

Hog Point Cove Sanctuary Management Plan



Brevard County Board of County Commissioners
Environmentally Endangered Lands Program
February 09, 2010

**HOG POINT COVE SANCTUARY
MANAGEMENT PLAN**

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I. EXECUTIVE SUMMARY

The Hog Point Cove 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 Hog Point Cove Sanctuary is comprised of several properties that encompass approximately 17.8 acres, located 7 miles south of the Melbourne Causeway (US 192) on State Road A1A in the City of Melbourne Beach, Florida. All of the 17.8 acres are located west of State Road A1A and consists of disturbed and undisturbed maritime hammock. Assessments of flora and fauna utilizing this habitat are ongoing.

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 and treatment of exotic plants and restoration of the sanctuary is ongoing. Native vegetation is recruiting into the disturbed areas that were cleared of exotic plants.

The Hog Point Cove Sanctuary, along with the other EEL properties in the South Beaches Regional Management Area is served by an EEL Center for Regional Management at the Barrier Island Center (BIC), located 7 miles south of the Hog Point Cove Sanctuary. The goals of the Hog Point Cove Sanctuary are to preserve unique and essential barrier island habitat as well as promote research and educational opportunities. The three main parcel groups are categorized individually due to their varied land-use history. The northernmost parcel (HPC-1) is a modified Category I site, meaning it will be utilized for research purposes. The proposed Hog Point Cove Field Station will be housed on the foundation of a preexisting structure to ensure minimal infringement on undisturbed habitat. Faculty from the Florida Institute of Technology as well as local NGOs have already expressed interest in utilizing the field station for research purposes. The two southern parcels (HPC-2 and HPC-3) are Category III sites, meaning they will undergo minimal improvements and function as conservation land. These sites are too small for public access but aid in connecting other local and federal conservation habitat in the area. The EEL program plans to coordinate management practices with these neighboring conservation lands in order to more effectively preserve habitat function.

The EEL Program looks to address both short term and long term needs of Hog Point Cove Sanctuary. This includes assessment and management of the ongoing spread of Laurel Wilt Disease in Red Bay Trees as well as the eventual problems that will arise from climate change and sea level rise.

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.

In addition to the conservation principles, this management plan provides specific goals, strategies and actions to guide management of the Hog Point Cove 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 Hog Point Cove 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 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 the Refuge in Brevard County represent the northern extent of leatherback turtle nesting areas in the United States (Brevard County EEL Program, 1995a).

The Hog Point Cove Sanctuary consists of 17.8 acres, and is located 7 miles south of the Melbourne Causeway (US 192) and south of the town of Melbourne Beach, Florida (Section 3/4, Township 29, Range 38 East), as shown in Figure 1. The sanctuary is comprised of fourteen parcels whose tax ID's are 29-38-03-00-250, 29-38-03-00-264, 29-38-03-00-251, 29-38-03-00-278, 29-38-03-00-277, 29-38-03-00-276, 29-38-03-00-275, 29-38-03-00-274, 29-38-03-00-273, 29-38-03-00-271, 29-38-03-00-268, 29-38-03-00-267, 29-38-03-00-258, and 29-38-03-00-260 (Figure 2). The legal descriptions of the parcels are attached as Appendix A. The EEL Program acquired the fourteen parcels of the Hog Point Cove Sanctuary as a donation from the Richard King Mellon Foundation along with other parcels in 2002.

All parcels of the Hog Point Cove Sanctuary (HPC) are bounded to the east by A1A, and to the west by the Indian River Lagoon. Figure 3 outlines the conservation lands adjacent to the property and the fourteen parcels which make up the Sanctuary. The parcels make up three non-contiguous blocks of land, and are referred to as HPC-1 through HPC-3. The northern collective parcel, HPC-1, comprises 29-38-03-00-250, 29-38-03-00-264, and 29-38-03-00-251. HPC-1 is bounded to the north by a U.S. Fish and Wildlife parcel and to the south by residential homes. The center parcel, HPC-2, comprises 29-38-03-00-278, 29-38-03-00-277, 29-38-03-00-276, 29-38-03-00-275, 29-38-03-00-274, 29-38-03-00-273, and 29-38-03-00-271. HPC-2 is bounded to the north and south by residential homes. The southern parcel, HPC-3, comprises 29-38-03-00-268, 29-38-03-00-267, 29-38-03-00-258, and 29-38-03-00-260. HPC-3 is bounded to the north and south by residential homes. The lands directly east of the Hog Point Cove Sanctuary are several conservation land parcels, some owned by U.S Fish and Wildlife and by the State of Florida. These undisturbed tracts of land can act as a wildlife corridor, essentially linking all of the Hog Point Cove parcels.

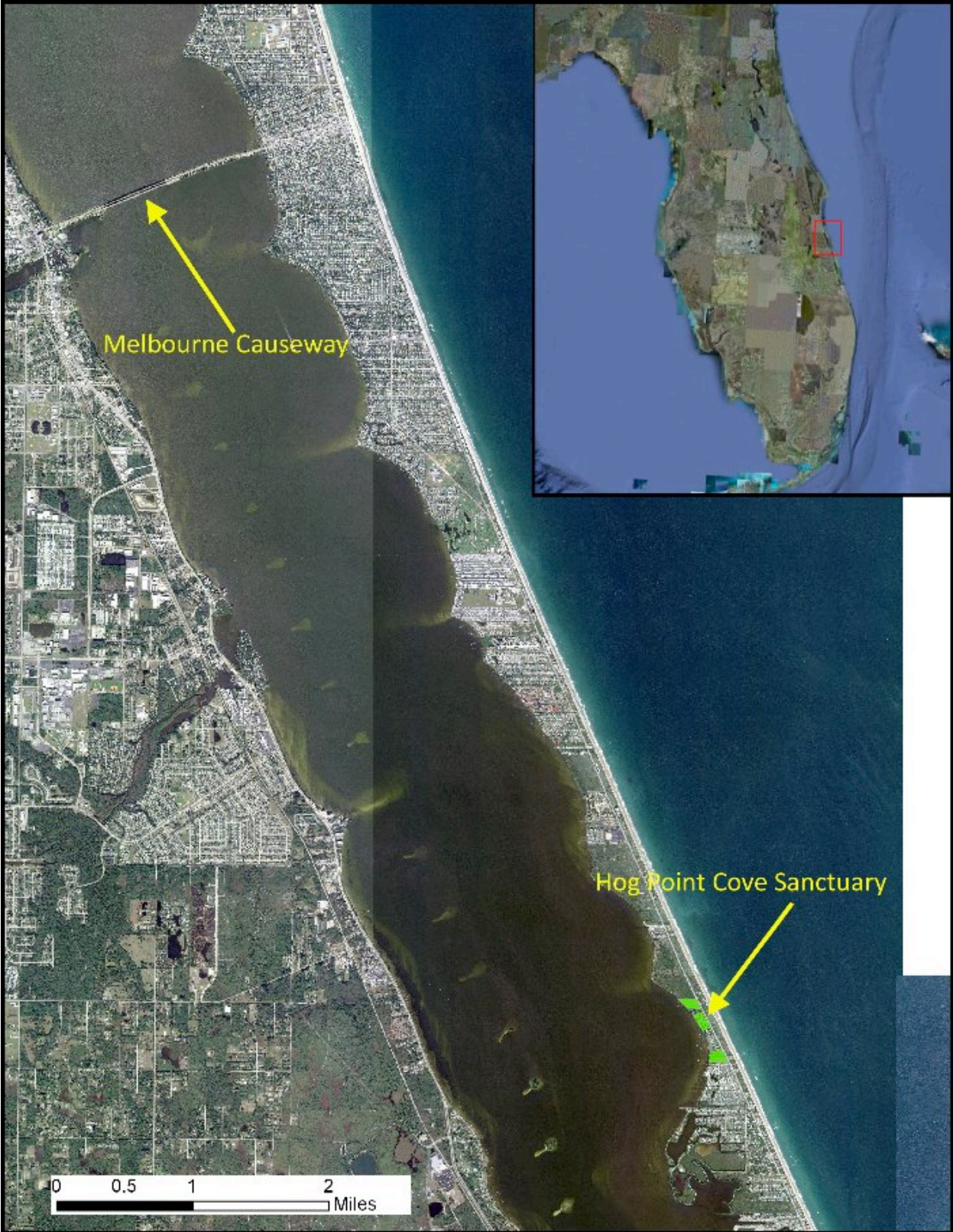


Figure 1. Location of Hog Point Cove Sanctuary



Figure 2. Hog Point Cove Sanctuary parcels and Tax ID's.



Figure 3. Hog Point Cove 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 Hog Point Cove 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, and the dry season between November and April. Annual and seasonal rainfall are 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 Hog Point Cove 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 ridge and swale topography with some ridge elevations in excess of 30 feet (Parkinson, 1995; Parkinson and White, 1994). Maximum elevations at the Hog Point Cove Sanctuary are 20 feet above mean sea level.

At present, the coastal processes that lead to the development of the geomorphology at the Hog Point Cove 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 Hog Point Cove Sanctuary has a relatively simple topography with elevations up to 15' National Geodetic Vertical Datum (NGVD) on a ridge immediately west of SR A1A (Figure 4). The land slopes off towards the lagoon with a 5-foot line 200 feet west of A1A. The sloping of land from the 15-foot ridge towards the lagoon is linear on HPC-1 and HPC-3. HPC-2, however shows elevation irregularities along the 15-foot line along Highway A1A, then slopes downward toward the lagoon linearly. Onsite topography has also been altered somewhat by past land use on HPC-1.

