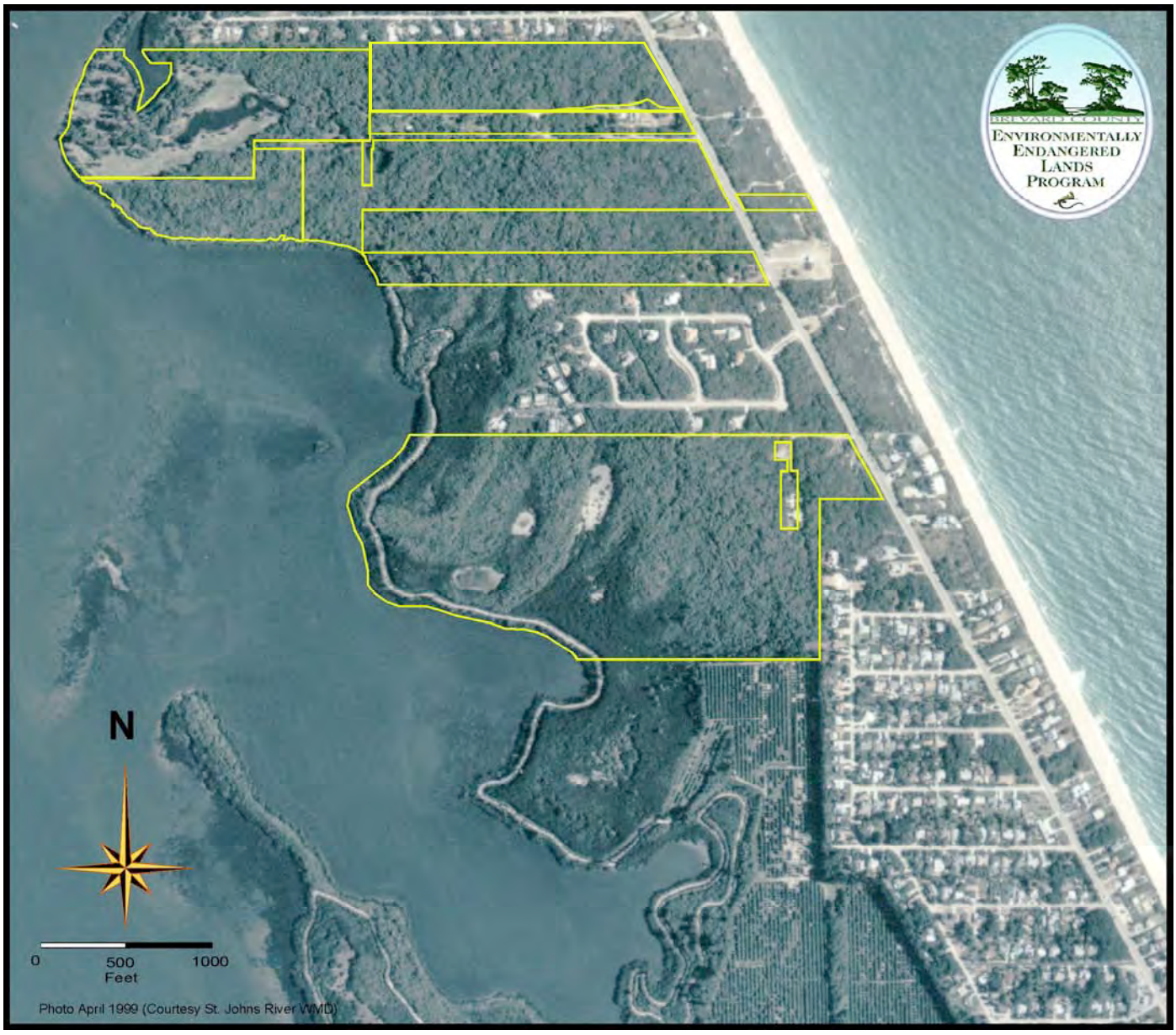
Maritime Hammock Sanctuary Management Plan



Brevard County Board of County Commissioners

Environmentally Endangered Lands Program

October 13, 2006

MARITIME HAMMOCK SANCTUARY
MANAGEMENT PLAN

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I. EXECUTIVE SUMMARY

The Maritime Hammock 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, 1995). The EEL Program also offers passive recreation and environmental education opportunities on the acquired lands to Brevard County residents and visitors.

The Maritime Hammock Sanctuary is comprised of several non-contiguous properties that encompass approximately 166 acres of which 135 acres are state owned. The Sanctuary is located 9.5 miles south of the Melbourne Causeway (US 192) on State Road A1A and south of the City of Melbourne Beach, Florida. All but 0.87 acres of the 166 acres are located west of State Road A1A and consist of coastal scrub, maritime hammock and tidal swamp. The properties are imbedded amongst and bordered by a mixture of conservation lands, residences and citrus groves.

The Maritime Hammock Sanctuary, along with the other EEL properties in the South Beaches Regional Management Area will be served by an EEL Center for Regional Management at the Barrier Island Sanctuary Management & Education Center, located 3.5 miles south of the sanctuary. As described in the Sanctuary Management Manual, the Maritime Hammock Sanctuary is a Category 2 or intermediate use site meaning that the sanctuary will receive minimal capital development that may include trails, kiosks, etc.

The primary goals of the sanctuary 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 and the preservation of natural landscape/topographic features.

The Maritime Hammock Sanctuary will provide outstanding opportunities for nature-based outdoor recreation, environmental education, field research, and interpretive tours highlighting the sanctuary's unique ecology and geology. Due to the sensitive nature of the resources, access will be limited to passive recreation activities such as hiking, nature study, picnicking, and environmental education. Onsite facilities will be limited to parking areas, boardwalks, bridges, informational kiosks and trail signage.

The proposed recreation and educational opportunities will serve both regional residents and tourists to Brevard County. An emphasis will be placed on providing education to Brevard County schools to promote the understanding and appreciation of the unique and valuable resources available in Brevard County and thereby promote their long-term preservation.

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 Ecosystem Center
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 Sams House
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 systems 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 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.

In addition to the conservation principles, this management plan provides specific goals, strategies and actions to guide management of the Maritime Hammock 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 Maritime Hammock Sanctuary is located within the 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 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 host the largest concentration of loggerhead and green sea turtles in the United States. Green turtles nest within the refuge but not in globally significant numbers. The beaches of the Refuge in Brevard County represent the northern extent of leatherback turtle nesting areas in the United States (Brevard County EEL Program, 1995a).

The Maritime Hammock Sanctuary is 166 acres, located 9.5 miles south of the Melbourne Causeway (US 192) and south of the town of Melbourne Beach, Florida (Section 33/34, Township 28, Range 38 East), as shown in Figure 1. The sanctuary is comprised of several State owned parcels which total 135 and several County owned parcels totaling 32 acres. The tax IDs and common names of the State owned parcels are 29-38-14-00-513 (Vislocky), 29-38-15-00-752 (Rusnak), 29-38-23-00-2 (American Equities), 29-38-14-00-507 (Diocese of Orlando) and 29-38-14-00-500 & 29-38-14-00-502 (Brevco). The legal descriptions are attached as Appendix A. The EEL Program and the State of Florida acquired the Vislocky, Rusnak and American Equities parcels as part of the Conservation and Recreational Lands (CARL) Program Maritime Hammocks Initiative Project. The State reimbursed the County for approximately 50% of the purchase price of these properties and the County was designated manager. The State acquired the Diocese and Brevco properties with 100% State funds. To fulfill its management pledge, the County entered into management lease # 4177 in January 1999. The lease was amended in 1999 to include the Vislocky property (08/04/99 - #4177-1). It was amended a second time in 2000 to include the Rusnak and American Equities properties (03/20/00 - #4177-2) and amended a third time in 2001 to include the Diocese and Brevco properties (09/04/01 - #4177-3). In addition to the State titled land detailed above, an additional 32 acres of land located to the north of the Diocese and Rusnak parcels were donated to the EEL Program by the Richard King Mellon Foundation in October of 2002. The County holds the title to these properties, known collectively as the Yotti Property. These parcels are included in the attached figures for reference only and are not specifically covered in this management plan.

Figure 2 outlines the parcels that make up the Maritime Hammock Sanctuary and adjacent conservation properties. The Vislocky parcel is bounded on the east by A1A, on the north by a Save Our Coast (SOC) parcel, on the west by the Diocese Property and to the south by the Mark's Landing subdivision and a Conservation Fund owned Property. The Rusnak Property is bounded to the west and south by the Indian River Lagoon, to the north by the recently donated Yotti Property, and to the east by the Diocese Property. The Diocese Property consists of two parcels, one east and one west of A1A. The 0.87-acre parcel east of A1A is bounded by A1A to the west, the Atlantic Ocean to the east and SOC parcels to the north and south. The remainder of the Diocese Property is bounded by A1A to the east, a SOC parcel to the south, the recently donated Yotti Property to the north and the Rusnak Property to the west. The American Equities parcel is bounded to the north by the Mark's Landing and Treetop Village subdivisions and the Conservation Fund property, to the west by the Indian River Lagoon, to the south by a citrus grove and to the east by A1A and the Floridana Beach subdivision. An out parcel within the American Equities parcel holds a water treatment plant for Mark's Landing and Treetop Village.

