

Dagny Johnson Key Largo Hammock Botanical State Park

Advisory Group Draft Unit Management Plan

**STATE OF FLORIDA
DEPARTMENT OF ENVIRONMENTAL PROTECTION**

**Division of Recreation and Parks
August 2018**



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Dagny Johnson Key Largo Hammock State Park


Introduction

Hammock Paradise, Protector of Reefs



Dagny Johnson Key Largo Hammock Botanical State Park was acquired for the purpose of protecting the exceptional natural resources within the park, including the largest contiguous tract of rockland hammock in the United States, an extensive variety of imperiled and endangered plants and animals, as well as protecting water quality for the invaluable coral reefs of the Florida Keys.

Rockland hammock is a globally imperiled community and is extremely limited in range, it supports numerous rare and endemic plant and animal species, making it an integral component of efforts to protect biodiversity in the region. The park is widely recognized for its extraordinary number of imperiled and endangered plant and animal species supported by the high quality natural communities of the park. These rare species include Key Largo woodrat (*Neotoma floridana smalli*), Schaus swallowtail butterfly (*Heraclides aristodemus ponceanus*), white-crowned pigeon (*Patagioenas leucocephala*), and wild cotton (*Gossypium hirsutum* L.).



84 protected plants and animals call Dagny Johnson Key Largo Hammock Botanical State Park home.

84

Dagny Johnson Key Largo Hammock Botanical State Park was established in 1982 with land acquired under Florida's Conservation and Recreational Lands Program. It was named for Dagny Johnson, a local environmental activist, approximately one year before her death in 2003.

The park now includes nearly 2,400 acres on the northern third of the island of Key Largo. Once slated to become a condominium development, it was set aside to preserve its unique ecosystems, as well as the adjacent John Pennekamp Coral Reef State Park and Crocodile Lake Wildlife Refuge.

Once a dominant habitat type in the Florida Keys and southern tip of Florida's peninsula, this area has been designated as an "Area of Critical State Concern." Tropical hardwood hammocks form a low canopy beneath which is a dense, sometimes impenetrable tangle of shrubs and vines. Hidden in the hammocks are some of Florida's rarest and most beautiful animal life. It is home to 84 protected species of plants and animals, including some of the rarest in the United States such as the Schaus' swallowtail butterfly, the Key Largo woodrat, and mahogany mistletoe.

The park contains the largest remaining contiguous rockland hammock in the continental United States. The tropical hardwood hammock is a self-maintaining community that usually remains untouched by fire or flood. These tiny "islands" of hammock support over 20 species of broad-leaved trees, shrubs, and vines, most of which are native to the West Indies. This West Indian plant community was originally established largely by migratory birds. Northbound migrant songbirds, having fed on the fruits of trees and shrubs in the Bahamas, Greater Antilles, and Yucatan Peninsula of Mexico, often carry seeds in their digestive tract. Many tropical species, including the white-crowned pigeon, mangrove cuckoo, and black-whiskered vireo may be seen here. Tropical birds, including the thick-billed vireo and La Sagra's flycatcher, are frequently reported in the park.



INTRODUCTION

Dagny Johnson Key Largo Hammock Botanical State Park is located in Monroe County (see Vicinity Map). Access to the park is from the east side of CR 905 near the intersection with U.S. Highway 1 at MM 106 (see Reference Map). The Vicinity Map also reflects significant land and water resources existing near the park.

Dagny Johnson Key Largo Hammock Botanical State Park was initially acquired on July 26, 1982 with funds from the Land Acquisition Trust Fund (LATF) program. Currently, the park comprises 2,805.20 acres. The Board of Trustees of the Internal Improvement Trust Fund (Trustees) hold fee simple title to the park and on November 16, 1982, the Trustees leased (Lease Number 3267) the property to the DRP under a 30-year lease with two subsequent consecutive 10-year renewal options.

Dagny Johnson Key Largo Hammock Botanical State Park is designated single-use to provide public outdoor recreation and other park-related uses. There are no legislative or executive directives that constrain the use of this property; however, The North Key Largo Land Use Feasibility Study, approved by the Governor and Cabinet in April 1991, contains executive directives that apply to the park (see Addendum 1).

Purpose and Significance of the Park

Dagny Johnson Key Largo Hammock Botanical State Park was acquired for the purpose of protecting the exceptional natural resources within the park, including the largest continuous example of rockland hammock in the United States, an extensive variety of imperiled and endangered plants and animals, as well as protecting water quality in John Pennekamp Coral Reef State Park.

Park Significance

- Within the park is the largest contiguous rockland hammock community in the United States. This natural community is a globally imperiled community and is extremely limited in range. Rockland hammock supports numerous rare and endemic plant and animal species, making it an integral component of efforts to protect biodiversity in the region.
- The park is widely recognized for its extraordinary number of imperiled and endangered plant and animal species supported by the high quality natural communities of the park. These rare species include Key Largo woodrat (*Neotoma floridana smalli*), Schaus swallowtail butterfly (*Heraclides aristodemus ponceanus*), white-crowned pigeon (*Patagioenas leucocephala*), and wild cotton (*Gossypium hirsutum L.*).
- The park plays a crucial role in helping to maintain high water quality levels for the unique living reefs of John Pennekamp Coral Reef State Park.
- The park contains significant passive resource-based recreation opportunities including several miles of secluded trails ideal for birding and wildlife appreciation in a remarkable environment.

Dagny Johnson Key Largo Hammock Botanical State Park is classified as a State Special Feature Site in the DRP's unit classification system. In the management of a

State Special Feature Site, a special feature is a discrete and well-defined object or condition that attracts public interest and provides recreational enjoyment through visitation, observation and study. A state special feature site is an area which contains such a feature, and which is set aside for controlled public enjoyment. Special feature sites, for the most part, are either historical or archaeological by type, but they may also have a geological, botanical, zoological, or other basis. State special feature sites must be of unusual or exceptional character, or have statewide or broad regional significance.

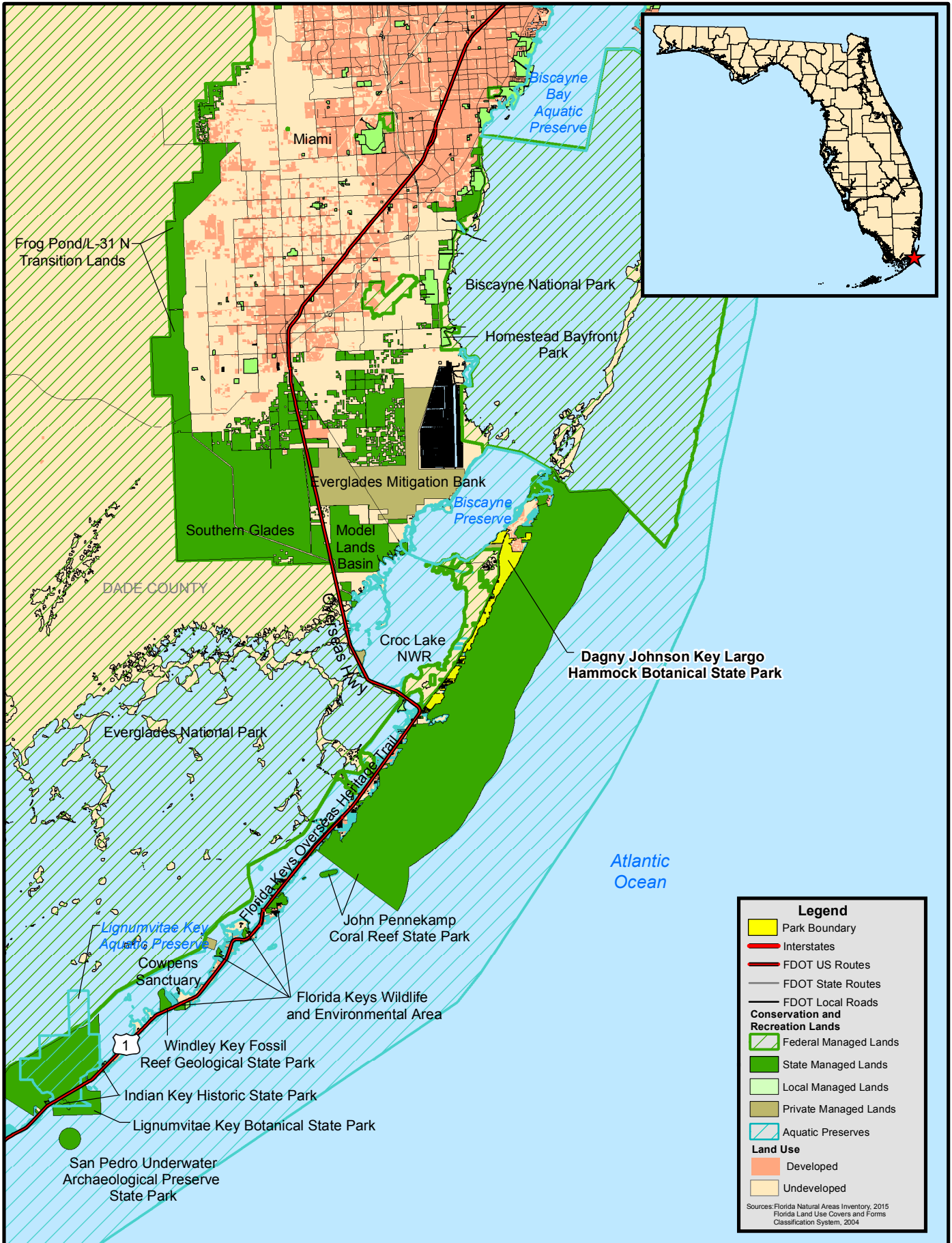
Management of special feature sites places primary emphasis on protection and maintenance of the special feature for long-term public enjoyment. Permitted uses are almost exclusively passive in nature and program emphasis is on interpretation of the special feature. Development at special feature sites is focused on protection and maintenance of the site, public access, safety and the convenience of the user.

Purpose and Scope of the Plan

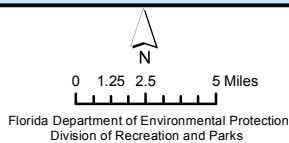
This plan serves as the basic statement of policy and direction for the management of Dagny Johnson Key Largo Hammock Botanical State Park as a unit of Florida's state park system. It identifies the goals, objectives, actions and criteria or standards that guide each aspect of park administration, and sets forth the specific measures that will be implemented to meet management objectives and provide balanced public utilization. The plan is intended to meet the requirements of Sections 253.034 and 259.032, Florida Statutes, Chapter 18-2, Florida Administrative Code, and is intended to be consistent with the State Lands Management Plan. With approval, this management plan will replace the 2004 approved plan.

The plan consists of three interrelated components: Resource Management Component, Land Use Component and Implementation Component. The Resource Management Component provides a detailed inventory and assessment of the natural and cultural resources of the park. Resource management needs and issues are identified, and measurable management objectives are established for each of the park's management goals and resource types. This component provides guidance on the application of such measures as prescribed burning, exotic species removal, imperiled species management, cultural resource management and restoration of natural conditions.