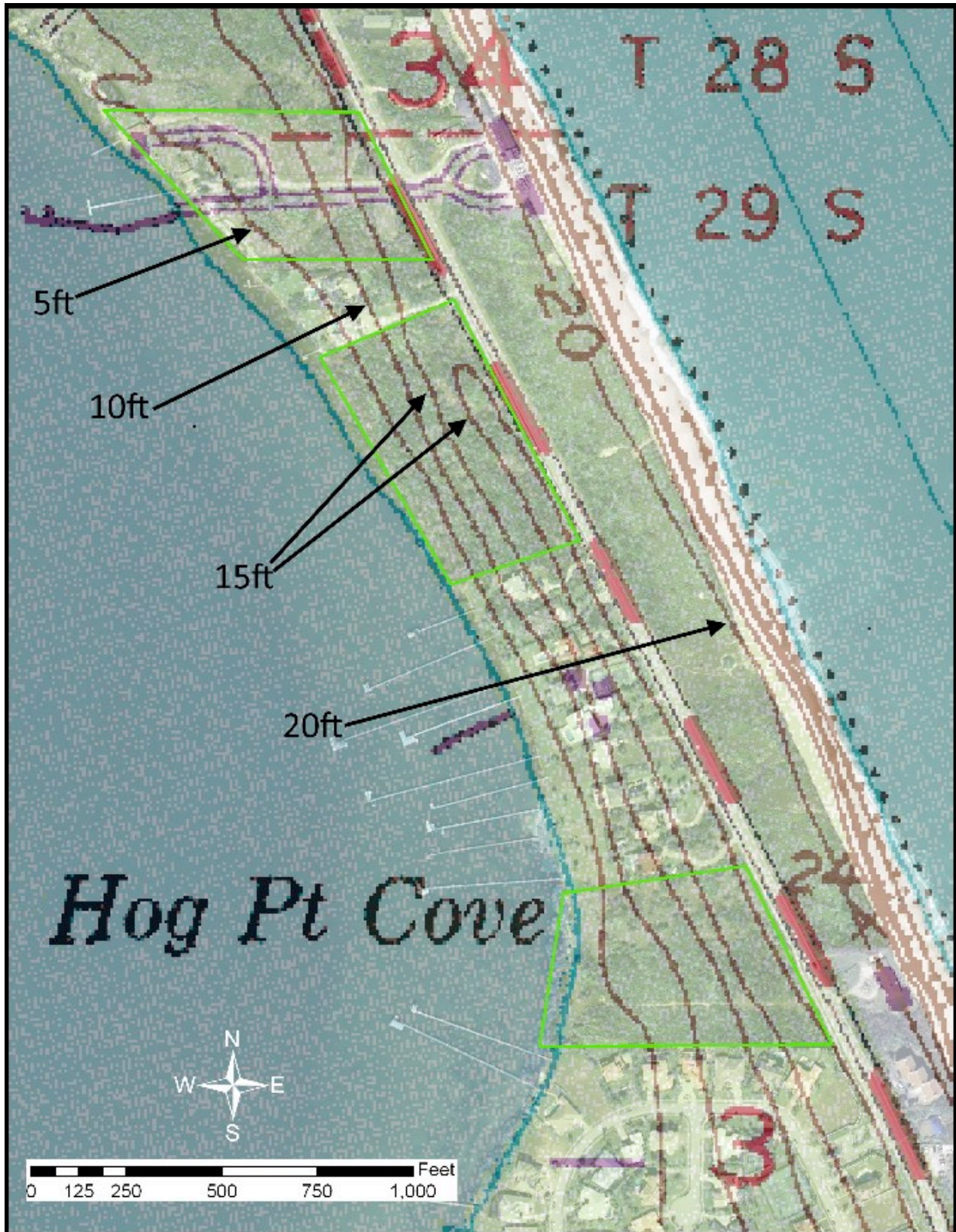


Figure 4. Topography of Hog Point Cove Sanctuary

4. Soils

The Natural Resource Conservation Service (formerly the Soil Conservation Service) describes the soils within the Hog Point Cove Sanctuary (Figure 5) as listed:

Palm Beach sand (Pb)

Welaka sand (We)

Pomello sand (Ps)

(Source: Huckle et al., Soil Survey of Brevard County, Florida, 1974)

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.

Pomello sand (Ps) is classified as nearly level, moderately well drained sandy soil on broad low ridges and low knolls. The soil is composed of old beds of marine sand in weakly cemented layers.

Welaka sand (We) is classified as a nearly level, well drained sandy soil on moderately broad ridges interspersed with long narrow sloughs. The water table is usually below 5 ft in depth.

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 Hog Point Cove Sanctuary conserves valuable water recharge areas for this region.

In addition to the hydrologic impacts due to SR A1A, HPC-1 has been altered by the clearing of vegetation, construction of buildings, and the creation of a small retention pond for use in clam farming. Exotic vegetation clearing and removal have occurred on HPC-1, HPC-2, and HPC-3.

All of the Hog Point Cove 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).

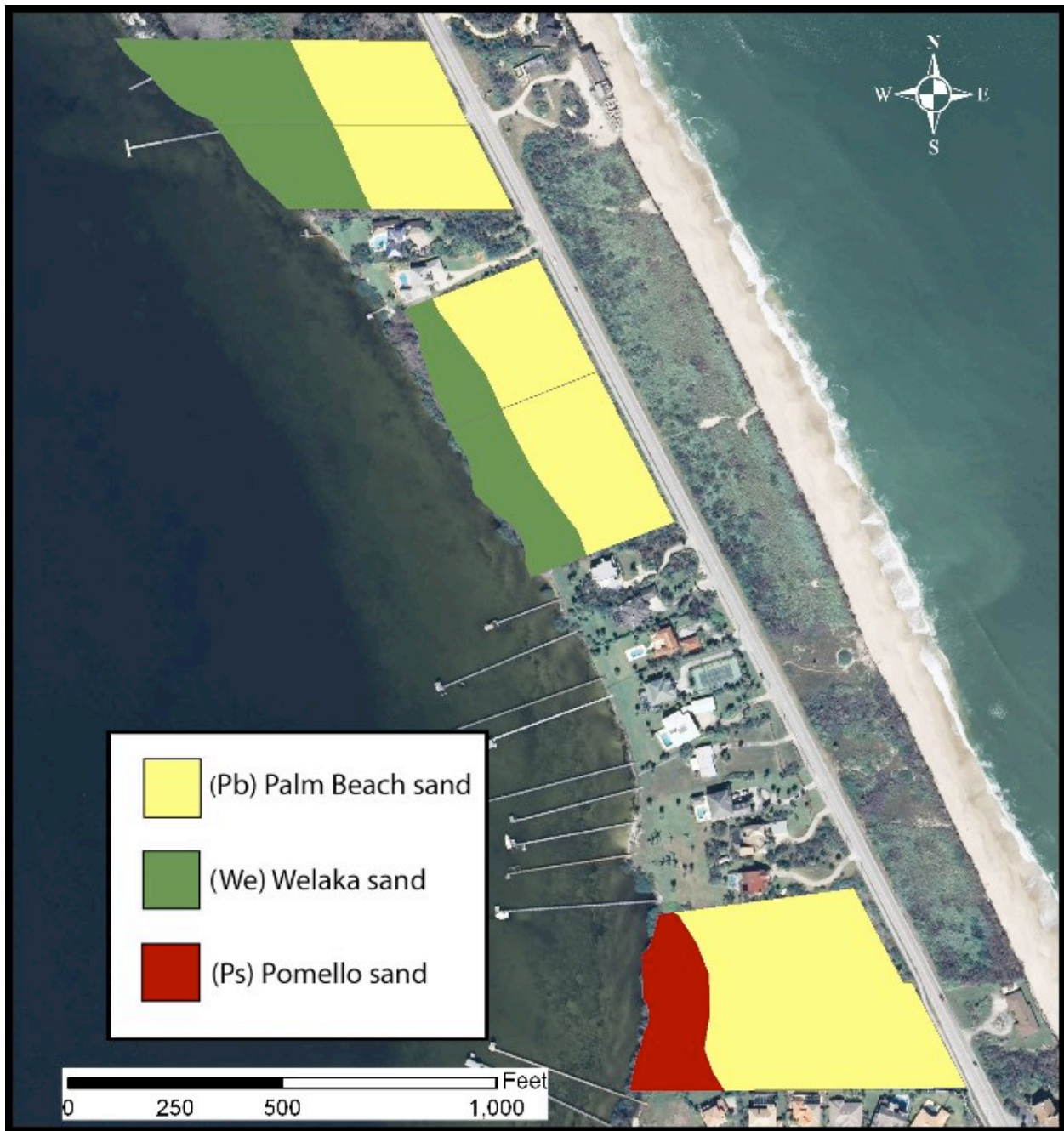


Figure 5. Hog Point Cove Sanctuary Soils

B. Biological Resources

1. Ecosystem Function

The Hog Point Cove Sanctuary consists of disturbed and relatively undisturbed maritime hammock habitats located west of Highway A1A. Years of natural fire suppression have caused the maritime hammock habitat to slowly migrate westward over previous coastal strand and scrub, now bordering Highway A1A. These habitats are typical for a barrier island ecosystem in a tropical environment that grades from the ancient dune to the Indian River Lagoon. Though HPC-1 has been disturbed over the past 60 years by land clearing and construction, HPC-2 and HPC-3 have remained relatively unaltered with the exception of exotic plant introduction and subsequent removal.

2. Flora

Development and clearing on HPC-1 allowed heavy colonization of the invasive exotic plant Brazilian pepper (*Schinus terebinthifolius*) and to a lesser extent Australian pine (*Casuarina equisetifolia*). Since HPC-2 and HPC-3 underwent less land clearing, exotic species were unable to gain as large a foothold. Exotic Removal began in July 2004 on HPC-1, removing almost exclusively Brazilian pepper using a Brontosaurus Mower (Figure 6). Brazilian pepper was also removed from HPC-2 and HPC-3 in early 2005. Follow-up herbicide treatments continue to present on all parcels.

In 2008, Nichole Perna, Assistant Land Manager of the South Beach Region generated a plant list of Hog Point Cove Sanctuary (Appendix B). The entirety of Hog Point Cove Sanctuary is listed as disturbed and undisturbed maritime hammock habitat (Figure 7). HPC-1 consists of both disturbed and undisturbed habitat, while HPC-2 and HPC-3 are mostly undisturbed. Undisturbed areas consist largely of sabal palm (*Sabal palmetto*), live oak (*Quercus virginiana*), and red bay (*Persea borbonia*). Undisturbed habitats in HPC-2 and HPC-3 typically begin along Highway A1A as salt pruned saw palmetto (*Serenoa repens*) and quickly grade into maritime hammock plants.

Disturbed areas consist of vine-like or low lying plants, sometimes draping over deadwood. Percentage of disturbed areas for HPC-1 HPC-2 and HPC-3 are approximately 60%, 4% and 40% respectively. HPC-1 has been heavily colonized by bracken fern (*Pteridium aquilinum*) as well as pennywort (*Hydrocotyle sp.*) and southern cattail (*Typha domingensis*) around the man-made pond. The disturbed areas of HPC-2 and HPC-3 contain plants more indicative of maritime hammock like wild coffee (*Psychotria nervosa*) and juvenile red bay and live oak.

A fringe of predominately red mangroves (*Rhizophora mangle*) exist along the Indian River Lagoon on HPC-2 and HPC-3 as well as white (*Laguncularia racemosa*) and black (*Avicennia germinans*) mangroves in lesser numbers. The shoreline of HPC-1 is mostly bare, possibly from previous development or changes in hydrology. An attempt was made in July 2007 to supplement natural red mangrove recruitment in the area through use of a PVC planting method