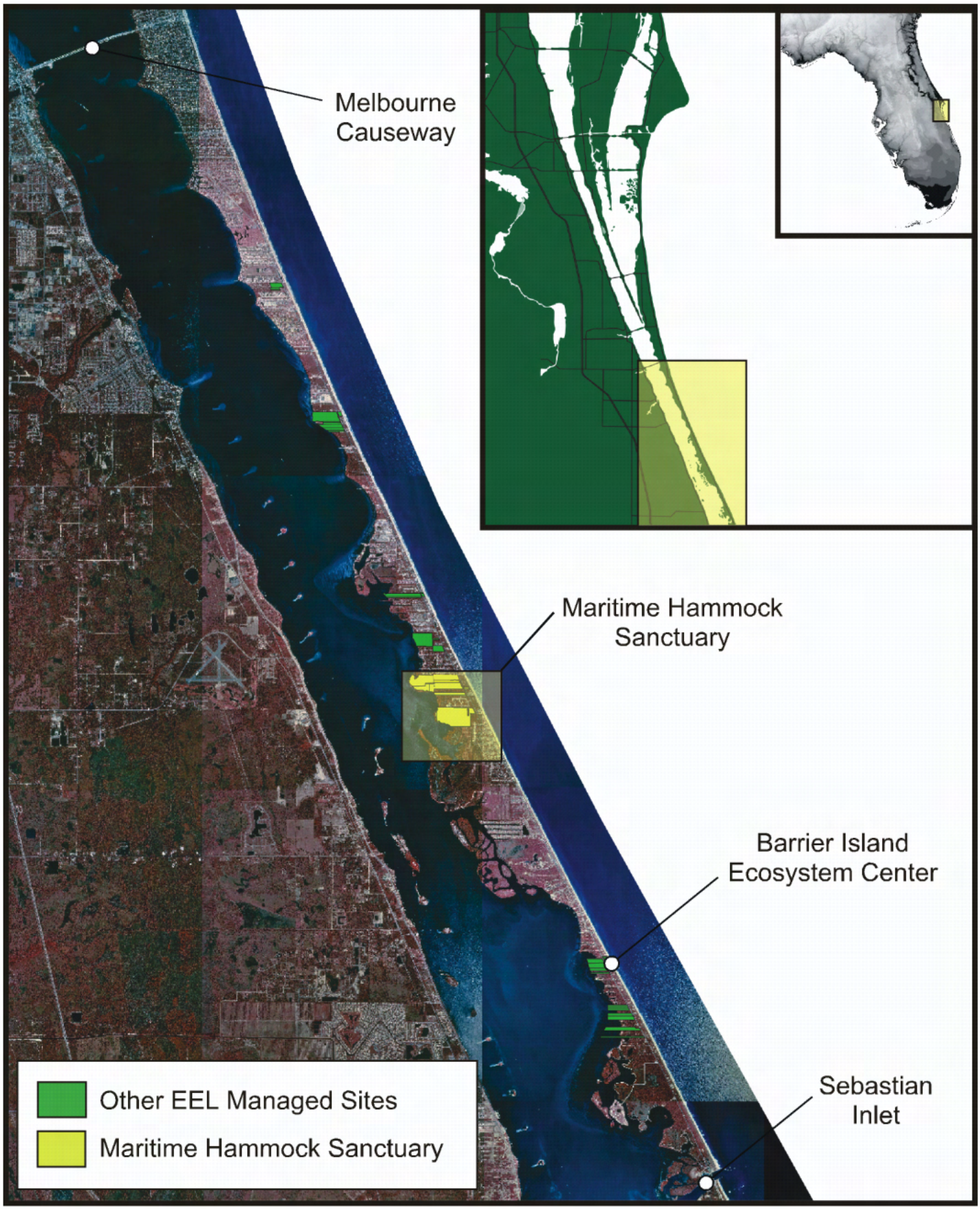
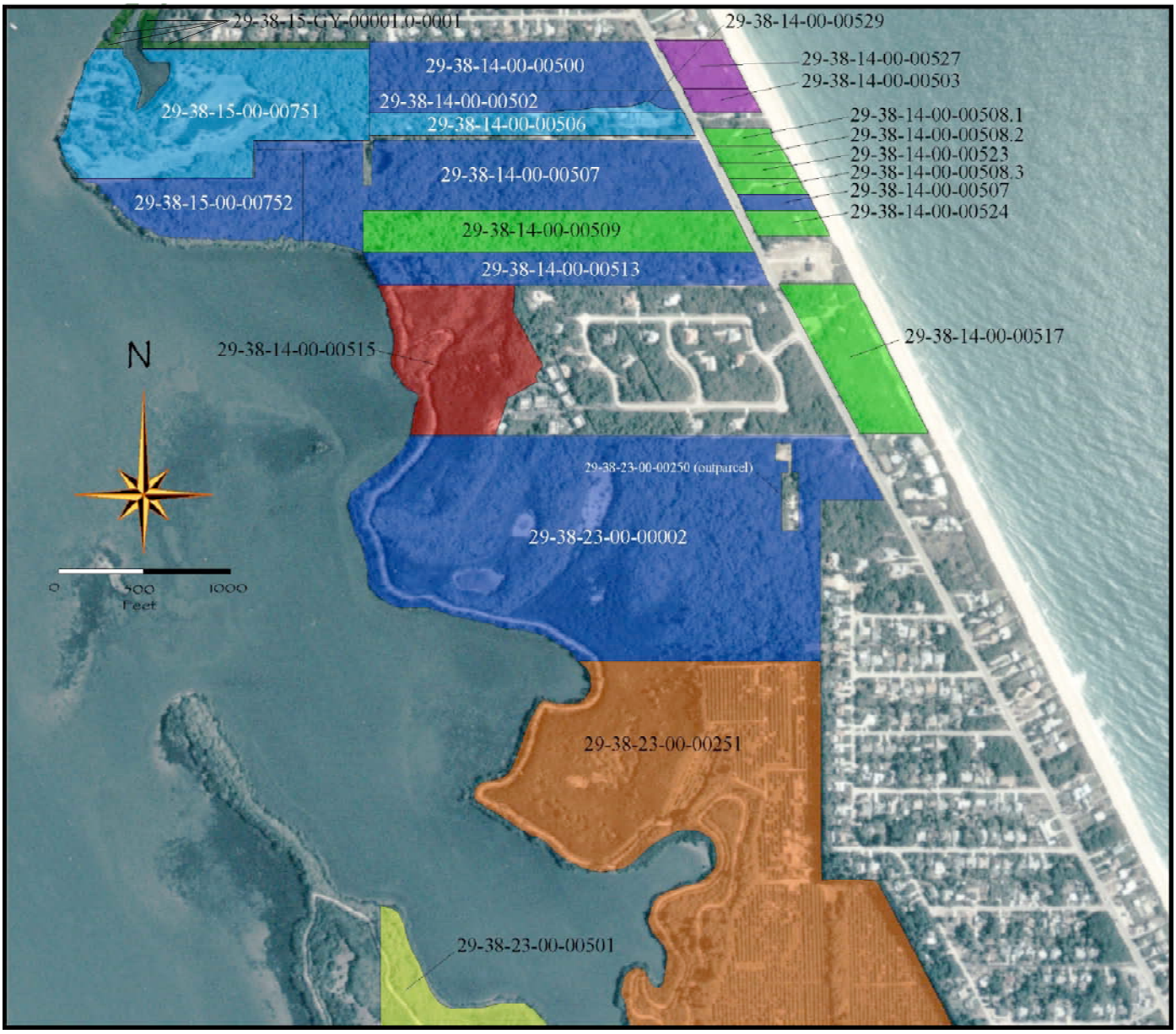


Figure 1. Location of the Maritime Hammock Sanctuary and other EEL Managed Properties within the South Beach Regional Management Area



State of Florida (Managed by Brevard County EEL Program)
Brevard County (Managed by Brevard County EEL Program)
State of Florida Save Our Coast (Managed by Brevard County Parks and Recreation)
State of Florida
State of Florida/St Johns River Water Management District
St Johns River Water Management District
U.S. Fish and Wildlife Service
The Conservation Fund

Figure 2. Maritime Hammock Sanctuary and Adjacent Conservation 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 Maritime Hammock Sanctuary 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, 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 fluid 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 Maritime Hammock Sanctuary 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 a ridge and swale topography with some ridge elevations in excess of 30 feet (Parkinson, 1995; Parkinson and White, 1994). Maximum elevations at the Maritime Hammock Sanctuary are 20 feet above mean sea level.

At present, the coastal processes that lead to the development of the geomorphology at the Maritime Hammock Sanctuary are unknown. Three processes are possible: 1) washover, 2) tidal inlet evolution, and 3) beach ridge progradation. Washover fans occur when waves surge over the crest of the dune, depositing sand on the backbarrier of the island. A flood-tidal delta develops when sand flushes through a tidal inlet under rising tide or storm surge conditions. Unlike washover 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, washover 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 backbarrier shoreline. The straight seaward shoreline is indicative of erosion and the rugged backbarrier shoreline is indicative of depositions (Parkinson, 1995; Parkinson and White, 1994).

3. Topography

The Maritime Hammock Sanctuary has a relatively simple topography with elevations up to 20' National Geodetic Vertical Datum (NGVD) on a ridge immediately east of SR A1A. To the west the land slopes off towards the lagoon with a 5-foot line midway between the Atlantic Ocean and the shoreline of the Indian River Lagoon. The sloping of land from the 20-foot ridge towards the lagoon is not linear but instead is characterized by several swales running north to south (Figure 3).

4. Soils

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

Canaveral Complex (Ca)
Coastal Beaches (Ck)
Myaka Sand (Mk)
Palm Beach sand (Pb)
Paola Complex (Ph)