The Land Use Component is the recreational resource allocation plan for the park. Based on considerations such as access, population, adjacent land uses, the natural and cultural resources of the park, current public uses and existing development. Measurable objectives are set to achieve the desired allocation of the physical space of the park. These objectives identify use areas and propose the types of facilities and programs as well as the volume of public use to be provided.



**DAGNY JOHNSON KEY LARGO
HAMMOCK BOTANICAL
STATE PARK**



VICINITY MAP

LEGEND

- Florida Circumnavigational Saltwater Paddling Trail
- Park Boundary
- Florida Keys Overseas Heritage Trail
- US Routes
- Managed Conservation Lands



Biscayne National Park

Everglades Mitigation Bank

Card Sound

Model Lands Basin

Dagny Johnson
Key Largo Hammock
Botanical State Park

Crocodile Lake
National Wildlife Refuge

Nike Base Day Use Area

Barnes Sound

Residence Area

Port B Day Use Area

Everglades
National Park

KEY
LARGO



John Pennekamp
Coral Reef State Park

Florida Keys
National Marine
Sanctuary

ATLANTIC OCEAN



DAGNY JOHNSON
KEY LARGO HAMMOCK
BOTANICAL STATE PARK



Florida Department of Environmental Protection
Division of Recreation and Parks
Date of aerial: 2011

REFERENCE MAP

The Implementation Component consolidates the measurable objectives and actions for each of the park's management goals. An implementation schedule and cost estimates are included for each objective and action. Included in this table are (1) measures that will be used to evaluate the DRP's implementation progress, (2) timeframes for completing actions and objectives and (3) estimated costs to complete each action and objective.

All development and resource alteration proposed in this plan is subject to the granting of appropriate permits, easements, licenses, and other required legal instruments. Approval of the management plan does not constitute an exemption from complying with the appropriate local, state or federal agencies. This plan is also intended to meet the requirements for beach and shore preservation, as defined in Chapter 161, Florida Statutes, and Chapters 62B-33, 62B-36 and 62R-49, Florida Administrative Code.

In the development of this plan, the potential of the park to accommodate secondary management purposes was analyzed. These secondary purposes were considered within the context of the DRP's statutory responsibilities and the resource needs and values of the park. This analysis considered the park's natural and cultural resources, management needs, aesthetic values, visitation and visitor experiences. For this park, it was determined that accepting clean fill to assist with efforts to restore the topography of borrow pits and other dredged areas to historic natural conditions could be accommodated in a manner that would be compatible and not interfere with the primary purpose of resource-based outdoor recreation and conservation. This compatible secondary management purpose is addressed in the Resource Management Component of the plan. Uses such as water resource development projects, water supply projects, stormwater management projects, linear facilities and sustainable agriculture and forestry (other than those forest management activities specifically identified in this plan) are not consistent with this plan or the management purposes of the park.

The potential for generating revenue to enhance management was also analyzed. Visitor fees and charges are the principal source of revenue generated by the park. It was determined that accepting clean fill to assist with efforts to restore borrow pits would be appropriate at this park as an additional source of revenue for land management since it is compatible with the park's primary purpose of resource-based outdoor recreation and conservation.

The DRP may provide the services and facilities outlined in this plan either with its own funds and staff or through an outsourcing contract. Private contractors may provide assistance with natural resource management and restoration activities or a concessionaire may provide services to park visitors in order to enhance the visitor experience. For example, a concessionaire could be authorized to sell merchandise and food and to rent recreational equipment for use in the park. A concessionaire may also be authorized to provide specialized services, such as interpretive tours, or overnight accommodations when the required capital investment exceeds that which the DRP can elect to incur. Decisions regarding outsourcing, contracting with

the private sector, the use of concessionaires, etc., are made on a case-by-case basis in accordance with the policies set forth in the DRP's Operations Manual (OM).

Management Program Overview

Management Authority and Responsibility

In accordance with Chapter 258, Florida Statutes and Chapter 62D-2, Florida Administrative Code, the Division of Recreation and Parks (DRP) is charged with the responsibility of developing and operating Florida's recreation and parks system. These are administered in accordance with the following policy:

It shall be the policy of the Division of Recreation and Parks to promote the state park system for the use, enjoyment, and benefit of the people of Florida and visitors; to acquire typical portions of the original domain of the state which will be accessible to all of the people, and of such character as to emblemize the state's natural values; conserve these natural values for all time; administer the development, use and maintenance of these lands and render such public service in so doing, in such a manner as to enable the people of Florida and visitors to enjoy these values without depleting them; to contribute materially to the development of a strong mental, moral, and physical fiber in the people; to provide for perpetual preservation of historic sites and memorials of statewide significance and interpretation of their history to the people; to contribute to the tourist appeal of Florida.

The Trustees have also granted management authority of certain sovereign submerged lands to the Division under Management Agreement MA 68-086 (as amended January 19, 1988). The management area includes a 400-foot zone from the edge of mean high water where a park boundary borders sovereign submerged lands fronting beaches, bays, estuarine areas, rivers or streams. Where emergent wetland vegetation exists, the zone extends waterward 400 feet beyond the vegetation. The agreement is intended to provide additional protection to resources of the park and nearshore areas and to provide authority to manage activities that could adversely impact public recreational uses.

Many operating procedures are standardized system-wide and are set by internal direction. These procedures are outlined in the OM that covers such areas as personnel management, uniforms and personal appearance, training, signs, communications, fiscal procedures, interpretation, concessions, public use regulations, resource management, law enforcement, protection, safety and maintenance.

In the management of Dagny Johnson Key Largo Hammock Botanical State Park preservation and enhancement of natural conditions is all important. Resource considerations are given priority over user considerations and development is restricted to the minimum necessary for ensuring its protection and maintenance, limited access, user safety and convenience, and appropriate interpretation. Permitted uses are primarily of a passive nature, related to the aesthetic, educational and recreational enjoyment of the botanical site, although other

compatible uses are permitted in limited amounts. Program emphasis is placed on interpretation of the natural and cultural attributes of the botanical site.

Park Management Goals

The following park goals express the DRP's long-term intent in managing the state park:

- Provide administrative support for all park functions.
- Protect water quality and quantity in the park, restore hydrology to the extent feasible and maintain the restored condition.
- Restore and maintain the natural communities/habitats of the park.
- Maintain, improve or restore imperiled species populations and habitats in the park.
- Remove exotic and invasive plants and animals from the park and conduct needed maintenance-control.
- Protect, preserve and maintain the cultural resources of the park.
- Provide public access and recreational opportunities in the park.
- Develop and maintain the capital facilities and infrastructure necessary to meet the goals and objectives of this management plan.

Management Coordination

The park is managed in accordance with all applicable laws and administrative rules. Agencies having a major or direct role in the management of the park are discussed in this plan.

The Florida Fish and Wildlife Conservation Commission (FWC) assists staff in the enforcement of state laws pertaining to wildlife, saltwater fish and other aquatic life existing within the park. In addition, the FWC aids the DRP with wildlife management programs, including imperiled species management. The Florida Department of State (FDOS), Division of Historical Resources (DHR) assists staff to ensure protection of archaeological and historical sites. The Florida Department of Environmental Protection (DEP), Florida Coastal Office (FCO) aids staff in aquatic preserves management programs. The DEP, Bureau of Beaches and Coastal Systems aids staff in planning and construction activities seaward of the Coastal Construction Control Line (CCCL). In addition, the Bureau of Beaches and Coastal Systems aid the staff in the development of erosion control projects.

Public Participation

DRP provided an opportunity for public input by conducting a general public meeting and an advisory group meeting to present the draft management plan to the public. These meetings were held on Tuesday, August 21 and Wednesday, August 22, 2018, respectively. Meeting notices were published in the Florida Administrative Register, August 13, 2018, Volume 44, Issue 157, included on the Department Internet Calendar, posted in clear view at the park, and promoted locally. The purpose of the advisory group meeting is to provide the advisory group members an opportunity to discuss the draft management plan (see Addendum 2).

Other Designations

Dagny Johnson Key Largo Hammock Botanical State Park is within an Area of Critical State Concern as defined in Section 380.05, Florida Statutes. The park was designated as a component of the Florida Greenways and Trails System, a program administered by the Department's Office of Greenways and Trails as defined by Section 260, Florida Statute.

All waters within the park are designated as Outstanding Florida Waters, pursuant to Chapter 62-302, Florida Administrative Code. Surface waters in this park are also classified as Class III waters by the Department. This park is adjacent to the Florida Keys National Marine Sanctuary.

RESOURCE MANAGEMENT COMPONENT

Introduction

The Florida Department of Environmental Protection (DEP), Division of Recreation and Parks (DRP) in accordance with Chapter 258, Florida Statutes, has implemented resource management programs for preserving for all time the representative examples of natural and cultural resources of statewide significance under its administration. This component of the unit plan describes the natural and cultural resources of the park and identifies the methods that will be used to manage them. Management measures expressed in this plan are consistent with the DRP's overall mission in natural systems management. Cited references are contained in Addendum 3.

The DRP's philosophy of resource management is natural systems management. Primary emphasis is placed on restoring and maintaining, to the degree possible, the natural processes that shaped the structure, function and species composition of Florida's diverse natural communities as they occurred in the original domain. Single species management for imperiled species is appropriate in state parks when the maintenance, recovery or restoration of a species or population is complicated due to constraints associated with long-term restoration efforts, unnaturally high mortality or insufficient habitat. Single species management should be compatible with the maintenance and restoration of natural processes and should not imperil other native species or seriously compromise the park values.

The DRP's management goal for cultural resources is to preserve sites and objects that represent Florida's cultural periods, significant historic events or persons. This goal often entails active measures to stabilize, reconstruct or restore resources, or to rehabilitate them for appropriate public use.

Because park units are often components of larger ecosystems, their proper management can be affected by conditions and events that occur beyond park boundaries. Ecosystem management is implemented through a resource management evaluation program that assesses resource conditions, evaluates management activities and refines management actions, and reviews local comprehensive plans and development permit applications for park/ecosystem impacts.

The entire park is divided into management zones that delineate areas on the ground that are used to reference management activities (see Management Zones Map). The shape and size of each zone may be based on natural community type, burn zone, and the location of existing roads and natural fire breaks. It is important to note that all burn zones are management zones; however, not all management zones include fire-dependent natural communities. Table 1 reflects the management zones with the acres of each zone.

Table 1. Dagny Johnson Key Largo Hammock Botanical State Park Management Zones			
Management Zone	Acreage	Managed with Prescribed Fire	Contains Known Cultural Resources
KL-01	32.56	N	N
KL-02	290.48	N	Y
KL-03	28.11	N	N
KL-04	30.71	N	N
KL-05	24.29	N	Y
KL-06	111.05	N	Y
KL-07	71.65	N	Y
KL-08	13.55	N	N
KL-09	29.03	N	N
KL-10	104.64	N	N
KL-11	51.83	N	N
KL-12	74.63	N	N
KL-13	67.50	N	N
KL-14	59.40	N	N
KL-15	63.89	N	Y
KL-16	51.31	N	Y
KL-17	92.87	N	Y
KL-18	295.56	N	Y
KL-19	209.94	N	Y
KL-20	146.35	N	Y
KL-21	399.62	N	N
KL-22	110.17	N	N
KL-23	202.54	N	N

RESOURCE DESCRIPTION AND ASSESSMENT

Natural Resources

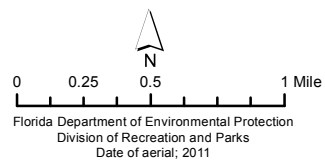
Topography

The Florida Keys are a chain of low-lying islands approximately 220 miles long extending from the southeastern tip of the Florida Peninsula, forming a barrier between the waters of the Gulf of Mexico and the Straits of Florida. The island chain begins in Biscayne Bay at Soldier Key and extends southward at first and then turns westward forming an arc to Key West and ultimately to the Dry Tortugas (Davis 1943; Monroe County 1986).