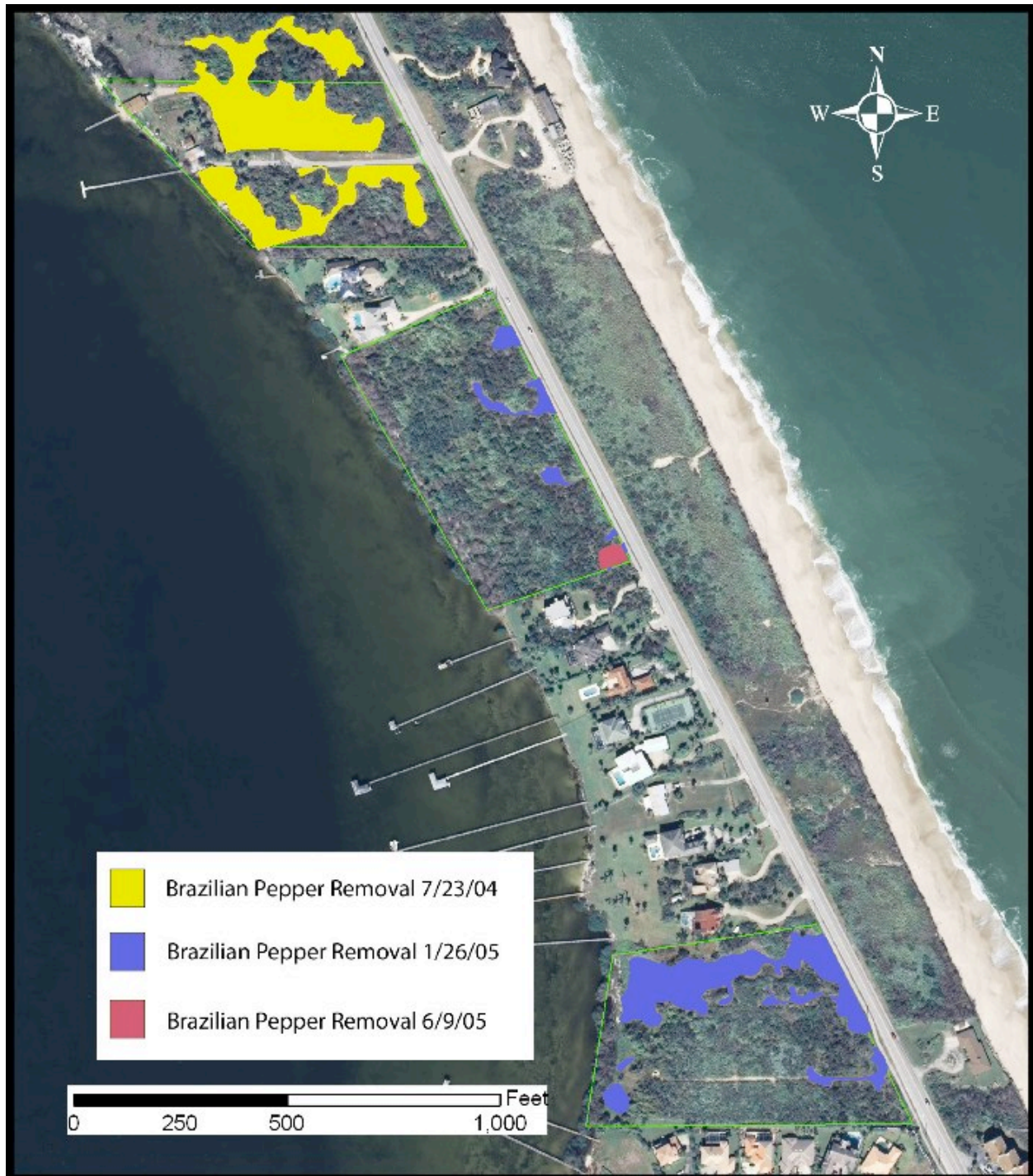


Figure 6. Hog Point Cove Sanctuary Brazilian Pepper removal.



Figure 7. Natural communities of Hog Point Cove Sanctuary and adjacent properties.

(Figure 8). EEL staff continues to monitor and maintain the encasements in conjunction with Florida Department of Environmental Protection's Shoreline Restoration Project Division.

The EEL Program is dedicated to the long-term removal of invasive exotic plants from within the Hog Point Cove 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

No formal faunal surveys have been conducted on the Hog Point Cove Sanctuary. Gopher tortoise burrows have been noted on HPC-1. Scat and tracks of a large cat, most likely a bobcat (Lynx rufus), have also been found on HPC-1 indicating at least some habitat utilization. Other mammals observed on site (Appendix C) include the common racoon (Procyon lotor) and eastern spotted skunk (Spilogale putorius).

General bird and insect surveys have been conducted (Appendices D&E) but only serve as a baseline from which more extensive research may be built. Detailed faunal surveys are an initial goal of the EEL Program for the Hog Point Cove Sanctuary.

4. Designated Species

Animals

The gopher tortoise (Gopherus polyphemus), and the Florida Scrub Jay (Aphelocoma coerulescens) have been documented in the area by the Florida National Areas Inventory (Appendix F). More recent surveys on the southern barrier island have documented a decline in Scrub Jay Populations (Breininger, 1999). Wading birds known to utilize the habitat, particularly along the Indian River Lagoon include; the Little Blue Heron (Egretta caerulea), Snowy Egret (Egretta thula), White Ibis (Eudocimus albus), Brown Pelican (Pelecanus occidentalis) and Roseate Spoonbill (Ajaia ajaja). In addition, the endangered green (Chelonia mydas) and loggerhead (Caretta caretta) and leatherback (Dermochelys coriacea) sea turtles are known to nest on adjacent beaches east of the Sanctuary.

Plants

In October 2005, Paul Schmalzer conducted a rare plant survey at Hog Point Cove Sanctuary, identifying the native Florida shrub verbena (Lantana depressa var. floridana) as well as the exotic shrub verbena (Lantana camara) (Schmalzer and Foster 2005). Since native and exotic Lantana are capable of hybridizing, exotic control must be diligent. All three types of mangroves occurring in Florida are found within the sanctuary and are protected under The Mangrove Trimming and Preservation Act of 1996.



Figure 8. Red Mangrove plantings along northern Hog Point Cove Sanctuary parcel.

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.

5. Biological Diversity

Aside from the limited 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

The Inventory and Assessment of Cultural Resources in the Archie Carr Sea Turtle Refuge (Glowacki & Newman, October 2003) revealed no archaeological sites within the borders of Hog Point Cove Sanctuary.

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 National Wildlife Refuge. One shell midden (burial mound) is located on the Hog Point Sanctuary.

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 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, marsh impoundment) lowered the mosquito population to acceptable levels (Barille, 1988).

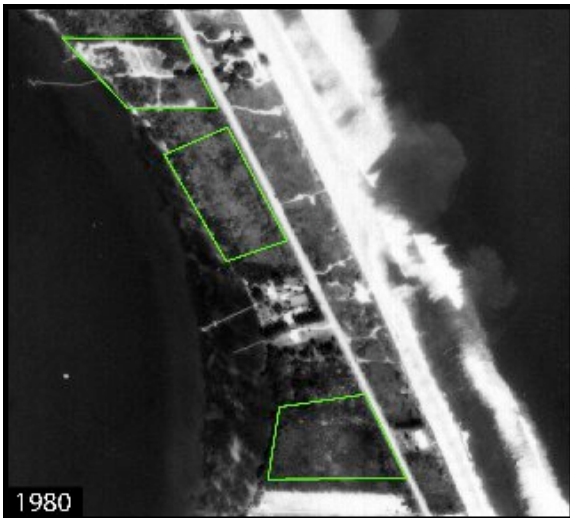
The 1920s ushered in a boom in real estate throughout Florida. Construction of new roads, such as Dixie Highway (US1), and increasing popularity of automobiles brought many residents to Brevard County. It was during this time bridges were built in Titusville, Cocoa, Eau Gallie, and Melbourne providing more access to the barrier islands. Other "modern" conveniences such as telephone service and air conditioning made the area even more appealing (Shofner 1996).

Finishing the 1920s was the stock market crash of 1929 and the ensuing Great Depression. During this time real estate stagnated, forcing Brevard County into ownership of 87% of the land through loan defaults. It was not until 1940, and the beginnings of World War II that Brevard Counties economy began to recover. World War II brought about development of Cape Canaveral's military and naval installations. (Shofner 1996).

Following the war, boating as well as commercial and recreation fishing became a big draw to Brevard County. By the late 1940s Sebastian Inlet was stabilized much to the delight of commercial fisherman, who were reporting catches of 2,000,000 pounds of fish per year. Cape Canaveral became the site for NASA in 1958, accompanying an economic and population boom throughout the 1950's. During the next few decades, improved transportation and a booming tourism industry slowly transformed Florida into the residential and recreational destination it is today (Shofner 1996).

3. Land-use History

The availability of aerial photographs beginning in 1951 provides a glimpse into the land-use history of the Hog Point Cove Sanctuary, (Figure 9). In 1951, Highway A1A was running north/south along the Atlantic Ocean, at this time the northern half of HPC-1 was cleared of



Note: Images courtesy of Florida Department of Transportation

Figure 9. Hog Point Cove historic aerial photographs

vegetation, but no structures yet existed. The southern half of the parcel was still relatively undisturbed coastal strand. A structure was located east of HPC-1 and Highway A1A along with coastal strand and beach habitat. Both HPC-2 and HPC-3 were composed of dense, undisturbed coastal strand. The land between HPC-2 and HPC-3 had been cleared but no structures existed yet. It appears a small part of the northeast corner of HPC-3 was cleared during this event. By 1972, there were three structures and two docks extending into the water on the previously cleared portion of HPC-1. HPC-2 and HPC-3 both remain unchanged during this time. Two structures were located several hundred feet north of HPC-3 as well as another structure east of Highway A1A. The 1980 aerial photo reveals little change to Hog Point Cove or surrounding landscape with the exception of two new trails running into the previously undisturbed section of HPC-1.

Between 1980 and 1993 there were few additional impacts to the site with the exception of a small trail on HPC-3 in 1986 and a vehicle trail on HPC-2 in 1989. The surrounding area however saw an increase in residential development beginning in 1983 when land was cleared along the southern border of HPC-3. In 1989, additional structures were built east, northeast, and south of HPC-2. Then in 1993 additional structures were added both north and south of HPC-3.

Aside from development on the northern section of HPC-1 and trails on HPC-2 and HPC-3, Hog Point Cove Sanctuary has remained relatively unchanged since 1951. Removal of exotics began in 2004 and was completed 2005 throughout the sanctuary. 2006 aerials show sites of exotic removal in the early stages of regrowth. Continued monitoring and removal of exotics is an ongoing goal of the EEL program.

4. Public Interest

Public interest in the Hog Point Cove Sanctuary has been limited to HPC-1, most notably the clam farm structure and lagoon bottom oyster lease. Several faculty members from The Florida Institute of Technology have expressed interest in transforming the site into a field station for mesocosm studies and student research. The proposed Hog Point Cove Field Station would house wetlabs and limited environmental education such as guided tours. Additional partners in the management and maintenance of the sanctuary include the U.S. Fish & Wildlife Service, the Florida Fish and Wildlife Conservation Commission, Brevard County Parks and Recreation, and local universities. The Archie Carr National Wildlife Refuge is 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.

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. Dune loss due to storm surge or human activity can greatly affect the back dune, coastal strand and maritime hammock communities.

Large scale natural trends such as sea level rise and climate change must also be taken into consideration. While the exact severity and timeline of these changes are uncertain, the Intergovernmental Panel on Climate Change predicts rises in sea level of up to 0.59 m by 2099. Changes in climate are expected to disrupt spring timed events such as leaf unfolding, bird migration and egg laying. Many plant and animal species limited in range by climate are predicted to move upward and poleward as temperature increases (IPCC Fourth Assessment 2007).

B. HUMAN-INDUCED TRENDS

The mild sub-tropical climate and easy access to major population centers make 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 location of Route A1A has obvious influences on the survivorship of designated species such as gopher tortoises. 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 is the only issue that altered this ecosystem more 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 Wildlife 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.

In the past, trespassing has been observed on all three parcels, most notably on HPC-1 where individuals would access the dilapidated clam farm dock. Small trails and scattered garbage were found on HPC-2 and HPC-3, possibly used by residents for access to the lagoon. Since the implementation of a caretaker on HPC-1, trespassing has been dramatically reduced, most notably indicated by the regrowth and closure of trails on HPC-2 and HPC-3. Minor encroachments by adjacent land owners in the form of dumping yard waste are dealt with immediately.

