and tourist destination it remains today.

3. Land-use History

The availability of aerial photographs beginning in 1943 provides a glimpse into the land-use history of the BIS (Figure 11). In 1943, old Highway A1A was already running parallel to the Atlantic Ocean and the BIS parcels consisted of open land with scattered vegetation.

In 1958, mosquito impoundments were constructed around the salt marshes along the shoreline of the Indian River Lagoon. Blacks mangroves and buttonwoods were unable to adjust to the lack of natural tidal cycles and/or the full time inundation of water prescribed for mosquito control. Red and white mangroves that could withstand long-term inundation later colonized these areas. Up until 2001, when culverts were installed to reconnect the impounded areas to the lagoon, the impoundment was managed by maintaining high water levels eliminating oviposition by salt marsh mosquitoes. This

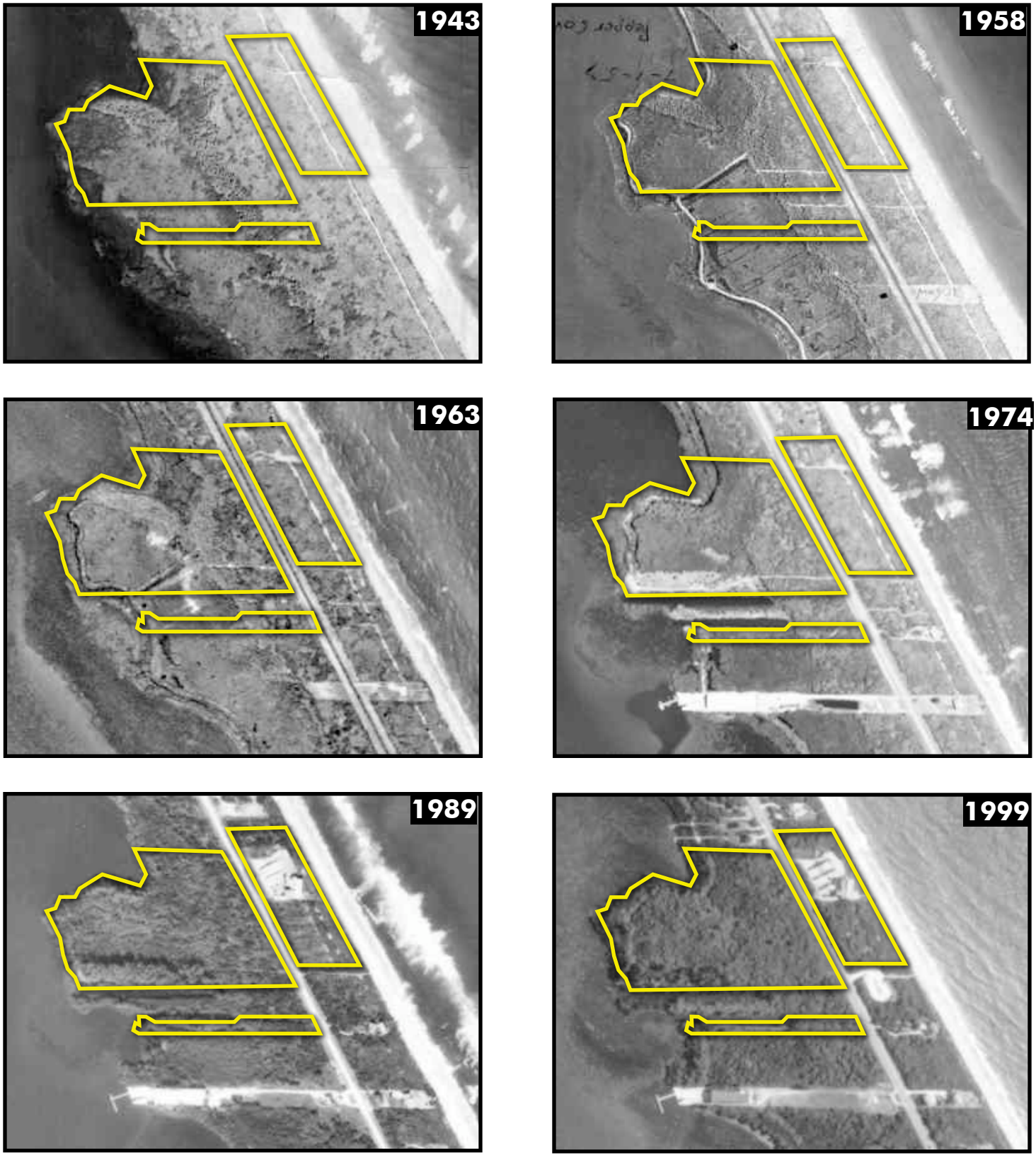

Figure 11. Barrier Island Sanctuary Historic Aerial Photographs.

was accomplished by trapping rainwater and periodically pumping lagoon water into the impoundment using portable diesel pumps, to replace water lost through evaporation and seepage through the dike. In addition to the construction of mosquito impoundments, old AlA is still visible and the newly paved AlA has been constructed to the west. An access road was cut on the southern portion of BIS-W to allow access to the mosquito impoundments and the Indian River Lagoon.

Between 1973 and 1974 a drainage canal was built directly south of BIS-W presumably to allow direct boating access for a proposed residential neighborhood. A second canal located north of BIS-S was also built. Spoil from these canals were deposited on the southern portion of BIS-W and northern portion of BIS-S.

By 1989, Chucks Steakhouse was constructed on the northern portion of BIS-E along with a parking lot located directly north of the building. A dense thickets of Brazilian pepper and Australian pines were established in areas that had been cleared for restaurant overflow parking, on the unmaintained mosquito impoundment dike and on spoil associated with the canal dredging. No significant changes were observed in the 1999 aerial photograph beyond the further entrenchment of the exotic plant species. In 1999, the EEL Program employed a full time land manager and restoration efforts began.

By August 2004, Chucks Steakhouse was demolished for the construction of the Barrier Island Sanctuary Management & Educational Center (Barrier Island Center). In December of 2005, a prescribed fire was conducted to burn coastal strand habitat located on the central and southern portions of BIS-E. Ground breaking for the Center was in August of 2006, construction was completed in February of 2008 and the Center was opened to the public on May 10, 2008(Figure 12).

Figure 11 (Continued). Barrier Island Sanctuary Historic Aerial Photographs.

4. Public Interest

Public interest for the Barrier Island Sanctuary has been enthusiastic and supportive. A public meeting held on June 8, 1998 that introduced the Master Site Plan for the BIS and educational center was very well received. The Archie Carr National Wildlife Refuge is also served by a working group composed of local, state, federal, citizen and private groups dedicated to the preservation and management of the Refuge's resources. Public interest at the Barrier Island Sanctuary has been focused on passive recreation, environmental education and habitat restoration.

V. FACTORS INFLUENCING MANAGEMENT

A. NATURAL TRENDS

The primary variable that affects the formation and succession of Florida's barrier island communities is the ocean, including associated storms, wind, and salt. Each of the coastal plant communities is specifically adapted to its geographic and topographic position. Natural alterations are frequent, resulting from storm surges and overwash, or loss of canopy trees due to age, wind and occasional fire. The loss of dunes due to storm surge or human activity can greatly affect the back dune, coastal strand and maritime hammock communities. If possible land management practices developed for the Barrier Island Sanctuary should consider the restoration and maintenance of the barrier dunes.

In September and October 2004 storm surges from Hurricane Frances and Hurricane Jeanne significantly affected the dune system located along the shoreline of BIS-E. Approximately 10 feet of vegetated dune located directly east of the high point of the dune was lost (Figure 13). In February 2005, the State of Florida and FEMA authorized a dune restoration project within the Archie Carr Refuge to shore up at risk structures. Sand from an offsite borrow pit was trucked in and deposited onto the beach to replace dune habitat lost to the storms. In April of 2005, the dune restoration project was completed at the BIS and sea oats were planted to stabilize the dune system (Figure 14). In the spring of 2007, Brevard County Natural Resources Management Office (NRMO) planted additional sea oats, beach elder and sea purselane to fill in areas that did not survive the first planting in 2005. In the fall of 2008, the BIS received a NRMO Sea Turtle Mitigation Grant to plant 72 inkberry and 36 sea grapes on BIS-E.

In the summer of 2007, laurel wilt disease, caused by a fungus (Raffaelea sp.) carried by the Ambrosia Beetle (Xyleborus glabratus) was first observed in the Red Bay (Persea borbonia) trees throughout the Archie Carr Refuge. The fungus infects the sapwood of the host tree and restricts the flow water to the tree causing the leaves to wilt. By the fall of 2008, the infection had caused the death of nearly all of the Red Bay trees at the Sanctuary. This has resulted in the loss of roughly 5% of our canopy trees in the

Figure 12. Barrier Island Sanctuary Dune Loss Due to Hurricane Frances and Jean.

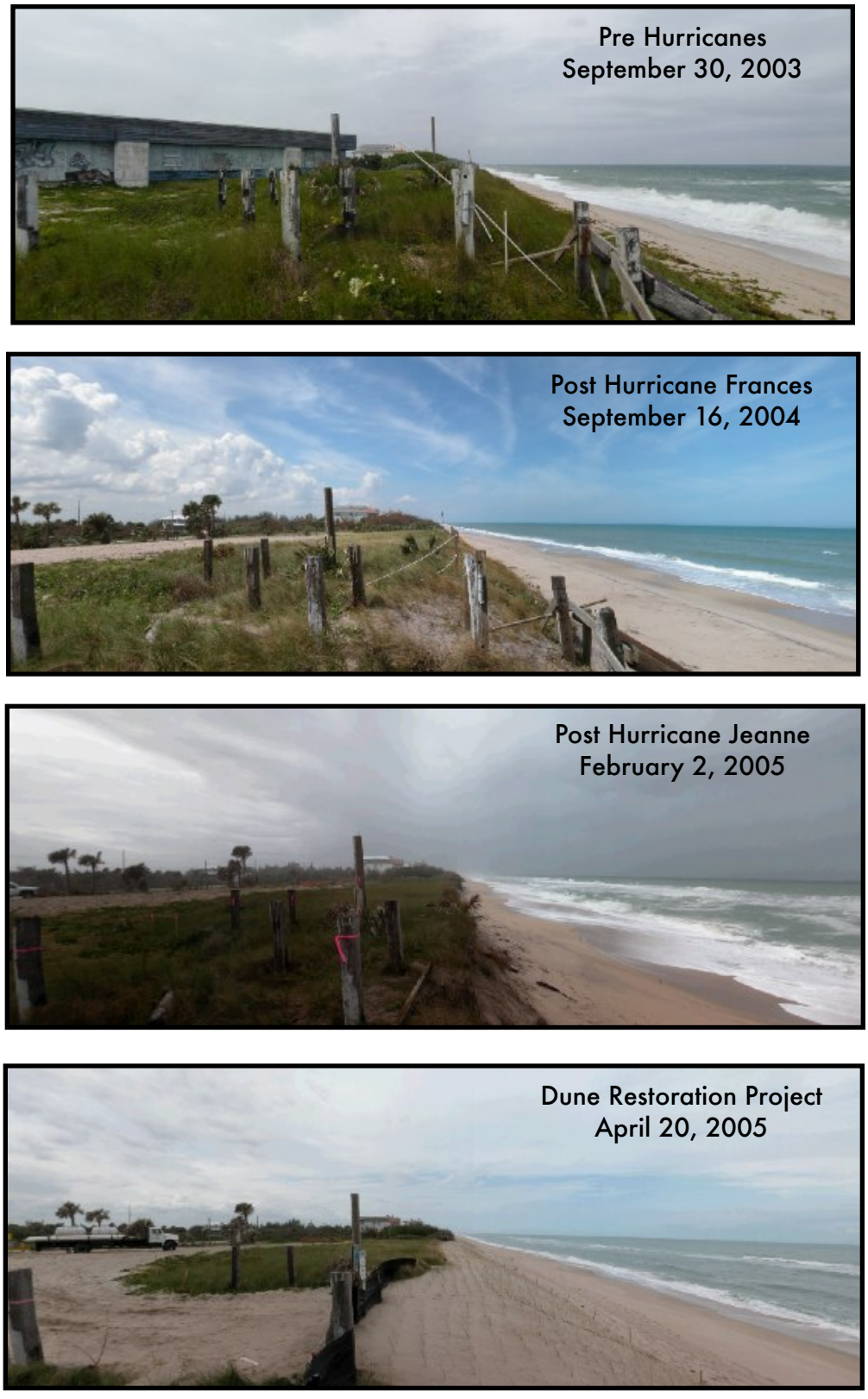

Figure 13. Barrier Island Sanctuary Dune Restoration Project

maritime hammock and coastal strand habitats. The disease also has the potential to negatively impact swallow tail butterfly (Papilio rumanzovia) populations living at the Sanctuary because the larvae only feed on the Red Bay and closely related Persea species.

B. HUMAN-INDUCED TRENDS

The mild sub-tropical climate and easy access to major population centers makes the barrier island a prime residential, resort and retirement area. Humans have altered the surrounding landscape through activities such as development, agriculture, beach armoring, runoff, the introduction of exotic plants and animals, recreation and tourism.

The major historical influences onsite are detailed above in the Land-use History section of the report. The location of State Road A1A has obvious influences on the survivorship of designated species such as gopher tortoises. The impoundment of salt marshes located within the Sanctuary, has also had obvious effects on the hydrology of the property and all of the organisms inhabiting the area. Fragmentation of habitat, due to rapid development of our coastline has most severely affected the barrier island ecosystem. Populations of rare or endangered species have become isolated from one another and are no longer able to survive. Large predators such as the Florida Panther, which require a large territory to hunt and reproduce, are now almost non-existent on the fragmented barrier island habitats. Without these larger predators in the area, nuisance animal species like the raccoon can become out of control, reeking havoc on the endangered sea turtle nests. The invasion of exotic plant species and hydrological alterations associated with the impounding of salt marshes have impacted this ecosystem most severely.

C. EXTERNAL INFLUENCES

External influences that have the potential to impact the Sanctuary include the introduction of exotic plants and animals from adjacent properties, and illegal dumping or unpermitted use of the property. The EEL Program has been working with its neighbors within the Archie Carr Refuge to eliminate exotic plant species from their properties as well as the sanctuaries. This is the only way to keep these exotics from continually moving back into EEL properties.

The majority of the development on the adjacent parcels is located directly north of BIS-E and BIS-W, leaving large portions of the parcels virtually undisturbed. These undisturbed tracts of land can act as a wildlife corridor, essentially linking all of the BIS. The EEL Program has fenced and post signage on the front portions of the Sanctuary (on A1A) to deter any illegal activities.

D. LEGAL OBLIGATIONS AND CONSTRAINTS

The following is a list of possible legal constraints to management and public access on site.

The Richard King Mellon Foundation acquired the seven parcels and donated them to the EEL Program in 1997. All of these BIS parcels are titled to Brevard County.

E. MANAGEMENT CONSTRAINTS

1. Exotic Plant Species

Invasive, exotic, and/or nuisance plants have the potential to displace native species and to significantly alter natural ecosystem function. Exotic species are a major concern within the BIS, particularly along roads, old survey trails and along the shore of the Indian River Lagoon. The primary species of concern, Brazilian pepper (Schinus terebinthifolius), Australian pine (Casuarina equisetifolia), Wild papaya (Carica papaya), and Torpedo grass (Panicum repens) are currently being targeted through a grant under the Florida Department of Environmental Protection Invasive Plant Management Program. The treatment of exotic plants will be an ongoing for several years.

Bi-annual surveys of the Sanctuary for exotic plant species limits the ability of exotic plants to become established.

2. Exotic Animal Species

The list of non-indigenous animal species noted with BIS includes the Cuban tree frog (Osteopilus septentrionalisu), the brown anole (Anolis sagrei), and several other exotic herptile and ant species. Further investigation into the levels and impacts of these species will be conducted prior to the establishment of a control strategy.

F. PUBLIC ACCESS AND PASSIVE RECREATION

The EEL Program is committed to providing a range of public use opportunities that are consistent with the conservation and protection goals of the voter approved referendum. The EEL Program's Selection & Management Committee determined that passive recreation activities best support the EEL Program goals. This is supported in the EEL Program *Sanctuary Management Manual* (SMM) adopted by the Board of County Commissioners in 1997. The SMM defines passive recreation as:

"recreational types of uses, level of uses and combination of uses that do not, individually or collectively, degrade the resource values, biological diversity, and aesthetic or environmental qualities of a site."

> The SMM includes public recreation uses such as hiking, nature observation, nature photography, canoeing, kayaking, bicycling, horseback riding, primitive camping, fishing or hunting as acceptable at selected sites. At all Sanctuary sites, monitoring of natural resources and visitor impact analyses will be used to evaluate trends in resource quality and quality of visitor experiences. These recreational activities are also a component of nature-based tourism (or ecotourism) which is an expanding component in Florida's tourism market.

To balance recreational use and conservation activities, the master planning process for the BIS began with the identification of core conservation areas. Core conservation areas are those areas identified as environmentally sensitive, such as wetlands. Access to these areas should be restricted. In addition to the recreational activities suggested as compatible in the SMM, the following questions were generally asked about each proposed activity:

- Would the activity result in clear impacts to protected species habitat that would decrease the likelihood of occurrence of that species?
- Would the proposed activity result in the deposition of hazardous wastes, in the long term?
- Would the activity likely result in substantial direct impacts to wetlands, or a substantial reduction in habitat for native wildlife?

If any of the questions was answered in the affirmative, the proposed activity was modified or eliminated.

The BIS will accommodate hiking, and nature watching as well as scientific studies and research. Facilities at the BIS include a hiking trail, a canoe launch, an environmental learning center, and a parking lot for vehicles and buses. The hiking trail is approximately 3/4 mile long with three informational kiosks located along the trail. Two kiosks are located on the west side of AlA, and the third is located on the southeastern portion of BIS-W. A bridge and a boardwalk located on BIS-W have been constructed on the trail to traverse areas of standing water and wetlands respectively. A second boardwalk connects the Barrier Island Center to the adjacent Bonsteel Park beach access and can accommodate persons with physical disabilities and complies with ADA requirements (Figure 15). A picnic pavilion will be built directly off the hiking trail in the vicinity of the Indian River Lagoon to provide additional wildlife viewing areas. Other recreational activities at the BIS include wade fishing in the Indian River Lagoon and ocean fishing on BIS-E. To the greatest extent possible, the environmental learning center and support facilities (parking, paved walkways, utility lines, etc.) were strategically located in areas already disturbed or degraded. Efforts were made to limit and mitigate impacts associated with staging and construction activities for these facilities. The Recreation and Education Committee (REAC) of the EEL Program reviewed and approved the public access plan on August 10, 2006 (Appendix E).

Figure 14. Barrier Island Sanctuary Trail Map

VI. MANAGEMENT ACTION PLANS

The following is a comprehensive outline of the goals, strategies and actions necessary to manage the Barrier Island Sanctuary.

A. GOALS

The *Sanctuary Management Manual* of the EEL Program provides the following management goals for EEL sanctuaries, which apply to the BIS.

- Documentation of historic public use
- Conservation of ecosystem function
- Conservation of natural (native) communities
- Conservation of species (including endemic, rare, threatened and endangered species)
- Provision of public access for responsible public use
- Assessment of carrying capacity of natural resources with public use
- Provision of environmental education programs
- Opportunities for multiple uses and compatibility
- Assurance of general upkeep and security of the property

B. STRATEGIES AND ACTIONS

The following is an outline of the specific management strategies and actions that are needed to meet the management goals for the Barrier Island Sanctuary.

GOAL: DOCUMENTATION OF HISTORIC PUBLIC USE

Strategy 1: Document historic public use

Actions:
- Collect historic information regarding the types of activities that have occurred on-site
- Evaluate how historic public use impacted the site's natural resources
- Consider historic public use patterns in planning future public uses

GOAL: CONSERVATION OF ECOSYSTEM FUNCTION

Strategy 2: Protect, maintain, and restore native diversity, ecological patterns, and the processes that maintain diversity.

Actions:
- Research and monitor baseline conditions of natural systems
- Research the connection of on-site natural resources with adjacent resources

- Research hydrologic patterns on and off-site
- Research native species' movement patterns on and off-site
- Focus natural community restoration efforts on enhancing native diversity
- Investigate the historic hydroperiod and restore natural hydrologic patterns

GOAL: CONSERVATION OF NATURAL (NATIVE) COMMUNITIES

Strategy 3: Restore degraded, disturbed, or altered uplands within the Barrier Island Sanctuary

Actions:

- Conduct monitoring to establish baseline conditions within the upland communities
- Collect historic information regarding prior wetland communities that may have occurred on-site
- Consult local experts and current literature regarding best scientific methods for wetland restoration
- Prioritize the upland communities in need of restoration
- Identify appropriate restoration activities
- Assess possible impacts of proposed restoration on adjacent communities and off-site properties
- Implement the selected restoration activities
- Monitor the effects of the restoration activities, evaluate the success of the restoration projects, and revise the restoration plan as necessary

Strategy 4: Design and implement a "natural" fire management program

Actions:

- Identify natural communities that require prescribed fire management
- Identify and evaluate individual proposed burn management units
- Identify the goal of the application of fire to each proposed burn unit
- Document listed species within each burn unit
- Identify and plan perimeter and internal fire breaks
- Develop and implement public education campaign including programs and literature regarding the need for periodic controlled burns
- Secure the necessary permits from the State Division of Forestry
- Begin prescribed fire management program
- Monitor the effects of the fire management activities, evaluate the success of the program, and revise the program strategies as needed

GOAL: CONSERVATION OF SPECIES (INCLUDING ENDEMIC, RARE, THREATENED AND ENDANGERED)

Strategy 5: Protect on-site populations of endemic, rare, threatened and endangered species through the utilization of existing habitat management and species recovery plans.