The park is located within the northern portion of the archipelago on the island of Key Largo. The northern islands within Monroe County are more generally known as the Upper Keys. The islands of the Upper Keys are narrow, low elevation (up to 18 feet), and are oriented more or less northeast to southwest; with the main axis of



DAGNY JOHNSON KEY LARGO
HAMMOCK BOTANICAL STATE PARK



MANAGEMENT ZONES MAP

the islands parallel to the island chain. The shoreline of the park is vegetated primarily by mangrove swamp that gradually increases into higher elevations and ultimately into rockland hammock vegetation (see Elevation Map). Offshore on the Atlantic side, lays a well-developed reef tract with various patch reefs between the shoreline and the outer reef. The majority of the Park (management zones KL-01 – KL-19, KL-21, KL-23) lies along CR 905, which is a State road that is managed by Monroe County and is shown on maps as both State Rd. 905 and CR 905. This roadway travels directly through the upland habitat of the northern portion of island of Key Largo. The rockland hammock habitat contains various features of karst topography such as solution holes, fissures, or pits. The habitat between the rockland hammock and mangrove swamp is the Keys tidal rock barren. This habitat is very low in elevation and may be subject to periodic tidal events. The substrate consists of open cap rock with loose limestone rock. Dispatch Slough, which was historically altered by road construction, can be found in management zones KL-19 and KL-21. This area contains submerged habitat and is influenced by tidal events.

Topography has been altered throughout the park at various times since the Upper Keys have been inhabited. Typically, the types of alterations in the park that have occurred prior to State of Florida ownership, include but are not limited to: paved roadways, mechanical clearing of vegetation, dredging activities such as borrow pits, canals and basins, and filling of low lying areas such as wetlands and transitional habitats. More detailed descriptions of these topographic alterations can be found in the Natural Communities section.

Geology

During the Pleistocene epoch (1 million to 10,000 years ago) sea level fell and rose repeatedly over the Florida Plateau in response to glaciations on the North American continent. These fluctuations in sea level are relatively rapid when measured in geologic time. Some 20,000 years ago, sea level may have been as low as 450 feet below present level. The islands of the Florida Keys, which are only a few feet above sea level, would have been affected by these large oscillations. Therefore, in a geologic sense, the Keys are very young. =

The surface geology found within the park is Key Largo Limestone. Geologists have concluded from analysis of sediment cores and old quarry pits that the Keys were once a patch reef that developed as the sea level rose to approximately 25 feet above the current sea level. This ancient patch reef was comprised primarily of boulder star coral and brain corals. As the sea receded far below today's current level, the ancient coral reefs became exposed and began eroding. When sea levels began again to rise to current levels, the ancient coral outer reefs were submerged and became the foundation for our live coral reefs today (Hoffmeister and Multer 1968).

Key Largo Limestone can be found at the surface from Soldier Key in Biscayne Bay south to the southeast corner of Big Pine Key. It varies in thickness from 70 to over 170 feet. It is a very porous coralline limestone and is riddled with solution features (karst topography) allowing water to easily pass both vertically and horizontally. The substrate would potentially create an excellent aquifer; however it contains

very little fresh water since its permeability allows ready outflow (Hoffmeister and Multer 1968; Hoffmeister 1974; Parker et al. 1955, Monroe County 1986).

Soils

The United States Department of Agriculture (USDA) Natural Resources Conservation Service (NRCS) Soil Survey Division has described six (6) soil series (see Soils Map) within the park (1989; 1995). They are Pennekamp gravelly muck, Matecumbe muck, Rock outcrop-Tavernier complex, Islamorada muck, Key Largo muck and Udorthents-Urban land complex.

Pennekamp gravelly muck is found in the upland hammock areas typically at the highest elevations. It is characterized by a thin layer of organic debris and leaf layer over the limestone rock. Soil in this unit is well drained. Pennekamp gravelly muck is found in close association with Matecumbe muck, which is found at lower elevations that are subject to occasional flooding. In the low intertidal area, the soil unit is Rock Outcrop-Tavernier complex. In this soil unit, the mangrove tidal swamps are subject to daily flooding by tides causing the soil to be poorly drained. The exposed limestone rock has weathered into smooth caprock pitted with solution holes filled with accumulated marl soil. The submerged shallow bottom in Dispatch Slough consists of fine mud of organic particles and calcareous sediments known as Islamorada muck. In addition to the Rock Outcrop-Tavernier complex, both Islamorada muck and Key Largo muck are associated with mangrove tidal swamps. Udorthents-Urban land complex includes constructed upland areas where land has been altered by dredging and filling for development. A detailed description of each of the representative pedons (unit of soil) as well as the associated characteristic plant communities for each of these series is included in Addendum 4.

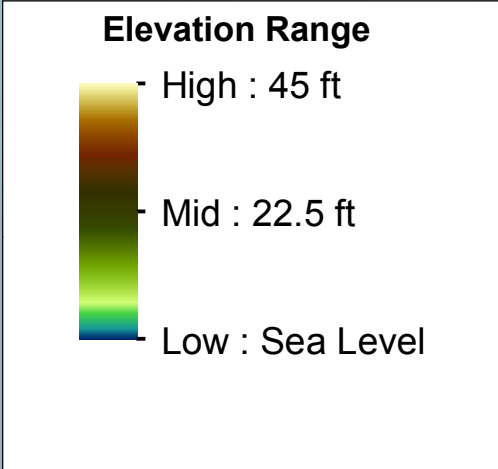
Ongoing restoration efforts at the Carysfort Marina and Port Bougainville sites continue to increase the quality of soil resources at these areas. There are no activities within the park that contribute to erosion and/or removal of the soil substrate.

Minerals

The mineral resource in the park is limestone. Key Largo limestone was historically used as ornamental stone and building blocks (Davis 1943). Several quarries were also created at one time to obtain fill material. Currently the removal of limestone is not permitted from the park. Minor mineral deposits in the park are calcite and halite.

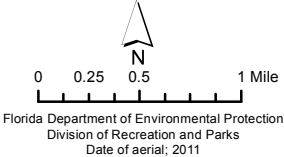
Hydrology

Unlike the Miami area and the lower Keys, which are composed of Miami oolite, a more dense limestone substrate, the upper Keys do not have an ample supply of fresh water. The underlying Key Largo limestone contains voids and channels interconnected horizontally so fresh water recharge from rainfall cannot be retained laterally, resulting in outflow. In addition, the voids and channels allow saltwater to










Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AEX, Getmapping, Aerogrid,

DAGNY JOHNSON KEY LARGO
HAMMOCK BOTANICAL STATE PARK

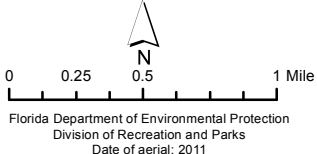


ELEVATION MAP



Legend	
	2 - Pennekamp gravelly muck, 0-2 percent slopes, extremely stony
	3 - Matecumbe muck, occasionally flooded
	4 - Rock outcrop-Tavernier complex, tidal
	5 - Islamorada muck, tidal
	6 - Keylargo muck, tidal
	7 - Udorthents-Urban land complex
	99 - Water

DAGNY JOHNSON KEY LARGO
HAMMOCK BOTANICAL STATE PARK



SOILS MAP

readily pass through the aquifer (rainwater layer) in response to tidal movements. Therefore, the result is an increase in mixing and dissipation of fresh water (Parker et al. 1955;). Rainfall is the only natural source of freshwater in the Upper Keys. Historically, early settlers collected rainwater in cisterns or used water from wells and solution holes that tapped the small, shallow freshwater lenses. These lenses form in the limestone above sea level during the rainy season. Until recently, nearshore freshwater upwelling, an extension of the Biscayne Aquifer, occurred in at least one location on northern Key Largo. Drainage of the Everglades and the subsequent canalization of southeast Florida (including canals in the Florida Keys) resulted in saltwater intrusion into the Biscayne Aquifer and changed the regional hydrology. Only on the larger islands such as Key Largo and Big Pine Key is rainwater retained for any length of time.

Within management zones KL-02, KL-05, KL-08, KL-10, KL-11, KL-13, KL-15 in the park, several man-made features have been created that disrupted the natural hydrology. Large dredged lakes, open channels, and canals were created in association with failed developments. These large cuts in to the porous Key Largo limestone disrupt the geology enough to cause extensive saltwater intrusion. Two of the largest developments have been under active restoration and are currently being restored to their natural condition.

Natural Communities

This section of the management plan describes and assesses each of the natural communities found in the state park. It also describes of the desired future condition (DFC) of each natural community and identifies the actions that will be required to bring the community to its desired future condition. Specific management objectives and actions for natural community management, exotic species management, imperiled species management [and population restoration] are discussed in the Resource Management Program section of this component.

The system of classifying natural communities employed in this plan was developed by the Florida Natural Areas Inventory (FNAI). The premise of this system is that physical factors such as climate, geology, soil, hydrology and fire frequency generally determine the species composition of an area, and that areas that are similar with respect to those factors will tend to have natural communities with similar species compositions. Obvious differences in species composition can occur, however, despite similar physical conditions. In other instances, physical factors are substantially different, yet the species compositions are quite similar. For example, coastal strand and scrub--two communities with similar species compositions--generally have quite different climatic environments, and these necessitate different management programs. Some physical influences, such as fire frequency, may vary from FNAI's descriptions for certain natural communities in this plan.

When a natural community within a park reaches the desired future condition, it is considered to be in a "maintenance condition." Required actions for sustaining a community's maintenance condition may include; maintaining optimal fire return intervals for fire-dependent communities, ongoing control of non-native plant and animal species, maintaining natural hydrological functions (including historic water

flows and water quality), preserving a community's biodiversity and vegetative structure, protecting viable populations of plant and animal species (including those that are imperiled or endemic), and preserving intact ecotones that link natural communities across the landscape.