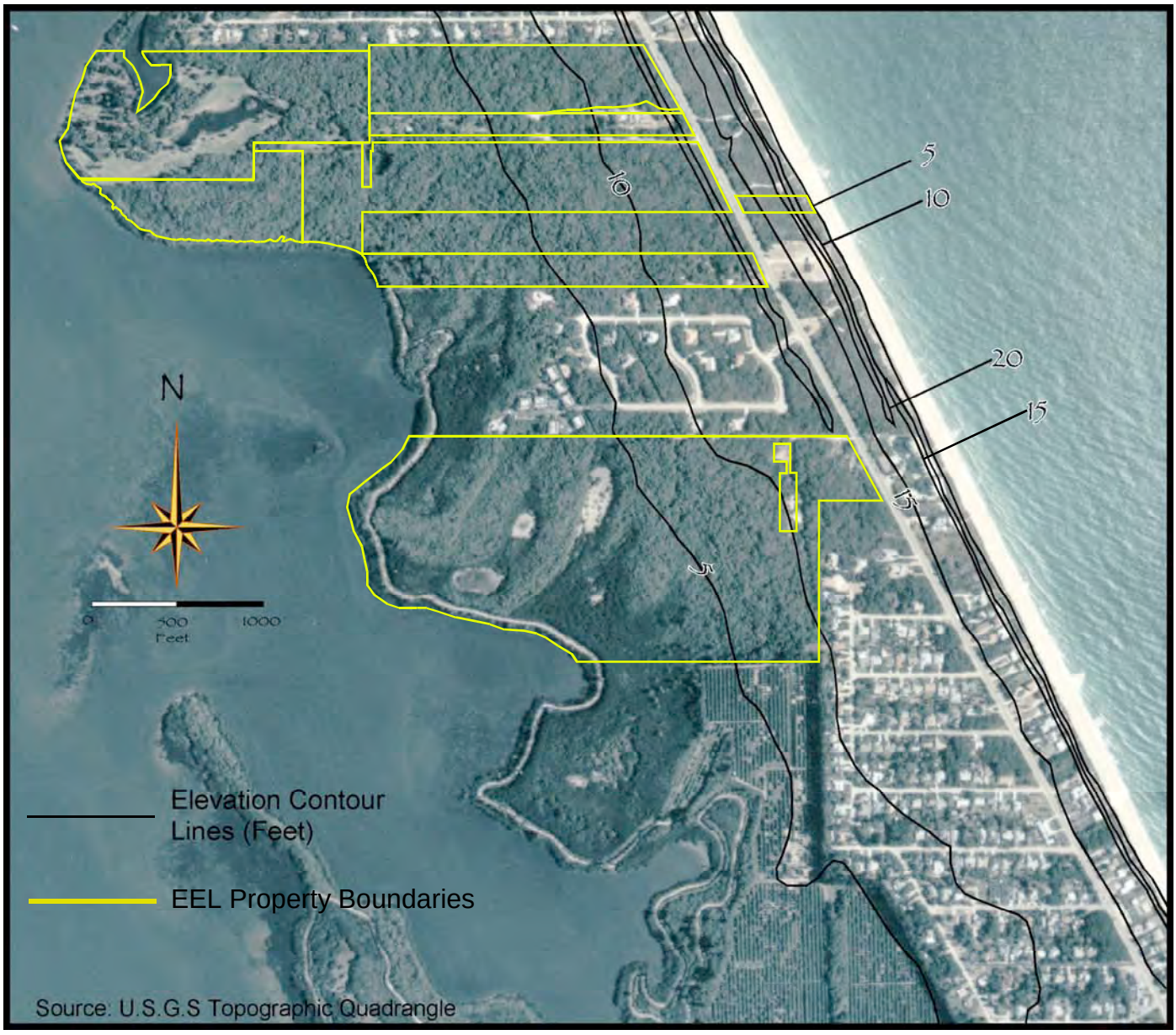


Figure 3. Maritime Hammock Sanctuary Topography

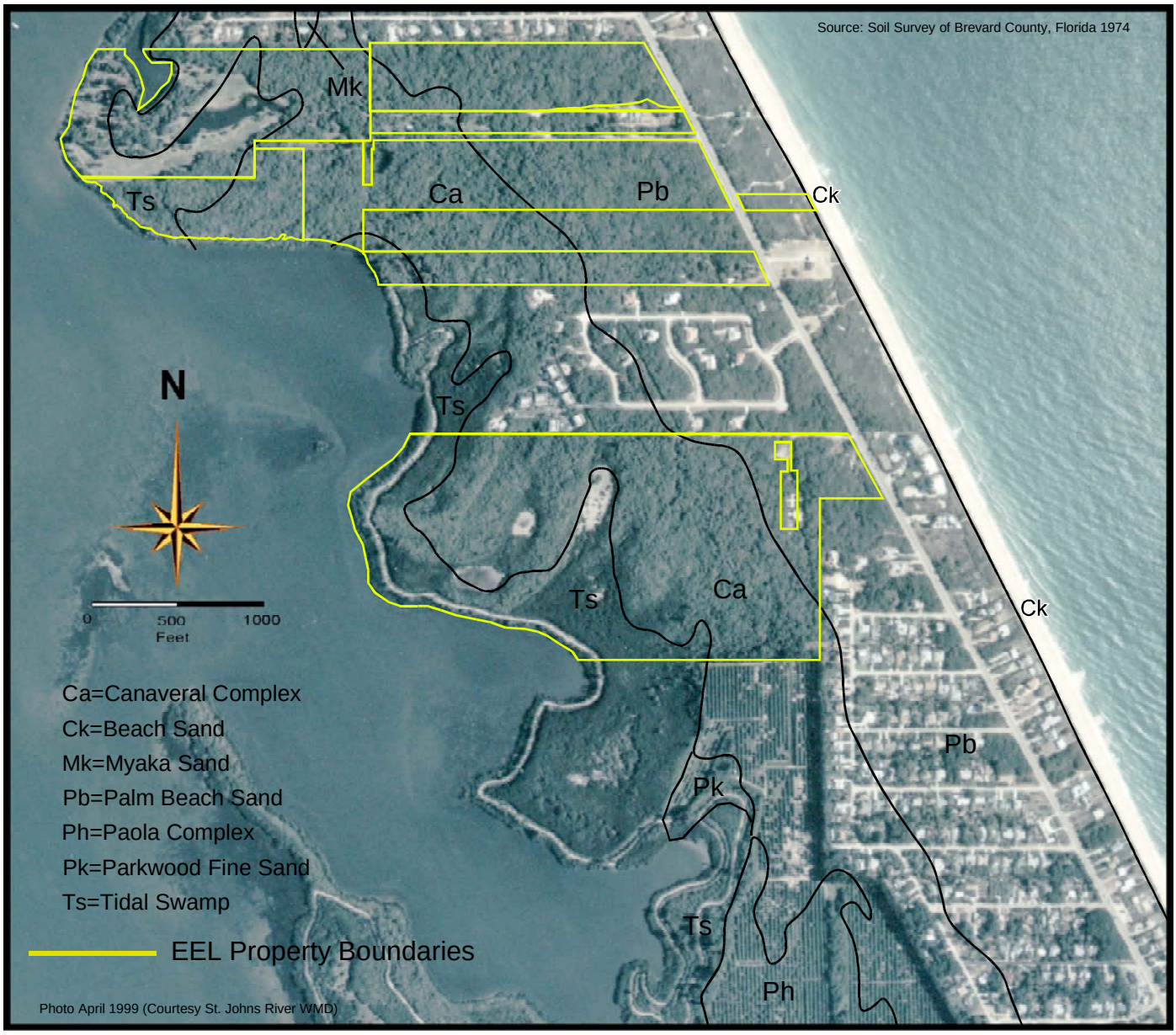


Figure 4. Maritime Hammock Sanctuary Soils

Parkwood Fine Sand (Pk)
Tidal Swamp (Ts)
(Source: Huckle et al., Soil Survey of Brevard County, Florida, 1974)

Canaveral complex soils (Ca) are located on a strip along the eastern edge of the mosquito impoundment. This series consists of nearly level, well-drained sandy soils 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 soils are composed of sand and shell fragments.

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.

Myaka Sand (Mk) are nearly level poorly drained sandy soil in broad areas between ridges. In most years the water table is within 10 inches of the surface for 1 to 4 months and between 10 and 40 inches for more than 6 months.

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. Natural vegetation found on Palm Beach sand consists of saw palmetto, sand live oak, sea grape, prickly pear cactus and sea oats. The water table is usually at a depth of more than 9 foot.

Paola Complex (Ph) consists of nearly level to strongly sloping, excessively drained soils on the tops and sides of ridges. These soils form in thick beds of eolian sands. Permeability is rapid and available water capacity is low. Organic content and natural fertility are low. Paola is a much older, leached, acid soil. This suggests a fairly complicated history to this section of barrier island.

Parkwood Fine Sand (Pk) consist of nearly level, poorly drained soils with a loamy subsoil. These soils are in hammocks and depressions. The water table is generally at a depth of 10 to 30 inches.

Tidal swamp (Ts) is located primarily within the mosquito impoundment though a small area exists west of the impoundment dike. Tidal swamp 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.

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 Maritime Hammock Sanctuary conserves valuable water recharge areas for this region.

In addition to the hydrologic impacts due to SR A1A, the hydrology of the Vislocky and American Equities parcels has also been altered by recent disturbances, including vegetation clearing and the impounding of salt marshes for mosquito control on the western portion of the property. The impacts to the flora and fauna of mosquito control measures undertaken on the site will be discussed in the Biological Resources sections below.

All of the Maritime Hammock Sanctuary 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).

B. Biological Resources

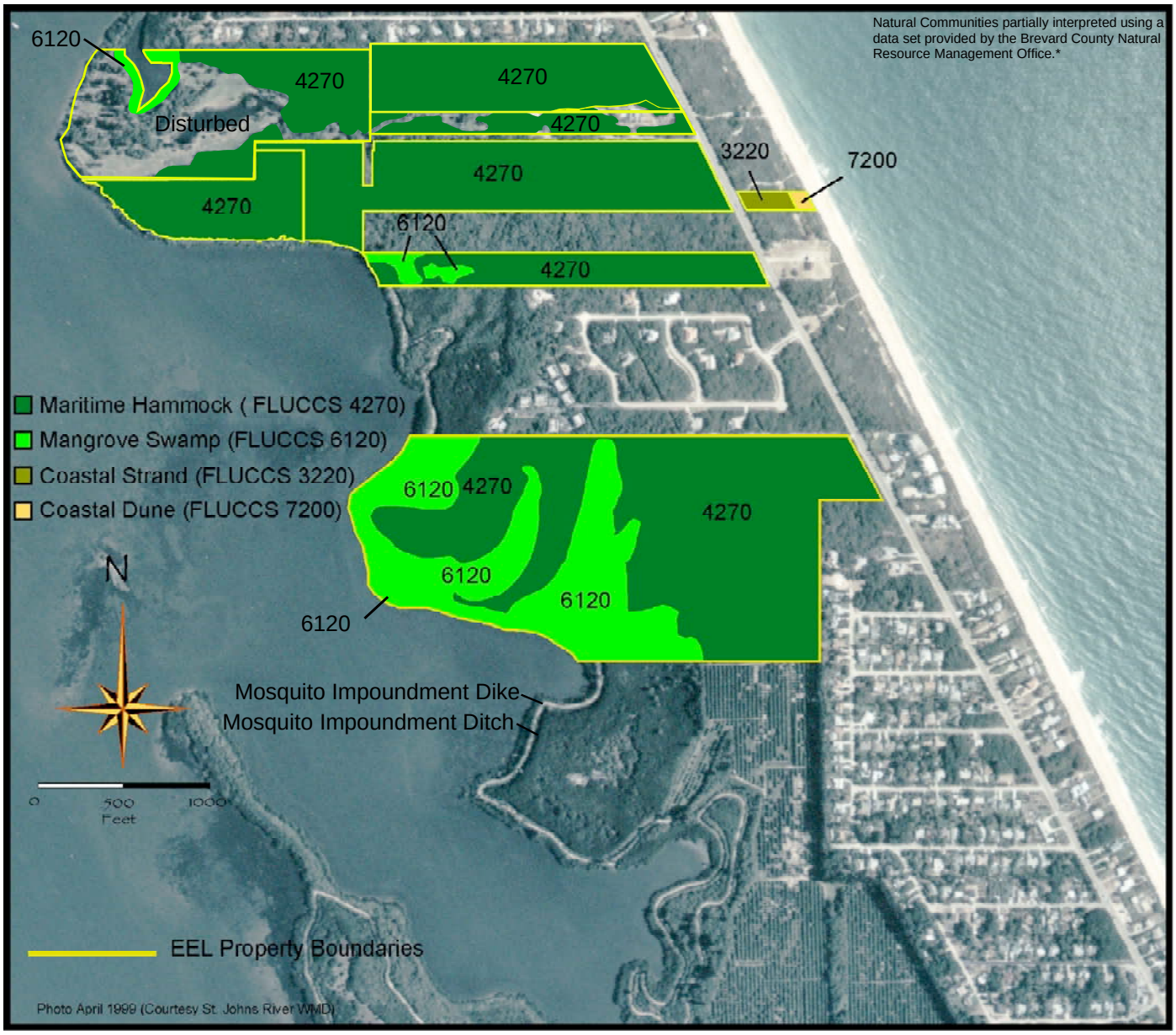
1. Ecosystem Function

The Maritime Hammock Sanctuary consists of small areas of Coastal Dune and Coastal Strand east of SRA1A and Maritime Hammock habitat that grade westward into Mangrove Swamp along the Indian River Lagoon (Figure 5). Though the site has been disturbed in the past 60 years, including land clearing, survey trails, ditching, dumping, exotic plant introductions and the installation of mosquito control ditches, the sanctuary contains relatively undisturbed habitats. The Sanctuary, along with adjacent protected parcels, is the largest remaining area of Maritime Hammock habitat on the south barrier island of Brevard County.

2. Flora

In the fall of 1993, two students working with Dr. Hilary Swain from the Florida Institute of Technology conducted plant surveys on the American Equities parcel. A simple species list was generated for the disturbed area east of the out-parcel, while a series of three transects were run through the maritime hammock habitat. Though a figure detailing the exact location of the three transects is unavailable, the data is presented to illustrate the plant diversity within the maritime hammock. The species list generated during this study was completed with the help of Dr. Paul Schmalzer of Dynamac and Margaret Hames a local plant expert (Appendix B), both of whom served on the EEL Program's Selection & Management Committee at the time of the surveys.

The point-quarter and line-intercept combination sampling technique was used at each of the three transects through the maritime hammock. For each transect, the first sampling point (comprised of four quadrants) was 3 m in from the edge of the canopy. This first point was arbitrarily (but consistently) divided into four quadrants such that Quadrant 1 was between the north and east axes, quadrant 2 between north and west, and so forth. The tree and shrub



* The 2002 Brevard County Natural Communities Dataset was produced by the Brevard County Natural Resources Management Office (NRMO) for its own purposes, NRMO was unable to complete ana error estimate so the data is provided as-is. Therefore its suitability for other purposes is neither implied nor guaranteed. Documentation can be obtained by contacting Brevard County NRMO at (321) 633-2016.

Figure 5. Maritime Hammock Sanctuary Natural Communities

nearest to the origin was identified in each quadrant. The next point was located 20 m further along the transect and plants were recorded in the same manner as at the first point. At each point (endpoint of 20 m length of transect), the occurrence and relative abundance (subjective) of epiphytes was recorded. The number of vines on trees or shrubs at each point was also noted.

Relative densities (Cox 1990) of each tree and shrub species at each of the three transects were calculated as follows:

$$\text{Relative Density} = \frac{\text{\# of individuals of a species}}{\text{Total \# of individuals of all species}} \times 100$$

Transect A was most representative of a maritime hammock with the canopy (5-7 m) dominated by live oak and red bay. There were few epiphytes and vines and a relatively open understory, indicating a mesic habitat (sandy, dry soil). Saw palmetto patches dominated the understory and additional species included marlberry, wild coffee, beautyberry, myrsine, and coral bean. Only one or two Brazilian pepper trees were present.

Transect A:

Trees		Shrubs	
54%	live oak	43%	saw palmetto
29%	red bay	25%	marlberry
17%	naked wood	18%	wild coffee
		14%	beauty berry, myrsine, coral bean

Transect B represents a transition between a maritime and hydric hammock as can be seen by a dominance of cabbage palms. The canopy is approximately 6-8 m high and fairly closed. The soil is wetter than that at Transect A and gumbo-limbo is the dominant understory species.

Transect B:

Trees		Shrubs	
30 %	cabbage palm	36 %	gumbo limbo
25 %	naked wood	28 %	marlberry
22 %	live oak	8 %	naked wood
11%	red bay	6%	live oak
6 %	Brazilian pepper	6%	saw palmetto
6 %	Tough buckthorn	6%	wild coffee
		10%	cabbage palm, poison ivy, beauty berry, gray twig

Transect C has patches of open and closed canopy. Wax myrtle, Brazilian pepper, and cabbage palms dominate the open areas. The understory is very dense where the canopy is

sparse. Canopy height ranges 2-7 m. Brazilian pepper has invaded the west end of the transect.