D. LEGAL OBLIGATIONS AND CONSTRAINTS

Accompanying the three parcels of Hog Point Cove Sanctuary are two oyster leases (Lease no. 795 and no. 635) totaling 74 acres (Figure 10). These submerged land leases occupy lagoon bottom west of Hog Point Cove Sanctuary, bordering land at HPC-1. Care must be taken to ensure proper usage as stated within the boundaries and allowances of the lease agreement. There are no plans to manage these leases as shellfish grow out locations though it is hoped that they can be managed for research purposes.

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 Hog Point Cove 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) were targeted through grants under the Florida Department of Environmental Protection's Bureau of Invasive Plant Management. The initial treatment of exotic plants was completed in 2005 and will continue with routine monitoring and maintenance treatments using EEL Program funds. The exotic shrub verbena (Lantana camara) has also been observed on site and special care must be taken to prevent hybridization with native species (Lantana depressa var. floridana).

2. Exotic Animal Species

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

The red bay tree (Persea borbonia) is found throughout the Hog Point Cove Sanctuary. An infestation by the non-native redbay ambrosia beetle (Xyleborus glabratus) has been observed within the sanctuary and into several counties in Florida. Once the redbay beetle bores into a living red bay tree, a fungus found within the beetle infects the host tree, eventually killing it. The disease, known as laurel wilt, then spreads when redbay beetles move to neighboring

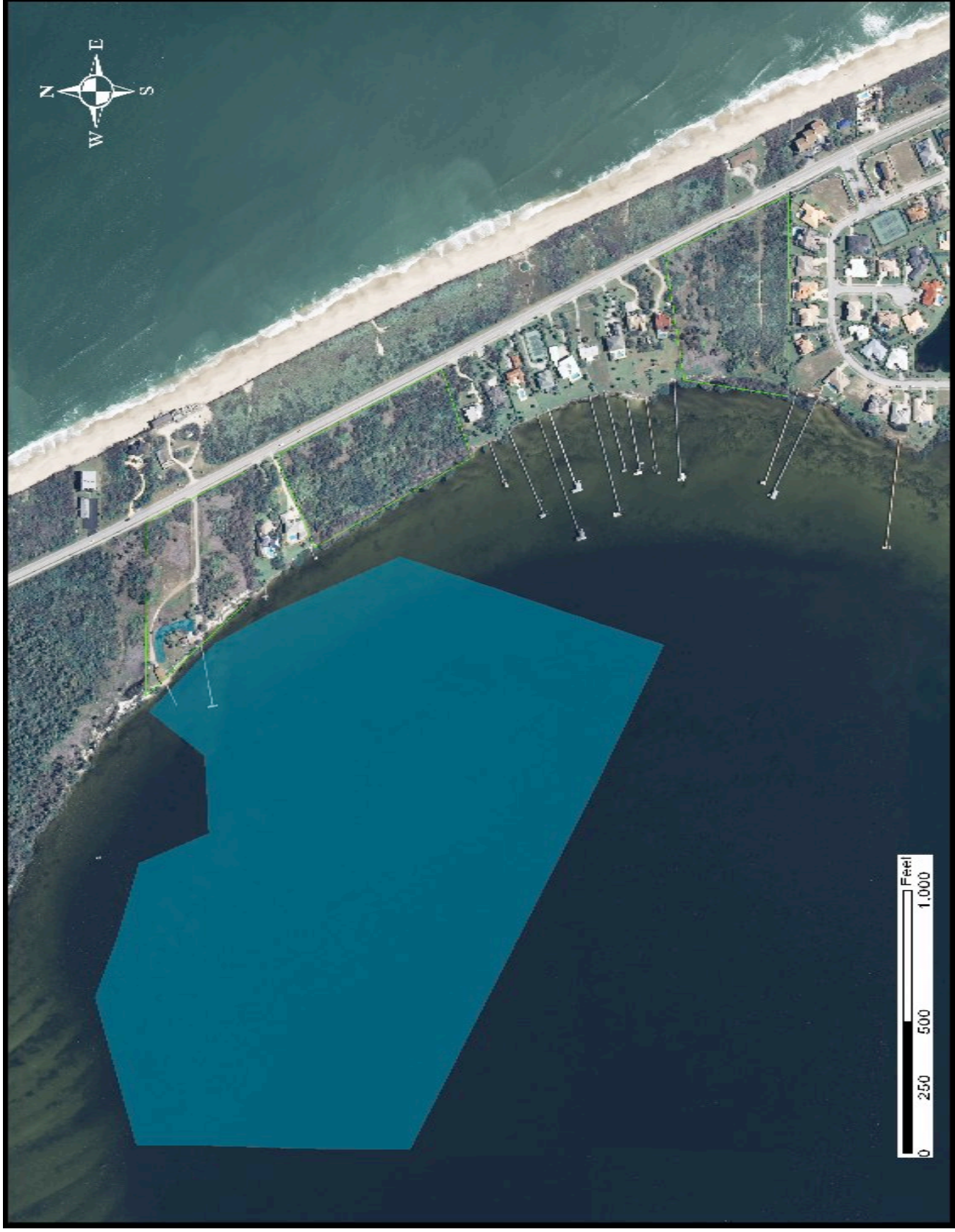


Figure 10. Combined lagoon bottom lease (Lease no. 795&635) accompanying Hog Point Cove Sanctuary.

trees. All three parcels of Hog Point Cove Sanctuary and surrounding conservation lands have experienced canopy loss due to Laurel Wilt Disease. Assessments of total canopy loss and control methods are an initial goal of the EEL Program for Hog Point Cove Sanctuary.

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 fragmented nature and varied land use of Hog Point Cove Sanctuary requires each parcel to be classified individually under the SMM. HPC-1 is considered a modified Category I site, which means the site will be developed for educational and research purposes. HPC-1 is ideal for this because the existing clam farm structure allows for construction of the Hog Point Cove Field Station with minimal impact on undisturbed habitat. Along with research opportunities with Florida Institute of Technology and NGOs, the site will also accommodate environmental education (i.e. guided tours). HPC-2 and HPC-3 are classified as Category III sites, meaning they will be left undisturbed in order to preserve essential habitat and environmental resources. The small and fragmented nature of these parcels makes them unsuitable for development or public use. The Recreation and Education Advisory Committee (REAC) of the EEL Program reviewed and approved the public access plan on August 10th, 2006 (Appendix G).

VI. MANAGEMENT ACTION PLANS

The following is a comprehensive outline of the goals, strategies and actions necessary to manage the Hog Point Cove Sanctuary.

A. GOALS

The *Sanctuary Management Manual* of the EEL Program provides the following management goals for EEL sanctuaries, which apply to the Hog Point Cove 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)
- Preservation 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 Hog Point Cove 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 Hog Point Cove 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: Assess the risks and benefits of implementing a “natural” fire management program

Actions:

- Identify natural communities that may 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

Strategy 5: Assessment and management of Red Bay loss from Laurel Wilt Disease

Actions:

- Assess total canopy loss and remaining unaffected trees
- Determine how loss in Red Bays affect fire management
- Research into fungicide mitigation methods

- Implement management strategies where appropriate (removal, burial/burning of infected trees)

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

Strategy 6: 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 such as removal of exotic/nuisance species (i.e. non-native lantana), 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 7: Survey of archaeological and historical sites within the Hog Point Cove Sanctuary.

Actions:

- Review the State Division of Historic Resources Phase I Assessment of the historical and archaeological sites within the Hog Point Cove Sanctuary
- Review available maps and historic records for indications of past usage of the site
- Map all archaeological and historic sites for future reference
- Limit public access to these sites by fencing access points and by continuous monitoring of sanctuary.

GOAL: ASSURANCE OF GENERAL UPKEEP AND SECURITY OF THE PROPERTY

Strategy 8: 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;
- Employ a caretaker to monitor the sanctuary and its facilities
- 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.

GOAL: PROVISION FOR LIMITED RESEARCH AND EDUCATION FACILITIES

Strategy 9: Where appropriate repurpose pre-existing clam farm facility to be used by researchers at local universities

Actions:

- Develop management agreement with Florida Tech to promote research
- Develop management agreement with NGOs to promote education
- Investigate potential uses of man-made pond and lagoon bottom oyster lease as research resources

GOAL: COORDINATE MANAGEMENT PRACTICES WITH NEIGHBORING CONSERVATION PROPERTIES

Strategy 10: Work with other land management agencies through the Archie Carr Working group to effectively manage parcels with an eye towards habitat/species specific goals and regional connectivity.

Actions:

- Open communication between neighboring conservation landowners
- Compare management goals, strategies, and results
- Coordinate efforts to focus on connectivity between land parcels to better manage barrier island ecosystem

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 Hog Point Sanctuary.

<u>ACTION</u>	<u>TIMELINE</u>
Strategy 1: Document historic public use	
Collect historic use information	Complete
Evaluate use a impacts on resources	Complete
Consider historic use in future planning	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	Complete
Research connection of on-site natural resources with adjacent resources	On-going
Research hydrologic patterns on and off-site	Complete
Research native species movement patterns on and off site	On-going
Focus on natural community restoration efforts on enhancing native diversity	On-going
Investigate hydroperiod and restore natural hydrologic patterns	Long Term
Strategy 3: Restore degraded, disturbed, or altered uplands within the Hog Point Cove Sanctuary	
Conduct monitoring to establish baseline conditions within the upland communities	On-going
Collect historic information regarding prior upland communities that may have occurred on-site	Complete
Consult local experts and current literature regarding best scientific methods for upland restoration	Short Term
Prioritize the upland communities in need of restoration	Complete
Identify appropriate restoration activities	On-going
Assess possible impacts of proposed restoration on adjacent communities and off-site properties	Short Term
Implement the selected restoration activities	Short Term
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: Asses the risks and benefits of implementing a “natural” fire management program	
Identify natural communities that may require prescribed fire management	Immediate
Identify and evaluate individual proposed burn management units	Short Term
Identify the goal of the application of fire to each proposed burn unit	Short Term
Document listed species within each burn unit	Short 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: Assessment and Management of Red Bay loss due to Laurel Wilt Disease	
Assess total canopy loss and remaining unaffected trees	On-going
Determine how loss in Red Bays affect fire management	Immediate
Research into fungicide mitigation methods	Short Term
Implement management strategies where appropriate (removal, burial/burning of infected trees)	Long Term
Strategy 6: 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	Immediate
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	Short Term
Implement habitat restoration activities such as removal of exotic/nuisance species (i.e. non-native lantana), restoration of ecosystem function	On-going
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	On-going
Strategy 7: Survey of archaeological and historical sites within the Hog Point Cove Sanctuary.	
Review the State Division of Historic Resources Phase I Assessment of the historical and archaeological sites within the Hog Point Cove Sanctuary	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