Actions:

- Develop a methodology and work plan to accomplish the identification of designated plant and animal species
- Survey for, and identify, designated plant and animal species
- Plot the location of identified designated species within and/or adjacent to the Sanctuary for use in the implementation, or re-distribution, of amenities or site improvements
- Periodically update these baseline survey data to determine possible changes in designated species distribution or density
- Review management plans for consistency with USFWS and FGFWFC guidance concerning listed species
- Implement habitat restoration activities for listed species (i.e. removal of exotic/ nuisance species, restoration of ecosystem function)
- Establish periodic monitoring of habitat suitability (where indices are available for a given species), species population levels, diversity levels, and exotic/nuisance species, as a means of evaluating the success of management strategies

GOAL: PROVISION OF PUBLIC ACCESS AND RESPONSIBLE PUBLIC USE

Strategy 6: Establish and enforce specific policies and management techniques for public access and responsible public use.

Actions:

- Plan appropriate public facilities by examining the site's natural and cultural resources and reviewing public input;
- Evaluate design of future public facilities for consistency with ADA guidelines;
- Use daily or seasonal quotas, restricted access or limited parking to enforce established carrying capacities;
- Coordinate recreational use with the ecological burning strategies of the EEL Program;
- Minimize unauthorized trail expansion by establishing sufficient trails, constructing handrails, and the development of written guidelines;
- Construct hiking trails in accordance with the USDA Forest Service "Standard Specifications for the Construction of Trails";

GOAL: ASSESSMENT OF CARRYING CAPACITY OF NATURAL RESOURCES WITH PUBLIC USE

Strategy 7: Establish a monitoring program to assess effects of public use on natural resources.

Actions:

- Establish baseline vegetation monitoring transects to provide data regarding existing conditions prior to development;
- Establish a methodology and record keeping system to document public use;
- Conduct regular and periodic monitoring to assess impacts of public use on natural habitats, including habitat alteration, disturbance/harassment, pollution, harvesting (see NPS (1995) Visitor Experience and Resource Protection Implementation Plan, Arches National Park);
- Conduct regular "walk-throughs" over frequently used sites to assess the need for changes in routing/user types, or user intensity;
- Re-route users from sensitive areas or popular sites on a regular (seasonal, annual, etc.) or as-needed basis;
- Re-align public use to avoid areas which observations or data indicate are too sensitive for the level of use originally planned.

GOAL: PROVISION OF ENVIRONMENTAL EDUCATION PROGRAMS

Strategy 8: Develop a plan to provide on-going environmental educational programs to Brevard County residents and visitors.

Actions:

- Employ an education/exhibit coordinator or curator and education or scientist intern;
- Determine target audiences and types of programming best suited to those groups;
- Design and develop indoor and outdoor exhibits, signs and printed materials;
- Include educators, friends groups and other organizations in the design, development and delivery of programs;
- Develop and coordinate a docent program to assist in program delivery;
- Develop and provide training and site specific informational materials for use by docents and other educators;
- Develop a marketing and promotions plan for educational programs;
- Identify appropriate site-specific goals outlined in the EEL Environmental Education Manual;
- Coordinate outreach and on-site programs for school-aged children with school board and area schools;

GOAL: OPPORTUNITIES FOR MULTIPLE USES AND COMPATIBILITY

Strategy 9: Provide opportunities for multiple use and compatibility where practical.

Action:

- Design the environmental learning center facility to accommodate multiple uses (i.e. meeting rooms, classrooms, etc.);

GOAL: ASSURANCE OF GENERAL UPKEEP AND SECURITY OF THE PROPERTY

Strategy 10: Secure and maintain the Sanctuary to the highest degree possible using EEL staff. Parks and Recreation staff, contract employees and volunteers.

Actions:

- Retain a land manager to oversee maintenance and security activities;
- Employ maintenance staff
- Develop a Security plan for the BIS to include provisions for perimeter barriers, security alarm and lighting systems, patrol schedules, arrangements for assistance and necessary back-up from Sheriff and municipal police;
- Develop a specific operation plan for building operations, opening and closing of gates, special event support, etc.
- Develop a specific maintenance plan identifying specific task, frequency and responsible entities or individuals, with consideration given to hiring a part or full-time maintenance employee;
- Coordinate daily maintenance tasks (trash collection, building janitorial, etc.) using EEL staff and volunteer staff;
- Based on the maintenance, security and resource management plan, develop an annual budget for the BIS;
- Construction document preparation;
- Permitting;
- Construction of infrastructure;
- Construction of environmental learning center, exhibits, trails, bridges, site amenities.

VII. PROJECTED TIMETABLE FOR IMPLEMENTATION

The implementation of the management plan is outlined in a recommended timeline. This timeline includes immediate, short-term and long-term time frames. Immediate time frame is defined as within one year of the adoption of this management plan, short term is 1 to 5 years, and long-term is more than 5 years. Some actions are also defined as on-going, if the activity is required for the on-going maintenance of the Barrier Island Sanctuary.

ACTION	TIMELINE
Strategy 1: Document historic public use	
Collect historic information regarding the types of activities that have occurred on-site	Complete
Evaluate how historic public use impacted the site's natural resources	Complete
Consider historic public use patterns in planning future public uses	Complete
Strategy 2: Protect, maintain, and restore native diversity, ecological patterns, and the processes that maintain diversity	
Research and monitor baseline conditions of natural systems	On-Going
Research the connection of on-site natural resources with adjacent resources	Complete
Research hydrologic patterns on and off-site	Complete
Research native species' movement patterns on and off-site	Immediate
Focus natural community restoration efforts on enhancing native diversity	On-Going
Investigate the historic hydroperiod and restore natural hydrologic patterns	On-Going
Strategy 3: Restore degraded, disturbed, or altered uplands with the BIS	
Conduct monitoring to establish baseline conditions within the upland communities	Complete
Collect historic information regarding prior wetland communities that may have occurred on-site	Complete
Consult local experts and current literature regarding best scientific methods for wetland restoration	Complete
Prioritize the upland communities in need of restoration	Complete
Identify appropriate restoration activities	Complete
Assess possible impacts of proposed restoration on adjacent communities and off-site properties	Complete
Implement the selected restoration activities	On-Going
Monitor the effects of the restoration activities, evaluate the success of the restoration projects, and revise the restoration plan as necessary	On-Going

Strategy 4: Design and implement a "natural" fire management program

Identify natural communities that require prescribed fire management	Complete
Identify and evaluate individual proposed burn management units	Complete
Identify the goal of the application of fire to each proposed burn unit	Complete
Document listed species within each burn unit	Complete
Identify and plan perimeter and internal fire breaks	Complete
Develop and implement public education campaign including programs and literature regarding the need for periodic controlled burns	Complete
Secure the necessary permits from the State Division of Forestry	Complete
Begin prescribed fire management program	Complete
Monitor the effects of the fire management activities, evaluate the success of the program, and revise the program strategies as needed	On-Going

Strategy 5: Protect on-site populations of endemic, rare, threatened and endangered species through the utilization of existing habitat management and species recovery plans

Develop a methodology and work plan to accomplish the identification of designated plant and animal species	Complete
Survey for, and identify, designated plant and animal species	Complete
Plot the location of identified designated species within and/or adjacent to the Sanctuary for use in the implementation, or re-distribution, of amenities or site improvements	On-going
Periodically update these baseline survey data to determine possible changes in designated species distribution or density	On-Going
Review management plans for consistency with USFWS and FGFWFC guidance concerning listed species	Complete
Implement habitat restoration activities for listed species	Short-Term
Establish periodic monitoring of habitat suitability, species population levels, diversity levels, and exotic/nuisance species, as a means of evaluating the success of management strategies	Short-Term

Strategy 6: Establish and enforce policies and management techniques for public access and responsible public use

Plan appropriate public facilities by examining the site's natural and cultural resources and reviewing public input;	Complete
Evaluate design of future public facilities for consistency with ADA guidelines;	Complete
Coordinate recreational use with the ecological burning strategies of the EEL Program;	On-Going
Construct hiking trails in accordance with the USDA Forest Service "Standard Specifications for the Construction of Trails";	Complete

Minimize unauthorized trail expansion by establishing sufficient trails, constructing handrails, and the development of written guidelines;	Complete
Use daily or seasonal quotas, restricted access or limited parking to enforce established carrying capacities.	Ongoing
Strategy 7: Establish a monitoring program to access effects of public use on natural resources	
Establish baseline vegetation monitoring transects to provide data regarding existing conditions prior to development;	Immediate
Establish a methodology and record keeping system to document public use;	Immediate
Conduct regular and periodic monitoring to assess impacts of public use on natural habitats;	Ongoing
Conduct regular "walk-throughs" over frequently used sites to assess the need for changes in routing/user types, or user intensity;	Ongoing
Re-route users from sensitive areas or popular sites on a regular (seasonal, annual, etc.) or as-needed basis.	Ongoing
Re-align public use to avoid areas which observations or data indicate are too sensitive for the level of use originally planned.	Ongoing
Strategy 8: Develop a plan to provide on-going environmental educational programs to Brevard County residents and visitors	
Employ an education/exhibit coordinator or curator and education or scientist intern;	Complete
Determine target audiences and types of programming best suited to those groups;	Complete
Design and develop indoor and outdoor exhibits, signs and printed materials;	Complete
Include educators, friends groups and other organizations in the design, development and delivery of programs;	Complete
Develop and coordinate a docent program to assist in program delivery;	Complete
Develop and provide training and site specific informational materials for use by docents and other educators;	Ongoing
Develop a marketing and promotions plan for educational programs;	Ongoing
Identify appropriate site-specific goals outlined in the EEL Environmental Education Manual;	Ongoing
Coordinate outreach and on-site programs for school-aged children with school board and area schools;	Ongoing

Strategy 9: Provide opportunities for multiple use and compatibility where practical	
Design the environmental learning center facility to accommodate multiple uses (i.e. meeting rooms, classrooms, etc.);	Complete
Strategy 10: Secure and maintain the BIS to the highest degree possible using EEL staff, Parks and Recreation staff, contract employees and volunteers	
Retain a land manager to oversee security and maintenance activities;	Complete
Employ maintenance staff;	Complete
Develop a security plan for the BIS to include provisions for perimeter barriers, security alarm and lighting systems, patrol schedules, arrangements for assistance and necessary back-up from Sheriff and municipal police;	Complete
Develop a specific operation plan for building operations, opening and closing of gates, special event support, etc..	Ongoing
Develop a specific maintenance plan identifying specific task, frequency and responsible entities or individuals, with consideration given to hiring a part- or full-time maintenance employee;	Ongoing
Coordinate daily maintenance tasks (trash collection, building janitorial, etc.) using EEL staff and volunteer staff;	Ongoing
Based on the maintenance, security and resource management plan, develop an annual budget for the BIS;	Ongoing
Construction document preparation;	Complete
Permitting;	Complete
Construction of infrastructure;	Complete
Construction of environmental learning center, exhibits, trails, bridges, site amenities.	Complete

VIII. FINANCIAL CONSIDERATIONS

The following is a breakdown of the general costs estimated for capital improvement and annual management of the Barrier Island Sanctuary for fiscal year 2008/2009:

Capital Improvement

Outdoor Pavilion (see Figure 15 for location)	$24,000.00

Annual Management

Follow-up treatment of Brazilian Pepper and other exotics	$ 1000.00
Treatment for other invasive plants species	$ 500.00
Upkeep of fences and boundary signs	$1000.00
Communications (phone, internet, security, postage)	$10,300.00
Utilities	$7,700.00
Facility Maintenance	$3,500.00
Staff Salaries to Support Annual Management	$30,465.00

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Appendix A.
BIS Legal Descriptions

Parcel 30-39-06-00-00264.0
PART OF N 640.70 FT OF GOVT LOT 2
LYING E OF A1A AS DESC IN ORB 3234
PG 1419

Parcel 30-39-06-00-00265.0
SLY 423.5 FT OF GOVT LOT 2
MEASURED ALONG OCEAN EX A1A
R/W

Parcel 30-39-06-00-00265.2
N 346.5 FT OF S 770 FT OF GOVT LOT 2
AS MEASURED ALONG ATLANTIC OCEAN
AS DES IN ORB 1007 PG 578
LYING W OF A1A

Parcel 30-39-06-00-00267.0
PART OF GOVT LOT 2E OF A1A AS
DES IN ORB 2057 PG 440

Parcel 30-39-06-00-00282.0
N 1/2 OF S 150.93 FT OF N 640.70 FT OF
GOVT LOT 2E OF A1A AS DESC IN ORB 3234 PG 1415

Parcel 30-39-06-00-00500.0
N 200 FT OF GOVT LOT 3 LYING W OF SR A1A

Parcel 30-39-06-00-00501.1
S 100 FT OF S 200 FT OF N 400 FT OF GOVT LOT 3 LYING WEST OF
ST RD A1A AS DES IN ORB 1585 PG 434

Appendix B. BIS Observed Plant Species

FAMILY	GENUS	SPECIES	VARIETY	COMMON NAME
Agavaceae	Yucca	aloifolia		Spanish bayonet
Amaranthaceae	Iresine	diffusa		Juba's Bush
Anacardiaceae	Schinus	terebinthifolius		Brazilain pepper
Anacardiaceae	Toxicodendron	radicans		Poision Ivy
Annonaceae	Annona	glabra		Pond Apple
Apiaceae	Hydrocotyle	sp.		Pennywort
Apocynaceae	Catharanthus	roseus		Madagascar periwinkle
Apocynaceae	Rhabdadenia	biflora		Mangrove rubber vine
Apocynaceae	Sarcostemma	clausum		white twinevine
Arecaceae	Sabal	palmetto		Sabal palm
Arecaceae	Serenoa	repens		Saw palmetto
Asteraceae	Ageratina	jucunda		Hammock snakeroot
Asteraceae	Ambrosia	artemisiifolia		Ragweed
Asteraceae	Baccharis	glomeruliflora		
Asteraceae	Baccharis	halimifolia		Groundsel
Asteraceae	Bidens	alba	radiata	Spanish needle
Asteraceae	Borrichia	frutescens		Sea oxeye daisy
Asteraceae	Emilia	fosbergii		Tasselflower non-native several colors
Asteraceae	Erechtites	hieraciifolius		American Burnweed
Asteraceae	Eupatorium	capillifolium		Dog fennel
Asteraceae	Flaveria	linearis		Yellow top
Asteraceae	Helianthus	debilis	debilis	Dune sunflower
Asteraceae	Heterotheca	subaxillaris		Camphorweed yellow flower
Asteraceae	Iva	frutescens		Beach elder
Asteraceae	Melanthera	nivea		Snow squarestem
Asteraceae	Mikania	sp.		Climbing hempvine
Asteraceae	Pluchea	sp.		purple flower wetland fragrant

Asteraceae	Solidago	sp.		Goldenrod
Asteraceae	Verbesina	virginica		Frostweed
Avicenniaceae	Avicennia	germinans		Black Mangrove
Boraginaceae	Heliotropium	angiospermum		Scorpionstail
Brassicaceae	Capparis	flexuosa		Bayleaf capertree
Bromeliaceae	Tillandsia	recurvata		Ball moss
Bromeliaceae	Tillandsia	usneoides		Spanish moss
Burseraceae	Bursera	simaruba		Gumbo-limbo
Cactaceae	Opuntia	stricta		Prickley pear cactus
Caricaceae	Carica	papaya		Papaya
Chrysobalanaceae	Licania	michauxii		Gopher apple
Combretaceae	Conocarpus	erectus		Buttonwood
Combretaceae	Laguncularia	racemosa		White Mangrove
Convolvulaceae	Ipomoea	alba		Moonvine
Convolvulaceae	Ipomoea	triloba		Exotic morning glory purple flower
Cucurbitaceae	Momordica	charantia		Balsampear
Cyperaceae	Cladium	jamaicense		Jamaica swamp sawgrass
Cyperaceae	Cyperus	esculentus		Yellow nut grass
Cyperaceae	Cyperus	ligularis		Swamp flat sedge
Euphorbiaceae	Cnidoscolus	stimulosus		Tread-softly
Euphorbiaceae	Poinsettia	cyathophora		Paintedleaf
Fabaceae	Caesalpinia	bonduc		Gray nickernut
Fabaceae	Canavalia	rosea		Baybean
Fabaceae	Centrosema	virginianum		Butterfly pea
Fabaceae	Chamaecrista	fasciculata		Partridge pea
Fabaceae	Dalbergia	ecastaphyllum		Coin vine
Fabaceae	Erythrina	herbacea		Coral Bean
Fabaceae	Galactia	volubilis		Downy milkpea purple flower
Fabaceae	Vigna	luteola		Cow pea
Fagaceae	Quercus	virginiana		Live Oak

Gentianaceae	Eustoma	exaltatum		Marsh Gentian
Lamiaceae	Callicarpa	americana		American Beautyberry
Lamiaceae	Monarda	punctata		Dotted Horsemint
Lamiaceae	Salvia	coccinea		tropical sage
Lamiaceae	Trichostema	dichotomum		Forked bluecurls
Lauraceae	Ocotea	coriacea		Lancewood
Lauraceae	Persea	borbonia		Red bay
Loasaceae	Mentzelia	floridana		Poorman's patch
Malvaceae	Kosteletzkya	virginica		Virginia saltmarsh mallow
Moraceae	Ficus	aurea		Strangler Fig
Moraceae	Morus	rubra		Red Mulberry
Myricaceae	Myrica	cerifera		Wax myrtle
Myrsinaceae	Ardisia	escallonioides		Marlberry
Myrsinaceae	Rapanea	punctata		Myrsine
Myrtaceae	Eugenia	axillaris		White Stopper
Myrtaceae	Eugenia	foetida		Spainish Stopper
Myrtaceae	Myrcianthes	fragrans		Simpson Stopper
Nyctaginaceae	Guapira	discolor		Blolly
Olacaceae	Schoepfia	chrysophylloides		Greytwig
Oleaceae	Forestiera	segregata		Florida Privet
Orchidaceae	Encyclia	tampensis		Florida Butterfly Orchid
Passifloraceae	Passiflora	suberosa		Passion flower
Phytolaccaceae	Phytolacca	americana		American pokeweed
Poaceae	Andropogon	glomeratus		Bushy Bluestem
Poaceae	Cenchrus	sp.		Sandbur
Poaceae	Cynadon	dactylon		
Poaceae	Dactyloctenium	aegyptium		Durban crowfootgrass
Poaceae	Digitaria	ciliaris		Southern crabgrass
Poaceae	Eustachys	petrae		Pinewoods fingergrass
Poaceae	Panicum	amarum		Bitter panic grass

Poaceae	Paspalum	vaginatum		Seashore paspalum
Poaceae	Setaria	parviflora		Yellow bristlegrass; knotroot foxtail
Poaceae	Spartina	bakeri		Smooth cord grass
Poaceae	Sporobolus	indicus		Smutgrass
Polygonaceae	Coccoloba	diversifolia		Pigeon plum
Polygonaceae	Coccoloba	uvifera		Sea grape
Polygonaceae	Rumex	verticillatus		Swamp dock, mh marsh annual
Polypodiaceae	Phlebodium	aureum		Golden polypody
Polypodiaceae	Pleopeltis	polypodioides		resurrection fern
Pteridaceae	Acrostichum	danaeifolium		Giant leather fren
Rhamnaceae	Krugiodendron	ferreum		Black Ironwood
Rhizophoraceae	Rhizophora	mangle		Red mangrove
Rubiaceae	Chiococca	alba		Snowberry
Rubiaceae	Psychotria	nervosa		Wild coffee
Rubiaceae	Randia	aculeata		White indigo berry
Rutaceae	Zanthoxylum	clava-herculis		Hercules'-club
Rutaceae	Zanthoxylum	fagara		Wild lime
Salicaceae	Salix	caroliniana		Coastalplain Willow
Sapindaceae	Exotheca	paniculata		
Sapotaceae	Sideroxylon	foetidissimum		False mastic
Sapotaceae	Sideroxylon	tenax		Tough bully
Smilacaceae	Smilax	auriculata		Greenbrier
Solanaceae	Physalis	walteri		Walter's Groundcherry
Solanaceae	Solanum	americanum		Black nightshade
Urticaceae	Boehmeria	cylindrica		False nettle
Urticaceae	Parietaria	praetermissa		Clustered pellitory
Verbenaceae	Citharexylum	spinosum		Fiddlewood
Verbenaceae	Lantana	depressa	floridana	Lantanna
Verbenaceae	Lantana	involucrata		White lantana
Verbenaceae	Phyla	nodiflora		matchhead, fogfruit

Veronicaceae	Bacopa	monnieri		Herb-of-Grace
Vitaceae	Parthenocissus	quinquefolia		Virginia creeper
Vitaceae	Vitis	rotundifolia		Muscadine grape
Vitaceae	Vitis	shuttleworthii		Callose grape
Vittariaceae	Vittaria	lineata		Shoestring fern
Zygophyllaceae	Tribulus	cistoides		

Appendix C

FLORIDA Natural Areas INVENTORY

1018 Thomasville Road
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Tallahassee, FL 32303
850-224-8207
fax 850-681-9364
www.fnai.org

September 24, 2008

Caitlin Fisher
Florida Institute of Technology

Dear Ms. Fisher,

Thank you for your request for information from the Florida Natural Areas Inventory (FNAI). We have compiled the following information for your project area.