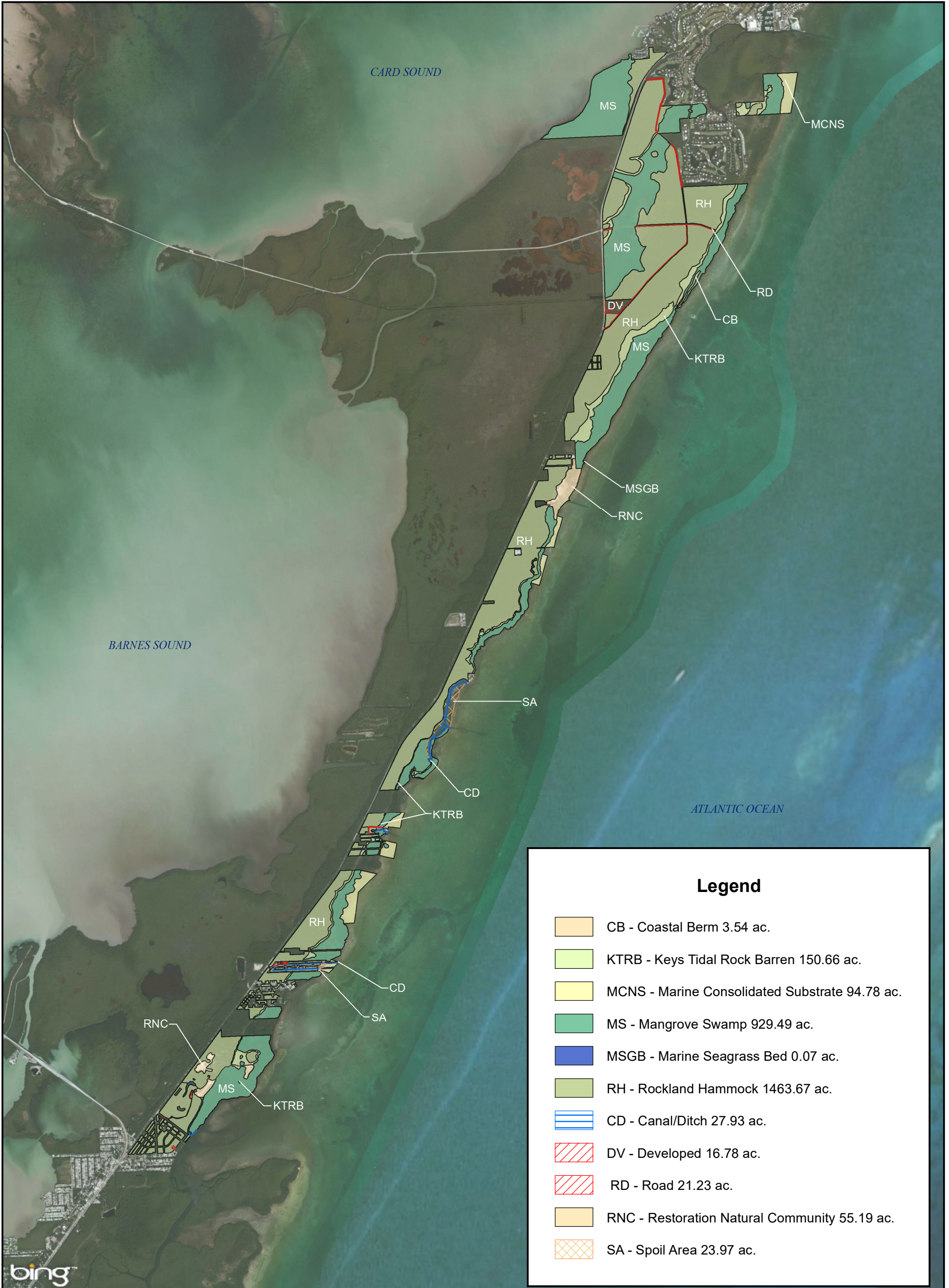
The park contains 5 distinct natural communities as well as altered land cover types (see Natural Communities Map). A list of known plants and animals occurring in the park is contained in Addendum 5.

Coastal Berm

Desired future condition: Coastal berm habitat will be found on the seaward edge or landward edge of the mangroves or further inland depending on the height of the storm surge that formed them. They will range in height from 1 to 10 feet. Structure and composition of the vegetation will be variable depending on height and time since the last storm event. Coastal berm will consist of a mixture of tropical herbs, shrubs and trees and is defined by its substrate of coarse, calcareous, storm-deposited sediment forming long narrow ridges that parallel the shore. The most stable berms may share some tree species with rockland hammocks, but generally will have a greater proportion of shrubs and herbs. Tree species may include blolly (*Guapira discolor*), gumbo limbo, and poisonwood. Characteristic tall shrub and short tree species may include Spanish stopper (*Eugenia foetida*), hog plum (*Ximenia americana*), white indigo-berry (*Randia aculeata*), seven-year apple (*Genipa clusiifolia*), blackbead, and saffron plum (*Sideroxylon celastrinum*). Short shrubs and herbs may include perfumed spiderlily (*Hymenocallis latifolia*), bayleaf capertree (*Cynophalla flexuosa*), buttonsage (*Lantana involucrata*), and rougeplant (*Rivina humilis*). More seaward berms or those more recently affected by storm deposition may support a suite of plants similar to beaches, including shoreline seapurslane (*Sesuvium portulacastrum*), saltgrass (*Distichlis spicata*), and seashore dropseed (*Sporobolus virginicus*), or dense shrub thickets with buttonwood, black, red, and white mangroves, joewood (*Jacquinia keyensis*), and bushy seaside oxeye (*Borrichia frutescens*).

Description and assessment: A narrow strip of coastal berm can be found within management zones KL-18, and KL-20. The berm is characterized by a ridge of storm deposited sediment consisting of coarse, calcareous sand which has accumulated to an elevation of one to four feet. Historically, people inhabiting the Keys would utilize these areas given their close proximity to the shoreline; therefore, the coastal berm in the park retains several cultural sites.

A variety of plant associations develop on this berm and include dense thickets of large shrubs, small trees, or sparse shrubby vegetation. Similar species found in the rockland hammock will also be found in the coastal berm. Such species include; blackbead, prickly pear cactus (*Opuntia stricta*), Spanish stopper, poisonwood, white indigo berry, and manchineel (*Hippomane mancinella*). Manchineel is an imperiled species that is only found in a few locations in the Keys. The population in the park is located next to a cultural site in management zone KL-20 and has been impacted by recent storm events and the population is down to only one remaining individual. Exotic species infestation has been an ongoing problem in this zone,



Legend

- CB - Coastal Berm 3.54 ac.
- KTRB - Keys Tidal Rock Barren 150.66 ac.
- MCNS - Marine Consolidated Substrate 94.78 ac.
- MS - Mangrove Swamp 929.49 ac.
- MSGB - Marine Seagrass Bed 0.07 ac.
- RH - Rockland Hammock 1463.67 ac.
- CD - Canal/Ditch 27.93 ac.
- DV - Developed 16.78 ac.
- RD - Road 21.23 ac.
- RNC - Restoration Natural Community 55.19 ac.
- SA - Spoil Area 23.97 ac.

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Florida Department of Environmental Protection
Division of Recreation and Parks
Date of aerial; 2011

DAGNY JOHNSON KEY LARGO
HAMMOCK BOTANICAL STATE PARK

NATURAL COMMUNITIES
MAP

particularly portia (*Thespesia populnea*) and latherleaf (*Colubrina asiatica*). This area has been targeted for several exotic removal projects.

The difference in elevation from the surrounding mangroves, no matter how slight, prevents inundation from tides except during major storm events and extreme spring tides. Therefore, even with existing fringing mangroves present along the majority of the shoreline, when high water events occur, flotsam and jetsam wash into this area from the Atlantic Ocean. The debris can be very thick (as well as very large) depending on the location and topography of the berm. The coastal berm in the park is in good condition.

General management measures: In order to achieve the desired future condition, the coastal berm will require continued regular exotic removal projects as well as debris removal where possible. Continued monitoring of this habitat is needed to ensure non-native plant populations do not become re-established.

Rockland Hammock

Desired future condition: Rockland hammock is a rare tropical hardwood forest on upland sites and occurs on a thin layer of highly organic soil covering limestone. This habitat does not regularly flood but it is often dependent upon a high water table to maintain reservoirs in solution features of the limestone and to keep humidity levels high. Organic acids may dissolve the surface limestone causing collapsed depressions in the surface rock called solution holes. Rockland hammocks will typically have larger more mature trees in the interior, while the margins are dense with growth of smaller shrubs, trees, and vines. Within the Florida Keys there will be variation and some species are found only in the upper Keys, while others will be found only in the lower Keys. This is even true with Dagny Johnson Key Largo Hammock Botanical State Park where a few hammock species are found only within a small portion of the park; these include worm vine orchid (*Vanilla barbellata*), Cuban clustervine (*Jacquemontia havanensis*) and red-berried stopper (*Eugenia confusa*). This is due to elevation, geologic, and rainfall differences between the islands and within the islands. Typical canopy and understory species will include, gumbo limbo (*Bursera simaruba*), false tamarind (*Lysiloma latisiliquum*), pigeon plum (*Coccoloba diversifolia*), false mastic (*Sideroxylon foetidissimum*), strangler fig (*Ficus aurea*), poisonwood (*Metopium toxiferum*), several species of stoppers (*Eugenia* spp.), torchwood (*Amyris elemifera*), marlberry (*Ardisia escallonioides*), satinleaf (*Chrysophyllum oliviforme*), and blackbead (*Pithecellobium keyense*). Vines and herbaceous vegetation will be less common and include greenbrier (*Smilax* spp.) and epiphytes, including orchids, ferns, and bromeliads that are found on larger trees.

Description and assessment: Rockland hammock is the largest and most diverse habitat within the park and can be found in all but one management zone listed for Key Largo Hammock (management zones KL-24). In addition, within management zones KL-19 and KL-21, there is a unique habitat containing both rockland hammock and a remnant pine rockland. This remnant area is approximately fifteen acres in size and is considered a remnant pine-oak community (Alexander 1953; 1974). This habitat was a functional pine rockland until the pines were logged in the

early 1900s (Stevenson 1969). However, due to a rise in sea level, some areas of this remnant pine rockland are barely above high tide which is atypical for this type of natural community. Several stumps of Dade County slash pine (*Pinus elliottii* var. *densa*) persist along the edge adjacent to Dispatch Slough. These pine stumps are now interspersed with red mangrove (*Rhizophora mangle*), black mangrove (*Avicennia germinans*), white mangrove (*Laguncularia racemosa*) and green buttonwood (*Conocarpus erectus*) trees. Further inland from Dispatch Slough and bisected by the old Card Sound Rd., the remnant pine rockland has succeeded into rockland hammock with scattered live oak (*Quercus virginiana*), the southernmost population in the United States, and other pine rockland associates including wax myrtle (*Myrica cerifera*) and myrsine (*Myrsine cubana*) persisting. Surveys were conducted in 2009 throughout the upland portions of the relict pine rockland to determine the feasibility of restoring this habitat since remnant pine rockland associates still persist. However over 100 years have passed since this was a functional pine rockland and the integrity of the successional rockland hammock is such that this restoration concept was determined to be incompatible. The substrate within the natural areas is primarily limestone cap rock with clay-like marl in depressions overlaid with dead organic material. Low lying areas are periodically flooded by tides. Of additional interest is a variety of varnish leaf (*Dodonea eleagnoides*) that is restricted to Key Largo Hammock, Big Pine Key, and an island in Great White Heron National Wildlife Refuge. Other pine rockland species found in this area include, but are not limited to pineland acacia (*Acacia pinetorum*), locust berry (*Byrsonima lucida*), bracken fern (*Pteridium aquilinum* var. *caudatum*) and saw palmetto (*Serenoa repens*). These species are found nowhere else in the park but in this remnant pine rockland.