Limit public access to these sites by fencing access points and by continuous monitoring of sanctuary.	Complete
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
Employ a caretaker to monitor the sanctuary and its facilities	Complete
Contract with Brevard County, Parks and Recreation for maintenance of parking areas, fire breaks, trails, boardwalks, bridges, benches etc.;	Complete
Coordinate daily maintenance tasks using staff and volunteers.	On-going
Strategy 9: Where appropriate repurpose pre-existing clam farm facility to be used by researchers at local universities	
Demolish existing structures	Ongoing
Develop management agreement with Florida Tech to promote research	Immediate
Develop management agreement with NGOs to promote education	Immediate
Investigate potential uses of man-made pond and lagoon bottom oyster lease as research resources	Short Term
Strategy 10: Work with other land management agencies through the Archie Carr Working group to effectively manage parcels with an eye towards habitat/species specific goals and regional connectivity.	
Open communication between neighboring conservation landowners	Immediate
Compare management goals, strategies, and results	Short Term
Coordinate efforts to focus on connectivity between land parcels to better manage barrier island ecosystem	Short Term

VIII. FINANCIAL CONSIDERATIONS

The following is a breakdown of the general costs estimated for capital improvement and annual management of the Hog Point Cove Sanctuary:

Capital Improvement

Hog Point Cove Field Station Renovation and construction	\$90,000.00
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Annual Management

Follow-up treatment of Brazilian Pepper and other exotics	\$ 1000.00
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Treatment for other invasive plants species	\$ 500.00
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Upkeep of fences and boundary signs	\$1000.00
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Utilities	\$1,000.00
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Facility Maintenance	\$3,500.00
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Staff Salaries to Support Annual Management	\$30,465.00
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Appendix A. Hog Point Cove Sanctuary Legal Descriptions

HPC-1

29-38-03-00-00250.0

N 150 FT OF GOVT LOT 1 LYING W OF A1A

29-38-03-00-00264.0

S 50 FT OF N 200 FT OF GOV'T LOT 1 W OF A1A

29-38-03-00-00251.0

S 200 FT OF N 400 FT OF GOVT LOT 1 WEST OF A1A

HPC-2

29-38-03-00-00278.0

PART OF GOV'T LOT 1 LYING W OF SR A1A AS DESC IN ORB 2777 PG 474

29-38-03-00-00277.0

PART OF GOV'T LOT 1 LYING W OF SR A1A AS DESC IN ORB 2777 PG 468

29-38-03-00-00276.0

PART OF GOV'T LOT 1 LYING W OF SR A1A AS DESC IN ORB 2777 PG 466

29-38-03-00-00275.0

PART OF GOV'T LOT 1 LYING W OF SR A1A AS DESC IN ORB 2777 PG 460

29-38-03-00-00274.0

PART OF GOV'T LOT 1 LYING W OF SR A1A AS DESC IN ORB 2777 PG 383

29-38-03-00-00273.0

PART OF GOV'T LOT 1 LYING W OF SR A1A AS DESC IN ORB 2777 PG 381

29-38-03-00-00271.0

PART OF GOV'T LOT 1 LYING W OF SR A1A AS DESC IN ORB 2777 PG 367

HPC-3

29-38-03-00-00268.0

PART OF GOV'T LOT 2 LYING W OF SR A1A AS DESC IN ORB 2777 PG 339

29-38-03-00-00267.0

PART OF GOV'T LOT 2 LYING W OF SR A1A AS DESC IN ORB 2777 PG 365

29-38-03-00-00258.0

N 150 FT OF S 500 FT OF LOT 2 W OF HWY

29-38-03-00-00260.0

N 100 FT OF S 350 FT OF LOT 2 LYING W OF A1A

Appendix B. Hog Point Cove Sanctuary Observed Plant Species

Note: Surveyors Nichole Perna and Marc Virgilio

GENUS	SPECIES	VARIETY	EXOTIC	COMMON NAME
<i>Acrostichum</i>	<i>danaeifolium</i>			Giant Leather Fern
<i>Ambrosia</i>	<i>artemisiifolia</i>			Ragweed
<i>Andropogon</i>	<i>glomeratus</i>			Bushy Bluestem
<i>Annona</i>	<i>glabra</i>			Pond Apple
<i>Ardisia</i>	<i>escallonioides</i>			Marlberry
<i>Avicennia</i>	<i>germinans</i>			Black Mangrove
<i>Baccharis</i>	<i>glomeruliflora</i>			Silverlining
<i>Baccharis</i>	<i>halimifolia</i>			Groundsel
<i>Bidens</i>	<i>alba</i>	<i>radiata</i>		Spanish Needle
<i>Boehmeria</i>	<i>cylindrica</i>			False Nettle
<i>Borrchia</i>	<i>frutescens</i>			Sea Oxeye Daisy
<i>Bursera</i>	<i>simaruba</i>			Gumbo-limbo
<i>Callicarpa</i>	<i>americana</i>			American Beautyberry
<i>Capparis</i>	<i>flexuosa</i>			Bayleaf Capertree
<i>Carica</i>	<i>papaya</i>		X	Papaya
<i>Catharanthus</i>	<i>roseus</i>		X	Madagascar Periwinkle
<i>Cenchrus</i>	<i>sp.</i>			Sandbur
<i>Centrosema</i>	<i>virginianum</i>			Butterfly Pea
<i>Chamaecrista</i>	<i>fasciculata</i>			Partridge Pea
<i>Chiococca</i>	<i>alba</i>			Snowberry
<i>Citharexylum</i>	<i>spinosum</i>			Fiddlewood
<i>Cladium</i>	<i>jamaicense</i>			Jamaica Swamp Sawgrass
<i>Cnidoscolus</i>	<i>stimulosus</i>			Tread-softly
<i>Coccoloba</i>	<i>diversifolia</i>			Pigeon Plum
<i>Coccoloba</i>	<i>uvifera</i>			Seagrape
<i>Conocarpus</i>	<i>erectus</i>			Buttonwood
<i>Cynadon</i>	<i>dactylon</i>		X	Bermuda Grass
<i>Cyperus</i>	<i>esculentus</i>			Yellow Nut Grass
<i>Cyperus</i>	<i>ligularis</i>			Swamp Flat Sedge
<i>Dactyloctenium</i>	<i>aegyptium</i>			Durban Srowfootgrass
<i>Dalbergia</i>	<i>ecastaphyllum</i>			Coin Vine
<i>Dichantherium</i>	<i>sp.</i>			Rosette Grass
<i>Digitaria</i>	<i>ciliaris</i>			Southern Crabgrass
<i>Emilia</i>	<i>fosbergii</i>		X	Tasselflower (non-native several colors)
<i>Encyclia</i>	<i>tampensis</i>			Florida Butterfly Orchid
<i>Erythrina</i>	<i>herbacea</i>			Coral Bean
<i>Eugenia</i>	<i>axillaris</i>			White Stopper
<i>Eugenia</i>	<i>foetida</i>			Spanish Stopper
<i>Eupatorium</i>	<i>capillifolium</i>			Dog Fennel
<i>Eustachys</i>	<i>petrae</i>			Pinewoods Fingergrass
<i>Exothea</i>	<i>paniculata</i>			Inkwood
<i>Ficus</i>	<i>aurea</i>			Strangler Fig
<i>Flaveria</i>	<i>linearis</i>			Yellow Top
<i>Forestiera</i>	<i>segregata</i>			Florida Privet
<i>Guapira</i>	<i>discolor</i>			Blolly
<i>Helianthus</i>	<i>debilis</i>	<i>debilis</i>		Dune Sunflower

<i>Heliotropium</i>	<i>angiospermum</i>		Scorpionstail
<i>Heterotheca</i>	<i>subaxillaris</i>		Camphorweed (Yellow Flower)
<i>Hydrocotyle</i>	<i>sp.</i>		Pennywort
<i>Ipomoea</i>	<i>alba</i>		Moonvine
<i>Ipomoea</i>	<i>sagittata</i>		Saltmarsh Morning Glory
<i>Ipomoea</i>	<i>triloba</i>		X Morning Glory (Purple Flower)
<i>Iresine</i>	<i>diffusa</i>		Juba's Bush
<i>Iva</i>	<i>frutescens</i>		Beach Elder
<i>Kosteletzkya</i>	<i>virginica</i>		Virginia Saltmarsh Mallow
<i>Krugiodendron</i>	<i>ferreum</i>		Black Ironwood
<i>Laguncularia</i>	<i>racemosa</i>		White Mangrove
<i>Lantana</i>	<i>camara</i>		X Exotic Lantanna
<i>Lantana</i>	<i>depressa</i>	<i>floridana</i>	Lantanna
<i>Licania</i>	<i>michauxii</i>		Gopher Apple
<i>Melanthera</i>	<i>nivea</i>		Snow Squarestem
<i>Mentzelia</i>	<i>floridana</i>		Poorman's Patch
<i>Mikania</i>	<i>sp.</i>		Climbing Hempvine
<i>Momordica</i>	<i>charantia</i>		Balsampear
<i>Monarda</i>	<i>punctata</i>		Dotted Horsemint
<i>Myrcianthes</i>	<i>fragrans</i>		Simpson Stopper
<i>Opuntia</i>	<i>stricta</i>		Prickley Pear Cactus
<i>Parietaria</i>	<i>praetermissa</i>		Clustered Pellitory
<i>Parthenocissus</i>	<i>quinquefolia</i>		Virginia Creeper
<i>Paspalum</i>	<i>vaginatum</i>		Seashore Paspalum
<i>Passiflora</i>	<i>suberosa</i>		Passion Flower
<i>Persea</i>	<i>borbonia</i>		Red Bay
<i>Phlebodium</i>	<i>aureum</i>		Golden Polypody
<i>Phyla</i>	<i>nodiflora</i>		Matchhead, Fogfruit
<i>Physalis</i>	<i>walteri</i>		Walter's Groundcherry
<i>Phytolacca</i>	<i>americana</i>		American Pokeweed
<i>Pleopeltis</i>	<i>polypodioides</i>		Resurrection Fern
<i>Poinsettia</i>	<i>cyathophora</i>		Paintedleaf
<i>Psychotria</i>	<i>nervosa</i>		Wild coffee
<i>Pteridium</i>	<i>aquilinum</i>		Braken Fern
<i>Quercus</i>	<i>laurifolia</i>		Laurel Oak
<i>Quercus</i>	<i>virginiana</i>		Live Oak
<i>Randia</i>	<i>aculeata</i>		White Indigo Berry
<i>Rapanea</i>	<i>punctata</i>		Myrsine
<i>Rhizophora</i>	<i>mangle</i>		Red Mangrove
<i>Rhynchelytrum</i>	<i>repens</i>		Rose Natal Grass
<i>Sabal</i>	<i>palmetto</i>		Sabal Palm
<i>Salix</i>	<i>caroliniana</i>		Coastalplain Willow
<i>Salvia</i>	<i>coccinea</i>		Tropical Sage
<i>Sarcostemma</i>	<i>clausum</i>		White Twinevine
<i>Schinus</i>	<i>terebinthifolius</i>		X Brazilain Pepper
<i>Serenoa</i>	<i>repens</i>		Saw Palmetto
<i>Sideroxylon</i>	<i>tenax</i>		Tough Bully
<i>Smilax</i>	<i>auriculata</i>		Greenbrier
<i>Solanum</i>	<i>americanum</i>		Black Nightshade
<i>Solidago</i>	<i>odora</i>	<i>chapmanii</i>	Chapman's Goldenrod