Project: Barrier Island Sanctuary

Date Received: September 19, 2008

Location: Township 30S, Range 39E, Section 6
Brevard County

Based on the information available, this site appears to be located on or very near a significant region of scrub habitat, a natural community in decline that provides important habitat for several rare species within a small area. Additional consideration should be given to avoid and/or mitigate impacts to these natural resources, and to design land uses that are compatible with these resources.

Element Occurrences

A search of our maps and database indicates that currently we have several Element Occurrences mapped within the vicinity of the study area (see enclosed map and element occurrence table). Please be advised that a lack of element occurrences in the FNAI database is not a sufficient indication of the absence of rare or endangered species on a site.

The Element Occurrences data layer includes occurrences of rare species and natural communities. The map legend indicates that some element occurrences occur in the general vicinity of the label point. This may be due to lack of precision of the source data, or an element that occurs over an extended area (such as a wide ranging species or large natural community). For animals and plants, Element Occurrences generally refer to more than a casual sighting; they usually indicate a viable population of the species. Note that some element occurrences represent historically documented observations which may no longer be extant.

*Several of the species and natural communities tracked by the Inventory are considered **data sensitive**. Occurrence records for these elements contain information that we consider sensitive due to collection pressures, extreme rarity, or at the request of the source of the information. The Element Occurrence Record has been labeled "Data Sensitive." We request that you not publish or release specific locational data about these species or communities without consent from the Inventory. If you have any questions concerning this please do not hesitate to call.*

Likely and Potential Rare Species

In addition to documented occurrences, other rare species and natural communities may be identified on or near the site based on habitat models and species range models (see enclosed Biodiversity

Florida Resources and Environmental Analysis Center

Institute of Science and Public Affairs

The Florida State University

Matrix Report). These species should be taken into consideration in field surveys, land management, and impact avoidance and mitigation.

FNAI habitat models indicate areas, which based on land cover type, offer suitable habitat for one or more rare species that is known to occur in the vicinity. Habitat models have been developed for approximately 300 of the rarest species tracked by the Inventory, including all federally listed species.

FNAI species range models indicate areas that are within the known or predicted range of a species, based on climate variables, soils, vegetation, and/or slope. Species range models have been developed for approximately 340 species, including all federally listed species.

The FNAI Biodiversity Matrix Geodatabase compiles Documented, Likely, and Potential species and natural communities for each square mile Matrix Unit statewide.

Florida Scrub-jay Survey – U.S. Fish and Wildlife Service

This survey was conducted by staff and associates of the Archbold Biological Station from 1992 to 1996. An attempt was made to record all scrub-jay (*Aphelocoma coerulescens*) groups, although most federal lands were not officially surveyed. Each map point represents one or more groups.

This data layer indicates that there are potential scrub-jay populations on or very near your site. For additional information:

Fitzpatrick, J.W., B. Pranty, and B. Stith, 1994, Florida scrub jay statewide map, 1992-1993. U. S. Fish and Wildlife Service Report, Cooperative Agreement no. 14-16-004-91-950.

Managed Areas

Portions of the site appear to be located within three managed areas: Archie Carr National Wildlife Refuge, managed by the United States Department of Interior, Fish and Wildlife Service; the Hardwood Hammock Sanctuary, managed by Brevard County; and the Barrier Island Ecosystem Center, managed by Brevard County.

The Managed Areas data layer shows public and privately managed conservation lands throughout the state. Federal, state, local, and privately managed conservation lands are included.

Land Acquisition Projects

This site appears to be located within the Archie Carr Seat Turtle Refuge Florida Forever BOT Project, which is part of the State of Florida's Conservation and Recreation Lands land acquisition program. A description of this project is enclosed. For more information on this Florida Forever Project, contact the Florida Department of Environmental Protection, Division of State Lands.

Florida Forever Board of Trustees (BOT) projects are proposed and acquired through the Florida Department of Environmental Protection, Division of State Lands. The state has no regulatory authority over these lands until they are purchased.

The Inventory always recommends that professionals familiar with Florida's flora and fauna should conduct a site-specific survey to determine the current presence or absence of rare, threatened, or endangered species.

Please visit www.fnai.org/trackinglist.cfm for county or statewide element occurrence distributions and links to more element information.

The database maintained by the Florida Natural Areas Inventory is the single most comprehensive source of information available on the locations of rare species and other significant ecological resources. However, the data are not always based on comprehensive or site-specific field surveys. Therefore, this information should not be regarded as a final statement on the biological resources of the site being considered, nor should it be substituted for on-site surveys. Inventory data are designed for the purposes of conservation planning and scientific research, and are not intended for use as the primary criteria for regulatory decisions.

Information provided by this database may not be published without prior written notification to the Florida Natural Areas Inventory, and the Inventory must be credited as an information source in these publications. FNAI data may not be resold for profit.

This report is made available at no charge due to funding from the Florida Department of Environmental Protection, Division of State Lands.

Thank you for your use of FNAI services. If I can be of further assistance, please give me a call at (850) 224-8207.

Sincerely,

Lindsay Horton

Lindsay Horton
Data Services Coordinator

Encl

Barrier Island Sanctuary

Site boundaries are approximate.

Brevard County

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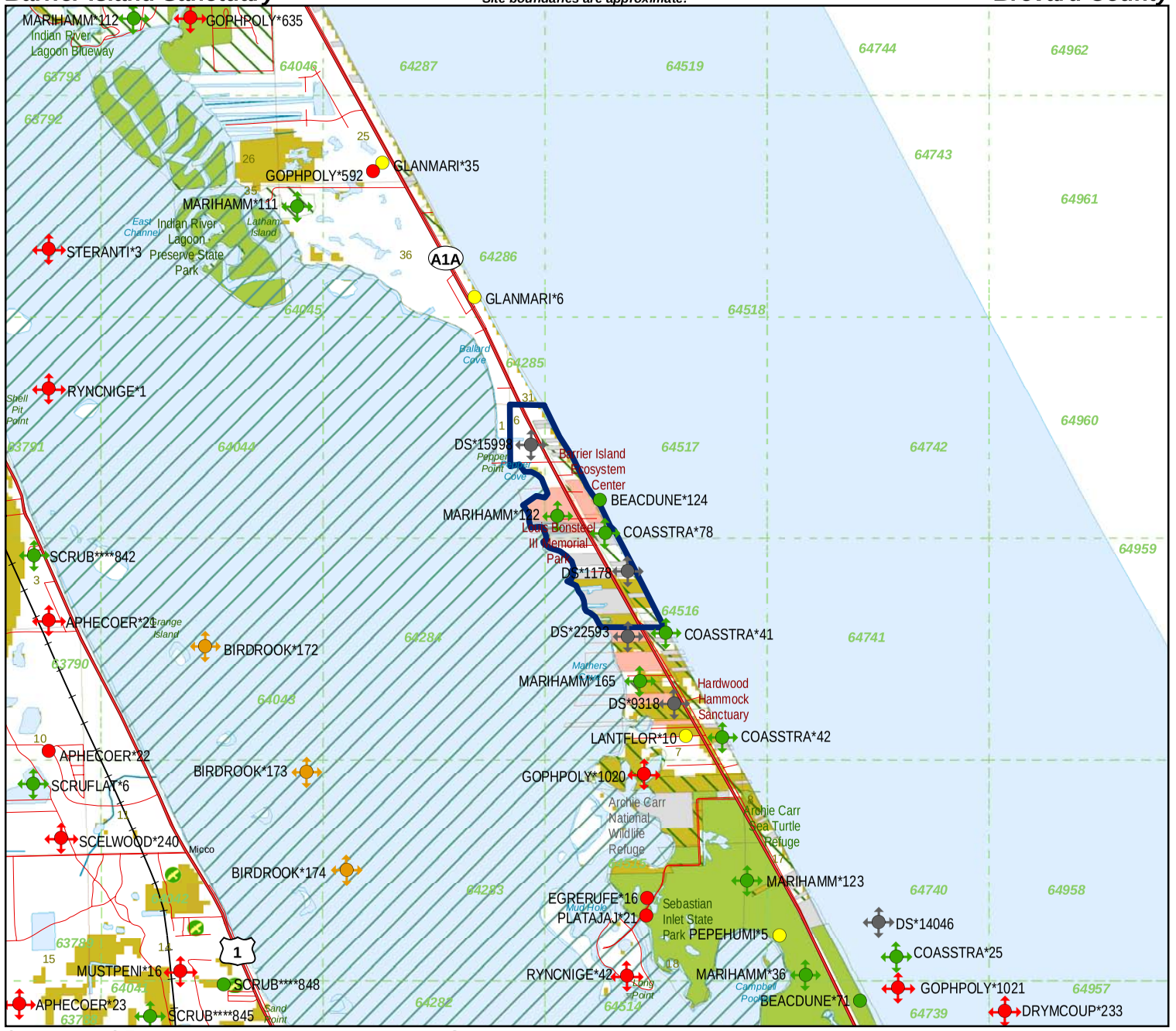
FLORIDA Natural Areas INVENTORY



Element Occurrences

- Animals
- Plants
- Communities
- Other
- Data Sensitive

Point Indicates General Vicinity of Element

U.S. Fish & Wildlife Service Scrub Jay Survey 1992-96

Conservation Lands

- Federal
- State
- Local
- Private
- State Aquatic Preserves

Land Acquisition Projects

- Florida Forever Board of Trustees Projects

- FNAI Rare Species Habitat
- FNAI Biodiversity Matrix Square Mile Units

- County Boundary
- Interstate
- Turnpike
- Major Highway
- Local Road
- Railroad [Inactive railroads shown in Gray]
- Water

NOTE
Map should not be interpreted without accompanying documents.

Map produced by LHH
Map Date: 23 SEPT 2008

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Florida Natural Areas Inventory

ELEMENT OCCURRENCES DOCUMENTED ON OR NEAR *PROJECT SITE*

Map Label	Scientific Name	Common Name	Global Rank	State Rank	Federal Status	State Listing	Observation Date	Description	EO Comments
BIRDROOK*173	Bird Rookery		GNR	SNR	N	N	1988-02-25	DOMINANT TERRESTRIAL VEGETATION-BRAZILIAN PEPPER, AUSTRALIAN PINE, BLACK MANGROVE, CABBAGE PALM, WHITE MANGROVE, RED MANGROVE. OFFSHORE-SHOAL GRASS ON E.	NESTING GREAT BLUE HERON, 4 INDIVIDUALS. ALSO PRESENT, BUT NOT NESTING: BROWN PELICAN, LEAST TERN, LITTLE BLUE HERON, BLACK CROWNED NIGHT HERON.
SCRUFLAT*6	Scrubby flatwoods		G3	S3	N	N	1981-05-13	2005-03-08: Area is now a housing development with no remnants of a natural community. Areas of scrubby flatwoods east of the intersection and also east of the railroad tracks. These areas are 250 to 600 meters east of the intersection of Barefoot Blvd	2005-03-08: Area is now a housing development with no remnants of a natural community (F05RUS06FLUS).
APHECOER*21	Aphelocoma coerulescens	Florida Scrub-jay	G2	S2	LT	LT	1991-08-12	DISTURBED SCRUB AND BURNED SAND PINE.	1981-05-13: 3-4 SCRUB JAYS (U81COX01). 1991-08-12: 4 ADULT JAYS REPORTED (U91SNO01); SNODGRASS ET AL. ESTIMATED RECORD NUMBERS 79, 80, 81, 82, 83, 84, 85 AND 86 TO CONSTITUTE A MEDIUM POPULATION OF 6-30 FAMILY GROUPS DURING A 1991 INVENTORY.
BIRDROOK*174	Bird Rookery		GNR	SNR	N	N	1987-11-17	DOMINANT TERRESTRIAL VEGETATION-SEA OXEYE, BRAZILIAN PEPPER, RED MANGROVE, AUSTRALIAN PINE, WHITE MANGROVE, BLACK MANGROVE, SEA PURSLANE. 1-2 CM OF SOIL HUMUS. OFF SHORE SHOAL GRASS ON N, E AND S.	NESTING GREAT BLUE HERON. ALSO PRESENT BUT NOT NESTING: SNOWY EGRET, LITTLE BLUE HERON, BLACK-CROWNED NIGHT HERON, GREAT EGRET, AMERICAN OYSTERCATCHER AND CASPIAN TERN.
RYNCNIGE*1	Rynchops niger	Black Skimmer	G5	S3	N	LS	1976-05-20	SPOIL ISLAND; NESTING SUBSTRATE CONSISTS OF DREDGED MATERIAL	1976-05-20: 2 BREEDING BIRDS, PAIRING; NEED ADDITIONAL DATA FROM LATER IN SEASON
BIRDROOK*172	Bird Rookery		GNR	SNR	N	N	1988-04-06	DOMINANT TERRESTRIAL VEGETATION-AUSTRALIAN PINE, BRAZILIAN PEPPER, BLACK MANGROVE, SEA OXEYE, RED MANGROVE, COIN VINE, SEA LAVENDER. OFFSHORE, SHOAL GRASS ON ALL SIDES.	NESTING GREAT BLUE HERON (1). ALSO NESTING NON-ELEMENTS.

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STERANTI*3	Sterna antillarum	Least Tern	G4	S3	N	LT	1976-05-20	SPOIL ISLAND; NESTING SUBSTRATE CONSISTS OF DREDGED MATERIAL	1976-05-20: 56 BREEDING BIRDS, INCUBATING
MUSTPENI*16	Mustela frenata peninsulae	Florida Long-tailed Weasel	G5T3	S3	N	N	1896-pre	No general description given	Skull. Collection of E.A. and O. Bangs, No. 3053. See O. Bangs, Proc. Biol. Soc. Washington 10:1-24, 1896 (pg. 12).
SCELWOOD*240	Sceloporus woodi	Florida Scrub Lizard	G3	S3	N	N	1986-05-13	Coastal scrub	1986-05-13: K.E. Enge, GFC - See Enge et al (1986; Coop Unit Tech Rep No 26).
GLANMARI*35	Glandularia maritima	Coastal Vervain	G3	S3	N	LE	1990-02-18	GRASSY AREA BETWEEN CLEARED SCRUB AND INTACT HAMMOCK ON NE SIDE OF DEVELOPMENT.	PLANTS PROSTRATE, FLOWERING.
LANTFLOR*10	Lantana depressa var. floridana	Atlantic Coast Florida Lantana	G2T1	S1	N	LE	1990-12-04	MARGIN OF COASTAL STRAND.	ONE "SURE" AND ONE APPARENT HYBRID PLANT (MULTI-COLORED FLOWERS) ON MARGIN OF STRAND. PLANTS CA. 2' TALL WITH LEAVES ROLLED UPWARD. ASSOCIATED SPECIES: QUERCUS VIRGINIANA, PERSEA BORBONIA, BUMELIA TENAX, MYRCIANTHES FRAGRANS.
DS*9318	Data Sensitive Element	Data Sensitive	G2	S2	N	LE	1988-04-09	Data Sensitive	Data Sensitive
DS*15998	Data Sensitive Element	Data Sensitive	G2	S2	N	LE	1988-04-09	Data Sensitive	Data Sensitive
DS*22593	Data Sensitive Element	Data Sensitive	G2	S2	N	LE	1990-12-04	Data Sensitive	Data Sensitive
GLANMARI*6	Glandularia maritima	Coastal Vervain	G3	S3	N	LE	1975-02-08	COASTAL DUNES E OF SR-A1A.	1975-02-08: PROSTRATE BRANCHES, FRUITING (IMMATURE).
APHECOER*22	Aphelocoma coerulescens	Florida Scrub-jay	G2	S2	LT	LT	1991-08-12	REMNANT SLASH PINE SCRUB [=SCRUBBY FLATWOODS] NEARBY BEING DEVELOPED.	1981-05-13: 1 SCRUB JAY (U81COX01). 1991-08-12: 2 ADULT JAYS REPORTED (U91SNO01); SNODGRASS ET AL. ESTIMATED RECORD NUMBERS 79, 80, 81, 82, 83, 84, 85 AND 86 TO CONSTITUTE A MEDIUM POPULATION 6-30 FAMILY GROUPS DURING A 1991 INVENTORY.
GOPHPOLY*592	Gopherus polyphemus	Gopher Tortoise	G3	S3	N	LT	1990-02-18	CLEARED AREA ON NE SIDE OF DEVELOPMENT. BERM ALONG MANGROVE AREA. SHELLY SAND.	CA. 30 ACTIVE BURROWS SPACED ABOUT EVERY 50 YDS. ALONG PATH. ONE TORTOISE SEEN (AROUND 6 P.M.).

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Florida Natural Areas Inventory

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BEACDUNE*71	Beach dune		G3	S2	N	N	2004	PROGRADING BEACH WITH	2004: Update to last obs date was based on interpretation of aerial photography (previous value was 1990-02-17) (U05FNA02FLUS). 2 DUNE LINES - OUTERMOST WITH SEA OATS (UNIOLA PANICULATA) AND BEACH ELDER (IVA IMBRICATA). INNER WITH SEA OATS PLUS CLUMPS OF
BEACDUNE*124	Beach dune		G3	S2	N	N	2004	NARROW SEA OATS LEDGE BACKED BY ABRUPTLY SLOPING SEA GRAPE RIDGE. RECENT ULTRA HIGH TIDES CUT INTO LEDGE.	2004: Update to last obs date was based on interpretation of aerial photography (previous value was 1990-12-04) (U05FNA02FLUS). UNIOLA PANICULATA-A, HELIANTHUS DEBILIS-F, SESUVIUM PORTULACASTRUM-F.
APHECOER*23	Aphelocoma coerulescens	Florida Scrub-jay	G2	S2	LT	LT	1981-05-13	OPEN SLASH PINE SCRUB [=SCRUBBY FLATWOODS]	1981-05-13: 2 SCRUB JAYS
RYNCNIGE*42	Rynchops niger	Black Skimmer	G5	S3	N	LS	1992-93	No general description given	B.R. Toland, GFC. Data from FY 1992-93 Coastal Wildlife Questionnaire. Delorme page 96, site # 14. Wintering concentrations.
DRYMCOUP*233	Drymarchon couperi	Eastern Indigo Snake	G3	S3	LT	LT	1987-pre	COASTAL STRAND	EHRHART OBSERVED SPECIES HERE DURING 1980'S
DS*14046	Data Sensitive Element	Data Sensitive	G2	S2	N	LE	1971-	Data Sensitive	Data Sensitive
GOPHPOLY*635	Gopherus polyphemus	Gopher Tortoise	G3	S3	N	LT	1989-08	VACANT, WEEDY LOT IN RESIDENTIAL AREA.	ONE TORTOISE SEEN FEEDING BY STEPPING ON PLANT STALKS, BENDING THEM OVER AND EATING THE TOPS.
GOPHPOLY*1020	Gopherus polyphemus	Gopher Tortoise	G3	S3	N	LT	1993	No data given in U93COA01FLUS.	Species reported as on-site by U93COA01FLUS; additional data needed.
GOPHPOLY*1021	Gopherus polyphemus	Gopher Tortoise	G3	S3	N	LT	1993	No data given in U93COA01FLUS.	Species reported as on-site by U93COA01FLUS; additional data needed.
DS*1178	Data Sensitive Element	Data Sensitive	G2	S2	N	LE	1988-04-09	Data Sensitive	Data Sensitive
PEPEHUMI*5	Peperomia humilis	Terrestrial Peperomia	G5	S2	N	LE	1990-11-24	IN MATURE TROPICAL HAMMOCK, SHELLY SOIL ON EAST SIDE OF INDIAN RIVER LAGOON. GUMBO LIMBO/LIVE OAK/RED BAY.	1 SPECIMEN IN SPIKE, CLUMP ABOUT 36" DIAMETER X 10" H IN LEAF MOLD ON GROUND.
EGRERUFE*16	Egretta rufescens	Reddish Egret	G4	S2	N	LS	1989-06-10	POOLS SURROUNDED BY MANGROVES.	1 BIRD FEEDING.