The rockland hammock at the park is the largest, contiguous West Indian hardwood hammock in the continental United States. Despite disturbances from extensive logging activities, development, early settlers, road construction, and habitat fragmentation, the majority of the hammock is in good condition. Management zones KL-01 – KL-05 have been the most impacted by partial development. All of north Key Largo was slated for development and some areas of the park retain remnants of habitat damage, specifically old survey transects. Despite this, species diversity is significant and there are many successional stages providing a mosaic of canopy cover. Typical canopy trees include wild tamarind, gumbo limbo, strangler fig and pigeon plum. Typical understory trees include white stopper, Spanish stopper, torchwood and soldierwood. Imperiled species distribution can be limited in Key Largo Hammock as demonstrated by the population distribution of lignumvitae, redberry stopper, Cuban clustervine, redberry stopper, myrtle of the river, and Swartz' snoutbean. Four U.S. Champion trees are found within the boundary of the park; white ironwood (*Hypelate trifoliata*), rough velevetseed (*Guettarda scabra*), stopper (*Eugenia foetida*), milkbark (*Drypetes diversifolia*), and rhacoma (*Crossopetalum rhacoma*). In addition, gulf graytwig (*Schoepfia chrysophylloides*) is listed as a Florida champion.

Rockland hammock restoration has been ongoing in the park to restore habitat continuity and topographic elevation. This restoration has included exotic species removal, installation of topographic material, removal of old buildings and

structures, and installation of native vegetation. Major restoration has been concentrated in management zones KL-02 and KL-15, but is also slated for management zone KL-18.

A number of solution holes in the rockland hammock retain fresh water except under condition of drought. These areas support moisture loving plants such as pond apple (*Annona glabra*) and golden leather fern (*Acrostichum aureum*).

Imperiled animal species also rely on the rockland hammock for their survival. These include Schaus' swallowtail butterfly (*Heraclides aristodemus ponceanus*), white-crowned pigeon (*Patagioenas leucocephala*), Key Largo woodrat (*Neotoma floridana smalli*), Key Largo cotton mouse (*Peromyscus gossypinus allapaticola*), and eastern indigo snake (*Drymarchon corais couperi*). The biology of the white-crown pigeon plays a major role in the health and welfare of the rockland hammock. Over seventy percent of the trees in hammocks produce fleshy fruit that is consumed by animals and birds. Effective seed dispersal is an essential mechanism for maintaining species diversity among all hammock habitats, not just within the park. One of the most important seed dispersers is the white-crowned pigeon. Therefore, the health of the hammock habitat and this bird are intertwined (Strong and Bancroft 1994).

Other typical animal species found in the rockland hammock include Chuck-will's-widow (*Caprimulgus carolinensis*), Black-and-white warbler (*Mniotilta varia*), Northern parula (*Parula americana*), ovenbird (*Seiurus aurocapilla*), *Liguus* tree snail (*Liguus fasciatus*), land crab (*Cardisoma guanhum*), hermit crab (*Coenobita clypeatus*), and a variety of butterflies including gulf fritillary (*Argraulis vanillae*), zebra heliconia, and great southern white (*Ascia monuste*).

Rockland hammock is also critical habitat for neotropical migrant birds. These birds travel from the northeastern United States funneling through Florida and concentrating in the Florida Keys before their flight to the West Indies and Central and South America. Some thirty species of neotropical migrants have been recorded in the Florida Keys, many of which utilize Rockland hammock habitat for feeding, resting, and shelter. Just as critical, the Florida Keys represents the first landing spot for migrants returning north in the spring (National Audubon Society 1992).

Disturbances that affect rockland hammock are varied and include natural events such as fire and hurricanes. Man-made impacts, such as land clearing, dredging, filling, and the introduction of exotic plants and animals also disrupt the natural succession of the rockland hammock. In addition, disturbances arise in association with private landowners; due to the fact many of the parcels within the park exist within developed platted subdivisions. Encroachment, dumping, non-native species, and land clearing are just a few of the challenges associated with residential activities.

The condition of the rockland hammock in the park ranges from fair to good. The boundary of the park has increased over the years due to the acquisition of new

parcels, many of which have been vacant for decades, and man-made disturbances are minimal. However, other parcels contain significant disturbances that require restoration efforts. These disturbances include, but are not limited to: paved roads, partial development, dredged canals, mechanical clearing, and fill material.

General management measures: Natural and man-made disturbances within the rockland hammock have resulted in various stages of biological succession depending on the extent and time of disturbance. Depending on the degree of disturbance, particularly in the platted subdivisions, management measures that should be implemented include: (1) continued monitoring and removal of non-native plant and animal species, (2) continued monitoring and addressing of dumping (both vegetative and debris) activities, (3) monitoring and enforcement of illegal encroachment activities by private homeowners onto park property, and (4) creating and maintaining a regular presence of staff and law enforcement to ensure continued support in the community. In addition, several sites within the park are in need of active restoration. For a more detailed discussion on the restoration activities for these sites, please see the Restoration Objective of the Resource Management Program of the plan.

The 15-acre site within management zones KL-19 and KL-21 is no longer a functional pine rockland so prescribed fire is not a resource management tool to be used in Dagny Johnson Key Largo Hammock Botanical State Park.

Keys Tidal Rock Barren

Desired future condition: Keys tidal rock barren is a flat rockland in the supratidal zone with much exposed and eroded limestone and a sparse cover of stunted halophytic herbs and shrubs, and will be inundated by salt water only during the extreme spring high tides. Patches of low, salt-tolerant herbaceous species will include bushy seaside oxeye (*Borrichia frutescens*), perennial glasswort (*Sarcocornia perennis*), saltwort, saltgrass (*Distichlis spicata*), and seashore dropseed (*Sporobolus virginicus*). Buttonwood will be the dominant woody plant. It will vary from stunted, sprawling, multi-stemmed shrubs to tree size. Other typical woody species will include red mangrove, black mangrove, white mangrove, and christmasberry (*Lycium carolinianum*). At the transition to upland vegetation, buttonwood may be joined by a variety of shrubs and stunted trees of inland woody species, including saffron plum (*Sideroxylon celastrinum*), wild cotton (*Gossypium hirsutum*), blackbead (*Pithecellobium keyense*), wild dilly (*Manilkara jaimiqui subsp. emarginata*), poisonwood (*Metopium toxiferum*) and joewood (*Jacquinia keyensis*).

Keys tidal rock barren occurs above the daily tidal range, but will be subject to flooding by seawater during extreme tides and storm events. Salt spray from coastal winds, as well as shallow soils, may limit height growth of woody plants. Aside from bare rock substrate, discontinuous patches of thin marl soils may be present. Depressions with deeper peat and mud soils support tidal swamp and tidal marsh communities, dominated respectively by mangroves or Gulf cordgrass.

Description and assessment: Keys tidal rock barren occurs as the ecotonal community between the rockland hammock and the mangrove swamp. It becomes

inundated with as much as eight inches of water during extreme high tides and this seasonal saltwater inundation has had effects on the plant species found in this community. The width of this habitat can vary from a few feet to over ten feet. Prior to state acquisition more land at the south end of the park was cleared for proposed developments. As a result, the north end of Key Largo Hammock contains a better-developed Keys tidal rock barren community. It occurs in the ecotonal community throughout the park in management zones KL-2, KL-3, KL-4, KL-6, KL-7, KL-9, KL-10, KL-12, KL-13, KL-16, KL-17, KL-18, KL-20, KL-21, KL-22, and KL-25.

Although no scientific studies have been conducted as to the impacts of increased inundation, park staff has noted that the level and intensity of this seasonal inundation occurring in the spring and fall has increased since the approval of the last Unit Management Plan in 2004. Along the edges of Dispatch Slough in management zone KL-21, particularly the western edge, the Keys tidal rock barren has developed into a wider habitat due to the increased level of the water in the Slough. This is a factor of both the higher spring tides and the restoration of Dispatch Slough in the year 2000. Species die-off has occurred and the habitat has become more open increasing the total acreage of this habitat (J. Duquesnel, personal communication).

Typical plant species found in the Keys tidal rock barren include joewood, black torch (*Erithalis fruticosa*), saltwort, saffron plum (*Sideroxylon celastrina*), white mangrove, buttonwood, Christmas berry, and black mangrove. A small population of the imperiled qualberry (*Crossepetalum ilicifolium*) is found in this habitat in management zone KL-21. Other imperiled species, including vanilla orchid (*Vanilla barbellata*), dollar orchid, and Cuban clustervine (*Jacquemontia havanensis*), are also found in the Keys tidal rock barren.

Mahogany mistletoe (*Phoradendron rubrum*) was thought to have been extirpated from the park, but was rediscovered in 1999 by park staff along the edge of the Keys tidal rock barren. A detailed description of this species and the conservation efforts to save it from extirpation from the Park is found in the Imperiled Species section.

Semaphore cactus (*Consolida corallicola*) was reintroduced into the park in 1996 through a cooperative partnership between FDEP park and District Staff and Fairchild Tropical Botanic Garden. Keys tidal rock barren was selected as one of two habitat types for this reintroduction project. Although some individuals are persisting, recent observations from surveys conducted in October 2012 showed that the fall high tide exceeded past years' influences and many cacti were underwater at the site in management zone KL-17 (J. Duquesnel personal communication October 2012). For a more detailed description on the conservation efforts of this imperiled species, see the Imperiled Species section.

Keys tidal rock barren is also subject to disturbances by natural events such as hurricanes and fires. Unfortunately, open canopy habitats, such as this one, can be changed dramatically by these types of events due to the removal (by tide or wind) of the normally sparse soil layer and canopy cover (Monroe County 1986).

Typical animal species found in this habitat include great egret (*Ardea alba*), white ibis, little blue heron, a variety of spiders, butterflies, raccoon (*Procyon lotor*), fiddler crab (*Uca pugilator*), and hermit crab.

Key tidal rock barren in the park is in good or excellent condition although it is are impacted by flotsam and jetsam as well as invasion by exotic plant species.

General management measures: This natural community should be considered in a maintenance state and does not require extensive management measures. However, in order to maintain the Keys tidal rock barren in its desired future condition, continued monitoring of this habitat is needed to ensure non-native plant populations do not become established, and removal of flotsam and jetsam where it persists and is accessible, should be addressed.

Marine Consolidated Substrate

Desired future condition: Marine consolidated substrate is characterized by Key Largo limestone substrate with minimal sediment accumulation. This habitat is also known as hardbottom and often time consists of a combination of macroalgae, octocoral and stony coral species. Because there is minimal sediment accumulation, seagrass does not thrive in this environment.