<i>Solidago</i>	<i>sp.</i>		Goldenrod
<i>Spartina</i>	<i>bakeri</i>		Smooth Coggrass
<i>Sphagneticola</i>	<i>trilobata</i>		Weedelia
<i>Sporobolus</i>	<i>indicus</i>		Smutgrass
<i>Toxicodendron</i>	<i>radicans</i>		Poision Ivy
<i>Trichostema</i>	<i>dichotomum</i>		Forked Bluecurls
<i>Typha</i>	<i>domingensis</i>		Southern Cattail
<i>Verbesina</i>	<i>virginica</i>		Frostweed
<i>Vigna</i>	<i>luteola</i>		Cow Pea
<i>Vitex</i>	<i>trifolia</i>	X	Exotic Vitex
<i>Vitis</i>	<i>rotundifolia</i>		Muscadine Grape
<i>Yucca</i>	<i>aloifolia</i>	X	Spanish Bayonet
<i>Zanthoxylum</i>	<i>clava-herculis</i>		Hercules'-club
<i>Zanthoxylum</i>	<i>fagara</i>		Wild Lime

Appendix C. Hog Point Cove Sanctuary Mammal Species

Note: Surveyor Nichole Perna

Genus	Species	Common Name
<i>Lynx</i>	<i>rufus</i>	Bobcat
<i>Procyon</i>	<i>lotor</i>	Common Raccoon
<i>Spilogale</i>	<i>putorius</i>	Eastern Spotted Skunk
<i>Lontra</i>	<i>canadensis</i>	River Otter
<i>Sylvilagus</i>	<i>palustris</i>	Marsh Rabbit

Appendix D. Hog Point Cove Sanctuary Observed Bird Species

Note: Surveyors Marc Virgilio, Andy Bankert, and Justin Ridge

Genus	Species	Common Name	FWCC	FWS
<i>Dendroica</i>	<i>coronata</i>	Yellow-rumper Warbler		
<i>Vermivora</i>	<i>celata</i>	Orange-crowned Warbler		
<i>Buteo</i>	<i>lineatus</i>	Red Shouldered Hawk		
<i>Quiscalus</i>	<i>quiscula</i>	Common Grackle		
<i>Thryothorus</i>	<i>ludovicianus</i>	Carolina Wren		
<i>Accipiter</i>	<i>cooperii</i>	Cooper's Hawk		
<i>Troglodytes</i>	<i>aedon</i>	House Wren		
<i>Dumetella</i>	<i>carolinensis</i>	Gray Catbird		
<i>Mimus</i>	<i>polyglottos</i>	Northern Mockingbird		
<i>Zenaida</i>	<i>macroura</i>	Mourning Dove		
<i>Aythya</i>	<i>marila</i>	Greater Scaup		
<i>Melanerpes</i>	<i>carolinus</i>	Red-Bellied Woodpecker		
<i>Ardea</i>	<i>herodias</i>	Great Blue Heron		
<i>Ardea</i>	<i>alba</i>	Great Egret		
<i>Egretta</i>	<i>thula</i>	Snowy Egret	SSC	
<i>Egretta</i>	<i>caerulea</i>	Little Blue Heron	SSC	
<i>Egretta</i>	<i>tricolor</i>	Tricolored Heron	SSC	
<i>Cardinalis</i>	<i>cardinalis</i>	Northern Cardinal		
<i>Ceryle</i>	<i>alcyon</i>	Belted Kingfisher		
<i>Pelecanus</i>	<i>occidentalis</i>	Brown Pelican		
<i>Phalacrocorax</i>	<i>auritus</i>	Double-Crested Cormorant		

FWCC=Florida Fish and Wildlife Conservation Commission

FWS=U.S. Fish and Wildlife Service

E=Endangered

T=Threatened

SSC=Species of Special Concern

Appendix E. Hog Point Cove Sanctuary Observed Insect Species

Note: Surveyors Marc Virgilio, Nichole Perna, and Roland Verduyne

Genus	Species	Common Name
<i>Augochlora</i>	<i>pura</i>	Augochlora Sweat Bee
<i>Condylostylus</i>	<i>sp.</i>	Long-legged Flies
<i>Drosophila</i>	<i>melanogaster</i>	Fruit Fly
<i>Gasteracantha</i>	<i>cancriformis</i>	Crab-Like Spiny Orb Weaver
<i>Hylephila</i>	<i>phylus</i>	Fiery Skipper
<i>Leucauge</i>	<i>venusta</i>	Venusta Orchard Spider
<i>Musca</i>	<i>domestica</i>	House fly
<i>Nomad</i>	<i>sp.</i>	Cuckoo Bee
<i>Ophion</i>	<i>sp.</i>	Short-Tailed Ichneumons
<i>Phaenicia</i>	<i>sericata</i>	Green bottle fly
<i>Sceliphron</i>	<i>caementarium</i>	Black and Yellow Mud Dauber
<i>Thorybes</i>	<i>pylades</i>	Northern Cloudywig
<i>Tipula</i>	<i>sp.</i>	Crane Fly
<i>Anax</i>	<i>junius</i>	Common Green Darner
<i>Megaselia</i>	<i>scalaris</i>	Laboratory Fly
<i>Culex</i>	<i>pipiens</i>	House Mosquito
<i>Erythroneura</i>	<i>comes</i>	Eastern Grape Leafhopper
<i>Gryllus</i>	<i>pennsylvanicus</i>	Field Cricket
<i>Cesonia</i>	<i>bilineata</i>	Long-legged Sac Spider
<i>Empis</i>	<i>sp.</i>	Dance Flies
<i>Solenopsis</i>	<i>invicta</i>	Red Fire Ant
<i>Polistes</i>	<i>sp.</i>	Paper Wasp



Appendix F

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February 20, 2009

Mark Virgilio
Environmentally Endangered Lands Program (EEL)
8385 South Highway A1A
Melbourne Beach, FL 32951

Dear Mr. Virgilio,

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: Hog Point Cove Sanctuary
Date Received: February 16, 2009
Location: 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.*



Florida Resources
and Environmental
Analysis Center

Institute of Science
and Public Affairs

The Florida State University

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

Tracking Florida's Biodiversity

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 the Hog Point Cove Sanctuary, 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.

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



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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

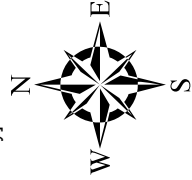
Land Acquisition Projects

- 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

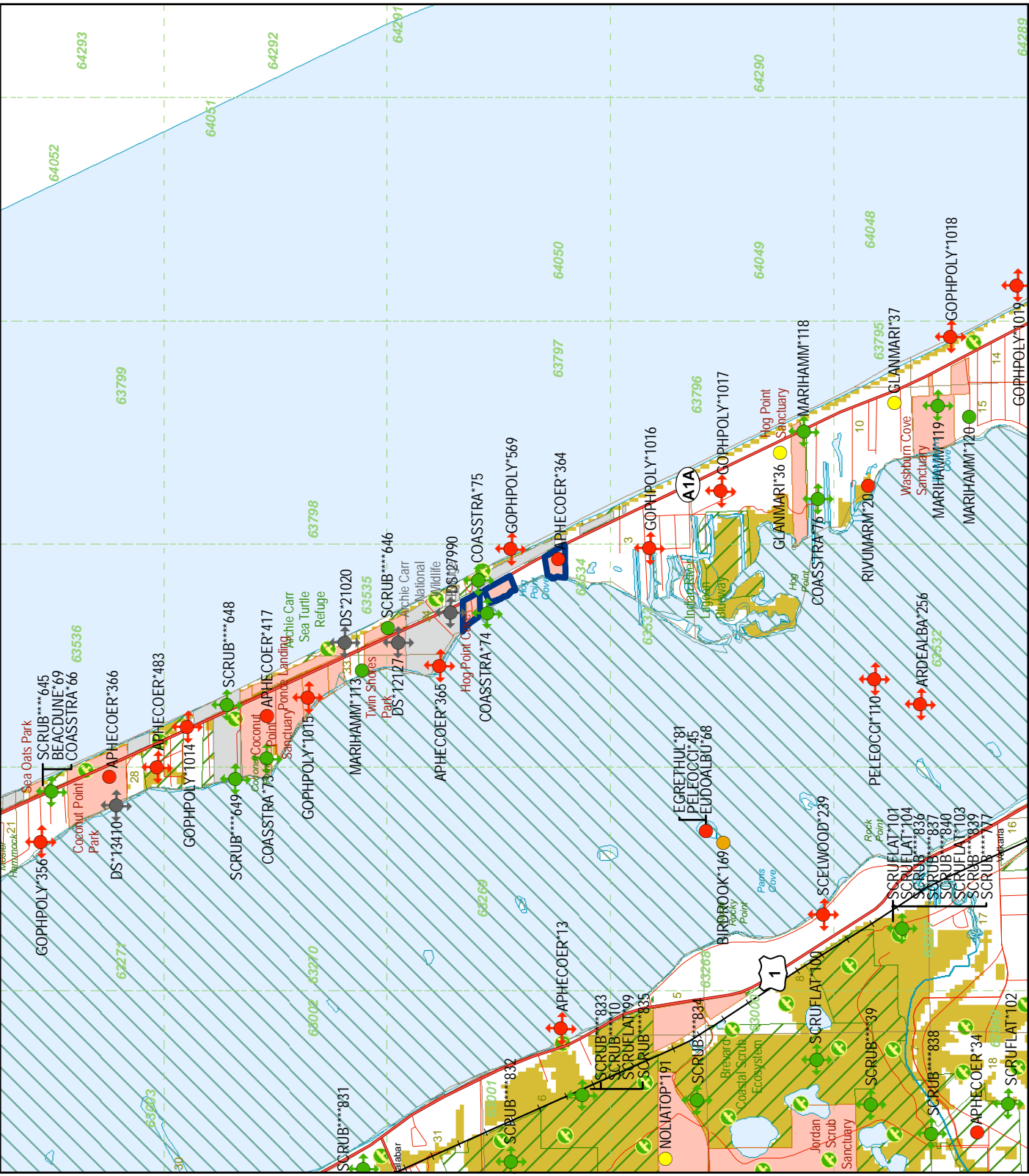


NOTE
 Map should not be interpreted without
 accompanying documents.

Hog Point Cove Sanctuary

Site boundaries are approximate.