Transect C:

Trees		Shrubs	
33%	live oak	25%	marlberry
17%	cabbage palm	11%	wild coffee
17%	Brazilian pepper	11%	Brazilian pepper
14%	wax myrtle	11%	saw palmetto
8%	red bay	8%	saltbush
6%	naked wood	6%	myrsine
5%	saltbush, snowberry	6%	poison ivy
		20%	Spanish stopper, gumbo-limbo, naked wood, wax-myrtle, myrsine, black ironwood, bracken fern, gray twig

The eastern portion of the American Equities site contains two disturbed areas, the water treatment site and an area directly adjacent to A1A which was cleared by 1951 and now contains several piles of fill dirt. Numerous gopher tortoises have constructed burrows amongst the fill piles, complicating any plans to restore this area.

In the area to the east and south of the water treatment plant, poor man's patch (Mentzelia floridana) and muscadine grape (Vitis rotundifolia) dominate.

The history of land clearing and alteration on site has also led to the proliferation of exotic plant species on site. The primary invasive exotic plant on the site is the Brazilian pepper (Schinus terebinthifolius), with some Australian pine (Casuarina equisetifolia). In addition, Madagascar periwinkle (Catharanthus roseus), guinea grass (Panicum maximum), simpleleaf chastetree (Vitex trifolia), and sea hibiscus (Taliparitti tilaceum) (Wunderlin and Hansen 2003) are also found on site.

In May of 2000, the EEL Program was awarded a grant through the Florida Department of Environmental Protection (FDEP) for the removal of both Brazilian pepper and Australian pine from the Maritime Hammock Sanctuary. 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) removed both Brazilian Pepper and Australian pine. Rodeo (100% solution) was used to treat plants found along the shoreline of the Indian River Lagoon. As of May 2003 the American Equities and Vislocky parcels have received initial and follow-up maintenance treatments on all Brazilian pepper. Additional FDEP grant applications are pending to treat the remainder of the parcels.

The EEL Program is dedicated to the long-term removal of invasive exotic plants from within the Maritime Hammock Sanctuary 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.

3. Fauna

Though no formal faunal surveys have been conducted on the Maritime Hammock Sanctuary, students working with Dr. Hilary Swain from the Florida Institute of Technology conducted bird, mammal, butterfly and herpetological surveys as part of a Conservation Biology course in 1993. These surveys are summarized in Appendices C-F. Detailed faunal surveys are an initial goal of the EEL Program for the Maritime Hammock Sanctuary.

4. Designated Species

Animals

Designated animals recorded from the site include Gopher Tortoises (Gopherus polyphemus), American alligator, (Alligator mississippiensis), Little Blue Heron, (Egretta caerulea), Snowy Egret (Egretta thula), Louisiana Heron, (Egretta tricolor), White Ibis, (Eudocimus albus), Wood Stork, (Mysteria americana) and American Kestrel, (Falco sparverius). In addition, the endangered green (Chelonia mydas) and loggerhead (Caretta caretta) sea turtles are known to nest on the beach adjacent to the portion of the sanctuary east of A1A.

Plants

Several designated plant species, including erect pricklypear (Opuntia stricta), Florida Shrubverbena, (Lantana depressa var. floridana) (Schmalzer and Foster 2005), coastal mock vervain (Glandularia maritima) and twinberry (Myrcianthes fragrans) are found in the sanctuary. The next step will require the generation of maps and a photographic series detailing the extent of coverage of the designated species followed by careful monitoring of the resources. 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.

5. Biological Diversity

Aside from the limited plant transects 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 late 2000, staff from the Division of Historic Resources CARL Archeological Survey visited the American Equities parcel after a large midden was discovered. This midden had not been previously documented though signs of past disturbance were noted.

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 its current level and much of the earth's 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 National Wildlife 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. Lathams's Oak Lodge located on the barrier island in the current location of the Mullet Creek Islands (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) 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 Maritime Hammock Sanctuary (Figure 6). In 1943, the site was nearly pristine with A1A present and a small home site visible on what is now the Rusnak and Diocese parcels. The transition from coastal strand/scrub (lighter grays) to maritime hammock (darker grays) is clearly visible west of A1A. Interpretation of the vegetation present on what is now impounded marsh is difficult though several open water ponds and areas of high marsh (lower vegetation height) were present. The citrus grove to the south of the American Equities parcel was already in operation.

By 1951 two parcels east of A1A had been cleared along with a small section on the northeast corner of the American Equities parcel. In 1956, the North Grove impoundment was created and impacts to vegetation were already visible two years after completion. Large areas of open water are visible as strips adjacent to upland ridges. This is probably a result of transitional mangrove species (black, buttonwoods) that 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 1996, 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 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. The reduction of salinity allowed the invasive exotic Brazilian pepper to exploit areas previously occupied by black mangroves and buttonwoods.

The 1974 infrared photo reveals several survey lines running both east/west and north/south through the American Equities parcel and the continued development of the Floridana Beach subdivision to the southeast. On the eastern portion of the Vislocky property, the Exotica nursery was already established. Also visible is a large depression that was filled by an artesian well and was presumably used as a reservoir for watering the nursery. A ditch running east/west along the midline of the Vislocky parcel was also created during this time. Since it was only extended about halfway to the lagoon and does not pass though any marsh areas it seems likely that it was constructed for some reason other than mosquito control. Interestingly, Australian pines were becoming dominant amongst the homes within Floridana Beach as evidenced in the photograph by

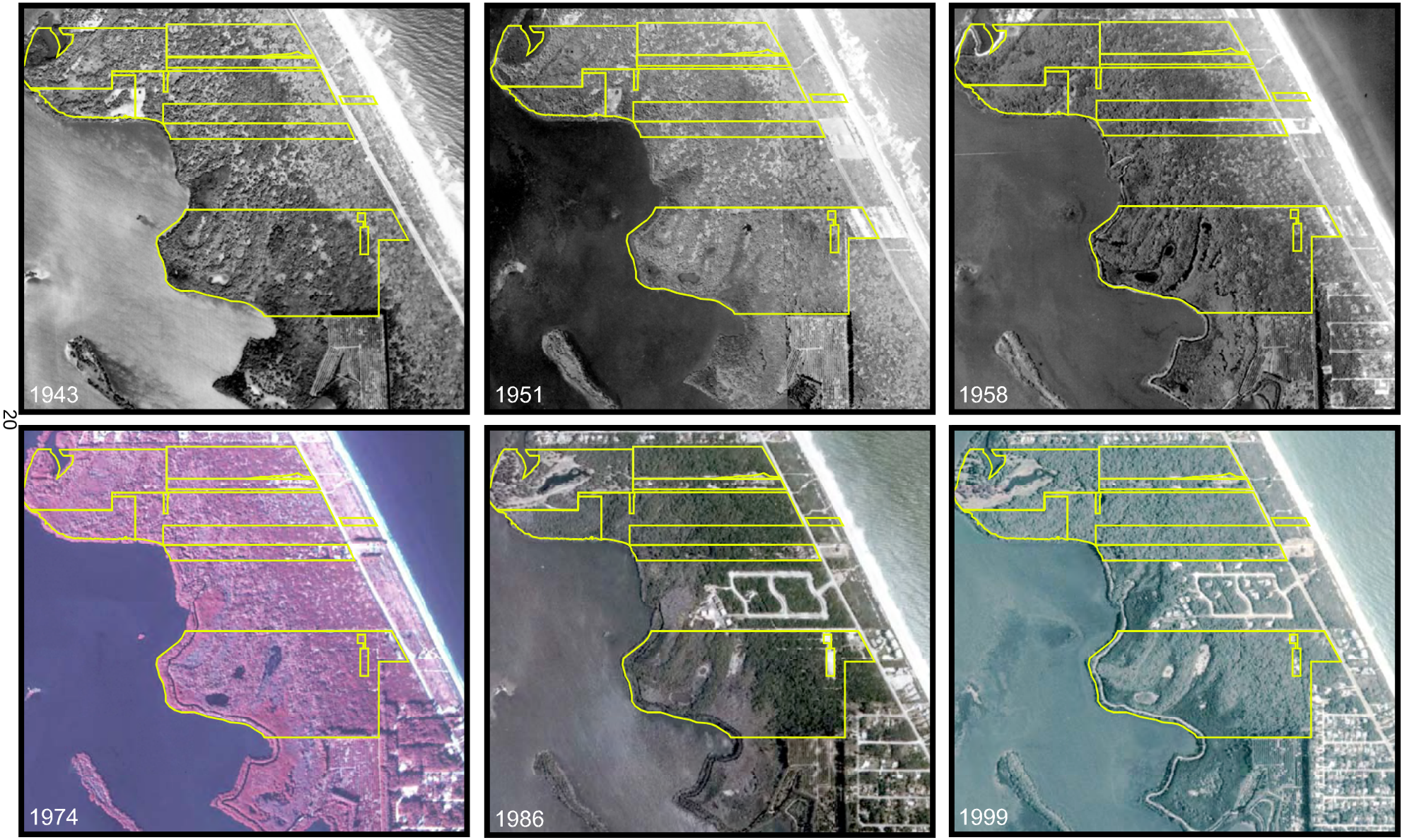


Figure 6. Maritime Hammock Sanctuary Historic Aerial Photos

the shadows cast by the pines. Whether these were planted or recruited naturally from the groves is unknown.

In 1986 several major alterations to the American Equities parcel are evident. The out-parcel, which now houses the water treatment plant, was cleared and additional survey lines were cut. The Treetop Village and Mark's Landing subdivisions located between the American Equities and Vislocky parcels were under construction. Major land clearing and pre-development work, including the creation of a large man-made pond, was conducted on the Yotti Property. This property was later acquired by the Richard King Mellon Foundation and subsequently donated to the EEL Program in December 2002.

Between 1986 and 1999 there have been few additional impacts to the site. Brazilian pepper colonized the mosquito control dike, survey lines and other areas. The areas visible as dark green within the impoundment are very dense patches of red mangroves, growing so closely together that many do not have prop roots though they are over 5 meters in height.

Aside from slightly different disturbances in the past 50 years, the parcels that make up the Maritime Hammock Sanctuary are essentially extensions of the same habitat types that were evident in the 1943 photos. On Vislocky, the remains of the Exotica nursery have lived up to its name with numerous escaped exotic plant species present including Surinam cherry (Eugenia michelii), Seaside Mahoe (Talipariti tilaceum), Carrotwood (Cupania anacarcoides) and Wedelia (Spagneticola trilobata) to name a few. Other alterations associated with the Exotica Nursery include numerous trash piles, the reservoir pond and the aforementioned ditch.

4. Public Interest

Public interest for the EEL Program has been enthusiastic and supportive. A public meeting held on June 8, 1998 that introduced the Master Site Plan for the Barrier Island Ecosystem Center was very well received. Additional partners in the management and maintenance of the sanctuary include the Archie Carr National Wildlife Refuge, Brevard County schools, and local universities. 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 in the Maritime Hammock Sanctuary has been focused on the exotic plant removal program and the development of a hiking trail. Since the State titled portion of the Maritime Hammock Sanctuary is less than 160 acres, a formal public review of this management plan is not required. Public involvement in this plan is limited to occasional public speaking events with local residents regarding the Sanctuary. In addition, the Selection & Management Committee, a citizen advisory board to the EEL Program made up of local scientists, has reviewed and approved the plan on October 17, 2006. The Brevard County Board of County Commissioners, in regular session, approved the management plan on November 14, 2006 for adherence to the Local Government Comprehensive Plan (Appendix H).

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. Land management practices developed for the Maritime Hammock Sanctuary must consider the restoration and maintenance of the barrier dunes.

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, the introduction of exotic plants and animals, recreation and tourism.

The major historical human influences on site are detailed in Figure 7. The location of Route A1A has obvious influences on the survivorship of designated species such as gopher tortoises.

C. EXTERNAL INFLUENCES

There are no known encroachments from adjoining property owners on the Maritime Hammock Sanctuary. External influences that have the potential to impact the Sanctuary include the introduction of exotic plants and animals from adjacent properties. There are no adjacent parcels of undeveloped land that should be purchased because they are essential to management.