Description and assessment: The marine consolidated substrate in the park is scattered in the nearshore waters along the shoreline of North Key Largo. This is an important community because it provides a foundation for the development of other marine communities. Seagrasses do not thrive here, instead, the marine consolidated substrate is dominated by macroalgae including; shaving brush algae, oatmeal algae (*Halimeda* spp.), fern algae (*Caulerpa* spp.), and mermaid's wine cup (*Acetabularia calyculus*); stony corals including finger coral, rose coral, lobed star coral (*Solenastrea hyades*), and starlet coral (*Siderastrea radians*); octocorals including sea whips (*Pterogorgia* spp.) and sea rods (*Plexaura* spp), Sargassum algae, starfish, and a variety of fish common in the shallow waters of the Florida Keys. Because of the structure that the stony coral species provide along with natural solution holes in the substrate, the marine consolidated substrate provides suitable habitat for the invasive lionfish (*Pterois volitans*) that has increased in abundance and distribution throughout the Florida Keys and the wider Caribbean basin. Park and District staff conduct surveys to locate and remove lionfish from park waters and park staff collaborate with the Reef Environmental Education Foundation (REEF) to eliminate this invasive species from Pennekamp waters.

General management measures: The marine consolidated substrate in Dagny Johnson Key Largo Hammock Botanical State Park is in good condition although it is subject to impacts from vessel groundings, water quality including run-off, increase in exotic marine species, and climatic changes resulting in coral bleaching events and increasing coral disease. In order to achieve the desired future condition, periodic surveys will be required to monitor for potential impacts from park visitors, exotic marine species and the short-term and long-term impacts of coral bleaching events.

Seagrass Bed

Desired future condition: Seagrass beds are typically characterized as expansive stands of vascular plants and are one of the most productive communities in the world. Seagrass beds occur in clear, coastal waters where wave energy is moderate. The three most common species of seagrasses in Florida are turtle grass (*Thalassia testudinum*), manatee grass (*Syringodium filiforme*), and shoal grass (*Halodule wrightii*). Johnson's grass (*Halophila* spp.) may be intermingled with the other seagrasses, but species of this genus are considerably less common in the Florida Keys.

Seagrass beds require unconsolidated substrate in order to establish their underground biomass root structure. They are typically found in waters ranging from 20° to 30°C (68° to 86°F), and require clear water for photosynthesis. Seagrass beds do not thrive where nutrient levels are high because of increased turbidity and competition of undesirable algae species.

Seagrass beds provide important habitat for a host of commercially and recreationally important species including the Florida spiny lobster, queen conch, stone crab (*Menippe mercenaria*) and shrimp. Information from the Florida Fish and Wildlife Conservation Commission's Annual Landings Report for 2006 estimated that the harvest of the six major recreational and commercially important species was \$25.8 million in the Florida Keys. All of these species rely on the marine grass bed for part or all of their life cycle. Larger predators such as the loggerhead turtle (*Caretta caretta*), green turtle (*Chelonia mydas*), hawksbill turtle (*Eretmochelys imbricata*), West Indian manatee (*Trichechus manatus*), and bottlenose dolphin (*Tursiops truncatus*) utilize the seagrass beds.

Most species migrate between the coral reef, seagrass beds and mangrove communities on a diurnal, seasonal or life cycle pattern. Seagrass stabilize sediment, cycle nutrients, and the seagrass blades trap suspended sediment in the water allowing clear water to be transported to the offshore coral reefs during tidal movement.

Description and assessment: The three species of seagrass found in the park are turtle grass, shoal grass, and manatee grass. Turtle grass is the climax species while shoal grass and manatee grass are the pioneer species and first to colonize into open and/or disturbed sites. Shoal grass has a greater tolerance for salinity and temperature fluctuations and is therefore typically found in areas where extreme conditions occur nearshore and in areas of minimal water depth. The morphology of its root structure enables shoal grass to effectively colonize open or disturbed areas stabilizing the sediment for the heavier rooted turtle grass. Manatee grass can be found in association with the other two species but is far less common in the park.

Macroalgae are found in association with the seagrass community although they are not as abundant in a climax seagrass bed that is predominantly a monoculture of turtle grass. These include shaving brush algae, oatmeal algae, Fan algae (*Udotea*

spp and *Avrainvillea* spp.), mermaid's wine cup, fern algae and *Batophora oerstedii*. Several non-reef building species of coral can be found in this habitat including finger coral, rose coral, ivory tube coral, golfball coral, and lobed star coral. These species are present in the offshore coral reef habitat, but they are also able to persist in the seagrass beds because they are tolerant of higher salinity, higher water temperature, and a greater amount of suspended sediment in the water column than most coral species. Other animals found in the seagrass include echinoderms, crustaceans, fish, worms, sponges, and epiphytic species that attach themselves to the turtle grass blades.

Aerial photographs were taken in 1994, 1997 and 2005 and along with current technology, can be utilized to analyze the trend of damage within the park, and to establish a list of seagrass restoration priorities. A Seagrass Restoration Plan (Duquesnel, J.A. 2011), a component of the Submerged Land Managed Plan is already in place and defines the goals, methods and objectives for seagrass restoration. This plan is based upon the seagrass restoration work that has been conducted at Lignumvitae Key Submerged Land Managed Area since 2005.

General management measures: Although protection of the resource to prevent damage is a top priority, seagrass restoration is also crucial to repair existing damage and to achieve the desired future condition of the seagrass habitat in the park. Seagrass beds found in the deeper waters in the park or in the mangrove creeks are in excellent condition.

In addition to restoration measures, the park will continue to maintain aids to navigation markers and No Motor Zone signs. It will also be important to determine whether additional No Motor Zone signs are necessary by analyzing aerial photographs as well as current technology to evaluate sites of concentrated damage.

Mangrove Swamp

Desired future condition: Mangrove swamp is typically characterized as a dense forest occurring along relatively flat, low wave energy, marine and estuarine shorelines. The dominant over story will include red mangrove, black mangrove, white mangrove, and buttonwood. These four species may occur either in mixed stands or often in differentiated, monospecific zones based on varying degrees of tidal influence, levels of salinity, and types of substrate. Red mangroves will typically dominate the deepest water, followed by black mangrove in the intermediate zone, and white mangroves and buttonwood in the highest, least tidally influenced zone. Mangroves will typically occur in dense stands (with little to no understory) but may be sparse, particularly in the upper tidal reaches where salt marsh species predominate. When present, shrub species can include seaside oxeye (*Borrchia arborescens*, *B. frutescens*), and vines including coinvine (*Dalbergia ecastaphyllum*), and rubbervine (*Rhabdadenia biflora*), and herbaceous species such as saltwort, shoregrass (*Monanthocloe littoralis*), perennial glasswort (*Sarcocornia perennis*), and giant leather fern (*Acrostichum danaeifolium*). Soils will generally be anaerobic and are saturated with brackish water at all times, becoming inundated at high tides. Mangrove swamps within the park will occur on multiple

mud soils and even solid limestone rock. In older mangrove swamps containing red mangroves, a layer of peat may build up over the soil from decaying plant material (primarily red and black mangrove roots).

Description and assessment: Mangrove swamp is found in every management zone in the park. Red mangroves are established along the shoreline with their prop-roots submerged in the water. Typical species found attached to or living near the red mangrove prop-roots include snapper (*Lutjanus* spp.), mosquitofish (*Gambusia affinis*), oysters (*Isognomon alatus*), barnacles (*Lepas anatifera*), mangrove crabs (*Goniopsis cruentata*) and fiddler crabs (*Uca pugilator*). The black mangroves are landward of the red mangroves in the intertidal zone, which is subject to tidal influences. To cope with saltwater inundation, salinity fluctuations, and anaerobic soil, black mangroves extend pneumatophores above the surface of the soil to aid in gas exchange. The white mangroves are often found in association with the black mangroves, but prefer slightly higher ground that is not prone to the daily tidal influences.

A mature forest of red mangroves lines the Atlantic shore. This fringe is of varying width, sometimes a narrow band of less than fifty feet, sometimes several hundred feet wide. In many areas, the trees exceed twenty feet in height. The marine tidal swamp grades into marine grass bed in the submerged areas of John Pennekamp Coral Reef State Park and coastal berm or coastal rock barren as the elevation increases towards the rockland hammock.

Another expanse of mangroves occupies Dispatch Slough. Red mangroves occur in the center of the slough with the black and white mangroves and buttonwoods growing along the edges. This shallow depression originally connected the Atlantic Ocean with Card Sound. Water flow among the mangroves was initially disrupted when Card Sound Road and old C-905 were constructed to the north and again when the new Card Sound Road and C-905 were re-constructed in parallel locations in the 1970s. The few culverts that were installed in the mid-1990's allowed limited water flow, but the slough had begun to reclaim some of its former passage by eroding and crossing the old C-905 roadbed. A small borrow pit was created as a source of fill for road building. Although it is almost completely surrounded by dredged spoil, it has become part of the slough with a thicket of red mangroves along its shores. This borrow pit has become the home of one or more American crocodiles (*Crocodylus acutus*). The natural flow of water was restored to Dispatch Slough in the year 2000 when sections of old C-905 and abandoned portions of Card Sound Road were removed and restored to the original topography.

Dispatch Slough is dotted with shallow areas where many species of birds such as woodstork (*Mycteria americana*), white ibis (*Eudocimus albus*), white pelican (*Pelecanus erythrorhynchos*) and roseate spoonbill (*Ajaia ajaja*) frequent particularly in the winter months. Several species of hawks including red-shouldered (*Buteo lineatus*) and short-tailed hawk (*Buteo brachyurus*) are observed flying overhead.

Mangrove swamp habitat is subject to extreme tidal events and storm surges and is therefore subject to an influx of flotsam and jetsam. Despite this accumulation of debris, the mangrove swamp in the park is in excellent condition.

Mangroves play an important role in the marine and estuarine ecosystems of the Park. They are the primary producers establishing food cycles. Mangroves also provide food and shelter to important commercial and recreational marine species. Over 220 fish species have been recorded utilizing mangrove ecosystems at some point during their lifecycle. A wide variety of birds use mangroves for nesting, roosting, and protection from predators and the elements. Mangroves also serve to baffle storm and wave energy and possess an extensive root system that helps to stabilize the shoreline. Mangrove ecosystems act as sinks (net accumulators) for a variety of elements, including nitrogen, phosphorous, trace elements, and heavy metals. These elements are filtered from the water by the concerted actions of mangrove prop roots, prop root algae, the associated sediments, fallen mangrove litter, the intricate root system, and a variety of sessile invertebrates (such as oysters), as well as microorganisms attached to all of these surfaces. Trimming mangroves decreases their ability to perform these important functions. Other species found here include white-crowned pigeon, black whiskered vireo (*Vireo altiloquus*), snowy egret (*Egretta thula*), brown pelican (*Pelecanus occidentalis*), white ibis (*Eudocimus albus*), and roseate spoonbill (*Platalea ajaja*).

Because the coral reefs offshore protect the islands from high-energy wave action, mangrove swamp was the dominant shoreline habitat prior to development of the Florida Keys. In addition to damage from boat grounding events, these areas are also subject to debris washed in by tides and storm surges.

General management measures: Mangrove swamp in the park is in the desired future condition however continued monitoring is needed to ensure non-native plant populations do not become established as well as debris removal where accessible.