Brevard County



Map produced by LHH
 Map Date: 20 FEB 2009



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Florida Natural Areas Inventory

ELEMENT OCCURRENCES DOCUMENTED ON OR NEAR Hog Point Cove Sanctuary



Global State Federal State Observation

Map Label	Scientific Name	Common Name	Rank	Status	Listing	Date	Description	EO Comments
SCRUB****39	Scrub		G2	S2	N	N	2005-08-06	1981-05-13: OCCURRENCE AT SITE; MOST 2-4 M. OAK SCRUB (U81COX01FLUS).
PELEOCC*110	Pelecanus occidentalis	Brown Pelican	G4	S3	N	LS	1989-05-10	1989/05/10: J.A. Hovis, GFC. Surveyed from helicopter. Site visited by plane on 04/28/89. "Total" = D (includes GREG, BRPE, DCCO).
ARDEALBA*256	Ardea alba	Great Egret	G5	S4	N	N	1989-05-10	1989-05-10: J.A. Hovis, GFC; Surveyed from helicopter. 1989-04-28: surveyed with plane. "Total" = D (includes Great Egret, Brown Pelican, Double-crested Cormorant) (U97GFC02FLUS).
GLANMARI*37	Glandularia maritima	Coastal Vervain	G3	S3	N	LE	1990-02-21	SEVERAL PROSTRATE PLANTS IN FLOWER AROUND CLEARING ADJ. TO ELECTRICAL INSTALLATION. SURROUNDING COMMUNITY IS COASTAL STRAND GRADING TO MARITIME HAMMOCK.
DS*21020	Data Sensitive Element	Data Sensitive	G2	S2	N	LE	1988-04-09	Data Sensitive
GLANMARI*36	Glandularia maritima	Coastal Vervain	G3	S3	N	LE	1990-02-21	FEW PLANTS ALONG S MARGIN PLANTS FLOWERING. OF N PIECE OF HAMMOCK.
DS*27990	Data Sensitive Element	Data Sensitive	G2	S2	N	LE	1990-02-18	Data Sensitive
MARIHAMM*120	Maritime hammock		G3	S2	N	N	1990-02-21	TALL OAK/PALM HAMMOCK (35') CANOPY: QUERCUS VIRGINIANA, BURSERA SIMAROUBA, PERSEA BORBONIA, SABAL PALMETTO, EXOTHEA PARNICULATA. UNDERSTORY: TOXICODENDRON RADICANS; EUGENIA AXILLARIS, CHIOCocca ALBA (X), ENCYCLIA TAMPENSIS; NECTANDRA CORIACEA (X).
APHECOER*364	Aphelocoma coerulescens	Florida Scrub-jay	G2	S2	LT	LT	1991-07-15	COASTAL STRAND - PNDHAR03; 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



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EGRETHUL*81	Egretta thula	Snowy Egret	G5	S3	N	LS	1988-10-28	DOMINANT TERRESTRIAL VEGETATION-BRAZILIAN PEPPER, AUSTRALIAN PINE, CABBAGE PALM.	No EO data given
BIRDROOK*169	Bird Rookery		GNR	SNR	N	N	1988-10-28	DOMINANT TERRESTRIAL VEGETATION-BRAZILIAN PEPPER, AUSTRALIAN PINE, CABBAGE PALM.	No EO data given
SCRUB****646	Scrub		G2	S2	N	N	2004	DISTURBED SCRUB WITH MUCH DUMPING. HEAVY CASSYTHA INFESTATION TO N OF SAND RD. SCRUB GRADES INTO BRAZILIAN PEPPER STAND NEAR LAGOON.	2004: Update to last obs date was based on interpretation of aerial photography (previous value was 1990-02-18) (U05FNA02FLUS). DOMINANT SHRUBS: QUERCUS GEMINATA, BUMELIA TENAX, FORESTIERA SEGREGATA, SERENOA REPENS AND PARASITIC VINE, CASSYTHA FILIFORMIS
EUDOALBU*68	Eudocimus albus	White Ibis	G5	S4	N	LS	1988-10-28	DOMINANT TERRESTRIAL VEGETATION-BRAZILIAN PEPPER, AUSTRALIAN PINE, CABBAGE PALM.	No EO data given
RIVUMARM*20	Rivulus marmoratus	Mangrove Rivulus	G3	S3	C	LS	1997	MANGROVE SWAMP.	SEVEN SPECIMENS CAPTURED IN DEC. 1989.
PELEOCCI*45	Pelecanus occidentalis	Brown Pelican	G4	S3	N	LS	1988-10-28	DOMINANT TERRESTRIAL VEGETATION-BRAZILIAN PEPPER, AUSTRALIAN PINE, CABBAGE PALM.	100 INDIVIDUALS: NESTING.
MARIHAMM*113	Maritime hammock		G3	S2	N	N	1990-02-18	LOW HAMMOCK (15-20' CANOPY) OF REDBAY, LIVE OAK AND CABBAGE PALM. UNDERSTORY OF MYRSINE AND WILD COFFEE. SURROUNDED BY BRAZILIAN PEPPER.	CANOPY: QUERCUS VIRGINIANA, PERSEA HUMILIS, SABAL PALMETTO UNDERSTORY: MYRCIANTHES FRAGRANS, SERENOA REPENS, ZANTHOXYLUM CLAVA-HERCULIS, SMILAX AURICULATA, PSILOTUM NUDUM.
APHECOER*34	Aphelocoma coerulescens	Florida Scrub-jay	G2	S2	LT	LT	1981-05-13	MOSTLY OAK SCRUB	1981-05-13: 14 SCRUB JAYS (U81COX01). 1991-08-15: 4 ADULT JAYS AND 3 JUVENILE JAYS REPORTED; NUMEROUS DATES: 31 ADULT JAYS AND 10 JUVENILE JAYS REPORTED (U91SNO01). SNODGRASS ET AL. ESTIMATED RECORDS 75 AND 76 TO CONSTITUTE A LARGE POPULATION OF > 30 FAM



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Florida Natural Areas Inventory

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GOPHPOLY*569	Gopherus polyphemus	Gopher Tortoise	G3	S3	N	LT	ZZ	No general description given SPECIMEN (UM-106310), COLLECTOR N/A, DATE N/A.
APHECOER*365	Aphelocoma coerulescens	Florida Scrub-jay	G2	S2	LT	LT	1986-	RESIDENT SCRUB JAYS HAVE BEEN OBSERVED ON THE DISNEY MIDDLE TRACT FROM 1972-1986 BY HARDEN.
APHECOER*483	Aphelocoma coerulescens	Florida Scrub-jay	G2	S2	LT	LT	1993	Species reported as on-site by U93COA01FLUS; additional data needed.
APHECOER*13	Aphelocoma coerulescens	Florida Scrub-jay	G2	S2	LT	LT	1981-05-13	1981-05-13: 1 SCRUB JAY
GOPHPOLY*356	Gopherus polyphemus	Gopher Tortoise	G3	S3	N	LT	1992-pre	1992 MARITIME HAMMOCK INITIATIVE LISTS SPECIES PRESENT IN COASTAL STRAND/SCRUB. 1986: ONE GOPHERUS BURROW WAS OBSERVED ON THE TRAIL TO THE HAMMOCK (DISNEY NORTH) BY HARDEN.
SCELWOOD*239	Sceloporus woodi	Florida Scrub Lizard	G3	S3	N	N	1986-05-13	1986-05-13: K.E. Enge, GFC - Also seen on 2 August 86. See Enge et al (1986; Coop Unit Tech Rep No 26).
GOPHPOLY*1014	Gopherus polyphemus	Gopher Tortoise	G3	S3	N	LT	1993	Species reported as on-site by U93COA01FLUS; additional data needed.
GOPHPOLY*1015	Gopherus polyphemus	Gopher Tortoise	G3	S3	N	LT	1993	Species reported as on-site by U93COA01FLUS; additional data needed.
GOPHPOLY*1016	Gopherus polyphemus	Gopher Tortoise	G3	S3	N	LT	1993	Species reported as on-site by U93COA01FLUS; additional data needed.
GOPHPOLY*1017	Gopherus polyphemus	Gopher Tortoise	G3	S3	N	LT	1993	Species reported as on-site by U93COA01FLUS; additional data needed.
GOPHPOLY*1018	Gopherus polyphemus	Gopher Tortoise	G3	S3	N	LT	1993	Species reported as on-site by U93COA01FLUS; additional data needed.
GOPHPOLY*1019	Gopherus polyphemus	Gopher Tortoise	G3	S3	N	LT	1993	Species reported as on-site by U93COA01FLUS; additional data needed.
DS*12127	Data Sensitive Element	Data Sensitive	G2	S2	N	LE	1990-02-18	Data Sensitive



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Map Label	Scientific Name	Common Name	Global Rank	State Rank	Federal Listing	State Observation Date	Description	EO Comments
APHECOER*366	Aphelocoma coerulescens	Florida Scrub-jay	G2	S2	LT	1991-07-15	SCRUB	RESIDENT: HARDENS HAVE OBSERVED SCRUB JAYS ON DISNEY N. FROM 1972-1986 BUT HAVE NOT ATTEMPTED TO LOCATE NESTS. AFJ 90-02-15--ONE PAIR OF SCRUB JAYS W SIDE OF A1A. ONE WAS TAME AND SAT ON HAND. 1990-01-28: 4 JAYS REPORTED; 1990-02-03: 6 JAYS REPORTED; 199
APHECOER*417	Aphelocoma coerulescens	Florida Scrub-jay	G2	S2	LT	1993	SCRAPED SCRUB THAT IS REGENERATING-MANY OPENINGS CA. 3RD DUNE RIDGE W OF BEACH.	1993: SPECIES REPORTED AS ON-SITE BY U93COA01FLUS; ADDITIONAL DATA NEEDED. 1991(?): SPECIES PRESENT IN COASTAL STRAND/SCRUB. 1990: 2 PAIRS OF SCRUB JAYS SEEN ENGAGING IN TERRITORIAL DISPLAY (I.E., LOOPING FLIGHT ALONG BOUNDARY LINE; CALLING).
NOLIATOP*191	Nolina atopocarpa	Florida Beargrass	G3	S3	N	2003-07-30	2003-07-30: plants occur at six closely spaced locations along a sand road in mesic flatwoods with Serenoa repens and Aristida stricta (U04SCH02FLUS).	2003-07-30: plants occur at six closely spaced locations along a sand road (U04SCH02FLUS).
SCRUB****777	Scrub		G2	S2	N	2004	Sand Pine Scrub grading into Scrubby Flatwoods that in turn grade into Mesic to Wet Flatwoods with extensively interspersed Depression Marshes.	2004: Update to last obs date was based on interpretation of aerial photography (previous value was 1992-06-19) (U05FNA02FLUS). Nearly closed canopy (ca. 60') of dense Pinus clausa with a lower ericaceous component including Lyonia ferruginea, L. frutico
SCRUFLAT*99	Scrubby flatwoods		G3	S3	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****837	Scrub		G2	S2	N	2004	No general description given	2004: Update to last obs date was based on interpretation of aerial photography (previous value was 1991) (U05FNA02FLUS). At late stages of succession.



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Florida Natural Areas Inventory

ELEMENT OCCURRENCES DOCUMENTED ON OR NEAR Hog Point Cove Sanctuary



Global State Federal State Observation

Map Label	Scientific Name	Common Name	Rank	Status	Listing	Date	Description	EO Comments	
COASSTRA*74	Coastal strand		G3	S2	N	N	2004	DENSE SPRAY PRUNED HEDGE OF TROPICAL AND TEMPERATE SHRUBS. FOUR DISTINCT PARCELS.	2004: Update to last obs date was based on interpretation of aerial photography (previous value was 1990-02-21) (U05FNA02FLUS). PERSEA BORBONIA-ABUNDANT; MYRCIANTHES FRAGRANS-A; QUERCUS VIRGINIANA-A; SERENOA REPENS (BLUE FORM)-OCCASIONAL; BUMELIA TENAX-A
SCRUB****832	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). At late stages of succession.
SCRUFLAT*100	Scrubby flatwoods		G3	S3	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****831	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). Scrub layer is low, 2-3 meters, and open sandy areas are common.
SCRUB****835	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). At late stages of succession.
SCRUB****838	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). At late stages of succession.
BEACDUNE*69	Beach dune		G3	S2	N	N	2004	GRASSY FOREDUNE GRADING UP TO SAW PALMETTO STRAND. ONE FOOT ERODED SCARP AT BASE OF DUNE.	2004: Update to last obs date was based on interpretation of aerial photography (previous value was 1990-02-15) (U05FNA02FLUS). DOMINANT GRASSES: UNIOLA PANICULATA, PANICUM AMARULUM. OTHER SPP: IVA IMBRICATA; ERNODEA LITTORALIS (X).