D. LEGAL OBLIGATIONS AND CONSTRAINTS

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

State of Florida

To fulfill its pledge to manage the properties Brevard County entered into management lease # 4177 on January 28, 1999, which was the initial lease for all properties acquired within the Maritime Hammock Initiatives CARL project. The term of the lease is fifty (50) years from the date of the initial lease. On August 4, 1999 the County and State entered into Amendment #1 to the lease to include the Vislocky property. On March 30, 2000 the County and State entered into Amendment #2 to the to include the Rusnak and American Equities properties. On September 4, 2001 the County and State entered into

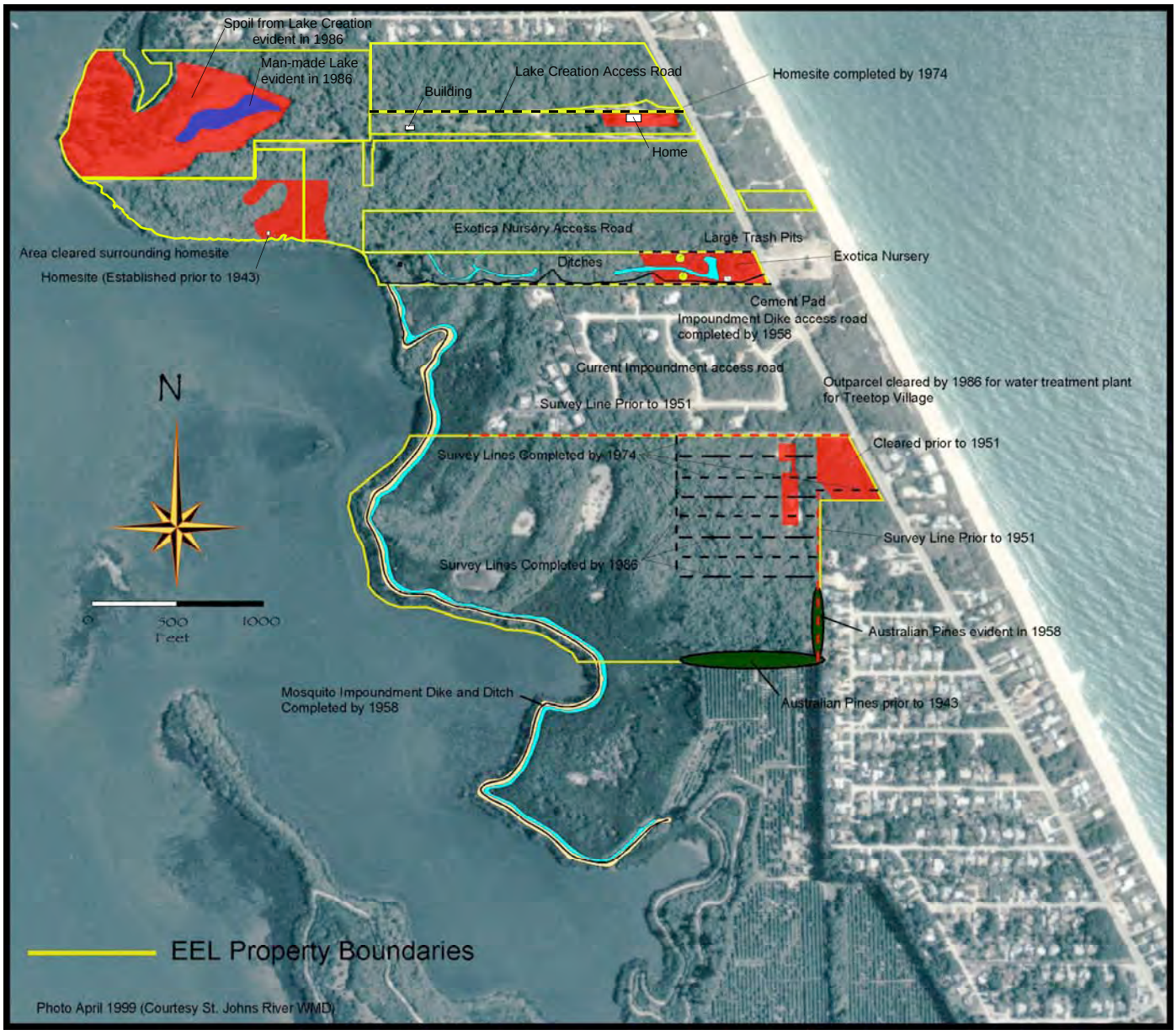


Figure 7. Maritime Hammock Sanctuary Human Impacts

Amendment #3 to the lease to include the Diocese and Brevco properties. The original lease is for a period of fifty (50) years with the State of Florida. The County is obligated to manage all the properties composing the Maritime Hammock Sanctuary according to the terms of Lease #4177 (attached).

This management plan is consistent with the State Lands Management Plan adopted by the Trustees on March 17, 1981.

No portions of any of the State owned parcels that make up the Maritime Hammock Sanctuary are of a condition that would warrant their being declared surplus.

St. John's River Water Management District

The St. John's River Water Management District (SJRWMD) regulates impacts to wetlands pursuant to Part IV, Chapter 373 of the Florida Statutes and in accordance with Chapters 40C-400 of the Florida Administrative Code (F.A.C.). The SJRWMD typically requires an Environmental Resource Permit (ERP) to impact wetlands. An Environmental Resource Permit was obtained for the construction of a 200-foot section of raised boardwalk through a wetland area associated with the hiking trail (Section F.).

Prior to submitting an application for dredging or filling within waters of the State, it is recommended that the areas proposed for impact be delineated in accordance with the Unified Wetland Delineation Methodology for the State of Florida dated 1 July, 1994 and then reviewed by SJRWMD staff.

U.S. Army Corps of Engineers

USACE regulates wetlands connected to "Waters of the United States" and isolated wetlands pursuant to Section 404 of the Clean Water Act. Mitigation may not be required if impacts are minimal or to degraded systems.

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 Maritime Hammock Sanctuary, particularly along roads, old survey trails and along the shore of the Indian River Lagoon. The primary species of concern, Brazilian pepper (Schinus terebinthifolius) and Australian pine (Casuarina equisetifolia), are currently being targeted through a grant under the Florida Department of Environmental Protection's Invasive Plant Management Program. The initial treatment of exotic plants was completed in 2004.

A thorough survey of the extent of the Madagascar periwhinkle (Catharanthus roseus), guinea grass (Panicum maximum), and simpleleaf chastetree (Vitex trifolia) needs to be

conducted throughout the sanctuary. Once determined, these species can be treated and monitored. The EEL Program is currently developing a comprehensive treatment and monitoring program to ensure the long-term removal of these species from the Maritime Hammock Sanctuary and other EEL managed properties.

2. Exotic Animal Species

The list of non-indigenous animal species noted with the Maritime Hammock Sanctuary 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 Maritime Hammock Sanctuary is identified as a Category II site in the SMM, which means that minimal capital improvements are planned. The size, location and habitats of the Maritime Hammock Sanctuary have dictated the type of activities that are compatible with the overriding conservation mandate. Utilizing $50,000 in funds from the Florida Department of Community Affairs' Coastal Management Program, a 2.5 mile long hiking trail was developed. Activities that are permitted on this trail include hiking and nature observation (Figure 8). The habitats were deemed too sensitive to permit mountain bikes. Funds were used to build two bridges which cross the mosquito control ditches, a raised boardwalk through an area of wetlands and an overlook onto an interior pond. The trail guides visitors through the maritime hammock habitat as it grades into the mangrove swamps associated with the mosquito impoundment. A kiosk and bicycle rack is available at both points where the trail meets the existing bicycle path along A1A. A proposed trail extension through the Diocese, Rusnak and Yotti properties is planned that will require the construction of a small bridge over a tidal creek. The trail extension is scheduled for completion in late 2006.

An additional positive use of the site is as a research and educational resource. The undisturbed areas interspersed with areas that have been disturbed by human use can be used to illustrate the ways in which habitats recover. Whenever possible, research and restoration conducted on site will be used to guide educational programs.

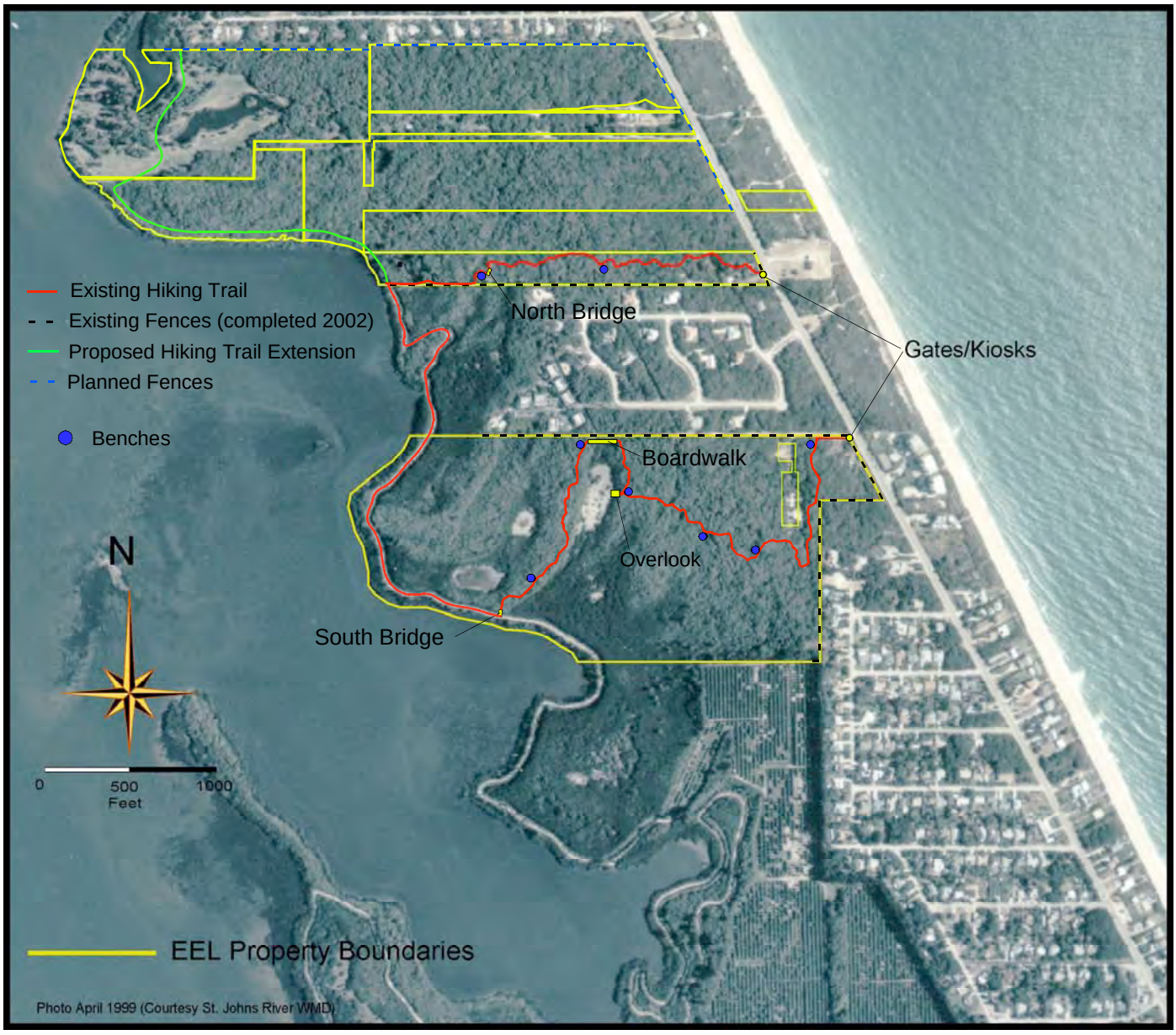


Figure 8. Maritime Hammock Sanctuary Improvements

VI. MANAGEMENT ACTION PLANS

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

A. GOALS

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

- Documentation of historic public use
- Conservation of ecosystem function
- Conservation of natural (native) communities
- Conservation of species (including endemic, rare, threatened and endangered species)
- Documentation of significant archeological and historical sites
- Provision of public access for responsible public use
- Assessment of carrying capacity of natural resources with public use
- Provision of environmental education programs
- Provision of opportunities for compatible uses
- 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 Maritime Hammock 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 Maritime Hammock 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: DOCUMENTATION OF SIGNIFICANT ARCHAEOLOGICAL AND HISTORIC SITES

Strategy 6: Survey for archaeological and historical sites within the Maritime Hammock Sanctuary.