Canal/Ditch

Desired future condition: Canal and ditch sites will minimize hydrological impacts to adjacent natural communities. Priority invasive plant species (EPPC Category I and II species) will be removed from all canal/ditch sites. Where determined feasible canal and ditches will be filled to surrounding natural elevations and associated native plant species re-established. Canal and ditch areas where full rehabilitation of the site is determined not feasible, will be filled to a depth suitable for the recruitment of native submerged vegetation and be navigable via motored boat.

Description and assessment: Several canals can be found in the park, all of which are remnants of past and present human development activities. They can be found within management zones KL-2, KL-5, KL-8, KL-10, KL-11, KL-13, and KL-15 and equal approximately 28 acres. There are three dredged canals within the Port Bougainville area in management zone KL-2. These consist of two land-locked 'lakes' and the entrance channel to what used to be a marina, but which has been resorted to historic upland and wetland habitat elevations. On the north end of the

entrance channel is located a permitted 'clean-fill' dump site. This is an active restoration site, where small amounts of material are brought in from local contractors when available.

Within management zone KL-05 is located the Ocean Reef Shores development. This platted subdivision contains a U-shaped canal which was illegally dredged and therefore "plugged" (closed) at each end to protect the shallow adjacent ocean-bottom communities within John Pennekamp Coral Reef State Park. Two dredged entrance channels are also located on the ocean side of the plugs. Ownership of private parcels within this development extend out into the canal, making restoration of the canal difficult.

Nichols Subdivision/Elbow Lane is a platted subdivision containing an illegally dredged canal. This canal is actively utilized by the two private residences located within this subdivision, one of which has a legal easement to utilize and access a boat dock on the south side of the canal.

The largest canal system in the park is located within management zones KL-10 and KL-11 and is known as the Harrison Tract or Ocean Forest Estates. This tract consists of 48 acres of marine tidal swamp that were destroyed by a dredge and fill operation. This operation created large spoil piles and a spoil island associated with a 0.8-mile-long canal system which is currently open in three locations to the Atlantic Ocean. There is also an entrance channel associated with this canal system that is located within the adjacent submerged resources of John Pennekamp Coral Reef State Park.

The Key Largo Beach and Tennis Club Subdivision is located within management zone KL-13. This tract contains an isolated dredged lake, likely quarried for fill while the proposed development was under construction. In addition, a large concrete structure is evident on the site. This site has been assessed by park staff and it was determined that the area surrounding the quarry has recruited naturally to a degree that a significant amount of native vegetation would now need to be removed to access the quarry. The level of disturbance is more than what would be acceptable to attempt restoration of this site currently.

One of the park's longest active restoration projects is located within management zone KL-15 and is known as the Carysfort Yacht Club or else as Carysfort Marina. Much of the area was completely cleared during development and was used as a campground with a dredged marina basin which once connected to the Atlantic Ocean. This site has been under active restoration since 2001 and much of the marina basin has now been restored to natural grade (National Audubon Society 2006). All that remains of this site is the 2.7 acre back basin that is approximately 30 feet deep.

General management measures: All dredged canals and/or lake areas should be actively restored to natural grade and the native vegetation that historically would have been associated with this area re-established. Currently, within both the areas of Port Bougainville and Carysfort Marina, active restoration projects are underway.

Efforts to restore borrow pits within the park by accepting source-separated clean fill is a compatible restoration technique that will be considered on a case-by-case basis. Exotic plant removal projects should continue in order to keep these species from establishing within these restoration sites.

Developed

Desired future condition: The developed areas within the park will be managed to minimize the effect of the developed areas on adjacent natural areas. Priority invasive plant species (EPPC Category I and II species) will be removed from all developed areas. Other management measures include proper storm water management and development guidelines that are compatible with prescribed fire management in adjacent natural areas. Developed areas that are not useable in its current state or slated for refurbishment will be demolished and the area restored to natural historic elevations and habitats.

Description and assessment: Developed areas within the park can be divided into two groups: sites that will be maintained and sites that will be demolished. The developed sites within the park that will be maintained include 7 staff residence houses (management zones KL-01 and KL-05) and a three-story building (management zone KL-05) with numerous sheds. The first floor of this building houses the administrative staff and equipment for the Florida Keys Overseas Heritage State Trail. The second and third floor are residences for the park. Developed areas that are slated to be demolished can be found in management zones KL-02 and KL-18. These sites include the remnant buildings at Port Bougainville and the Nike radar base.

Port Bougainville (management zone KL-02) is the largest developed site within the park and is the remnant of multiple failed development projects. Currently the site contains several building structures, tennis courts, tunnel, paved road, unpaved trails, entrance archway, fill/spoil pile, two rock walls, dredged canal, two man-made lakes, and numerous scarified areas scattered throughout the site. Several phases of restoration have occurred over the years in an attempt to bring this site back to its historical rockland hammock, tidal rock barren, and mangrove swamp habitat condition. The current phase of restoration includes the removal of remaining building structures and tennis courts, portions of paved road, and the filling of dredged canal.

The site locally known as the missile base located within management zone KL-18 along the new (and old) County Road 905, is an old U.S. Army, Army Air Defense Command facility (ARADCOM HM40) Control Area. The entire site is approximately 26 acres. There are numerous buildings, sidewalks, and structures throughout the site, including a gatehouse, living quarters, wastewater treatment plant, paved roadways and four radar towers (radar equipment has been removed). Presently, this site is targeted for both interpretation and upland hammock restoration.

General management measures: All developed areas within the park have varying degrees of disturbance depending on the initial source of the activity. Depending on the degree of disturbance, particularly in the platted subdivisions, management

measures that should be implemented include: (1) continued monitoring and removal of non-native plant and animal species, (2) monitor and address dumping activities, (3) monitor and enforce illegal encroachment activities by private homeowners onto park property, and (4) create and maintain a regular presence of staff and law enforcement to ensure continued support in the community, and (5) continue restoration activities at those developed sites that are slated for demolition. Efforts to restore borrow pits within the park by accepting source-separated clean fill is a compatible restoration technique that will be considered on a case-by-case basis.

Road

Desired future condition: Road areas within the park will be managed to minimize negative effect on adjacent natural areas. Priority invasive plant species (FLEPPC Category I and II species) will be removed from all roads and road edges. Roads that are not utilized in its current state or slated for improvements will be demolished and the area restored to natural historic elevations and habitats. All roads and road edges will be clear of man-made debris except those occurring within the vicinity of cultural resources.

Description and assessment: Throughout the park man-made roadways can be found in varying stages of use and deterioration. Many of the older parcels are large tracts of land that were not part of a platted subdivision. These large parcels were homesteaded and the roadways that lead to fields and/or residences can still be found. All of these roadways are dirt roads. Historically, to avoid fees, many local people used these roadways as dumpsites for all manner of household goods. Washing machines, cars, tires, building debris, fencing, roof material, etc. have been dumped along these roadways for decades. In addition to dumping, the disturbance of the roadways encourages the establishment of non-native species. Sometimes non-native plants are included in the dumping, or the disturbance allows the non-native plants to become established. Non-native animals also take advantage of this disturbance.

Management zones KL-19, KL-21, KL-24 & KL-25 (Old Card Sound Road and Old County Road 905): Old County Road 905 is the most prevalent paved roadway in the park. A remnant of a historically larger slough known as Dispatch Slough can be found in the northern portion of the park and contains submerged habitat still influenced by tidal events. Old CR 905 and old Card Sound Road bisected this slough and its historic flow. In 1999, Keys Environmental Restoration Fund completed a restoration project and removed 2,240 feet of the old roadbed. The road removal helped to re-establish part of the historic flow of this ecosystem. Many of the remaining roadbeds are used as hiking/walking trails and access into the park for emergency vehicles and staff. Historically, the natural communities impacted were rockland hammock, tidal rock barren, and mangrove swamp.

Management zone KL-18 (Dynamite Trail & Dynamite Docks): Approximately 0.27 miles north of the intersection of CR-905 and Old CR-905 and running approximately perpendicular to old CR 905 towards the Atlantic Ocean is a dirt road known as Dynamite Trail. This roadway ends at a cultural site and an area known

as Dynamite Docks which originally consisted of a filled roadbed leading out into the Atlantic Ocean. Dynamite Docks was originally constructed by the military as a place to off-load dynamite from ships. This road bed has since been removed and the area restored to historic elevations, with the exception of a small island left to provide shorebird nesting habitat, specifically for Least Terns.

General management measures: All roadways should be evaluated for use in the existing trail system of the park. Roadways that are no longer deemed adequate should be restored to natural grade. Native vegetation that historically would have been associated with these areas should be allowed to colonize naturally and/or actively be planted in order to re-establish habitat. Roadways that will continue to be utilized by park staff and visitors will need to continue to be monitored for exotic plants and human debris removed where possible.

Spoil Area

Desired future condition: The spoil area is a location in the park where dredged or spoil material is deposited and which may re-colonize with native and non-native vegetation. Spoil areas that are not slated to be restored, will contain only native upland plant species and will be stabilized to reduce run-off into the adjacent natural submerged resources.

Description and assessment: Two areas of spoil have been identified within the park. They are located within management zones KL-5, KL-10, and KL-11. The spoil located within management zone KL-5 consists of sediment that was placed in historic mangrove habitat during construction activities for the Ocean Reef Shores development. This site contains minimal exotic plant species and has a rip-rap border along the ocean-side.

Within management zones KL-10 and KL-11 is the Harrison Tract, also known as Ocean Forest Estates. This tract consists of 48 acres of marine tidal swamp that were destroyed by a dredge and fill operation that created large spoil piles and a spoil island associated with a 0.8-mile-long canal system which is currently open to the Atlantic Ocean. Historically, the natural communities impacted were rockland hammock, tidal rock barren, and mangrove swamp. Restoration efforts for this site have been hampered due to the presence of the endangered Key Largo Woodrats.

General management measures: To reach the desired future conditions for these spoil areas the park will need to continue exotic plant removal at the sites. The Ocean Forest Estates site should be restored to natural grade. Native vegetation that historically would have been associated with this area should be allowed to colonize naturally and/or actively be planted in order to re-establish habitat.

For a list of proposed restoration sites, please see the restoration objective of the Resource Management Program of the plan.

Imperiled Species

Imperiled species are those that are (1) tracked by FNAI as critically imperiled (G1, S1) or imperiled (G2, S2); or (2) listed by the U.S. Fish and Wildlife Service (USFWS), Florida Fish and Wildlife Conservation Commission (FWC) or the Florida Department of Agriculture and Consumer Services (FDACS) as endangered, threatened or of special concern.

The imperiled plant species in the park have been mapped by DEP staff using a Trimble GPS unit as either individual points or as polygons when their population size exceeded a feasible limit to mapping individual plants. This project will be updated in its entirety or on a species by species basis when alterations to the landscape impact population abundance and/or distribution.

Extensive vegetation surveys have been conducted in the park for all species including imperiled species by DEP staff and staff from The Institute for Regional Conservation (IRC). Population estimates were determined using the logarithmic standards established by The Florida Natural Areas Inventory.

Additional GPS mapping of Cuban clustervine (*Jacquemontia havanensis*) was conducted by DEP staff and staff from IRC as part of a conservation initiative which included population distribution, population abundance and habitat requirements of this species at this park and Bahia Honda State Park. These are the only known locations of Cuban clustervine in the Florida Keys.