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PLATAJAJ*21	Platalea ajaja	Roseate Spoonbill	G5	S2	N	LS	1989-06-10	POOLS SURROUNDED BY MANGROVES.	2 BIRDS FEEDING CLOSE BEHIND A TRICOLORED HERON AS IT WALKED THROUGH THE WATER.
MARIHAMM*122	Maritime hammock		G3	S2	N	N	2004	NARROW PALM/OAK HAMMOCK FRINGING MANGROVES WITH PALMS PREDOMINATING. SCATTERED TROPICAL TREES. MEDIUM INVASION OF BRAZILIAN PEPPER INTO UNDERSTORY. MAPPED SEPARATELY FROM ADJACENT HAMMOCK BECAUSE OF DIFFERENCES IN SPECIES COMPOSITION. HAMMOCK GRADES INTO	2004: Update to last obs date was based on interpretation of aerial photography (previous value was 1990-02-22) (U05FNA02FLUS). SABAL PALMETTO - ABUNDANT; QUERCUS VIRGINIANA - RARE; MYRCIANTHES FRAGRANS - OCCASIONAL; BURSERA SIMAROUBA (X) - R; MASTICHODE
MARIHAMM*112	Maritime hammock		G3	S2	N	N	2004	TALL OAK/PALM FOREST BORDERING MANGROVES. MANY EPIPHYTES. NOT TOO DIVERSE.	2004: Update to last obs date was based on interpretation of aerial photography (previous value was 1990-02-18) (U05FNA02FLUS). CANOPY 40-50' TALL: SABAL PALMETTO, QUERCUS VIRGINIANA, PERSEA BORBONIA, MORUS RUBRA. UNDERSTORY: RAPANEA PUNCTATA, MYRCIANTHE
MARIHAMM*36	Maritime hammock		G3	S2	N	N	2004	N OF INLET, ON OLD DUNES W OF A1A. *[EORANKCOMM]: TROPICAL UNDERSTORY. 1990-02-17: 50-60 FT. TALL OAK/PALM HAMMOCK WITH TROPICAL TREES NEAR LAGOON, WITH DECREASING CANOPY HEIGHT NEAR OCEAN. (PRESENCE OF TROPICAL TREES DECREASES.)	2004: Update to last obs date was based on interpretation of aerial photography (previous value was 1990-02-17) (U05FNA02FLUS). DOMINATED BY QUERCUS VIRGINIANA. OTHER CANOPY TREES: SABAL PALMETTO, PERSEA BORBONIA, BURSERA SIMAROUBA, COCCOLOBA DIVERSIFOLI
COASSTRA*41	Coastal strand		G3	S2	N	N	2004	5-7' HEDGE OF SHRUBS AND DWARFED TREES. MAPPED SEPARATELY FROM ADJACENT STRAND BECAUSE OF MORE TROPICAL PLANT SPECIES COMPOSITION.	2004: Update to last obs date was based on interpretation of aerial photography (previous value was 1990-12-04) (U05FNA02FLUS). ZANTHOXYLUM FAGARA (X)-A, MYRICA CERIFERA-A, EUGENIA FOETIDA (X)-LA, MYRCIANTHES FRAGRANS-A, BUMELIA TENAX-A, AMYRIS ELEMIFERA

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Florida Natural Areas Inventory

ELEMENT OCCURRENCES DOCUMENTED ON OR NEAR *PROJECT SITE*

Map Label	Scientific Name	Common Name	Global Rank	State Rank	Federal Status	State Listing	Observation Date	Description	EO Comments
SCRUB****842	Scrub		G2	S2	N	N	2004	No general description given	2004: Update to last obs date was based on interpretation of aerial photography (previous value was 1991) (U05FNA02FLUS). OCCURRENCE ON SITE.
SCRUB****848	Scrub		G2	S2	N	N	2004	No general description given	2004: Update to last obs date was based on interpretation of aerial photography (previous value was 1991) (U05FNA02FLUS). OCCURRENCE ON SITE.
COASSTRA*25	Coastal strand		G3	S2	N	N	2004	N OF INLET, ON DUNES SEAWARD OF A1A, AND ALSO W. OF A1A --GRADING INTO HAMMOCK--1985-12-08. SHRUBS GRADING INTO SAW PALMETTO BEHIND FOREDUNES- -1990-02-17.	2004: Update to last obs date was based on interpretation of aerial photography (previous value was 1990-02-17) (U05FNA02FLUS). COCCOLOBA UVIFERA & SERENOA REPENS. WITH ASSOCIATED SPECIES: MYRCIANTHES FRAGRANS, RANDIA ACULEATA, ERYTH-RINA HERBACEA. DWARF
SCRUB****845	Scrub		G2	S2	N	N	2004	No general description given	2004: Update to last obs date was based on interpretation of aerial photography (previous value was 1991) (U05FNA02FLUS). OCCURRENCE ON SITE.
COASSTRA*78	Coastal strand		G3	S2	N	N	2004	LOW, DENSE HEDGE OF DIVERSE SHRUBS GRADING TO PURE SAW PALMETTO ALONG BEACH.	2004: Update to last obs date was based on interpretation of aerial photography (previous value was 1990-12-04) (U05FNA02FLUS). PERSEA BORBONIA-ABUNDANT; SERENOA REPENS-LOCALLY ABUNDANT; BUMELIA TENAX-A; COCCOLOBA UVIFERA (X)-4; RANDIA ACULEATA-R; FOREST
MARIHAMM*111	Maritime hammock		G3	S2	N	N	2004	HAMMOCK WITH OAK/PALM/REDBAY CANOPY AND TROPICAL SPECIES IN UNDERSTORY.	2004: Update to last obs date was based on interpretation of aerial photography (previous value was 1990-02-18) (U05FNA02FLUS). CANOPY: SABAL PALMETTO, PERSEA BORBONIA, QUERCUS VIRGINIANA, EXOTHEA PANICULATA, MORUS RUBRA. UNDERSTORY: MYRCIANTHES FRAGRANS

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Map Label	Scientific Name	Common Name	Global Rank	State Rank	Federal Status	State Listing	Observation Date	Description	EO Comments
MARIHAMM*165	Maritime hammock		G3	S2	N	N	2004	No general description given	2004: Update to last obs date was based on interpretation of aerial photography (previous value was 1990-12-04) (U05FNA02FLUS). BURSERA SIMAROUBA (X)-A, FICUS AUREA (X)-O, ZANTHOXYLUM FAGARA (X)-A, QUERCUS VIRGINIANA-O, SABAL PALMETTO-O. UNDERSTORY: ARDI
MARIHAMM*123	Maritime hammock		G3	S2	N	N	2004	TALL (25 FT.) WELL-FORMED HAMMOCK OF OAKS AND PALMS WITH TROPICAL SPECIES (INKWOOD, PIDGEON PLUM) MORE PROMINENT THAN TO N OF HERE.	2004: Update to last obs date was based on interpretation of aerial photography (previous value was 1990-12-04) (U05FNA02FLUS). CANOPY: QUERCUS VIRGINIANA, Q. LAURIFOLIA, SABAL PALMETTO, EXOTHEA PARNICULATA. UNDERSTORY: ARDISIA ESCALLONIOIDES, RAPANEA PU
COASSTRA*42	Coastal strand		G3	S2	N	N	2004	SHRUBBY STAND DOMINATED BY LOW OAK, BUCKTHORN, AND PURE SAW PALMETTO ON SEAWARD SIDE. MAPPED SEPARATELY FROM ADJACENT STRAND BECAUSE OF TEMPERATE SPECIES COMPOSITION.	2004: Update to last obs date was based on interpretation of aerial photography (previous value was 1990-12-04) (U05FNA02FLUS). QUERCUS VIRGINIANA (6-7' TALL)-A, BUMELIA TENAX-A, ECHITES UMBELLATA-O, COCCOLOBA UVIFERA (X)-LA, RAPANEA PUNCTAT (X)-O, CHIOC

GLOBAL AND STATE RANKS

Florida Natural Areas Inventory (FNAI) defines an **element** as any rare or exemplary component of the natural environment, such as a species, natural community, bird rookery, spring, sinkhole, cave, or other ecological feature. FNAI assigns two ranks to each element found in Florida: the **global rank**, which is based on an element's worldwide status, and the **state rank**, which is based on the status of the element within Florida. Element ranks are based on many factors, including estimated number of occurrences, estimated abundance (for species and populations) or area (for natural communities), estimated number of adequately protected occurrences, range, threats, and ecological fragility.

GLOBAL RANK DEFINITIONS

G1	Critically imperiled globally because of extreme rarity (5 or fewer occurrences or less than 1000 individuals) or because of extreme vulnerability to extinction due to some natural or man-made factor.
G2	Imperiled globally because of rarity (6 to 20 occurrences or less than 3000 individuals) or because of vulnerability to extinction due to some natural or man-made factor.
G3	Either very rare and local throughout its range (21-100 occurrences or less than 10,0000 individuals) or found locally in a restricted range or vulnerable to extinction from other factors.
G4	Apparently secure globally (may be rare in parts of range).
G5	Demonstrably secure globally.
G#?	Tentative rank (e.g., G2?)
G#G#	Range of rank; insufficient data to assign specific global rank (e.g., G2G3)
G#T#	Rank of a taxonomic subgroup such as a subspecies or variety; the G portion of the rank refers to the entire species and the T portion refers to the specific subgroup; numbers have same definition as above (e.g., G3T1)
G#Q	Rank of questionable species - ranked as species but questionable whether it is species or subspecies; numbers have same definition as above (e.g., G2Q)
G#T#Q	Same as above, but validity as subspecies or variety is questioned.
GH	Of historical occurrence throughout its range, may be rediscovered (e.g., ivory-billed woodpecker)
GNA	Ranking is not applicable because element is not a suitable target for conservation (e.g. as for hybrid species)
GNR	Not yet ranked (temporary)
GNRTNR	Neither the full species nor the taxonomic subgroup has yet been ranked (temporary)
GX	Believed to be extinct throughout range
GXC	Extirpated from the wild but still known from captivity/cultivation
GU	Unrankable. Due to lack of information, no rank or range can be assigned (e.g., GUT2).

STATE RANK DEFINITIONS

Definition parallels global element rank: substitute "S" for "G" in above global ranks, and "in Florida" for "globally" in above global rank definitions.

FEDERAL AND STATE LEGAL STATUSES (U.S. Fish and Wildlife Service – USFWS) PROVIDED BY FNAI FOR INFORMATION ONLY.

For official definitions and lists of protected species, consult the relevant state or federal agency.

FEDERAL LEGAL STATUS

Definitions derived from U.S. Endangered Species Act of 1973, Sec. 3. Note that the federal status given by FNAI refers only to Florida populations and that federal status may differ elsewhere.

LE	Listed as Endangered Species in the List of Endangered and Threatened Wildlife and Plants under the provisions of the Endangered Species Act. Defined as any species which is in danger of extinction throughout all or a significant portion of its range.
LE,XN	A non essential experimental population of a species otherwise Listed as an Endangered Species in the List of Endangered and Threatened Wildlife and Plants. LE,XN for Grus americana (Whooping crane), Federally listed as XN (Non essential experimental population) refers to the Florida experimental population only. Federal listing elsewhere for Grus americana is LE.
PE	Proposed for addition to the List of Endangered and Threatened Wildlife and Plants as Endangered Species.
LT	Listed as Threatened Species, defined as any species which is likely to become an endangered species within the foreseeable future throughout all or a significant portion of its range.
LT,PDL	Species currently listed Threatened but has been proposed for delisting.
PT	Proposed for listing as Threatened Species.
C	Candidate Species for addition to the list of Endangered and Threatened Wildlife and Plants, Category 1. Federal listing agencies have sufficient information on biological vulnerability and threats to support proposing to list the species as Endangered or Threatened.
SAT	Threatened due to similarity of appearance to a threatened species.
SC	Species of Concern, species is not currently listed but is of management concern to USFWS.
N	Not currently listed, nor currently being considered for addition to the List of Endangered and Threatened Wildlife and Plants.

FLORIDA LEGAL STATUSES (Florida Fish and Wildlife Conservation Commission – FFWCC/ Florida Department of Agriculture and Consumer Services – FDACS)

Animals: Definitions derived from "Florida's Endangered Species and Species of Special Concern, Official Lists" published by Florida Fish and Wildlife Conservation Commission - FFWCC, 1 August 1997, and subsequent updates.

LE	Listed as Endangered Species by the FFWCC. Defined as a species, subspecies, or isolated population which is so rare or depleted in number or so restricted in range of habitat due to any man-made or natural factors that it is in immediate danger of extinction or extirpation from the state, or which may attain such a status within the immediate future.
LT	Listed as Threatened Species by the FFWCC. Defined as a species, subspecies, or isolated population which is acutely vulnerable to environmental alteration, declining in number at a rapid rate, or whose range or habitat is decreasing in area at a rapid rate and as a consequence is destined or very likely to become an endangered species within the foreseeable future.
LT*	Indicates that a species has LT status only in selected portions of its range in Florida. LT* for Ursus americanus floridanus (Florida black bear) indicates that LT status does not apply in Baker and Columbia counties and in the Apalachicola National Forest. LT* for Neovison vison pop. 1 (Southern mink, South Florida population) state listed as Threatened refers to the Everglades population only (Note: species formerly listed as Mustela vison mink pop. 1. Also, priorly listed as Mustela evergladensis).
LS	Listed as Species of Special Concern by the FFWCC, defined as a population which warrants special protection, recognition, or consideration because it has an inherent significant vulnerability to habitat modification,

environmental alteration, human disturbance, or substantial human exploitation which, in the foreseeable future, may result in its becoming a threatened species.

LS* Indicates that a species has LS status only in selected portions of its range in Florida. LS* for Pandion haliaetus (Osprey) state listed as LS (Species of Special Concern) in Monroe County only.

PE Proposed for listing as Endangered.

PT Proposed for listing as Threatened.

PS Proposed for listing as a Species of Special Concern.

N Not currently listed, nor currently being considered for listing.

Plants: Definitions derived from Sections 581.011 and 581.185(2), Florida Statutes, and the Preservation of Native Flora of Florida Act, 5B-40.001. FNAI does not track all state-regulated plant species; for a complete list of state-regulated plant species, call Florida Division of Plant Industry, 352-372-3505 or please visit: http://DOACS.State.FL.US/PI/Images/Rule05b.pdf

LE Listed as Endangered Plants in the Preservation of Native Flora of Florida Act. Defined as species of plants native to the state that are in imminent danger of extinction within the state, the survival of which is unlikely if the causes of a decline in the number of plants continue, and includes all species determined to be endangered or threatened pursuant to the Federal Endangered Species Act of 1973, as amended.

PE Proposed by the FDACS for listing as Endangered Plants.

LT Listed as Threatened Plants in the Preservation of Native Flora of Florida Act. Defined as species native to the state that are in rapid decline in the number of plants within the state, but which have not so decreased in such number as to cause them to be endangered. LT* indicates that a species has LT status only in selected portions of its range in Florida.

PT Proposed by the FDACS for listing as Threatened Plants.

N Not currently listed, nor currently being considered for listing.

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FLORIDA Natural Areas INVENTORY

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FLORIDA RESOURCES & ENVIRONMENTAL ANALYSIS CENTER
AT THE FLORIDA STATE UNIVERSITY

FOR IMMEDIATE RELEASE

FNAI's Biodiversity Matrix Online

The Biodiversity Matrix Map Server is a new **screening tool** from FNAI that provides **immediate, free access** to rare species occurrence information statewide. This tool allows you to zoom to your site of interest and create a report listing documented, likely, and potential occurrences of rare species and natural communities.

The FNAI Biodiversity Matrix offers **built-in interpretation** of the likelihood of species occurrence for each 1-square-mile Matrix Unit across the state. The report includes a site map and list of species and natural communities by occurrence status: Documented, Documented-Historic, Likely, and Potential.

Try it today:

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Please note: FNAI will continue to offer our Standard Data Report service as always. The Standard Data Report offers the most comprehensive information available on rare species, natural communities, conservation lands, and other natural resources.

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Florida Natural Areas Inventory

Biodiversity Matrix Report

Scientific Name	Common Name	Global Rank	State Rank	Federal Status	State Listing
Matrix Unit ID: 64284					
Likely					
Bird Rookery		GNR	SNR	N	N
Gopherus polyphemus	Gopher Tortoise	G3	S3	N	LT
Potential					
Acipenser oxyrinchus oxyrinchus	Atlantic Sturgeon	G3T3	S1	C	LS
Centrosema arenicola	Sand Butterfly Pea	G2Q	S2	N	LE
Conradina grandiflora	Large-flowered Rosemary	G3	S3	N	LT
Ctenogobius stigmaturus	Spottail Goby	G2	S2	N	N
Dendroica discolor paludicola	Florida Prairie Warbler	G5T3	S3	N	N
Drymarchon couperi	Eastern Indigo Snake	G3	S3	LT	LT
Eretmochelys imbricata	Hawksbill	G3	S1	LE	LE
Glandularia maritima	Coastal Vervain	G3	S3	N	LE
Halophila johnsonii	Johnson's Seagrass	G2	S2	LT	N
Harrisia simpsonii	Simpson's Prickly Apple	G2	S2	N	LE
Lechea cernua	Nodding Pinweed	G3	S3	N	LT
Mustela frenata peninsulae	Florida Long-tailed Weasel	G5T3	S3	N	N
Nemastylis floridana	Celestial Lily	G2	S2	N	LE
Nolina atopocarpa	Florida Beargrass	G3	S3	N	LT
Peromyscus polionotus niveiventris	Southeastern Beach Mouse	G5T1	S1	LT	LT
Pteroglossaspis ecristata	Giant Orchid	G2G3	S2	N	LT
Rivulus marmoratus	Mangrove Rivulus	G3	S3	C	LS
Rostrhamus sociabilis plumbeus	Snail Kite	G4G5T3Q	S2	LE	LE
Sceloporus woodi	Florida Scrub Lizard	G3	S3	N	N
Trichechus manatus	Manatee	G2	S2	LE	LE
Warea carteri	Carter's Warea	G3	S3	LE	LE
Matrix Unit ID: 64285					
Likely					
Caretta caretta	Loggerhead	G3	S3	LT	LT
Chelonia mydas	Green Turtle	G3	S2	LE	LE
Dermochelys coriacea	Leatherback	G2	S2	LE	LE
Maritime hammock		G3	S2	N	N
Mycteria americana	Wood Stork	G4	S2	LE	LE
Potential					
Acipenser oxyrinchus oxyrinchus	Atlantic Sturgeon	G3T3	S1	C	LS
Aphelocoma coerulescens	Florida Scrub-jay	G2	S2	LT	LT
Centrosema arenicola	Sand Butterfly Pea	G2Q	S2	N	LE
Chamaesyce cumulicola	Sand-dune Spurge	G2	S2	N	LE
Charadrius melodus	Piping Plover	G3	S2	LT	LT
Cladonia perforata	Perforate Reindeer Lichen	G1	S1	LE	LE
Conradina grandiflora	Large-flowered Rosemary	G3	S3	N	LT
Ctenogobius stigmaturus	Spottail Goby	G2	S2	N	N
Dendroica discolor paludicola	Florida Prairie Warbler	G5T3	S3	N	N
Drymarchon couperi	Eastern Indigo Snake	G3	S3	LT	LT
Eretmochelys imbricata	Hawksbill	G3	S1	LE	LE

Definitions: *Documented - Rare species and natural communities documented on or near this site.*
Documented-Historic - Rare species and natural communities documented, but not observed/reported within the last twenty years.
Likely - Rare species and natural communities likely to occur on this site based on suitable habitat and/or known occurrences in the vicinity.
Potential - This site lies within the known or predicted range of the species listed.

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Florida Natural Areas Inventory

Biodiversity Matrix Report

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Glandularia maritima	Coastal Vervain	G3	S3	N	LE
Gopherus polyphemus	Gopher Tortoise	G3	S3	N	LT
Halophila johnsonii	Johnson's Seagrass	G2	S2	LT	N
Harrisia simpsonii	Simpson's Prickly Apple	G2	S2	N	LE
Lechea cernua	Nodding Pinweed	G3	S3	N	LT
Lechea divaricata	Pine Pinweed	G2	S2	N	LE
Mustela frenata peninsulae	Florida Long-tailed Weasel	G5T3	S3	N	N
Nemastylis floridana	Celestial Lily	G2	S2	N	LE
Nolina atopocarpa	Florida Beargrass	G3	S3	N	LT
Peromyscus polionotus niveiventris	Southeastern Beach Mouse	G5T1	S1	LT	LT
Rivulus marmoratus	Mangrove Rivulus	G3	S3	C	LS
Rostrhamus sociabilis plumbeus	Snail Kite	G4G5T3Q	S2	LE	LE
Sceloporus woodi	Florida Scrub Lizard	G3	S3	N	N
Schizachyrium niveum	Scrub Bluestem	G1	S1	N	LE
Tephrosia angustissima var. curtissii	Coastal Hoary-pea	G1T1	S1	N	LE
Trichechus manatus	Manatee	G2	S2	LE	LE
Warea carteri	Carter's Warea	G3	S3	LE	LE

Matrix Unit ID: 64516

Documented

Coastal strand		G3	S2	N	N
Harrisia simpsonii	Simpson's Prickly Apple	G2	S2	N	LE
Lantana depressa var. floridana	Atlantic Coast Florida Lantana	G2T1	S1	N	LE
Maritime hammock		G3	S2	N	N

Likely

Caretta caretta	Loggerhead	G3	S3	LT	LT
Chelonia mydas	Green Turtle	G3	S2	LE	LE
Dermochelys coriacea	Leatherback	G2	S2	LE	LE
Gopherus polyphemus	Gopher Tortoise	G3	S3	N	LT
Mycteria americana	Wood Stork	G4	S2	LE	LE
Scrub		G2	S2	N	N

Potential

Acipenser oxyrinchus oxyrinchus	Atlantic Sturgeon	G3T3	S1	C	LS
Aphelocoma coerulescens	Florida Scrub-jay	G2	S2	LT	LT
Centrosema arenicola	Sand Butterfly Pea	G2Q	S2	N	LE
Chamaesyce cumulicola	Sand-dune Spurge	G2	S2	N	LE
Charadrius melodus	Piping Plover	G3	S2	LT	LT
Cladonia perforata	Perforate Reindeer Lichen	G1	S1	LE	LE
Conradina grandiflora	Large-flowered Rosemary	G3	S3	N	LT
Ctenogobius stigmaturus	Spottail Goby	G2	S2	N	N
Dendroica discolor paludicola	Florida Prairie Warbler	G5T3	S3	N	N
Drymarchon couperi	Eastern Indigo Snake	G3	S3	LT	LT
Eretmochelys imbricata	Hawksbill	G3	S1	LE	LE
Glandularia maritima	Coastal Vervain	G3	S3	N	LE
Halophila johnsonii	Johnson's Seagrass	G2	S2	LT	N
Lechea cernua	Nodding Pinweed	G3	S3	N	LT
Lechea divaricata	Pine Pinweed	G2	S2	N	LE