Actions:

- Contact the State Division of Historic Resources to conduct a Phase I survey of the site
- Review available maps and historic records for indications of past usage of the site
- Map all archaeological and historic sites for future reference

GOAL: PROVISION FOR PUBLIC ACCESS AND RESPONSIBLE PUBLIC USE

Strategy 7: Establish and enforce specific policies and management techniques governing 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 proposed public facilities for consistency with ADA guidelines
- Establish social and environmental carrying capacities for proposed public facilities
- 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 educating the users, providing on-site public info, establishing sufficient trails, constructing handrails, and developing written guidelines
- Construct hiking trails in accordance with the USDA Forest Service "Standard Specifications for the Construction of Trails"
- Construct terraces for erosion control

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

Strategy 8: Establish a monitoring program to assess effects of public usage on natural resources.

Actions:
- Establish baseline vegetation monitoring transects to provide data regarding existing conditions
- Establish a methodology and record keeping system to document public use
- Conduct regular monitoring to assess impacts of public use on natural habitats
- Conduct regular walk-throughs" on 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 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 9: Develop a plan to provide on-going environmental education programs to Brevard County residents and visitors.

Actions:
- 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
- Develop criteria and process of evaluation for program review and refinement

- Provide a “special collection” of books and other materials specifically related to the environmental and cultural character of the Sanctuary

GOAL: PROVISION OF OPPORTUNITIES FOR COMPATIBLE USES

Strategy 10: Provide opportunities for multiple use and compatibility when practical.

Actions:
- Use fire breaks as multi-use recreation trails when not needed for resource management
- Include multiple benefits of natural community restoration efforts in education program

GOAL: ASSURANCE OF GENERAL UPKEEP AND SECURITY OF THE PROPERTY

Strategy 11: Secure and maintain the Sanctuary to the highest degree possible using EEL staff. Parks and Recreation staff, contract employees and volunteers.

Actions:
- Employ a land manager to oversee maintenance and security activities;
- Contract with Brevard County, Parks and Recreation for maintenance of parking areas, fire breaks, trails, boardwalks, bridges, benches etc.;
- Coordinate daily maintenance tasks using staff and volunteers.

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 Maritime Hammock 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	Immediate
Research the connection of on-site natural resources with adjacent resources	Immediate
Research hydrologic patterns on and off-site	Immediate
Research native species' movement patterns on and off-site	Immediate
Focus natural community restoration efforts on enhancing native diversity	On-Going Short-Term
Investigate the historic hydroperiod and restore natural hydrologic patterns	On-Going
Strategy 3: Restore degraded, disturbed, or altered uplands with the Maritime Hammock Sanctuary	
Conduct monitoring to establish baseline conditions within the upland communities	Immediate
Collect historic information regarding prior wetland communities that may have occurred on-site	Immediate
Consult local experts and current literature regarding best scientific methods for wetland restoration	On-Going
Prioritize the upland communities in need of restoration	On-Going
Identify appropriate restoration activities	On-Going
Assess possible impacts of proposed restoration on adjacent communities and off-site properties	On-Going
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	Long-Term

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

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	Immediate
Survey for, and identify, designated plant and animal species	Immediate
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	Immediate
Periodically update these baseline survey data to determine possible changes in designated species distribution or density	Short-Term
Review management plans for consistency with USFWS and FGFWFC guidance concerning listed species	Immediate
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	Immediate

Strategy 6: Survey for archaeological and historic sites within the Maritime Hammock Sanctuary.

Contact the State Division of Historic Resources to conduct a Phase I survey of the site	Complete
Review available maps and historic records for indications of past usage of the site	Complete
Map all archaeological and historic sites for future reference	Complete

Strategy 7: Provide opportunities for multiple use and compatibility when practical

Use fire breaks for multi-use recreation trails when not needed for resource management	Short-Term
Include multiple benefits of natural community restoration efforts in education program	Immediate & On-Going

Strategy 8: Secure and maintain the Sanctuary to the highest degree possible using EEL staff. Parks and Recreation staff, contract employees and volunteers

Employ a land manager to oversee maintenance and security activities	Complete
Contract with Brevard County, Parks and Recreation for maintenance of parking areas, fire breaks, trails, boardwalks, bridges, benches etc	On-Going
Coordinate daily maintenance tasks using staff and volunteers	On-Going

VIII. FINANCIAL CONSIDERATIONS

The following is a breakdown of the general costs estimated for capital improvement and annual management of the Maritime Hammock Sanctuary:

Capital Improvement

Property Boundary Fencing (Vislocky; FY 1999/2000)*	$11,362.00
Property Boundary Fencing (American Equities; FY 2000/2001)*	$46,800.00
Property Boundary Fencing (Remaining FY 2005/2006)	$68,214.00
Property Boundary Signs (Vislocky & American Equities FY 2000/2001)*	$ 840.00
Property Boundary Signs (Remaining FY 2005/2006)	$ 840.00
Kiosks (Vislocky & American Equities FY 2000/2001)*	$ 1000.00
Kiosk Backings (Vislocky & American Equities FY 2002/2003)*	$ 720.00
Initial Treatment of Brazilian pepper (Vislocky; FY 1999/2000, FDEP, Bureau of Invasive Plant Management Grant)*	$10,000.00
Initial Treatment of Brazilian pepper (American Equities; FY 2000/2001, FDEP, Bureau of Invasive Plant Management Grant)*	$34,355.00
Initial Treatment of Brazilian pepper (Remaining FY 2002/2003, FDEP, Bureau of Invasive Plant Management Grant)*	$67,500.00

Annual Management

Follow-up treatment of Brazilian Pepper	$ 1000.00
Treatment for other invasive plants species	$ 500.00
Upkeep of fences and kiosks	$ 1000.00

* Projects completed as of 12/28/2005

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Appendix A. Maritime Hammock Sanctuary Legal Descriptions

Vislocky (29-38-14-00-513)

THAT PART OF S 200 FT OF N 450 FT OF GOVT LOTS 4 & 5 LYING W OF HWY AS DESC IN ORB 3935 PG 511PAR 514

Rusnak (29-38-15-00-752)

PART OF GOVT LOT 3 AS DESC IN ORB 1038 PG 981, 3236 PG 1943 EXC E 355 FT OF ORB 779 PG 646 &ORB 3236 PG 1941 PARS 755 & 756

American Equities (29-38-23-00-2 (250))

THE N 400' OF GL-1 W OF SR A1A & PART OF GL-2 ALL AS DESC IN ORB 3194 PG 2866PAR 252

Diocese (29-38-14-00-507)

S 425 FT OF GOVT LOT 3 W OF A1A, S 100 FT OF GOVT LOT 3 E OF A1A, THAT PART OF GOVT LOT 6 N OF NLINE OF GOVT LOT 5 EXTENDED E & PART OF GOVT LOT 3 OF SEC 15 AS DESC IN PAR 1 OF ORB 672 PG 462

Brevco (29-38-14-00-500)

S 333.65 FT OF N 633.65 FT OF GOVT LOT 3 W OF RD & S 10 FT OF N 310 FT OF GOVT LOT 3 E OF A1AEXC ORB 2992 PG 1697 PAR 501

Brevco (29-38-14-00-502)

N 100 FT OF S 700 FT OF GOVT LOT 3 W OF A1A EXC ORB 2292 PG 1697

Appendix B. Maritime Hammock Sanctuary Observed Plant Species

SCIENTIFIC NAME	COMMON NAME	Exotic	Disturbed Site
Acrostichum danaeifolium	Giant Leather Fern		
Andropogon longiberbis	Hairy Bluestem		X
Ardisia escallonioides	Marlberry		X
Baccharis halimifolia	Groundsel Tree, Sea Myrtle		
Bidens alba	Beggerticks		X
Bursera simaruba	Gumbo-Limbo		
Callicarpa americana	American Beautyberry		X
Carica papaya	Papaya	X	
Catharanthus roseus	Madagascar Periwhinkle	X	
Chamaecrista fasciculata	Partridge Pea		X
Chiococca alba	Snowberry		
Citharexylum spinosum	Florida Fiddlewood		
Cladium jamaicense	Jamaica Swamp Sawgrass		
Cnidoscolus stimulosus	Tread Softly		X
Coccoloba diversifolia	Pigeon Plum		
Coccoloba uvifera	Seagrape		
Commelina erecta	Whitemouth Dayflower		X
Cynanchum scoparium	Leafless Swallowwort		
Cynodon dactylon	Bermuda grass	X	X
Desmodium spp.	Ticktrefoil		X
Erythrina herbacea	Coral Bean		X
Eugenia axillaris	White Stopper		
Eugenia foetida	Spanish Stopper		
Eupatorium capillifolium	Dogfennel		
Exotheca paniculata	Butterbough		
Ficus aurea	Strangler Fig		
Forestiera segregata	Florida Swampprivet		
Gaillardia pulchella	Firewheel		
Glandularia maritima	Coastal Mock-Vervain		X
Helianthus debilis	Dune Sunflower		X
Heterotheca subaxillaris	Camphorweed		X
Hydrocotyle umbellata	Manyflower Marshpennywort		
Ilex glabra	Inkberry, Gallberry		
Krugiodendron ferreum	Black Ironwood, Leadwood		
Lantana camara	Lantana	X	X
Lantana camera x depressa	Lantana (Hybrid)		
Lantana depressa var. floridana	Florida Shrubverbena		
Lantana involucrata	Buttonsage		
Licania michauxii	Gopher Apple		
Sideroxylon foetidissium	False Mastic		
Mentzelia floridana	Poorman's patch		X
Mikania cordifilia	Florida Keys Hempvine		
Momordica charantia	Balsampear		
Monarda punctata	Spotted Beebalm		X
Morus rubra	Red Mulberry		
Myrcianthes fragrans	Twinberry		
Myrica cerifera	Wax Myrtle		
Ocotea coriacea	Lancewood		
Oplismemus hirtellus	Basket grass		
Opuntia humifusa	Pricklypear		
Opuntia stricta	Erect Pricklypear		X
Parthenocissus quinquefolia	Virginia creeper		X

Persea borbonia	Red Bay		
Phlebodium aureum	Golden Polypody		
Polypodium polypodioides	Resurrection Fern		
Psychotria nervosa	Wild Coffee		
Pteridium aquilinum	Bracken		
Quercus virginiana	Virginia Live Oak		
Randia aculeata	White Indigoberry		
Rapanea punctata	Myrsine		
Sabal palmetto	Cabbage Palm		
Sarcostemma clausum	White Twinevine		
Schinus terebinthifolius	Brazilian pepper	X	X
Schoepfia chrysophylloides	Greytwig		
Serenoa repens	Saw Palmetto		X
Sideroxylon tenax	Tough Bully		
Smilax auriculata	Earleaf Greenbrier		
Solidago sempervirens	Seaside Goldenrod		X
Sophora tomentosa	Yellow Necklacepod		
Tillandsia fasciculata	Cardinal Airplant		
Tillandsia setacea	Southern Needleleaf		
Tillandsia simulata	Unnamed		
Tillandsia usneoides	Spanish Moss		
Tillandsia utriculata	Giant Airplant		
Toxicodendron radicans	Eastern Poison ivy		
Trichostema dichotomum	Forked bluecurls		X
Vitis rotundifolia	Muscadine grape		X
Vittaria lineata	Shoestring fern		
Ximenia americana	Tallow Wood, Hog Plum		
Yucca aliofolia	Spanish bayonet	X	
Zanthoxylum clava-herculis	Hercules' club		X