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Map Label	Scientific Name	Common Name	Rank	Status	Listing	Date	Description	EO Comments
COASSTRA*75	Coastal strand		G3	S2	N	N	2004	SAW PALMETTO STRAND WITH LOW CABBAGE PALMS PROTRUDING. SHRUBS MORE COMMON TOWARDS A1A. FOUR DISJUNCT PARCELS. PALMETTO-OCCASIONAL; COCOLOBA UVIFERA (X)-0; CHRYSOBALANUS ICACO 9X)-RARE; RAPANEA PUNCTATA (X
SCRUB****10	Scrub		G2	S2	N	N	2004	SAND PINE SCRUB 2004: Update to last obs date was based on interpretation of aerial photography (previous value was 1991) (U05FNA02FLUS). OCCURRENCE AT SITE
SCRUB****836	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). At late stages of succession.
COASSTRA*76	Coastal strand		G3	S2	N	N	2004	DENSE "HEDGE" OF SHRUBS 5-8' HIGH ON W SIDE OF A1A GRADING INTO HAMMOCK TO WESTWARD. 2004: Update to last obs date was based on interpretation of aerial photography (previous value was empty) (U05FNA02FLUS). PERSEA BORBONIA, BUMELIA TENAX, MYRICA CERIFERA, SERENOA REPENS (BLUE FORM), SABAL PALMETTO, MYRCIANTHES FRAGRANS, ZANTHOXYLUM CLAV
MARIHAMM*119	Maritime hammock		G3	S2	N	N	2004	SHORT (15-25') OAK/PALM HAMMOCK PLUS EPIPHYTES. 2004: Update to last obs date was based on interpretation of aerial photography (previous value was 1990-02-21) (U05FNA02FLUS). CANOPY: QUERCUS VIRGINIANA (PLUS RESURRECTION FERNS, TILLANDSIAS, AND BUTTERFLY ORCHIDS), PERSEA BORBONIA, SABAL PALMETTO, ZAN
SCRUB****834	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). At late stages of succession.
SCRUFAT*104	Scrubby flatwoods		G3	S3	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.



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Map Label	Scientific Name	Common Name	Rank	Status	Listing	Date	Description	EO Comments
SCRUB****840	Scrub		G2	S2	N	2004	No general description given	2004: Update to last obs date was based on interpretation of aerial photography (previous value was 1991) (U05FNA02FLUS). At late stages of succession.
MARIHAMM*118	Maritime hammock		G3	S2	N	2004	OAK/PALM HAMMOCK EXTENDING TO MANGROVES ON LAGOON.	2004: Update to last obs date was based on interpretation of aerial photography (previous value was 1990-02-21) (U05FNA02FLUS). QUERCUS VIRGINIANA, SABAL PALMETTO, BURSERA SIMAROUBA (X), UNDERSTORY: TOXICODENDRON RADICANS, RAPANEA PUNCTATA (X), CALLICARP
SCRUB****839	Scrub		G2	S2	N	2004	No general description given	2004: Update to last obs date was based on interpretation of aerial photography (previous value was 1991) (U05FNA02FLUS). At late stages of succession.
COASSTRA*66	Coastal strand		G3	S2	N	2004	DENSE SAW PALMETTO STRAND WITH OCC SEAGRAPE AND BUMELIA SHRUBS.	2004: Update to last obs date was based on interpretation of aerial photography (previous value was 1990-02-15) (U05FNA02FLUS). SERENOA REPENS-DOMINANT. SABAL PALMETTO (7-10')-OCC; BUMELIA TENAX-OCC; SMILAX AURICULATA-OCC; SHINIUS TEREBINTHIFOLIUS (X)-OCC
SCRUB****649	Scrub		G2	S2	N	2004	DENSE OAK SCRUB ON OLDER DUNE RIDGES ABOUT 1/4 MILE INLAND FROM COAST.	2004: Update to last obs date was based on interpretation of aerial photography (previous value was 1990-02-21) (U05FNA02FLUS). DOMINANT SHRUBS: QUERCUS GEMINATA, PERSEA BORBONIA, SERENOA REPENS, BUMELIA TENAX, QUERCUS MYRTIFOLIA, CATBRIAR (SIMILAX AURIC
DS*13410	Data Sensitive Element	Data Sensitive	G2	S2	N	2004	Data Sensitive	Data Sensitive
SCRUFLAT*103	Scrubby flatwoods		G3	S3	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.



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Map Label	Scientific Name	Common Name	Rank	Status	Listing	Date	Description	EO Comments
SCRUFAT*102	Scrubby flatwoods		G3	S3	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*73	Coastal strand		G3	S2	N	N	2004	PURE SAW PALMETTO BOTH E AND W OF A1A. SERENOA GRADUALLY REPLACED BY OAKS FURTHER INLAND. 2004: Update to last obs date was based on interpretation of aerial photography (previous value was 1990-02-21) (U05FNA02FLUS). DOMINATED BY LOW SAW PALMETTO (SERENOA REPENS) WITH SCATTERED LOW SHRUBS OF QUERCUS VIRGINIANA, BUMELIA TENAX, PERSEA BORBONIA
SCRUFAT*101	Scrubby flatwoods		G3	S3	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***648	Scrub		G2	S2	N	N	2004	SCRAPED SCRUB THAT IS REGENERATING - MANY OPENINGS. CA. 3RD DUINE RIDGE W OF BEACH. 2004: Update to last obs date was based on interpretation of aerial photography (previous value was 1990-02-21) (U05FNA02FLUS). QUERCUS GEMINATA AND Q. MYRTIFOLIA RESPROUTING. IN SANDY OPEN AREAS: XIMENIA AMERICANA, HETEROTHECA SUBAXILLARIS, LICANIA MICH
SCRUB***645	Scrub		G2	S2	N	N	2004	OAK-DOMINATED SCRUB ON 2ND RIDGE W OF A1A. GRADES INTO SERENOA STRAND TO E; HAMMOCK TO WEST. 2004: Update to last obs date was based on interpretation of aerial photography (previous value was 1990-02-15) (U05FNA02FLUS). DOMINANT SHRUBS: QUERCUS GEMINATA, QUERCUS MYRTIFOLIA, BUMELIA TENAX, SERENOA REPENS. SUB DOMINANTS: POLYGONELLA POLYGAMA, LIC
SCRUB***833	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). At late stages of succession.

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 10,000 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

Biodiversity Matrix Report



Scientific Name	Common Name	Global Rank	State Rank	Federal Status	State Listing
Matrix Unit ID: 63534					
Documented					
<i>Aphelocoma coerulescens</i>	Florida Scrub-jay	G2	S2	LT	LT
Coastal strand		G3	S2	N	N
Likely					
<i>Caretta caretta</i>	Loggerhead	G3	S3	LT	LT
<i>Chelonia mydas</i>	Green Turtle	G3	S2	LE	LE
<i>Dermochelys coriacea</i>	Leatherback	G2	S2	LE	LE
<i>Gopherus polyphemus</i>	Gopher Tortoise	G3	S3	N	LT
Scrub		G2	S2	N	N
Potential					
<i>Acipenser oxyrinchus oxyrinchus</i>	Atlantic Sturgeon	G3T3	S1	C	LS
<i>Centrosema arenicola</i>	Sand Butterfly Pea	G2Q	S2	N	LE
<i>Chamaesyce cumulicola</i>	Sand-dune Spurge	G2	S2	N	LE
<i>Charadrius melodus</i>	Piping Plover	G3	S2	LT	LT
<i>Cladonia perforata</i>	Perforate Reindeer Lichen	G1	S1	LE	LE
<i>Conradina grandiflora</i>	Large-flowered Rosemary	G3	S3	N	LT
<i>Ctenogobius stigmaturus</i>	Spottail Goby	G2	S2	N	N
<i>Dendroica discolor paludicola</i>	Florida Prairie Warbler	G5T3	S3	N	N
<i>Drymarchon couperi</i>	Eastern Indigo Snake	G3	S3	LT	LT
<i>Eretmochelys imbricata</i>	Hawksbill	G3	S1	LE	LE
<i>Glandularia maritima</i>	Coastal Vervain	G3	S3	N	LE
<i>Halophila johnsonii</i>	Johnson's Seagrass	G2	S2	LT	N
<i>Harrisia simpsonii</i>	Simpson's Prickly Apple	G2	S2	N	LE
<i>Lechea cernua</i>	Nodding Pinweed	G3	S3	N	LT
<i>Lechea divaricata</i>	Pine Pinweed	G2	S2	N	LE
<i>Mustela frenata peninsulae</i>	Florida Long-tailed Weasel	G5T3	S3	N	N
<i>Nemastylis floridana</i>	Celestial Lily	G2	S2	N	LE
<i>Nolina atopocarpa</i>	Florida Beargrass	G3	S3	N	LT
<i>Peromyscus polionotus niveiventris</i>	Southeastern Beach Mouse	G5T1	S1	LT	LT
<i>Rivulus marmoratus</i>	Mangrove Rivulus	G3	S3	C	LS
<i>Rostrhamus sociabilis plumbeus</i>	Snail Kite	G4G5T3Q	S2	LE	LE
<i>Sceloporus woodi</i>	Florida Scrub Lizard	G3	S3	N	N
<i>Schizachyrium niveum</i>	Scrub Bluestem	G1	S1	N	LE
<i>Tephrosia angustissima var. curtissii</i>	Coastal Hoary-pea	G1T1	S1	N	LE
<i>Trichechus manatus</i>	Manatee	G2	S2	LE	LE
<i>Warea carteri</i>	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.

Appendix G

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

August 10, 2006
Approved October 12, 2006

**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.

August 10, 2006

Page 2 of 3

Approved October 12, 2006

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 H

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 | 15.Grant Flatwoods |
| 2.Coconut Point | 16.Indian Mound |
| 3.Hog Point Cove | 17.Indian River Sanctuary |
| 4.Washburn Cove | 18.Johnson (Hall Road) |
| 5.Maritime Hammock area | 19.Jordan Scrub Sanctuary |
| 6.Barrier Island Sanctuary | 20.Kabboord |
| 7.Hardwood Hammock | 21.Kings Park |
| 8.1000 Islands | 22.Malabar Scrub Sanctuary |
| 9.Capron Ridge area | 23.Micco Scrub Sanctuary |
| 10.Crane Creek | 24.North Buck Lake Scrub Sanctuary |
| 11.Cruickshank | 25.Pine Island Conservation Area |
| 12.Dicerandra Scrub | 26.Scottsmoor Flatwoods Sanctuary |
| 13.Enchanted Forest | 27.Southlake Conservation Area |
| 14.Fox Lake | 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,
control typically be taken action will
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

Application 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 F.



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

*Protecting and Preserving Biological Diversity
Through Responsible Stewardship of Brevard County's Natural Resources*

*December 8, 2009
Approved January 8, 2010*



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 Breining, 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.

Additional Discussion

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.

EEL Program Selection and Management Committee Meeting

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Approved January 8, 2010

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 area 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 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 statutes 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.

Public Comment

Jack Lembeck asked if the meeting would be a public meeting.

Additional Discussion

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.

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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 addition 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

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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.**