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Florida Natural Areas Inventory

Biodiversity Matrix Report

Scientific Name	Common Name	Global Rank	State Rank	Federal Status	State Listing
Mustela frenata peninsulae	Florida Long-tailed Weasel	G5T3	S3	N	N
Nemastylis floridana	Celestial Lily	G2	S2	N	LE
Nolina atopocarpa	Florida Beargrass	G3	S3	N	LT
Peromyscus polionotus niveiventris	Southeastern Beach Mouse	G5T1	S1	LT	LT
Rivulus marmoratus	Mangrove Rivulus	G3	S3	C	LS
Rostrhamus sociabilis plumbeus	Snail Kite	G4G5T3Q	S2	LE	LE
Sceloporus woodi	Florida Scrub Lizard	G3	S3	N	N
Schizachyrium niveum	Scrub Bluestem	G1	S1	N	LE
Tephrosia angustissima var. curtissii	Coastal Hoary-pea	G1T1	S1	N	LE
Trichechus manatus	Manatee	G2	S2	LE	LE
Warea carteri	Carter's Warea	G3	S3	LE	LE

Matrix Unit ID: 64517

Documented

Beach dune		G3	S2	N	N
Coastal strand		G3	S2	N	N

Likely

Caretta caretta	Loggerhead	G3	S3	LT	LT
Chelonia mydas	Green Turtle	G3	S2	LE	LE
Dermochelys coriacea	Leatherback	G2	S2	LE	LE
Gopherus polyphemus	Gopher Tortoise	G3	S3	N	LT
Maritime hammock		G3	S2	N	N
Mycteria americana	Wood Stork	G4	S2	LE	LE
Scrub		G2	S2	N	N

Potential

Acipenser oxyrinchus oxyrinchus	Atlantic Sturgeon	G3T3	S1	C	LS
Aphelocoma coerulescens	Florida Scrub-jay	G2	S2	LT	LT
Centrosema arenicola	Sand Butterfly Pea	G2Q	S2	N	LE
Chamaesyce cumulicola	Sand-dune Spurge	G2	S2	N	LE
Charadrius melodus	Piping Plover	G3	S2	LT	LT
Cladonia perforata	Perforate Reindeer Lichen	G1	S1	LE	LE
Conradina grandiflora	Large-flowered Rosemary	G3	S3	N	LT
Ctenogobius stigmaturus	Spottail Goby	G2	S2	N	N
Dendroica discolor paludicola	Florida Prairie Warbler	G5T3	S3	N	N
Drymarchon couperi	Eastern Indigo Snake	G3	S3	LT	LT
Eretmochelys imbricata	Hawksbill	G3	S1	LE	LE
Glandularia maritima	Coastal Vervain	G3	S3	N	LE
Halophila johnsonii	Johnson's Seagrass	G2	S2	LT	N
Harrisia simpsonii	Simpson's Prickly Apple	G2	S2	N	LE
Lechea cernua	Nodding Pinweed	G3	S3	N	LT
Lechea divaricata	Pine Pinweed	G2	S2	N	LE
Mustela frenata peninsulae	Florida Long-tailed Weasel	G5T3	S3	N	N
Nemastylis floridana	Celestial Lily	G2	S2	N	LE
Nolina atopocarpa	Florida Beargrass	G3	S3	N	LT
Peromyscus polionotus niveiventris	Southeastern Beach Mouse	G5T1	S1	LT	LT
Rivulus marmoratus	Mangrove Rivulus	G3	S3	C	LS
Rostrhamus sociabilis plumbeus	Snail Kite	G4G5T3Q	S2	LE	LE

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Florida Natural Areas Inventory

Biodiversity Matrix Report

Scientific Name	Common Name	Global Rank	State Rank	Federal Status	State Listing
Sceloporus woodi	Florida Scrub Lizard	G3	S3	N	N
Schizachyrium niveum	Scrub Bluestem	G1	S1	N	LE
Tephrosia angustissima var. curtissii	Coastal Hoary-pea	G1T1	S1	N	LE
Trichechus manatus	Manatee	G2	S2	LE	LE
Warea carteri	Carter's Warea	G3	S3	LE	LE

Definitions: *Documented - Rare species and natural communities documented on or near this site.*
Documented-Historic - Rare species and natural communities documented, but not observed/reported within the last twenty years.
Likely - Rare species and natural communities likely to occur on this site based on suitable habitat and/or known occurrences in the vicinity.
Potential - This site lies within the known or predicted range of the species listed.

Archie Carr Sea Turtle Refuge

Group B
Full Fee

Brevard and Indian River Counties

Purpose for State Acquisition

Although sea turtle nesting occurs from the southern tip of Texas to the southern coast of Virginia, this 20-mile stretch of beach in Brevard and Indian River Counties is the second most significant nesting area for Loggerhead sea turtles in the world, one of the most significant nesting areas for Green Turtles in the western hemisphere, and an occasional nesting area for the Leatherback, the largest and rarest sea turtle. For thousands of years, these sea turtles have returned each year to these beaches to lay their eggs and continue the species. The Archie Carr Sea Turtle Refuge project is designed to help protect the habitat and assure the continued survival of these endangered sea turtles.

Managers

The Division of Recreation and Parks (DRP), Department of Environmental Protection, the U.S. Fish and Wildlife Service, and Brevard and Indian River Counties will be the cooperating managers.

General Description

This project will consolidate several small public ownerships and add to them substantially, protecting almost ten miles of undeveloped Atlantic Coast shoreline. Natural communities are in good condition and include beach, coastal strand, and maritime hammock, but the primary significance of this tract is its value as sea turtle nesting habitat. Stretches of quiet, undisturbed sandy beaches, with little or no artificial light, are essential to the reproductive success and survival of sea turtles. The project harbors several other rare plant and animal species. The project is of particular importance to unique offshore reefs (sabellariid "worm" and hard coral) that have been proposed for listing as the focus of a*Florida Coral Grounds National Marine Sanctuary*. At least 30 archaeological sites (primarily shell middens) are located near or within the refuge. It is threatened by intense development pressure, both commercial and residential.

Public Use

The project is designated as a recreation area and a wildlife and environmental area. The designation will allow such uses as photography, swimming, fishing and nature appreciation.

Acquisition Planning and Status

Appraisals on the remaining essential or core parcels are being reviewed. Phase I: 500 feet or more of contiguous beach frontage adjacent to publicly owned lands; Phase II: 500 feet or more of contiguous beach frontage in a single ownership or under the contract of a single agent; Phase III: less than 500 feet of beach frontage adjacent to publicly owned lands. The project excludes developed and undeveloped parcels situated between developed parcels. Acquisition efforts are ongoing.

The LAMAC approved the addition of 112 acres to the project boundary on March 10, 1995.

On April 6, 2001, the Council transferred this project to the full fee from the negotiated impasse group.

FNAI Elements	
Devil's shoestring	G1Q/S1
Coastal vervain	G2/S2
Prickly-apple	G2G3/S2S3
SHELL MOUND	G3/S2
Loggerhead turtle	G3/S2
Green turtle	G3/S2
Leatherback turtle	G3/S2
Gopher tortoise	G3/S3
15 elements known from site	

Placed on list	**1991**
Project Area (Acres)	**1,203**
Acres Acquired	**518**
at a Cost of	**$35,895,365**
Acres Remaining	**685**
with Estimated (Tax Assessed) Value of	**$21,169,751***

***The LAMAC directed that a $10 million cap per year be set on acquisition expenditures within Archie Carr Sea Turtle Refuge.**

Archie Carr Sea Turtle Refuge - Group B/Full Fee

On January 25, 2001, the Acquisition and Restoration Council added 5 acres to the project.

Coordination

This project was developed in conjunction with the U.S. Fish and Wildlife Service (USFWS). In 2000, the federal government approved $2 million for the acquisition of parcels within Archie Carr Sea Turtle Refuge. Indian River County is an acquisition partner on several tracts within the Indian River County portion of the project.

The Richard King Mellon Foundation has made a substantial contribution to the overall protection and acquisition of the project area. The Foundation has acquired several tracts within the project boundary.

In 1994, individuals representing eleven government agencies, conservation groups, non-profit organizations and the local community formed the Archie Carr Working Group to enhance coordination, cooperation, and communication among the diverse interest groups involved in the protection of the refuge and barrier island ecosystem.

Management Policy Statement

The primary goals of management of the Archie Carr Sea Turtle Refuge project are: to conserve scarce, undeveloped Atlantic Coast shoreline that is globally important nesting habitat for threatened and endangered sea turtles; to conserve this important ecosystem and its wildlife resources through purchase because regulation cannot adequately protect them; and to provide areas for natural-resource-based recreation.

Management Prospectus

Qualifications for state designation The Archie Carr Sea Turtle Refuge is recognized as the most important sea turtle nesting site in the United States and qualifies as a wildlife and environmental area.

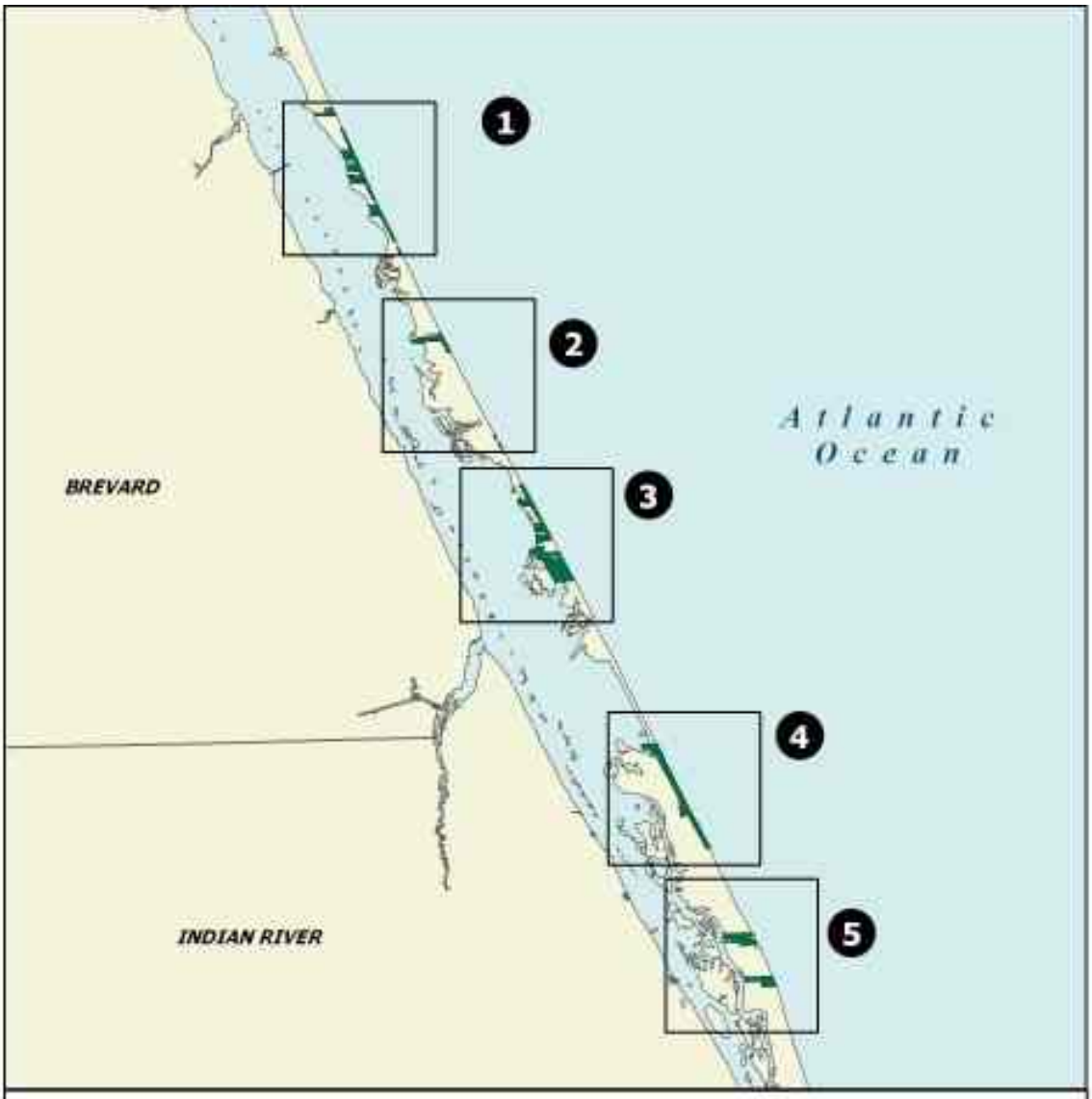
Manager The U.S. Fish and Wildlife Service will manage most of the project as a National Wildlife Refuge. Primary management partners include the State of Florida Department of Environmental Protection, Brevard County, and Indian River County. The portion of the project immediately north of the Sebastian Inlet State Recreation Area and west of the highway will be added to the state recreation area.

Conditions affecting intensity of management The project includes lands that are low-need, moderate-need and high-need tracts as defined by 259.032 (11)(c) F.S. About 30% of the lands are low-need, 50% moderate-need and 20% high-need properties.

Timetable for implementing management and provisions for security and protection of infrastructure Within the first year after acquisition, activities will concentrate on site security, controlling public access, removing trash and resource inventory. A management plan will be formulated. Brevard County plans to develop an innovative environmental education program for the area. Long-range plans for the properties, beginning one year after acquisition, will be directed toward protecting the nesting beach, restoring disturbed areas, inventorying resources, and perpetuating natural communities and listed species. To the greatest extent practical, parking lots and dune crossovers will be confined to already disturbed sites.

Revenue-generating potential Collecting parking or access fees is the only means of generating revenue from the tracts to be managed by the U.S. Fish and Wildlife Service or local governments. The Florida Division of Recreation and Parks expects no significant revenue to be generated initially from the tracts to be added to the state recreation area.

Cooperators in management activities The U.S. Fish and Wildlife Service will collaborate in management with local governments. Non-profit organizations with active management and education interests include The Nature Conservancy, The Trust for Public Land, Caribbean Conservation Corporation, Center for Marine Conservation and local non-profits and land trusts. A Brevard County volunteer warden program has been proposed to involve the local community in conservation, management and educational programs.



ARCHIE CARR SEA TURTLE REFUGE: OVERVIEW

BREVARD AND INDIAN RIVER COUNTIES

Map 1:
A. Archie Carr N.W.R. - Northern Boundary
B. Archie Carr N.W.R. - Core Segment I

Map 2:
A. Archie Carr N.W.R. - Core Segment II

Map 3:
A. Archie Carr N.W.R. - Core Segment III

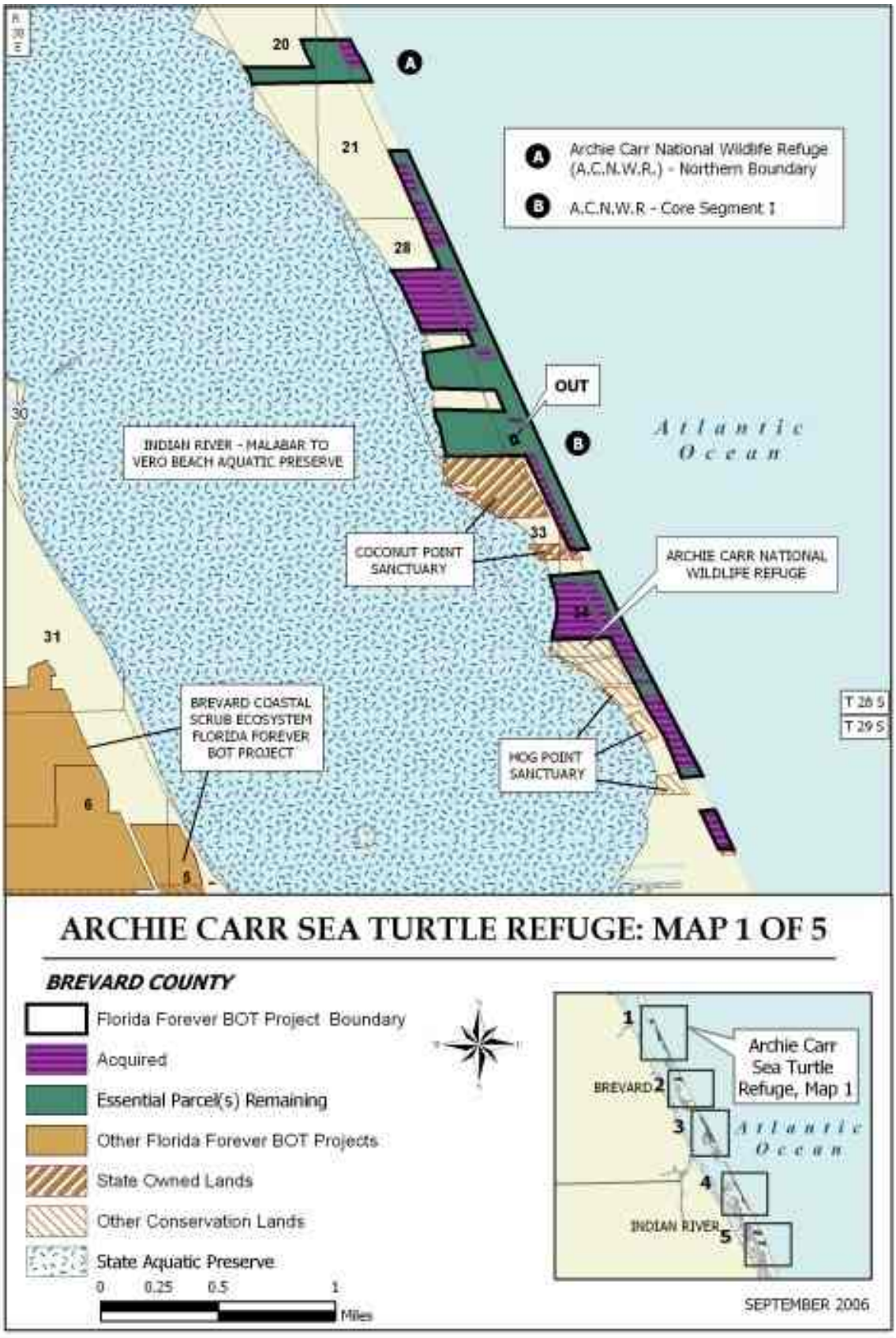
Map 4:
A. Archie Carr N.W.R. - Core Segment IV, Southern Boundary