Appendix C. Maritime Hammock Sanctuary Observed Bird Spec

Note: Surveyor Ken Snyder, Florida Institute of Technology

SCIENTIFIC NAME	COMMON NAME	FFWCC	FWS
Accipiter striatus	Sharp-shinned Hawk		
Agelaius phoeniceus	Red-winged Blackbird		
Anas americana	American Wigeon		
Anas fulvigula	Mottled Duck		
Anhinga anhinga	Anhinga		
Ardea herodias	Great-blue Heron		
Buteo lineatus	Red-should. Hawk		
Butorides striatus	Green Heron		
Caprimulgus carolinensis	Chuck-Will's Widow		
Cardinalis cardinalis	Northern Cardinal		
Casmerodius albus	Great Egret		
Cathartes aura	Turkey Vulture		
Catharus guttatus	Hermit Thrush		
Circus cyaneus	Northern Harrier		
Cistothorus platensis	Sedge Wren		
Colaptes auratus	Common Flicker		
Columbina passerina	Ground Dove		
Coragyps atratus	Black Vulture		
Corvus ossifragus	Fish Crow		
Cyanocitta cristata	Blue Jay		
Dendroica coronata	Yellow-rumped		
Dendroica discolor	Prarie Warbler		
Dendroica dominica	Yellow-throated		
Dendroica palmarum	Palm Warbler		
Dryocopus pileatus	Pileated Woodpeck		
Dumetella carolinensis	Gray Catbird		
Egretta caerulea	Little Blue Heron	SSC	
Egretta thula	Snowy Egret	SSC	
Egretta tricolor	Louisiana Heron	SSC	
Empidonax sp.	Empidonax sp.		
Eudocimus albus	White Ibis	SSC	
Falco sparverius	American Kestrel	T	
Geothlypis trichas	Common Yellowthroat		
Lophodytes cucullatus	Hooded Merganser		
Megaceryle alcyon	Belted Kingfisher		
Melanerpes carolinus	Red-bellied Woodpecker		
Melanerps erythrocephalus	Red Headed Woodpecker		
Melospiza georgiana	Swamp Sparrow		
Mimus polyglottos	Northern Mockingbird		
Mniotilta varia	Black-and-White		
Mycteria americana	Wood Stork	E	
Otus asio	Screech Owl		
Pandion haliaetus	Osprey		
Parula americana	Northern Parula		
Passerina cyanea	Indigo Bunting		

Phalacrocorax auritus	Double Crested Cormarant
Picoides pubescens	Downy Woodpecker
Pipila erythrophthalmus	Rufous-sided Towhee
Piranga rubra	Summer Tanager
Polioptila caerulea	Blue-gray Gnatcatcher
Rallus longirostris	Clapper Rail
Regulus calendula	Ruby-crowned Kinglet
Sayornis phoebe	Eastern Phoebe
Seiurus aurocapillus	Ovenbird
Seiurus noveboracensis	Northern Waterthrush
Sphyrapicus varius	Yellow-bellied Sapsucker
Spizella passerina	Chipping Sparrow
Thryothorus ludovicianus	Carolina Wren
Toxostoma rufum	Brown Thrasher
Troglodytes aedon	House Wren
Tyrannus tyrannus	Eastern Kingbird
Vermivora celata	Orange-crowned Warbler
Vireo griseus	White-eyed Vireo
Vireo olivaceus	Red-eyed Vireo
Zenaida macroura	Mourning Dove

FFWCC=Florida Fish and Wildlife Conservation Commision
FWS=US Fish and Wildlife Service
E=Endangered
T=Threatened

Appendix D. Maritime Hammock Sanctuary Observed Mammal Species

SCIENTIFIC NAME	COMMON NAME
Spilogale putorius	Spotted skunk
Sigmodon hispidus	Cotton rat
Podomys floridanus	Florida mouse
Peromyscus sp.	
Procyon lotor	Racoon
Vulpes vulpes	Red Fox

Appendix E. Maritime Hammock Sanctuary Observed Butterfly Species

Phoebis sennae	Cloudless Sulphur
Urbanus proteus	Long-tailed Skipper
Anartia jartrophae	White Peacock
Danaus plexippus	Monarch
Precis coenia	Common Buckeye
Dione vanillae	Gulf Fritillary
Heliconius charitonius	Zebra
Papilio polyxenes	Black Swallowtail
Papilio cresphontes	Giant Swallowtail
Hermeuptypchia hermes	Carolina Satyr
Venessa atalanta	Red Admiral
Phyciodes tharos	Pearl Crescent
Eurema sp.	Small sulphur
Papilio glaucus	Eastern Tiger Swallowtail

Appendix F . Maritime Hammock Sanctuary Observed Reptile and Amphibian Species

Order/Suborder	SCIENTIFIC NAME	COMMON NAME	FFWCC	FWS
Anura	***Osteopilus septentrionalis***	Cuban Treefrog		
	Eleutherodactylus planirostris	Greenhouse Frog		
	Hyla cinerea	Green tree frog		
Crocodylia	***Alligator mississippiensis***	American alligator	SSC	T(S/A)
Squamata/Lacertia	***Anolis carolinensis***	Green Anole		
	Anolis sagrei	Brown Anole		
	Cnemidophorus sexilineatus	Six-lined Racerunner		
Squamata/Serpentes	***Elaphe obsoleta***	Yellow Rat Snake		
	Diadophis punctatus	Southern Ringneck Snake		
	Micrurus fulvius fulvius	Eastern Coral Snake		
	Opheodrys venalis	Smooth Green Snake		
Testudines	***Gopherus polyphemus***	Gopher Tortoise	SSC	

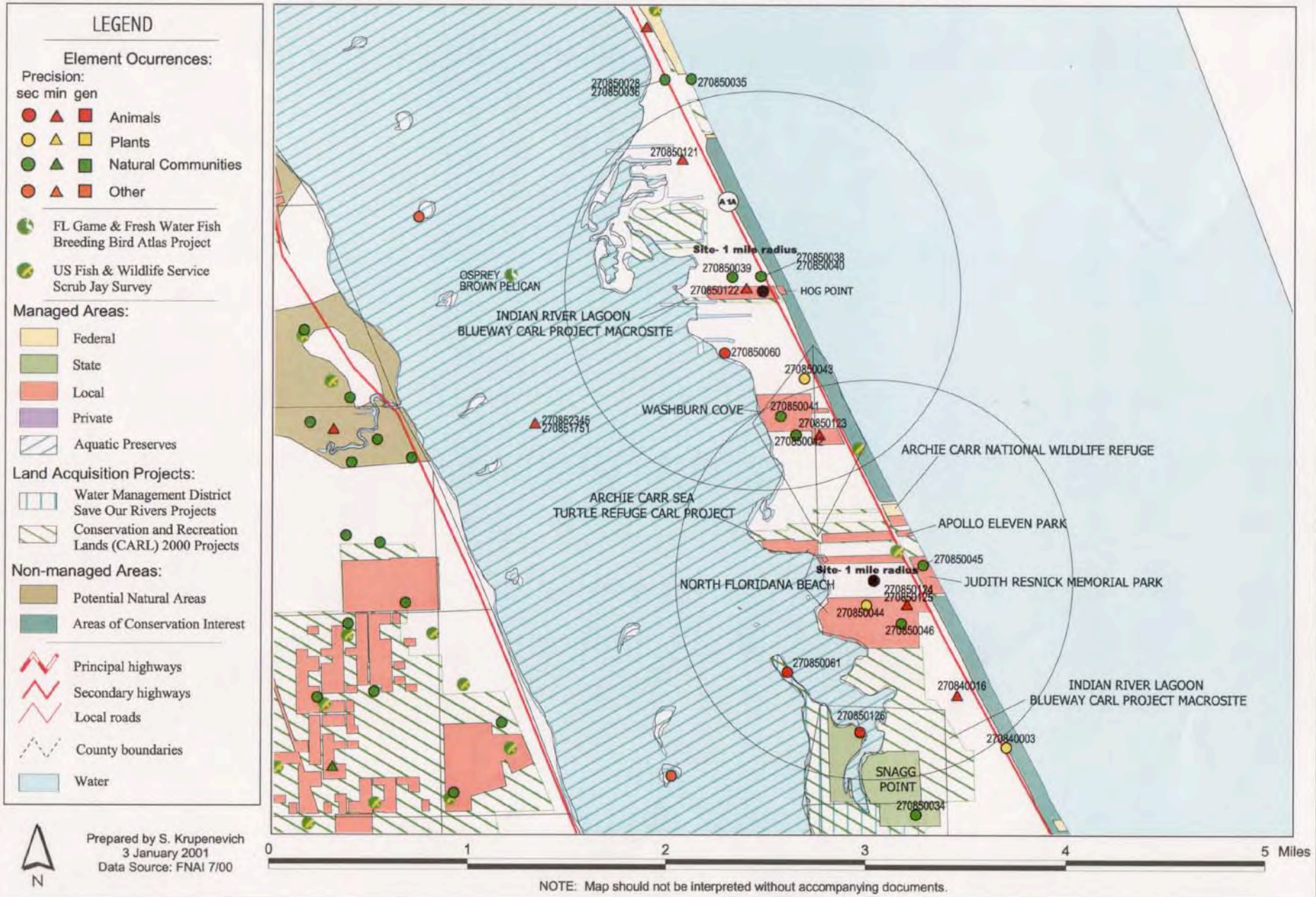
FFWCC=Florida Fish and Wildlife Conservation Commision
FWS=US Fish and Wildlife Service
SSC=Species of Special Concern
T(S/A)= Theatened (Similarity of Appearance)

FNAI

Florida Natural Areas Inventory

1018 Thomasville Road, Suite 200-C
Tallahassee, FL 32303
(850) 224-8207

Maritime Hammock Sanctuary and Hog Point Sanctuary, Brevard County



FNAI ELEMENT OCCURRENCE RECORDS ON OR NEAR SITE

GIS ID	SCIENTIFIC NAME	COMMON NAME	GLOBAL RANK	STATE RANK	FEDERAL STATUS	STATE STATUS	DATE OBSERVED	DESCRIPTION	COMMENTS
270840003	DATA SENSITIVE		G2	S2	N	LE	1983-07-26		
270840016	GOPHERUS POLYPHEMUS	GOPHER TORTOISE	G3	S3	(PS)	LS	1989-08	VACANT, WEEDY LOT IN RESIDENTIAL AREA.	ONE TORTOISE SEEN FEEDING BY STEPPING ON PLANT STALKS, BENDING THEM OVER AND EATING THE TOPS.
270850028	APHELOCOMA COERULESCENS	FLORIDA SCRUB-JAY	G3	S3	LT	LT	1991-07-15	COASTAL STRAND - PNDHAR03; STRAND DISTURBED BY CLEARING - F90JOH17.	RESIDENT: HARDENS HAVE OBSERVED SCRUB JAYS ON THE DISNEY SOUTH TRACT SINCE 1972 BUT HAVE NOT ATTEMPTED TO LOCATE NESTS. F90JOH17 - SAW THREE TAME JAYS IN DISTURBED PORTION OF STRAND (SOUTHERN). 1990-01-28: 1 JAY REPORTED; 1990-02-03: 4 JAYS REPORTED; 199
270850034	MARITIME HAMMOCK		G4	S2	N	N	1990-02-18	TALL OAK/PALM FOREST BORDERING MANGROVES. MANY EPIPHYTES. NOT TOO DIVERSE.	CANOPY 40-50' TALL: SABAL PALMETTO, QUERCUS VIRGINIANA, PERSEA BORBONIA, MORUS RUBRA. UNDERSTORY: RAPANEA PUNCTATA, MYRCIANTHES FRAGRANS, ERYTHRINA HERBACEA, SERENOA REPENS, ARDISIA ESCALLONIOIDES.
270850035	COASTAL STRAND		G3?	S2	N	N	1990-02-21	SAW PALMETTO STRAND WITH LOW CABBAGE PALMS PROTRUDING. SHRUBS MORE COMMON TOWARDS A1A. FOUR DISJUNCT PARCELS.	SERENOA REPENS-ABUNDANT; SABAL PALMETTO-OCCASIONAL; COCCOLOBA UVIFERA (X)-0; CHRYSOBALANUS ICACO 9X)-RARE; RAPANEA PUNCTATA (X)-0; FORESTIERA SEGREGATA-0; MYRCIANTHES FRAGRANS-0; BUMELIA TENAX-A; QUERCUS VIRGINIANA-0; PERSEA BORBONIA-0.
270850036	COASTAL STRAND		G3?	S2	N	N	1990-02-21	DENSE SPRAY PRUNED HEDGE OF TROPICAL AND TEMPERATE SHRUBS. FOUR DISTINCT PARCELS.	PERSEA BORBONIA-ABUNDANT; MYRCIANTHES FRAGRANS-A; QUERCUS VIRGINIANA-A; SERENOA REPENS (BLUE FORM)-OCCASIONAL; BUMELIA TENAX-A; FORESTIERA SEGREGATA-RARE; RAPANEA PUNCTATA (X)-0.
270850038	COASTAL STRAND		G3?	S2	N	N		DENSE "HEDGE" OF SHRUBS 5-8' HIGH ON W SIDE OF A1A GRADING INTO HAMMOCK TO WESTWARD.	PERSEA BORBONIA, BUMELIA TENAX, MYRICA CERIFERA, SERENOA REPENS (BLUE FORM), SABAL PALMETTO, MYRCIANTHES FRAGRANS, ZANTHOXYLUM CLAVA-HERCULIS, FORESTIERA SEGREGATA, RAPANEA PUNCTATA (X), ERYTHRINA HERBACEA (X).