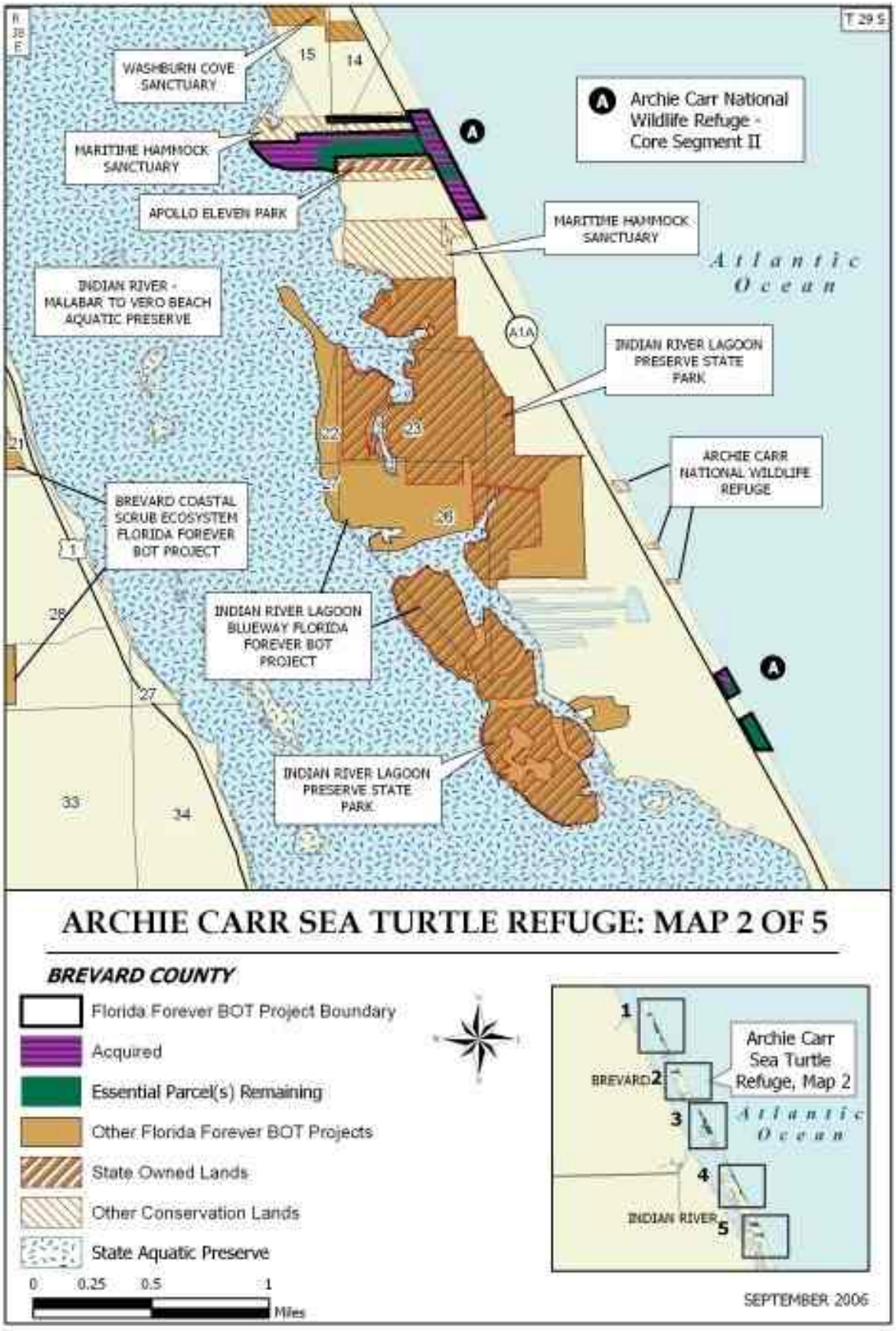
Map 5:
A. Archie Carr Sea Turtle Refuge

0 1.25 2.5 5
Miles

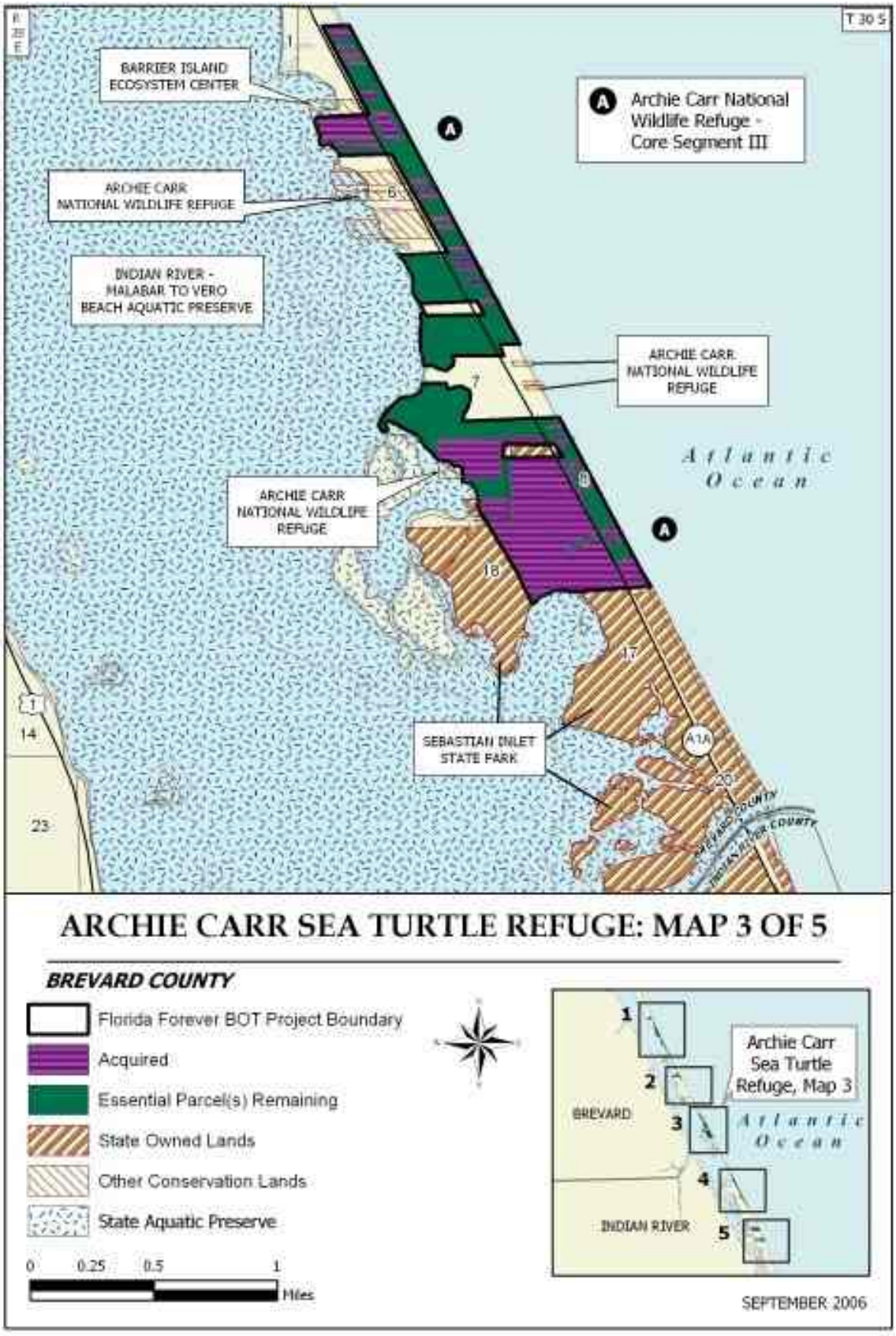
SEPTEMBER 2006

Archie Carr Sea Turtle Refuge - Group B/Full Fee



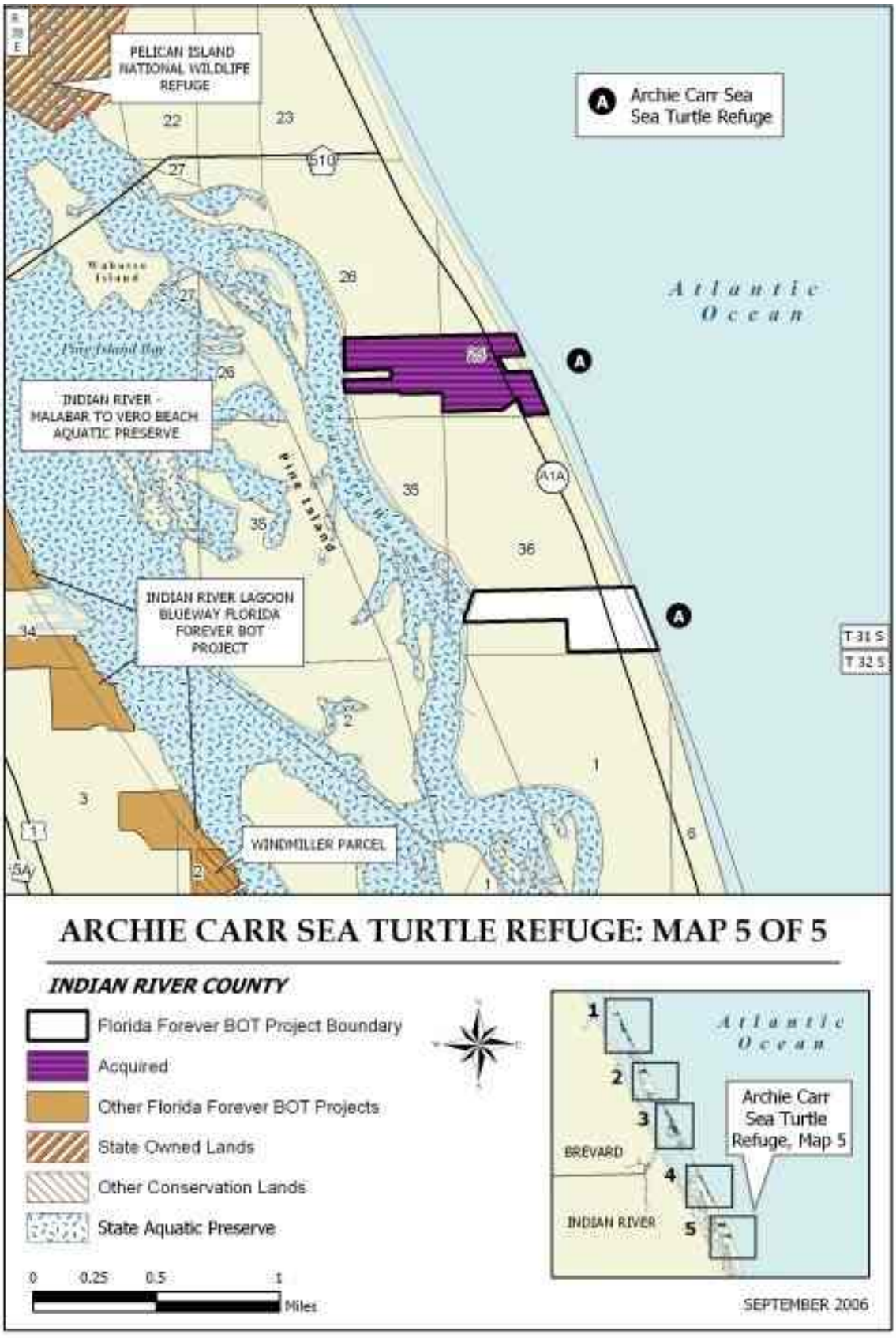

WASHBURN COVE SANCTUARY
MARITIME HAMMOCK SANCTUARY
APOLLO ELEVEN PARK
INDIAN RIVER - MALABAR TO VERO BEACH AQUATIC PRESERVE
BREVARD COASTAL SCRUB ECOSYSTEM FLORIDA FOREVER BOT PROJECT
INDIAN RIVER LAGOON BLUEWAY FLORIDA FOREVER BOT PROJECT
INDIAN RIVER LAGOON PRESERVE STATE PARK
Archie Carr National Wildlife Refuge - Core Segment II
MARITIME HAMMOCK SANCTUARY
INDIAN RIVER LAGOON PRESERVE STATE PARK
ARCHIE CARR NATIONAL WILDLIFE REFUGE
A1A
Atlantic Ocean
ARCHIE CARR SEA TURTLE REFUGE: MAP 2 OF 5
BREVARD COUNTY
Florida Forever BOT Project Boundary
Acquired
Essential Parcel(s) Remaining
Other Florida Forever BOT Projects
State Owned Lands
Other Conservation Lands
State Aquatic Preserve
0 0.25 0.5 1
Miles
Archie Carr Sea Turtle Refuge, Map 2
BREVARD
INDIAN RIVER
SEPTEMBER 2006

Archie Carr Sea Turtle Refuge - Group B/Full Fee




Archie Carr National Wildlife Refuge - Core Segment IV, Southern Boundary
PELICAN ISLAND NATIONAL WILDLIFE REFUGE
Atlantic Ocean
TREASURE SHORES
INDIAN RIVER - MALABAR TO VERO BEACH AQUATIC PRESERVE
A1A
T 31 S
ARCHIE CARR SEA TURTLE REFUGE: MAP 4 OF 5
INDIAN RIVER COUNTY
Florida Forever BOT Project Boundary
Acquired
State Owned Lands
Other Conservation Lands
State Aquatic Preserve
0 0.25 0.5 1
Miles
Atlantic Ocean
Archie Carr Sea Turtle Refuge, Map 4
BREVARD
INDIAN RIVER
SEPTEMBER 2006

Archie Carr Sea Turtle Refuge - Group B/Full Fee



Appendix D

This record search is for informational purposes only and does NOT constitute a project review. This search only identifies resources recorded at the Florida Master Site File and does NOT provide project approval from the Division of Historical Resources. Contact the Compliance and Review Section of the Division of Historical Resources at 850-245-6333 for project review information.

December 14, 2008

Florida Master Site File

Ms. Caitlin Fisher
Brevard County
Environmentally Endangered Lands Program
8385 South Highway A1A
Melbourne Beach, Florida 32951

Dear Ms. Fisher:
In response to your inquiry of September 15, 2008, the Florida Master Site File lists one previously recorded archaeological site and four historic standing structures in the following parcel of Brevard County:

Township 30 South, Range 39 East, Section 6

When interpreting the results of our search, please consider the following information:

- **This search area may contain *unrecorded* archaeological sites, historical structures or other resources even if previously surveyed for cultural resources.**
- **Because vandalism and looting are common at Florida sites, we ask that you limit the distribution of location information on archaeological sites.**
- **While many of our records document historically significant resources, the documentation of a resource at the Florida Master Site File does not necessarily mean the resource is historically significant.**
- **Federal, State and local laws require formal environmental review for most projects. This search DOES NOT constitute such a review. If your project falls under these laws, you should contact the Compliance and Review Section of the Division of Historical Resources at 850-245-6333.**

Please do not hesitate to contact us if you have any questions regarding the results of this search.

Kind Regards,

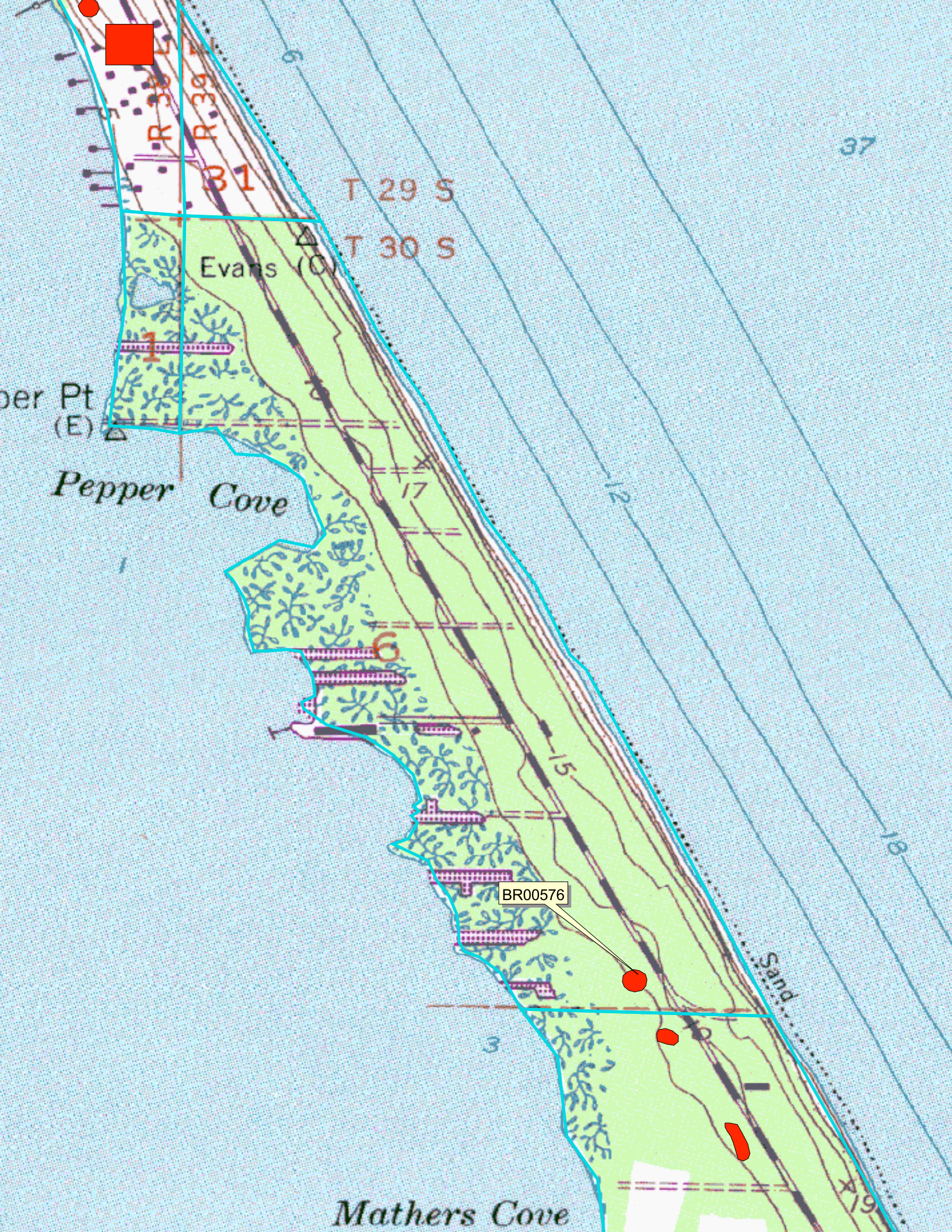
Lindsay Hafford

Lindsay Hafford
Historical Data Analyst
Florida Master Site File
lbhafford@dos.state.fl.us

CULTURAL RESOURCES REPORT

SITEID	FORMNO	T-R-S	CR	SITENAME	NRLIST	SURVEY	LOCATION	OTHER
BR00576	199004	30S/39E/6	AR	UWF 14		2391	Map: SBNW	Culture: SJ, TRAN Sitetype: CAMP, SCAR
IR00122	199604	30S/39E/6	SS	STEVENSON PROPERTY			COOLIDGE ST, SEBASTIAN	Uses: RESI, RESI Built: C1930
IR00131	199604	30S/39E/6	SS	HURRICANE HARBOR/ MCCAIN'S GARAGE			1540 INDIAN RIVER DR, SEBASTIA	Uses: COMM, COMM Built: C1927
IR00134	199604	30S/39E/6	SS	AUGUST PARK/ BEUGNOT/WEST PROPERTY			1737 INDIAN RIVER DR, SEBASTIA	Uses: RESI, RESI Built: C1900
IR00864	199604	30S/39E/6	SS	WARD PROPERTY			1736 INDIAN RIVER DR, SEBASTIA	Uses: RESI, RESI Built: C1926

5 site(s) evaluated; 5 form(s) evaluated. (1 AR, 4 SS)
Print date: 9/18/2008 10:59:39 AM


R 38 E
R 39 E
31
T 29 S
T 30 S
Evans (C)
Pepper Cove
(E)
BR00576
Sand
Mathers Cove

Appendix E

ENVIRONMENTALLY ENDANGERED LANDS (EEL) PROGRAM
RECREATION AND EDUCATION ADVISORY COMMITTEE
August 10, 2006
Attendance List

RECREATION AND EDUCATION ADVISORY COMMITTEE MEMBERS

Murray Hann
Karen Hill
Mark Nathan
Beverly Pinyerd
Steven Webster
Paul Saia
Dorn Whitmore

SUB-COMMITTEE MEMBERS

Kim Zarillo, Selection and Management Committee

EEL PROGRAM STAFF

Sandy Carnival
Laura Clark
Brad Manley
Ray Mojica
Nichole Strickler

GUESTS

Anthony Caravella, City of Cocoa Beach
Susan Gosselin, Brevard County Natural Resources Management Office

ENVIRONMENTALLY ENDANGERED LANDS PROGRAM
RECREATION AND EDUCATION ADVISORY COMMITTEE
August 10, 2006
Meeting Minutes

CALL TO ORDER:

Steven Webster, Vice-Chairman, called the meeting to order at 8:04 PM as Murray Hann had provided advance notification he would be arriving at the meeting late.

PUBLIC COMMENT:

None.

MINUTES:

The May 11, 2006 minutes were presented for approval.

Steven asked for comments to the May minutes.

MOTION ONE:
Dorn Whitmore moved to approve the May 11, 2006 minutes as presented
Beverly Pinyerd seconded the motion.

The motion carried unanimously

The June 8, 2006 minutes were presented for approval.

Steven asked for comments to the June 8, 2006 minutes.

MOTION TWO
Dorn Whitmore moved to approve the June 8, 2006 minutes, as presented.
Beverly Pinyerd seconded the motion.

The motion carried unanimously.

ADMINISTRATIVE REVIEW:

The Management Plan for the Enchanted Forest is under revision and a Public Meeting will be held at the Forest on August 15th to receive public input on the proposed revisions.

Brad informed the group that the Barrier Island Center's groundbreaking would be held on August 19th and invited everyone to attend.

The Dicerandra Scrub Sanctuary Management Plan has received approval from the Selection and Management Committee and will be presented to the Board of County Commissioners as the next step in the approval process.

OLD BUSINESS:

Volunteer Appreciation Dinner

Brad provided information on the Annual Volunteer Appreciation Dinner which was held July 14th at the Cocoa Civic Center. He expressed appreciation from the EEL Program staff for all the time that Committee members have spent serving on the REAC Committee and distributed water bottles, which were given out to volunteers as a thank you gift at the dinner, to members who were not able to attend. Beverly expressed her appreciation for the native horse mint plant which she also received at the dinner.

Status updates on past REAC motions

Brad reviewed each of the motions passed by the REAC Committee since the first meeting in July of 2005. He explained that he had a PowerPoint presentation prepared for the meeting, but would not be able to show it, due to technical difficulties.

Feedback on motions and suggestions provided by REAC Committee members will be reviewed on a regular basis in the future.

NEW BUSINESS:

South Beaches Proposed Public Access Plan

Ray Mojica provided information on the South Beaches Proposed Access Plan and discussed maps of plans for the Barrier Island Sanctuary Trail, Coconut Point Sanctuary Trail, and Maritime Hammock Sanctuary Trail.

MOTION THREE
Dorn Whitmore moved to approve the South Beaches Proposed Public Access Plan as presented by staff.
Mark Nathan seconded the motion.

The motion carried unanimously.

Discussion of annual elections and re-appointments

Brad explained that it would soon be time to elect Committee officers for the upcoming year. Staff will contact the Commissioners regarding possible appointments that should be filled. Election of officers will be scheduled for a meeting in the near future.

Additional Discussion

Steven Webster announced that he had enjoyed participating in the REAC Committee, but that he needed to resign from the Committee effective immediately. The group expressed appreciation for his efforts and wished him well.

NEXT MEETING:

The next meeting will be held September 14, 2006.

ADJOURNED:

The meeting was adjourned at 8:10 PM.

SUMMARY OF MEETING MOTIONS:

- Motion to approve the May 11, 2006 minutes as presented.
- Motion to approve the June 8, 2006 minutes as presented.
- Motion to approve the South Beaches Proposed Public Access Plan as presented.

Appendix F

Florida Department of Agriculture and Consumer Services
Division of Agricultural Environmental Services

CHARLES H. BRONSON

ARTHROPOD MANAGEMENT PLAN - PUBLIC LANDS

Chapters 388.4111, F.S. and 5E-13.042(4)(b), F.A.C.
Telephone: (850) 922-7011

For use in documenting an Arthropod control plan for lands designated by the State of Florida or any political subdivision thereof as being environmentally sensitive and biologically highly productive therein.

Name of Designated Land: Brevard County EELS Program – Sites include the following impoundments: From C-2 North, C-2 South, C-2A, Jefferson Marsh area, Crystal Lakes area, to Honest Johns Area.

Specific sites include:

1. Ocean Ridge Sanctuary
2. Coconut Point
3. Hog Point Cove
4. Washburn Cove
5. Maritime Hammock area
6. Barrier Island Sanctuary
7. Hardwood Hammock
8. 1000 Islands
9. Capron Ridge area
10. Crane Creek
11. Cruickshank
12. Dicerandra Scrub
13. Enchanted Forest
14. Fox Lake
15. Grant Flatwoods
16. Indian Mound
17. Indian River Sanctuary
18. Johnson (Hall Road)
19. Jordan Scrub Sanctuary
20. Kabboord
21. Kings Park
22. Malabar Scrub Sanctuary
23. Micco Scrub Sanctuary
24. North Buck Lake Scrub Sanctuary
25. Pine Island Conservation Area
26. Scottsmoor Flatwoods Sanctuary
27. Southlake Conservation Area
28. Sykes Creek

Is Control Work Necessary: ☒ Yes ☐ No

Location: Brevard County Florida

Land Management Agency: Environmentally Endangered Lands Program
Mike Knight, Program Manager
91 East Drive
Melbourne, FL 32904

Are Arthropod Surveillance Activities Necessary? ☒ Yes ☐ No
If "Yes", please explain:

According to the Florida Administrative Code 5E-13 surveillance shall be conducted to determine the species and numbers of both pestiferous and disease bearing arthropods. Our surveillance program provides information as to species and amounts of mosquitoes which may require larviciding and adulticiding.

Which Surveillance Techniques Are Proposed?
Please Check All That Apply:

☒ Landing Rate Counts ☒ Light Traps ☒ Sentinel Chickens

☒ Citizen Complaints ☒ Larval Dips ☐ Other

If "Other", please explain:

Arthropod Species for Which Control is Proposed: *Aedes taeniorhynchus*
Aedes sollicitans
Culex nigripalpus (ground treatment only)
Culex salinarius

Proposed Larval Control:

Number of dips per site: 3+ per location at specific site.

Proposed larval monitoring procedure: When 10% or more of the dips are positive for mosquito larvae, action will typically be taken control

Are post treatment counts being obtained: ☒ Yes ☐ No

Biological Control of Larvae:

Might predacious fish be stocked: ☒ Yes ☐ No

Other biological controls that might be used:

Material to be Used for Larviciding Applications:

(Please Check All That Apply:)

☒ Bti (*Bacillus thuringiensis israeliensis)*
☒ Bs (*Bacillus sphaericus*)
☒ Methoprene (Altosid)
☒ Non-Petroleum Surface Film
☐ Other, please specify:

Please specify the following for each larvacide:

Chemical or Common name: BTI =VectoBac, Bs = Vectolex, (S) methoprene = Altosid

☒ Ground ☒ Aerial

Appplication rate/s must be according to applicable, site specific label rates and conditions for each product; for example:

Rate/s of application: 12 lb-18lb/acre = VectoBac (BTI) Granules

5lb-20lb/acre = Vectolex (BS) Granules

2.5lbs-10lb/acre = Altosid pellets [(s) methoprene]

7-21.5lb/acre = Agnique MMF G (non-petroleum surface film)

Method of application: liquid by hand, or granular by air.

Proposed Adult Mosquito Control:

Aerial adulticiding ☒ Yes ☐ No

Ground adulticiding ☒ Yes ☐ No

Please specify the following for each adulticide: N/A

Chemical or common name: Dibrom/ Permethrin

Rate of application: 0.6 oz/acre (Dibrom), 0.5 oz/acre (Permethrin)

Method of application: Ultra low volume

Adult mosquito population controls are determined by Brevard Mosquito Control District (BMCD) thresholds that are legally based, including: Florida Administrative Code 5E-13.036 requirements, with adult landing rate surveillance counts in surrounding urban areas, triggering at 3 mosquitoes per minute and for surrounding rural areas, triggering at 5-7 per minute . Also, aerial application of adulticides within the areas defined as “Beaches and Bay shores” (areas within 1,500 feet landward of high tide mark), require a three-fold confirmed increase to adult mosquito population backgrounds in order to commence adulticide applications.

Proposed Modifications for Public Health Emergency Control:
BMCD may request special exception to this plan during a threat to public or animal health declared by State Health Officer or Commissioner of Agriculture.

Proposed Notification Procedure for Control Activities: Approval of this plan is intended as notification.

Records:

Are records being kept in accordance with Chapter 388, F.S.:
☒ Yes ☐ No

Records Location: In District office Titusville.

How long are records maintained: 5+ Years

Vegetation Modification: ☒ Yes ☐ No

What trimming or altering of vegetation to conduct surveillance or treatment is proposed?
Minor trail trimming for surveillance and for ground larviciding will be done as needed.
Some herbiciding with AquaStar, Reward or Rodeo for control of *exotic* vegetation will be carried out only as needed.

Proposed Land Modifications: ☐ Yes ☒ No

Is any land modification*, i.e.,* rotary ditching, proposed: ☐ Yes ☒ No

The Brevard Mosquito Control District policy is to operate all managed impoundments, when possible, on a Rotational Impoundment Management (RIM) program. RIM, essentially, is elevating the water levels inside the impoundment to an elevation adequate to inundate the high marsh areas during mosquito breeding seasons. This action eliminates the egg laying sites for the salt marsh mosquito and controls mosquito breeding in an environmentally friendly manner. This elevated water level number is ~1.50 feet above mean sea level. This water level elevation action takes place from approximately May 15th through October 15th. This activity requires yearly pumping and constant monitoring of water levels within the impoundment network. The impoundments are left open, to decrease water elevations, during other yearly times.

Chronologically, the Brevard Mosquito Control District activities are as follows:

- ·January- Mowing the deck and bush hogging the side growth.
- ·January through May- Repairing storm damage if any. Larviciding as necessary.
- ·May 15th- All boards in, culverts and flaps closed. Begin pumping if Lagoon level is adequate. (>.5 ft mean sea level).
- ·May 15th through October 15th- Pump in order to maintain 1.3-1.5 ft mean sea level inside impoundment. Larvicide as necessary (helicopter monitoring). Monitor culverts for tampering three days per week.
- ·June- Mow deck and bush hog side growth.
- ·October 15th- Pumping stops. Boards removed and flap gates opened."

List any periodic restrictions, as applicable, for example peak fish spawning times: NA

Proposed Modification of Aquatic Vegetation: ☐ Yes ☒ No

Land Manager Comments:

Arthropod Control Agency Comments:

_____ _____
Signature of Lands Manager or Representative
Date

Signature of Mosquito Control Department Director
Date

Signature of Mosquito Control District Director
Date

Appendix G.

ENVIRONMENTALLY ENDANGERED LANDS (EEL) PROGRAM
SELECTION & MANAGEMENT COMMITTEE (SMC)
December 8, 2009
Attendance List

SELECTION & MANAGEMENT COMMITTEE MEMBERS
Mark Bush
Dave Breininger
Sue Hann
Ross Hinkle
Randy Parkinson
Paul Schmalzer
Kim Zarillo

EEL PROGRAM STAFF
Laura Clark
Xavier de Seguin des Hons
Mike Knight
Brad Manley
Ray Mojica

THE NATURE CONSERVANCY
Anne Mayer
Rebecca Perry

GUESTS
Vince Lamb, Friends of Ulumay
Jack Lembeck, Brevard County Historical Commission
Linda Manner, District 3 Commission Office
Amy Tidd, Sierra Club
Suzanne Valencia, Sierra Club

ENVIRONMENTALLY ENDANGERED LANDS (EEL) PROGRAM
SELECTION & MANAGEMENT COMMITTEE (SMC)
December 8, 2009
Meeting Minutes

CALL TO ORDER:
Ross Hinkle, Chairman, called the meeting to order at 1:05 PM.

PUBLIC COMMENT:
None.

MINUTES:
No minutes were presented for approval. The September 18, 2009 minutes are incomplete.

ADMINISTRATIVE REVIEW:
The Administrative Review was reviewed.

Paul Schmalzer stated that he felt that the information which was included in the second item of the Miscellaneous Administrative Review, regarding BOCC direction to staff to broaden the criteria for membership on the Selection and Management Committee (SMC) to include at least one member associated with the Economic Development Commission, or Tourism Development Commission, with eco-tourism in mind, required clarification. He stated that the process for amending the EEL Program's Land Acquisition Manual (LAM) is that any revision to the manual requires the approval of both the Procedures Committee (PC) and the Selection and Management Committee (SMC) before it can be sent to the Board for final approval.

Mike explained that wording for that section of the Administrative Review had come from the Board documents and that page 1-12 of the LAM which explains this process was included in the meeting's handouts. He also confirmed that staff intends to follow the process as established by the LAM.

Paul also stated that was his understanding from the October 20, 2009 Board meeting, but that it had appeared to him that during the November 10, 2009 Board meeting discussion regarding the recent SMC appointment, there had been some discussion that seemed to indicate that the Board might feel that the provisions already in place regarding the Recreation and Education Advisory Committee (REAC) might satisfy the Board's desire.

Mike confirmed that he has asked for clarification on this issue.

Paul reminded the group that there is already a provision in the guidelines for the REAC Committee for a representative from the Tourist Development Council and Economic Development Council, or other appropriate agency to participate in a non-voting advisory capacity.

Mike stated that it was anticipated that the Cochran donation might be coming to a close in the near future.

The group expressed their pleasure in this news.

Mike also provided confirmation that the Coastal Jewel property acquisition closing is anticipated to occur in the near future.

SMC REPORTS

REAC Update – Indian Mound Station Sanctuary

Brad Manley provided an update on recent events in the REAC Committee. He explained that on August 10, 2006, the REAC Committee had reviewed public access plans for the Indian Mound Station Sanctuary based on the anticipated acquisition of additional property, but that the additional acquisition had not taken place. He explained that a meeting was also held on September 23, 2009 to gather public input on plans for the Indian Mound Station Sanctuary, and that on October 8, 2009 staff had presented a revised public access plan to REAC. Brad explained that although the Committee had passed a vote to support the plan as presented by staff, there were several committee members who expressed concerns regarding the use of firebreaks as trails. Staff is reviewing the trail plan to see if other trail options exist that will receive greater support from a larger majority of the REAC members. It is anticipated the plan will come back to the SMC after it is discussed by REAC.

Clarification was provided that although this plan does not need to go to the State for final approval, because the land is in County title, the Sanctuary is within the boundary of the Brevard Coastal Scrub Ecosystem (BCSE) Project and could be submitted for partnership funding in the event that additional Florida Forever Funding becomes available.

Paul expressed concern regarding the possible level of impact to the small 85 acre site, if another trail system was added in addition to the fire lines.

Kim Zarillo stated that she agreed with Paul and that she would prefer that additional trails not be added around the perimeter of the site and that one path to the Mound should be sufficient.

Mike confirmed that there were no plans for additional major trails, just possibly a few foot paths to enhance the visitor experience.

Paul stated that travel on the fire breaks immediately after they have been plowed might not be pleasant, but that he has lead many field trips to EEL Program sites and that staying on the firebreak/trails had not generated any complaints.

Dave mentioned that animals also walk the firebreaks and leave signs, and that rare plants sometimes show up there, as well.

Clarification was provided that Xavier will continue with the management plan approval process and when a new, revised Public Access Plan has been reviewed by REAC, it will come to the SMC.

Additional Discussion

Paul Schmalzer stated that he would be leading a Florida Native Plant Field Trip to the Pine Island Conservation Area on January 9, 2010 and that anyone was welcome to attend. He reminded everyone of the Birding and Wildlife Festival which will be held from January 27 – February 1, 2010. He also stated that the Festival field trip to South Lake that he, Dave Breininger, and Xavier would be leading has already filled.

Clarification was provided that the EEL Program has participated in the Birding and Wildlife Festival for many years and that it brings many visitors to the EEL Program sanctuaries.

Ross explained that at least 3 or 4 members of the SMC were extremely involved in the initiation of the Space Coast Birding and Wildlife Festival, and in developing hikes to the EEL Program sanctuaries, and that a company that he worked for at the time provided significant funding to help support those community efforts. He stated that he felt there was a misconception regarding the SMC's capacity to understand eco-tourism value in terms of the sanctuary networks.

Ross also explained that he is preparing a matrix regarding issues / perceptions / and reality related to some of the issues the EEL Program is currently facing and that he would be asking Mike to distribute it to the SMC for their review and comment, and that the final document would be submitted to the Board for their information.

Randy Parkinson stated he had attended the Barrier Island Bash and he felt the event was very successful.

STAFF REPORTS:

None.

THE NATURE CONSERVANCY:

Rebecca Perry and Anne Mayer reviewed The Nature Conservancy's December 8, 2009 Report to the SMC.

Maytown Flatwoods: Scottsmoor Partners In holdings –25 land owners, 30 parcels, totals approximately 50 acres. About half have signed willing seller applications.

Maytown Flatwoods: Honey Hole Ranch, LLC – Offer made to landowners on 12/3/2009 for both full fee and conservation easement.

Maytown Flatwoods: Gail Morris/North Buck Lake in holding – preparing negotiation strategy now, should be able to make offer within a week or so.

NIRL: Maggio Patrick eastern parcel, Mason and Miller, Parrish III / Price, Reichman, Jason, Valdyke, Trustee – appraisals due by end of January 2010.

NIRL: Xynidis – to be appraised soon. Appraisal will be separate from other properties.

PICA: The Nature Conservancy – BOCC Agenda item has been delayed.

Rockledge: Florida Power and Light – Appraisals due this week, will prepare negotiation summary soon.

Rockledge: Viera Company, Tract A – Appraisals due this week, will prepare negotiation summary soon.

Malabar: Bappi Investments, LLC/Rahman – BOCC approved acquisition contract October 20, 2009. On schedule for closing.

Malabar: Coastal Jewel – It is hopeful closing will occur in near future.

Additional Discussion

Paul asked if notification had been received regarding the CELP Grant application. Rebecca will follow up.

Mike confirmed that the folks at the Florida Navigation Inland District are working on due diligence related to mitigation issues related to the FIND property swap.

Public Comment
None.

AGENDA ITEMS:

Election of Officers

Ross commented that he has been appreciative of the wonderful support he has had as Chairman of the SMC since Hillary Swain resigned in 1995. He also stated that Randy Parkinson has served as Vice-Chairman during this time and that he would like to take this opportunity to nominate Randy as the next Chairman, if Randy would be willing to accept the nomination.

Randy stated that he would accept the nomination, if that was the decision of the Committee. Ross asked if there were additional nominations. No additional nominations were received.

Motion One

Ross Hinkle moved to nominate Randy Parkinson as Chairman of the SMC.

Paul Schmalzer seconded the motion.

Public Comment
None

The motion carried unanimously.

Motion Two

Paul Schmalzer moved to nominate Ross Hinkle as Vice-Chairman of the SMC.

Randy Parkinson seconded the motion.

Public Comment
None

The motion carried unanimously.

Additional Discussion
Ross stated that there has been a request to have the 3 management plans presented together as the presentations were stored on the same computer. No concerns were received regarding a change in the order of the agenda items.

North Buck Lake Scrub Sanctuary Management Plan

Xavier de Seguin des Hons, the EEL Program's North Region Land Manager, provided an overview of the North Buck Lake Scrub Sanctuary Management Plan which was being presented to the SMC for approval at the meeting.

This 169 acre site is located directly north of the St. Johns River Water Management District's Buck Lake Conservation Area and directly west of I-95 near Mims. The site is primarily upland communities with scrubby flatwoods and scrub on the west with a smaller wetland area on the east side.

State listed species on site include Gopher tortoise (Endangered) and spreading pinweed (Threatened) *Lechea divaricata.*

In addition, the State listed orchid Lacelip ladiestresses *Spiranthes laciniata* was found during a recent plant survey.

The site burned in the 1998 wildfires, but has had rapid re-growth in most areas since that time.

There are currently 3 gates for public access to the site, in addition to the access from the Buck Lake Conservation Area. There are plans to stabilize a small area for parking.

Management efforts have focused on restoration in order to prepare the site as suitable habitat for a Florida Scrub-Jay translocation effort, which is expected to begin within the next year.

Major sections of the site have received mechanical reduction, chopping, and timbering to assist in making the site safe for the application of prescribed fire. Much of the site has been burned and is recovering well. The majority of this work was completed with funding from a $25,000 grant received from USFWS to enhance the upland habitat on this site. Approximately half of the grant funding is still available for future use.

Management activities have been planned to work around the privately owned in-holdings that are within the sanctuary footprint.

Clarification was provided that the BOCC recently gave final approval for the EEL Program to accept management of the Communities Finance property which is located directly north of the Sanctuary, if the site is acquired by the State. There are plans to reopen discussion with willing sellers in the area if this occurs. An amendment to the current management plan will be required if the State does accept the site for donation.

Staff will continue to stay in contact with the Tourism Development Council that plans to expand the I-95 rest stop near SR 5A into a Welcome Center. It is anticipated that the Center may display an exhibit created by the EEL Program and that a trail from the Center may run through part of the North Buck Lake Scrub Sanctuary.

The site currently has minimal invasive exotic species. There is a lot of equestrian activity on this site.

Paul commented that the re-growth rates for scrub oak can be quite variable and that a scrub oak that was 3-4 inches diameter might be 20 years old and it might be 50 years old.

Dave Breininger stated that since Xavier has become the North Region's Land Manager, he has completed an incredible amount of restoration work. The SMC congratulated Xavier on this accomplishment.

Sue Hann stated that she had a concern regarding the language which stated that trails would not be stabilized. She said that she understood that at this time, there are no plans to stabilize any of the trails, but she suggested consideration of remaining silent on the stated language, as there may become a time when it might be desirable, specifically when the site is connected to the planned Welcome Center.

Sue also stated that the Plan stated there were plans to monitor the impacts of bicycling, but that the data she has seen indicates that equestrian use is more damaging than bicycling and she requested clarification regarding the monitoring plans.

Ross confirmed that the EEL Program's Sanctuary Management Manual (SMM) requires that any type of passive recreation, which may be determined to be appropriate for each particular site, is monitored for negative impact to the natural community as part of the EEL Program's adaptive management process.

Mike Knight confirmed that staff would ensure that a reference to the need for monitoring for each type of use was included in each section of the North Buck Lake Management Plan, in the event that the information was not already included.

A question was raised regarding whether or not information related to ensuring that the need for monitoring for each type of access was included in each section of the North Buck Lane Management Plan should be included in the motion.

Ross stated that he felt it would be appropriate for the motion to indicate that the plan was approved with editorial comments added, rather than making specific motions for specific items.

Sue mentioned that there had been previous discussion during the meeting regarding the joint use of trails and firebreaks, which she felt was a concern, and that she hoped that the group would be working on that issue in the future.

Xavier provided clarification that the fire lines at the North Buck Lake Sanctuary were sugar sand, which is very soft and that they had rarely needed to be disked. He also confirmed that fire lines in sugar sand required very little maintenance, due to the composition of the soil. He explained that a similar situation would be occurring at the Scottsmoor Scrub Sanctuary, where existing ATV trails were quite wide.

Additional clarification was provided that the North Buck Lake Scrub Sanctuary is a Category II site, which is designed for minimal capital improvement.

Additional discussion occurred regarding the wording which indicated that trails would not be stabilized.

Sue Hann questioned plans to stabilize for cars, but not stabilizing for non-motorized vehicles.

Mark Bush explained that the purpose of stabilizing a parking area for cars is to make it easier for citizen's to access a site, but that stabilizing trails for non-motorized vehicles was potentially favoring one particular user group.

Mike confirmed that the Management Plan could be amended, if the need arose.

Paul provided clarification that the North Buck Lake Scrub Sanctuary Management Plan would not need to go to the State at this time but the area is included in the Brevard Coastal Scrub Ecosystem Project and reimbursement could be pursued in the future, if the State receives additional Florida Forever funding.

Mike explained that a change in statutes at the State level changed some of the requirements for Management Plans which need to go to the State and that one of the changes relates to Arthropod Control, which in most Florida counties relates to mosquito control.

Mike explained that staff has been working with Mosquito Control to develop a plan and that there would be additional discussion later in the meeting on this topic when staff asked the SMC to review and approve the document which had been previously sent out to the SMC for review. He explained that if the document was approved by the SMC, staff would like to insert it into Management Plans that have been approved by the SMC, but have not yet gone through the complete Management Plan Approval Process.

Ross asked if there were any additional comments or questions. No comments or questions were received.

MOTION THREE
Paul Schmalzer moved to approve the North Buck Lake Scrub Sanctuary Management Plan, with the addition of the Arthropod Control Plan, and with editorial

comments as noted in the minutes, and to authorize forwarding the Plan to the Board of County Commissioners for final approval.

Kim Zarillo seconded the motion.

The motion carried unanimously.

Hog Point Cove Sanctuary Management Plan

Ray Mojica, EEL Program Land Manager for the South Beach Region provided overview information on the Hog Point Cove Sanctuary Management plan which was presented to the SMC for approval at the meeting.