FNAI ELEMENT OCCURRENCE RECORDS ON OR NEAR SITE

GIS ID	SCIENTIFIC NAME	COMMON NAME	GLOBAL RANK	STATE RANK	FEDERAL STATUS	STATE STATUS	DATE OBSERVED	DESCRIPTION	COMMENTS
270850039	MARITIME HAMMOCK		G4	S2	N	N	1990-02-21	OAK/PALM HAMMOCK EXTENDING TO MANGROVES ON LAGOON.	QUERCUS VIRGINIANA, SABAL PALMETTO, BURSERA SIMAROUBA (X). UNDERSTORY: TOXICODENDRON RADICANS, RAPANEA PUNCTATA (X), CALLICARPA AMERICANA, XIMENIA AMERICANA, ENCYCLIA TAMPENSIS, BUMELIA CELASTRINA, PSYCHOTRIA NERVOSA.
270850040	GLANDULARIA MARITIMA	COASTAL VERVAIN	G3	S3	N	LE	1990-02-21	FEW PLANTS ALONG S MARGIN OF N PIECE OF HAMMOCK.	PLANTS FLOWERING.
270850041	MARITIME HAMMOCK		G4	S2	N	N	1990-02-21	SHORT (15-25') OAK/PALM HAMMOCK PLUS EPIPHYTES.	CANOPY: QUERCUS VIRGINIANA (PLUS RESURRECTION FERNS, TILLANDSIAS, AND BUTTERFLY ORCHIDS), PERSEA BORBONIA, SABAL PALMETTO, ZANTHOXYLUM CLAVA-HERCULIS. UNDERSTORY: MYRCIANTHES FRAGRANS, RAPANEA PUNCTATA (X), EUGENIA FOETIDA (X), BUMELIA TENAX, SERENOA REP
270850042	MARITIME HAMMOCK		G4	S2	N	N	1990-02-21	TALL OAK/PALM HAMMOCK (35') WITH SCATTERING OF TROPICAL TREES (GUMBO LIMBO, INKWOOD).	CANOPY: QUERCUS VIRGINIANA, BURSERA SIMAROUBA, PERSEA BORBONIA, SABAL PALMETTO, EXOTHEA PARNICULATA. UNDERSTORY: TOXICODENDRON RADICANS, EUGENIA AXILLARIS, CHIOCOCCA ALBA (X), ENCYCLIA TAMPENSIS, NECTANDRA CORIACEA (X).
270850043	GLANDULARIA MARITIMA	COASTAL VERVAIN	G3	S3	N	LE	1990-02-21	CLEARING IN MARITIME HAMMOCK.	SEVERAL PROSTRATE PLANTS IN FLOWER AROUND CLEARING ADJ. TO ELECTRICAL INSTALLATION. SURROUNDING COMMUNITY IS COASTAL STRAND GRADING TO MARITIME HAMMOCK.
270850044	GLANDULARIA MARITIMA	COASTAL VERVAIN	G3	S3	N	LE	1990-02-22	PALM/OAK HAMMOCK GRADING TO STRAND TOWARD OCEAN AND TOWARD TALL PALM FOREST TOWARD LAGOON (MANGROVE FRINGE). SEMI-TROPICAL UNDERSTORY OF MARLBERRY, MYRSINE AND NAKEDWOOD.	SEVERAL PLANTS PROSTRATE ALONG SAND PATH ENDING S OF SEWAGE INSTALLATION FOR ST. MARKS LDG. DEVELOPMENT (BANKRUPT-FDIC). LAVENDER FLOWERS.

FNAI ELEMENT OCCURRENCE RECORDS ON OR NEAR SITE

GIS ID	SCIENTIFIC NAME	COMMON NAME	GLOBAL RANK	STATE RANK	FEDERAL STATUS	STATE STATUS	DATE OBSERVED	DESCRIPTION	COMMENTS
270850045	COASTAL STRAND		G3?	S2	N	N	1990-02-22	SAW PALMETTO E OF A1A GRADING TO SHRUB HEDGE E & W OF A1A (7-8' TALL).	SERENOA REPENS, SABAL PALMETTO AND COCCOLOBA UVIFERA(X) E OF A1A. PERSEA BORBONIA, MYRCIANTHES FRAGRANS, BUMELIA TENAX, QUERCUS VIRGINIANA, ZANTHOXYLUM CLAVA-HERCULIS, RAPANEA PUNCTATA (X) W OF A1A.
270850046	MARITIME HAMMOCK		G4	S2	N	N	1990-02-22	PALM/OAK HAMMOCK GRADING TO STRAND TOWARD OCEAN AND TOWARD TALL PALM FOREST TOWARD LAGOON (MANGROVE FRINGE). SEMI-TROPICAL UNDERSTORY OF MARLBERRY, MYRSINE AND NAKEDWOOD.	CANOPY: QUERCUS VIRGINIANA (WITH FERNS AND BUTTERFLY ORCHIDS); SABAL PALMETTO, PERSEA BORBONIA, MORUS RUBRA (RARE). UNDERSTORY: MYRCIANTHES FRAGRANS, BUMELIA TENAX, PSYCHOTRIA NERVOSA, ERYTHRINA HERBACEA, TOXICODENDRON RADICANS, SERENOA REPENS.
270850060	RIVULUS MARMORATUS	MANGROVE RIVULUS	G3	S3	(PS)	LS	1997	MANGROVE SWAMP.	SEVEN SPECIMENS CAPTURED IN DEC. 1989.
270850061	RIVULUS MARMORATUS	MANGROVE RIVULUS	G3	S3	(PS)	LS	1997	MANGROVE SWAMP.	TWO SPECIMENS CAPTURED IN NOV. 1990.
270850121	GOPHERUS POLYPHEMUS	GOPHER TORTOISE	G3	S3	(PS)	LS	1993	No data given in U93COA01FLUS.	Species reported as on-site by U93COA01FLUS; additional data needed.
270850122	GOPHERUS POLYPHEMUS	GOPHER TORTOISE	G3	S3	(PS)	LS	1993	No data given in U93COA01FLUS.	Species reported as on-site by U93COA01FLUS; additional data needed.
270850123	GOPHERUS POLYPHEMUS	GOPHER TORTOISE	G3	S3	(PS)	LS	1993	No data given in U93COA01FLUS.	Species reported as on-site by U93COA01FLUS; additional data needed.
270850124	GOPHERUS POLYPHEMUS	GOPHER TORTOISE	G3	S3	(PS)	LS	1993	No data given in U93COA01FLUS.	Species reported as on-site by U93COA01FLUS; additional data needed.
270850125	APHELOCOMA COERULESCENS	FLORIDA SCRUB-JAY	G3	S3	LT	LT	1993	No data given in U93COA01FLUS.	Species reported as on-site by U93COA01FLUS; additional data needed.
270850126	RIVULUS MARMORATUS	MANGROVE RIVULUS	G3	S3	(PS)	LS	1993-10-14	Un-impounded mangroves.	1993 - 1 fish collected at site; 1991 - 3 fish collected at site (PNDTAY05FLUS).
270851751	PELECANUS OCCIDENTALIS	BROWN PELICAN	G4	S3	(PS)	LS	1989-05-10	Cedar, palm, Australian pine.	1989/05/10: J.A. Hovis, GFC. Surveyed from helicopter. Site visited by plane on 04/28/89. "Total" = D (includes GREG, BRPE, DCCO).
270852345	ARDEA ALBA	GREAT EGRET	G5	S4	N	N	1989-05-10	Spoil Island with cedar, palm, Australian pine.	1989/05/10: J.A. Hovis, GFC; Surveyed from helicopter. Site visited by plane on 04/28/89. "Total" = D (includes GREG, BRPE, DCCO).

Meeting Date
November 14, 2006

AGENDA	
Section	CONSENT
Item No.	IB 9

AGENDA REPORT

BREVARD COUNTY BOARD OF COUNTY COMMISSIONERS

SUBJECT: Maritime Hammock Sanctuary Management Plan – District 3

DEPT. / OFFICE: Parks & Recreation Department
Environmentally Endangered Lands Program

Requested Action:

Approve the attached Maritime Hammock Sanctuary Management Plan under the Environmentally Endangered Lands Program.

Summary Explanation & Background:

The Maritime Hammock Sanctuary is a 166 ± acre site with portions purchased under the EEL Program referendum with a 50% reimbursement by the State, portions purchased entirely by the State (100%) and portions donated to the County by the Richard King Mellon Foundation. The State titled parcels are managed by the EEL Program through a lease agreement with the State of Florida (Amendments 1, 2 and 3, Lease Number 4177). The sanctuary is located in unincorporated south Melbourne Beach along State Highway A1A.

The Maritime Hammock Sanctuary Management Plan is being distributed in the form of compact disk to reduce paper use.

The accompanying management plan on CD outlines the land management activities proposed for the property. This site has been designated as a Category 2 site. As described in the Sanctuary Management Manual (Chapter 4.2.2 pg. 23), This site is an intermediate use site and will have some capital improvements. The site will be open during daylight hours and will have public access activities including hiking, environmental education, and wildlife observation. Management activities will primarily consist of removal of exotic plant species, and monitoring listed species.

EEL staff, the EEL Recreation Education Advisory Committee, and the EEL Selection & Management Committee have reviewed and approved the plan. Following Brevard County Board approval, EEL staff will present the plan to the State's Acquisition and Restoration Council for final approval.

Cost/Benefit Analysis: Proposed management activities will use EEL Program Funds (Fund 1617, Cost Center 300501). There are no impacts to General Revenue Funds. This action advances the conservation, environmental education and passive recreation goals of the EEL Program.

Contact: Mike Knight, EEL Program Manager, 255-4466 or mknight@brevardparks.com

Exhibits Attached:

- Maritime Hammock Sanctuary Management Plan on CD
- Sanctuary Map

Contract /Agreement (If attached): Reviewed by County Attorney	Yes ☐	No ☒

County Manager's Office	Department
Peggy Busacca, County Manager	Don Lusk, Interim Director, Parks and Recreation

BCC-149 (Rev. 7-98) / Electronic Form

BREVARD County
BOARD OF COUNTY COMMISSIONERS

FLORIDA'S SPACE COAST

TAMARA J. RICARD, Clerk to the Board, 400 South Street • P.O. Box 999, Titusville, Florida 32781-0999

Telephone: (321) 637-2001
Fax: (321) 264-6972

November 15, 2006

M E M O R A N D U M

TO: Don Lusk, Interim Parks and Recreation Department Director, Attn: Mike Knight

RE: Item I.B.9, Maritime Hammock Sanctuary Management Plan

The Board of County Commissioners, in regular session on November 14, 2006, approved the Maritime Hammock Sanctuary Management Plan, outlining the land management activities for the property, under the Environmentally Endangered Lands Program.

Your continued cooperation is greatly appreciated.

Sincerely yours,

BOARD OF COUNTY COMMISSIONERS
SCOTT ELLIS, CLERK

Tamara Ricard

Tamara Ricard, Deputy Clerk

/crc

Orig. Mike - EEL
CC: Mr. Lusk
Agenda file
Clerk file
EEL file