- South Beach Region has eight sanctuaries. Management plans for six sanctuaries are complete. Two management plans are being presented for approval today. This plan does not need to be approved by State as the County holds the title to this property.
- Hog Point Cove Sanctuary was received as part of a donation from the Mellon Foundation in 2002.
- The Sanctuary consists of three non-adjacent parcels located in the same general area.
- Sanctuary parcels are surrounded by residential and other conservation areas.
- Habitats within the Sanctuary are almost entirely maritime hammock.
- Management activities primarily involved removal of Brazilian pepper.
- Three of the eight sanctuaries in the South Beach region have a trail system. This site does not.
- Site is very similar to Coconut Point Sanctuary, which is located about a half a mile away, and which does include a trail system.
- Site contains a Caretaker Facility and previously contained abandoned clam farm structures which have been demolished.
- A 70 acre submerged land lease was also donated to the EEL Program by the Mellon Foundation.
- Research and education activities related to Board approved Memorandums of Understanding (MOU) between the EEL Program and Florida Institute of Technology (FIT), and between the EEL Program and Oceanic Applied Sciences and Environmental Solutions, Inc. (OASES) are conducted on the parcel which previously contained the abandoned clam farm.

<u>Additional Discussion</u>

Paul commented that the issues he had pointed out with the first draft had been resolved.

Randy asked why the Program was hosting a research facility on the property.

Clarification was provided that the FIT project regarding bio-fouling is expected to begin soon and that it will be compatible with research on water quality in the Indian River Lagoon, which affects the entire ecosystem. He also confirmed that the EEL Program has not expended any funding related to the FIT project.

Clarification was provided that OASES is a non-profit, scientific research and educational organization which cultivates plants that are used in EEL Program restoration efforts.

Ray provided additional clarification that both agreements relate to the EEL Program's directive regarding education outreach, and providing collaborative efforts with other organizations.

Ross stated it appeared the current activities were considered appropriate, and he suggested that staff should always be prepared to answer questions regarding how Memorandums of Understanding with different agencies regarding potential utilization of EEL Program properties related to the Program and the Program's goals. He provided additional clarification that anything that provided manipulation of habitats could be a real issue and that the SMC needed to ask the types of questions that staff had received.

Xavier stated a research project which released a parasitic fly at the Enchanted Forest in an attempt to control an invasive, exotic bromeliad weevil had received approval from the SMC before it was implemented.

Public Comment

Jack Lembeck stated that he felt it was important that the SMC set the parameters of research on EEL Program sites.

MOTION FOUR

Randy Parkinson moved to approve the Hog Point Cove Sanctuary Management Plan, with the inclusion of the Arthropod Control Plan, and to authorize forwarding the Plan to the Board for final approval.

Mark Bush seconded the motion.

The motion carried unanimously.

Barrier Island Sanctuary Management Plan

Ray provided overview information on the Barrier Island Sanctuary Management Plan including:

- The Management Plan currently being presented for approval is an update to the original plan to bring it in line with the current format and to address deficiencies.
- The 34 acre Barrier Island Sanctuary, which straddles A1A was received as a donation from the Mellon Foundation.
- Grant funds were used to remove the invasive, exotic Brazilian pepper and Australian pine trees that were previously found on site.
- A small natural marsh on the west side of A1A which had been previously impounded has been reconnected to the lagoon via 2 culverts.
- Restoration efforts have been very successful and the biodiversity of the site has been significantly increased.
- A one mile loop trail was established in 2005 on the west side of A1A.
- Trail includes a boardwalk, a bridge, several kiosks and benches, and a haul in kayak launch.
- Plans include a covered pavilion which can be used as a staging are for student field trips to the lagoon area.
- Barrier Island Center was opened in May of 2008.
- Visitors to Center since opening 43,000. This number is on target with expectations.

Last Saturday, the Barrier Island Center was used as a USFWS meeting location. Attendees at the meeting included Ken Salazar, US Secretary of the Interior; Tom Strickland, Assistant Secretary of the Interior for Fish, Wildlife and Parks and Sam Hamilton, USFWS Regional Director, Southeast Region. Secretary Salazar, Assistant Secretary Strickland, and Director Hamilton toured the Center and were very complimentary of their visit.

Public Comment
None.

MOTION FIVE
Paul Schmalzer moved to approve the Barrier Island Sanctuary Management Plan, with the inclusion of the Arthropod Control Plan, and to authorize forwarding the Plan to the Board for final approval.

Dave Breininger seconded the motion.

The motion carried unanimously.

Land Acquisition Manual Language Revision regarding Sale of Land

Mike stated that when the EEL Program submitted the sale of the 52 acre TICO Sanctuary property to the Board for final approval in April of 2009, the Board requested consideration be given to providing better, more detailed language in the LAM that addresses how the process should work if there is ever a need to sell land in the future. He explained that staff has prepared draft language, which has been reviewed and approved by the County Attorney, and which will be presented to the Procedures Committee for their review and discussion as a starting point for the possible revisions, and he asked the SMC if they had any comments or suggestions.

Sue Hann stated that she had a comment on paragraph 2, regarding the need to obtain a super majority vote in order to move a contract for sale on to the Board. She stated that her thought was that depending on circumstances, it may be beneficial for the Board to hear a request and the SMC's recommendation, but not preclude the Board's hearing a request that had not received a super majority vote by the SMC. She stated that a circumstance that might fall into that category would be if the Town of Malabar was requesting a piece of the scrub sanctuary that they want to use for some municipal purpose, or something along those lines, and that perhaps that would be inconsistent with the SMC's vision of the management of the property, but the circumstance may have other considerations that the Board may be interest in.

Sue stated that perhaps, any exchange, or sale proposal should be reviewed by the SMC, and then forwarded to the Board with the SMC's recommendation.

Paul stated that EEL Program land acquisitions require a 2nd Majority Vote, which is a vote of 5 of 7 members, and that a land acquisition can only move forward to the Board for final approval, if it is support by a super majority of the SMC and that he would think that the sale of property which had been acquired would required the same majority. He indicated he would not be supportive of a lesser majority and would not support weakening it.

Ross stated that the consideration was that land which might be sold had to result in acquisition of equal or greater conservation value in order to meet the obligations under the referendum. He stated that the groups needed to be very sure that what is approved and goes into the LAM does not set a precedent that is contrary to the objectives of the referendum.

Ross added that acquisition is based on conservation value, and sale is based on loss of conservation value and replacement, which was the case with the TICO sale, where the dollar value was to acquire scrub with equal or greater conservation value.

Mike provided clarification that any funds received from the sale of EEL Program property had to be used to acquire new property. He added that a portion of the funds from the sale of the TICO property had been earmarked for the pending FIND site exchange, and that there had been some discussion regarding the use of the TICO sale funds to help contribute to the Coastal Jewel property acquisition.

Mark Bush stated he felt it would be helpful to include explicit language which confirms that the proceeds of any land sale go directly back to the EEL Program, in order to provide that information to someone who might not know the guidelines quite as well and might think that someone could sell EEL Program land to make money and spend it on something else.

Paul agreed with Mark's suggestion.

Sue stated that there could be a piece of property whose conservation value has diminished over time, and that it was no longer of high value, and that perhaps the Town of Malabar wanted the land for a fire station or something like that and was willing to pay fair market value.

Mark stated that in that case, they would have to come back and make their case to the SMC, and it would require a super majority vote, just as it would be for an acquisition.

Ross and Kim agreed.

Ross stated that it was really the same procedure, the only thing that was changing was the direction the process was going.

Kim stated that the SMC has a responsibility to the public, and the 1990 referendum which established the EEL Program. She explained that the first referendum in 1989 did not pass, but the second one in 1990 did, as a result of changes between the two referendums.

Paul stated that the SMC has received previous requests for land exchanges, which were not approved by the SMC because of the conservation value of the land that was offered for exchange.

Ross stated that the conservation value of land is the basis of the evaluation process the SMC is charged as a Committee to consider. He stated that there have been public land acquisition programs in other states, where due to a change of circumstances, conservation lands have been sold and we have to be careful of that, and be sure that with regard to the EEL Program sanctuary lands, there is a procedure in place that requires very careful consideration of the possible sale of property, not that it isn't appropriate in some cases, just that it can't be easy.

Sue stated the she felt that she would agree with everything the others had said, with the exception that the prerogative really rests with the Board. She stated it is the Board's decision whether to sell or exchange property, and that she sees it a little differently - that the SMC is an advisory committee to the Board; versus the gatekeepers where the Board doesn't have any authority if the SMC didn't approve the super majority vote.

Kim stated that she thought the members of the SMC were aware of their place in the world and the position in the food chain, but that she felt they all took their duty very seriously about making recommendations, with the understanding that the Board has the final say.

Ross stated he wanted to be clear on the guidelines. He stated it was his understanding that with regards to the acquisition of land, the Board can not use EEL Program funds to buy land that has not been approved for conservation value by the SMC. He stated that the SMC could recommend acquisition, but could not force the Board to purchase, and that the Board could buy - with the SMC's recommendation. He asked if the same held true for selling.

Paul stated that he would say yes.

Ross stated he would think so, too.

Paul stated that was his reading of the existing LAM, and that the purpose of possible revision was a matter of clarifying the language within. He said that sales are mentioned within the LAM, but it was not considered something to be frequent, so it was not laid out in detail, but the LAM is very clear that the BOCC can not purchase lands under the EEL Program, except as recommended by the SMC.

Ross agreed.

Paul added that the original LAM was in place before the 1990 referendum and that in his view, the 1990 referendum was contingent on the LAM.

Public Comment

Amy Tidd stated that she intended to see that the PC should make the language in the LAM regarding the sale of land a more strict standard, because you need a high standard to buy the land, but once it is held for public good, she felt that it was possible that a unanimous vote to sell land should be required, because a super majority could be impacted by future appointments. She stated that land held for the public good should be seen as very, very valuable, and only sold or traded under the most important situations.

Jack Lembeck stated that the land wasn't just held for the public good, but it was held for a specific purpose, and that it is stated in the statues that the land is held for that purpose, in perpetuity to begin with and he asked how could anyone change perpetuity without a unanimous vote.

Suzanne Valencia stated that the EEL Program was sold to the public on its scientific basis, and that the County Commission changes every few years; but this scientific committee has been the backbone of the Program and it is what the citizens bought into and are happy to pay for. She stated she understood the Board has the final approval on everything, but she put a lot more trust in this Committee than she did the Board.

Ross stated that he thought the procedure was in place, and confirmed that the SMC would need to consider whatever the Procedures Committee came up with, but in the end, both committees had to approve the final language before it was sent to the Board.

Randy stated that the Board looked to the SMC to make good decisions and he liked the idea of a super majority vote because it showed confidence in the decision. He stated that the requirements for a vote to sell land should be equal, and perhaps greater to those which were required to purchase it.

Ross explained that conservation values could change because of the changes in surrounding or urbanized areas and that in some ways, conservation value could be a moving target.

Ross requested confirmation that the current task at hand was for the Procedures Committee to look at the language of the LAM regarding the requirements for the sale of land acquired by the Program.

Mike stated that was correct.

Ross asked for clarification that the draft document which was distributed at the meeting was what staff would be presenting to the Procedures Committee for consideration.

Mike stated that was correct and that the Procedures Committee would likely ask what does staff think, and what does the SMC think, and then deliberate and then they would send something back to the SMC.

Ross stated that he would like to recommend that something of this potential should be handled through a joint meeting of the Procedures Committee and the SMC, so the discussion could be held, real time, to eliminate the back and forth.

Mike stated that would be acceptable.

Paul stated he thought that would be a very good idea.

Mike stated that there were plans to have a separate Procedures Committee meeting before the joint meeting as the Procedures Committee meeting also needed to deal with the issue of the Selection and Management Committee membership criteria.

Ross said he thought it would be nice if the SMC could be in on that discussion, too.

Mike stated if the group wanted to have it all together, that would be fine and the only thing that jumped out at him was whether or not it was an issue to have the SMC discussing their own criteria.

Ross stated he did not see why it would be, because the SMC had developed the criteria.

Kim stated she did not think it mattered.

Paul stated it was part of the LAM.

Ross stated that he recognized that it might seem a little circular, but that was intentional.

Mike confirmed that any changes to the Land Acquisition Manual require the approval of both committees.

Ross agreed.

<u>Public Comment</u>
Jack Lembeck asked if the meeting would be a public meeting.

<u>Additional Discussion</u>
Confirmation was provided that all meetings of the SMC, PC, and REAC committees are public meetings.

January 8th was suggested as a possible meeting date. Staff will poll members of both committees to determine if that would work out.

Mike stated that if anyone had any other thoughts to send to him, he would try to compile things and have them documented for the meeting.

Public Comment
None.

Final Scrub Management Guidelines

Mike explained that the SMC had reviewed and approved the draft Florida Fish and Wildlife Conservation Commission (FL FWCC) *Scrub Management Guidelines for Peninsular Florida: Using the Scrub-Jay as an Umbrella Species* during the June 25, 2009 SMC meeting. He confirmed that the final Agency Guideline Document, dated June 30, 2009 had been sent to the SMC prior to the meeting and that staff was requesting approval of the final document so it could be forwarded to the Board for implementation.

Paul stated that the guidelines had been reviewed at length and that he felt the guidelines were the scientific consensus for the scrub ecologists in the State at this point.

Ross stated that the document has been reviewed by many reviewers and that he thought it was good to have guidelines like these in place to assist with operations.

MOTION SIX
Paul Schmalzer moved to approve the FL FWCC Scrub Management Guidelines for Peninsular Florida.

Randy Parkinson seconded the motion.

Additional Discussion
Kim Zarillo stated her support of the Guidelines.

Sue Hann requested additional information related to fireline maintenance activity and the use of empty roller drums versus disking.

Clarification was provided that the roller drum provides greater vegetation reduction capacity when it has more water, and that in some situations, a light roller drum would provide enough impact, and other times, a heavy roller drum was required to achieve the objectives and management goals for a specific area.

Xavier de Seguin des Hons stated that a wide group of machines are used in land management activities to achieve the desired result.

Ross commented that the term guidelines was important, and that particularly on EEL Program lands, the land managers discuss management vision and goals with the SMC as part of the Sanctuary Management Plan.

Ross asked if there were any further questions or comments. No additional comments or questions were received.

The motion carried unanimously.

Florida Fish and Wildlife Conservation Commission Cooperative Management Memo of Understanding

Mike explained that a Memo of Understanding (MOU) between the EEL Program and the FWCC Terrestrial Habitat Conservation and Restoration Section, Division of Habitat and Species Conservation, (THCR) has been prepared to facilitate a cooperative effort for prescribed burning and other land management activities at the FWCC Salt Lake Wildlife Management Area (SLWMA) and the adjacent EEL Program's Fox Lake Scrub Sanctuary in north Brevard.

Ray stated this agreement was similar to an agreement for prescribed fires within the Archie Carr Refuge and other places with a proximity to FWCC properties.

Paul stated it makes good sense to coordinate management efforts to jointly use resources to achieve compatible ends. He said it was important to remember in terms of these MOUs with other agencies that we are looking at sharing resources for ends that are compatible, things like habitat Management, and Prescribed burns which often require more resources than one agency can bring in at a given time. He stated that the EEL Program would not be taking over management of their lands, and they were not taking over our lands, it was a shared effort where appropriate and where both parties contribute and both benefit.

Ross agreed and stated that the Sanctuary Management Manuals provide for cooperative management agreements with other groups.

Ray Mojica stated that the agreement would provide cost savings to both groups.

Kim mentioned that a cooperative effort would also help both groups keep their skills up to date.

MOTION SEVEN
Kim Zarillo moved approve the FWCC THCR Memo of Understanding regarding land management activities at Salt Lake Wildlife Management Area and Fox Lake Scrub Sanctuary.

Dave Breininger seconded the motion.

Public Comment
None.

The motion carried unanimously.

Arthropod Management Plan
Mike reviewed that a change in statutes at the State level changed some of the requirements for Management Plans which need to go to the State and that one of the changes related to Arthropod Control, which in most Florida counties relates to mosquito control.

An Arthropod Control Plan provided by Brevard County Mosquito Control was distributed to the SMC for review prior to the meeting.

Mike confirmed that there are a few issues which need to be worked out in the future, regarding non-target impacts of adulticiding for mosquitos on EEL Program sites but that staff was requesting the SMC review the document to determine if it could be adopted by the EEL Program as a standard Arthropod Control Plan in order to expedite the approval process for the Management Plans.

He also provided clarification that the changes in the statute require a new checklist, which was included in the North Buck Lake Sanctuary Management Plan. This multi-page list documents where the Arthropod Plan is included within each Management Plan, in additional to clarifying where a few other new requirements (as an example - documentation that the Plan complies with the County's Comprehensive Plan), are included in each Management Plan.

Mike explained that if the Arthropod Control Plan was approved by the SMC, staff would like to insert the Plan and the new checklist, into a few management plans which the SMC has approved, but which have not yet completed the entire Management Plan approval process. He confirmed that on occasion, staff might need to insert a short reference to the checklist within body of some of the Management Plans, but that there would not be anything contrary to the intent of the Plans

which the SMC had approved. He stated that if needed, staff could bring all those Plans back, just for SMC approval of the new requirements, or staff could move those things forward and add the Arthropod Control Plan and minor checklist items as needed. He confirmed that if substantial changes were required, staff would be sure to bring a Plan back through the review and approval process.

Ross stated his understanding that there is a legal precedent that Mosquito Control agencies can come on to public lands to control mosquitoes.

Mike confirmed Ross's understanding was correct.

Ross asked if agreement to the Arthropod Control Plan, as presented, would provide a precedent where in a potential worst case scenario, a mosquito control agency wanted to establish mosquito control management efforts on EEL Program conservation lands, and there was a high potential of impact to the conservation value of the site.

Ross stated that he felt that if the SMC assumed that the Arthropod Control Plan, as it was being presented, was appropriate for all EEL Program sites, they could be making an erroneous assumption.

Mike stated that staff is currently developing a series of maps for all sites which show all of the upland locations. He explained that Mosquito Control, by their own rules, and the State statutes, can not adulticide in wetland communities, so it is only the upland communities that are at issue. He explained that Mosquito Control will review the maps and clarify whether they are currently doing helicopter adulticiding in the mapped areas.

Randy asked if it was possible the Arthropod Control Plan might be approved, with areas of exceptions.

Ross stated he was not familiar with current literature regarding the role of adulticide and asked if additional information could be provided.

Kim stated her understanding that the spraying was not discriminate.

Dave Breininger stated he was not comfortable agreeing with some of the items and asked if Scott Taylor could attend an SMC meeting and provide additional information.

Mike stated he felt the issue would take a long time to address and suggested the SMC consider accepting the Arthropod Control Plan that had been presented as a temporary fix, with some statement that the SMC didn't want to hold up the management plans, and that there would be further review of the issues related to EEL Program sites and aerial adulticiding, because staff was already headed down that road anyway.

Kim stated that she felt it was important to consider the adulticide issue carefully.

Mark stated he understood the need to get the Management Plans through, but that he would like to receive additional information on the topic. He added that he raises butterflies in his back yard and when the spray truck comes, all the caterpillars turn green and drop off, so clearly the insecticide was not selective to mosquitoes, and that was a concern.

Ross stated that perhaps there would be some sites where adulticiding would be appropriate and perhaps there would be some sites where it wouldn't be, but that first they needed to know which sites were potential targets, and then they would need to evaluate how much of the area will be

treated, how it will be treated, and determine what existing characteristics of the site might be impacted.

Mike stated that was already in progress.

Ross added that sites will need to be monitored for impacts.

Public Comment
Jack Lembeck stated it was important to get the Management Plans through, and suggested consideration of a reversal clause in the event that in the future, it became obvious that there were harmful effects.

Vince Lamb stated that he had the opportunity last week to serve on the State's Land Management Review Panel as a representative of the Native Plant Society, and while the Panel was very complimentary on the way that EEL Program properties have been managed, there was discussion regarding the number of Management Plans which have not been completely through the approval process. He stated he enjoyed watching the SMC at work because of the way they handled things.

MOTION EIGHT
Randy Parkinson moved to approve the Arthropod Control Plan with the understanding that it is being done to facilitate the general progress of the sanctuary Management Plans, and with the understanding that there will be a more rigorous, site specific review within a year.

Kim Zarillo seconded the motion

The motion carried unanimously.

NEXT MEETING:
Staff will poll members of the SMC and the PC to see if January 8th would be an appropriate date for a joint SMC/PC meeting.

ADJOURNED:
The meeting was adjourned at 3:55 PM.

SUMMARY OF MEETING MOTIONS:
- **Motion to approve Randy Parkinson as Chairman of the SMC.**
- **Motion to approve Ross Hinkle as Vice-Chairman of the SMC.**
- **Motion to approve North Buck Lake Scrub Sanctuary Management Plan, with the addition of the Arthropod Control Plan, and with editorial comments as noted in the minutes, and to authorize forwarding the Plan to the Board of County Commissioners for final approval.**
- **Motion to approve the Hog Point Cove Sanctuary Management Plan, with the inclusion of the Arthropod Control Plan, and to authorize forwarding the Plan to the Board for final approval.**
- **Motion to approve the Barrier Island Sanctuary Management Plan, with the inclusion of the Arthropod Control Plan, and to authorize forwarding the Plan to the Board for final approval.**

- **Motion to approve the FL FWCC Scrub Management Guidelines for Peninsular Florida.**
- **Motion to approve the FWCC THCR Memo of Understanding regarding land management activities at Salt Lake Wildlife Management Area and Fox Lake Scrub Sanctuary.**
- **Motion to approve the Arthropod Control Plan with the understanding that it is being done to facilitate the general progress of the Sanctuary Management Plans, and with the understanding that there will be a more rigorous, site specific review within a year.**