Extensive augmentation and reintroduction projects for Mahogany mistletoe (*Phoradendron rubrum*) and Semaphore cactus (*Consolea corallicola*) were initiated in 1999 and 1996 respectively.

Mahogany mistletoe is a hemiparasitic plant whose range includes the Florida Keys, Puerto Rico, Greater Antilles and the Bahamas. In the Florida Keys it is host specific to West Indian Mahogany (*Swietenia mahagoni*) and has been observed in only a few stations in north Key Largo and one station in south Key Largo. It was thought to have been extirpated from the Keys until its discovery in Key Largo Hammock by DEP staff in 1999. Staff from The Institute for Regional Conservation discovered a small population of mahogany mistletoe on Sands Key in 2004. Additional surveys were conducted on the island but no new individuals were observed (Bradley 2004).

Extensive surveys were conducted where documented, in hammocks adjacent to those stations, and in hammocks adjacent to the current population. No other populations were observed. A formal conservation proposal was drafted and DEP staff initiated a monitoring program. The original population consisted of approximately 28 individuals on three host trees; however, the smallest of the host trees died of unknown causes five weeks after the population was discovered.

Due to the decline of the host mahogany trees, a more intensive conservation project was initiated by DEP staff in 2001. Fruits were collected and out-planted on host trees in three separate events beginning in March 2001. No germination was observed, later understood to be due to the out-planting, which took place during

the rainy season. As a result of the rapid decline of the host mahogany trees, a dry season out-planting was conducted in December 2002. Germination was observed in February 2003. Additional out-plantings have been conducted in the park and more recently in Crocodile Lake National Wildlife Refuge. Mahogany mistletoe is not believed to have been an abundant component of the flora of rockland hammock in north Key Largo so the goal of this project is to maintain a self-sustaining population while protecting the species from stochastic events. It is important to note that the original population and the host mahogany trees died in May 2004.

There are currently 50 individuals persisting, the majority of which are reproductively mature. Of greater significance is the fact that 24 naturally occurring recruits are persisting; two root suckers have been documented; one naturally occurring recruit is established on a tree with no parent mistletoe plant; scat from small mammals containing mistletoe fruits were observed on two host trees, several of which germinated; several seeds have germinated on parent mistletoe plants but have not developed beyond the seed stage; two individuals that were broken during the 2004/2005 hurricane seasons regrew into new individuals; and five individuals that had died but remained swollen at the point of attachment, reemerged and developed into new plants.

It is important to note that this species was discovered in May 2013 in a subdivision adjacent to John Pennekamp Coral Reef State Park. Staff found two trees with sixteen live mistletoe plants and seven dead plants. This parcel is one of several parcels managed as part of the Monroe County Conservation Land program. Staff then initiated surveys throughout the Monroe County parcels and the parcels managed by Pennekamp and found two additional trees, one on the Monroe County right-of-way and one in Pennekamp's management zone KL-18. Both host trees had two individual mistletoe plants with flower stalks and fruit. This discovery is a critically important component to protection of mahogany mistletoe in Key Largo.

The population of semaphore cactus is historically known from only a few islands in the Florida Keys. Research work first began on this species in the lower Keys due to the impacts from the *Cactoblastis* moth, a non-native moth that attacks members of the *Opuntia* group (One of the synonyms of semaphore cactus is *Consolea corallicola*). Working in partnership with DEP staff, Fairchild Tropical Botanic Garden proposed to reintroduce this species at the park where it had been documented by John K. Small in the early 1900s. Rockland hammock and buttonwood ecotone sites were identified by DEP staff and germplasm was obtained from the population on Little Torch Key. Out-planting was initiated in November 1996 at six stations in two locations in the park including replicate stations. The distance between the locations was several miles to ensure an adequate response time in the event that any of the out-planting stations were impacted by the *Cactoblastis* moth. After several years of monitoring it was determined that the rockland hammock sites were not a suitable habitat for this species (one station was decimated by the invasive Cuban garden snail) so all remaining individuals were removed from the hammock stations in November 1999. Further evaluation of the habitat requirements for semaphore cactus led DEP staff to conduct additional out-plantings in Keys tidal rock barren habitat in 2002 and 2003 using the more vigorous genotype germplasm.

Of the 348 individuals that have been out-planted through the course of this project 146 are persisting, only two have set flower but no fruits developed due to the fact that only male flowers are being produced. There has been a high degree of mortality of the original population but recruits are still persisting as a result of fallen pads or pads re-rooting after the death of the basal pad. Monitoring throughout the course of this project illustrates the growth and development of individuals but once they gain a significant height (approximately 120 cm) their root and base structures are not capable of sustaining the plant and the basal pad either arches to the ground or falls completely to the ground and dies. Research at other sites in the Keys indicates a root disease which is most likely the cause for this phenomenon although this has not yet been verified.

The spring tides of October 2004 inundated the Keys tidal rock barren sites which resulted in the death of most of the individuals at those sites. Semaphore cactus has a narrow range of habitat requirements; the shady conditions of the hammock are unsuitable and the low elevation, open Keys tidal rock barren has become too susceptible to extreme high tide events. The populations located in the narrow band of buttonwood ecotone remain in the best condition, although reproduction at these sites is strictly vegetative. However, the October 2012 monitoring showed a higher than normal extreme high tide, and most individuals at one out-planting site were completely submerged. Higher elevation sites within the park were investigated to discover additional sites that might accommodate additional out-plantings in order to prevent extirpation of semaphore cactus within the park. In July and August of 2014, an additional 158 individuals were placed within these additional higher elevation sites.

The Schaus swallowtail butterfly is a large dark brown and yellow butterfly endemic to Florida and is the first butterfly species to be listed as imperiled by the Federal government. The historic distribution of the Schaus butterfly ranged from south Miami to lower Matecumbe Key, but habitat destruction, habitat fragmentation and mosquito control activities has altered the distribution to only a few islands in Biscayne National Park and the Dagny Johnson Key Largo Hammock Botanical State Park. Schaus prefer the edges of Rockland hammock and persist on a variety of nectar sources as adults, but rely solely on torchwood (*Amyris elemifera*) and wild lime (*Zanthoxylum flavum*) as its larval host plants.

Dr. Thomas Emmel and Marc Minno along with researchers and graduate students, conducted surveys for Schaus in the park in the 1990s as the decline of this population had already been noted. As a result of their surveys, they began a captive breeding program in order to attempt an augmentation project in the park. Adults were captured, taken to the lab in Gainesville, and pupae were reared for release back in to the wild. This project was funded for many years, although it was difficult to document the success of the project since the flight pattern for the adult butterfly is only a few weeks in length. Once funding ended, surveys were abandoned until 2010 when a partnership between FDEP, FWC, North American Butterfly Association, Biscayne National Park and University of Florida was established to design protocols for monitoring this species within the park,

Crocodile Lake National Wildlife Refuge, the offshore islands in Biscayne National Park, and John Pennekamp Coral Reef State Park. Replicate survey sites from earlier surveys were targeted and additional sites were added to the project. Surveys have been conducted since 2011 during the estimated period where adults should be active. It is important to note that the extreme cold temperatures in January 2010 impacted not just coral species, but also butterfly species, and those with low population numbers were most affected by what is believed to have been a die-off due to the cold conditions.

The Key Largo woodrat is a small, endemic, nocturnal rodent that was listed as an imperiled species by the Federal government in 1984. Historically the Key Largo woodrat was found as far south as southern Key Largo, but its current population distribution is limited to north Key Largo, mostly in Crocodile Lake National Wildlife Refuge and Dagny Johnson Key Largo Hammock Botanical State Park. The Key Largo woodrat is susceptible to disturbance from habitat fragmentation, habitat destruction, non-native plant species, predation by free roaming and feral cats, and human intrusion.

Researchers over the last thirty years have concentrated efforts to better understand this species by conducting population studies to determine distribution, abundance, and habitat requirements. Projects have included inserting PIT tags, collecting DNA samples, utilizing radio collars for tracking, and conducting repetitive trap nights to better understand the dynamics of this species. There has been an alarming decrease in both abundance and distribution in north Key Largo so a captive breeding program was initiated to enhance the potential survivability of this species. The most recent release of the Key Largo woodrat in 2011 was attempted on Palo Alto Key in John Pennekamp Coral Reef State Park in hopes that the lack of unnatural predators would provide a better chance for survival. Unfortunately, it is believed that the daytime feeding habits utilized when in captivity resulted in the die-off of all but two individuals from natural predation. A decision was made to remove the last individuals and place them in Crocodile Lake National Wildlife Refuge. The fate of this population is unknown as the woodrats lost their radio collars and could no longer be tracked.

Another threat to the population comes from non-native invasive reptile species, particularly the Burmese python which have naturalized in Everglades National Park. A python was captured in Key Largo Hammock in 2007 and was found to have two woodrats in its stomach content. A large comprehensive trapping program was conducted in North Key Largo from 2008 to 2012 by the U.S. Geological Service. Python traps were deployed a total of 74,879 trap nights and only one Burmese python was captured in a trap (McEachern et al. 2013).

Between 2013 and 2015, 60 artificial supplemental nest structures were deployed at three locations within the park. These structures will be monitored twice annually to determine use and occupancy. Additional structures will be deployed yearly in an effort to help connect these to the genetically distinct metapopulations within the park.

The Key Largo cotton mouse is a small, endemic rodent that was listed as an imperiled species by the Federal government in 1984. Historically found as far south as southern Key Largo, like the Key Largo woodrat, it is now limited in its distribution to the park and Crocodile Lake National Wildlife Refuge. The same stressors that impact the population of the Key Largo woodrat affect the Key Largo cotton mouse, but recent studies conducted by Dan Greene at the University of Georgia indicate that this species does not appear to be as close to extinction as the Key Largo woodrat. Over the years the majority of research has focused on the Key Largo woodrat, but peripheral data has been collected when cotton mice are found in woodrat traps. More research is needed to update the work conducted by Dan Greene, and to establish a model for the distribution of this species.

The Miami blue butterfly (*Cyclargus thomasi bethunebakeri*) is a small butterfly, with a wingspan of an inch or less. A member of the Lycaenidae family, the Miami blue butterfly is the only subspecies of Thomas's blue butterfly (*Cyclargus thomasi*) occurring in the United States. Except for a few records from the Bahamas, the Miami blue butterfly is endemic to the Florida peninsula and the Florida Keys. It was listed as federally imperiled in 2012. The adult Miami blue butterfly will nectar on a host of herbaceous plants, but the larval host plants are limited to blackbead, nickerbean (*Caesalpinia bonduc*), and ballonvine (*Cardiospermum corindum*).

Though occasionally found further north and further inland, the Miami blue butterfly was once abundant in coastal areas from Hillsborough and Volusia Counties south through the Florida Keys. The area occupied by the species has retracted southward as natural habitat was altered or destroyed and by 1992 the species was believed to be extinct. In 1999 a small population was discovered at Bahia Honda State Park, and two more colonies were discovered in 2006 on islands approximately 20 miles west of Key West. Unfortunately, the Miami blue butterfly is now believed to be extirpated from Bahia Honda.

The decline of the Miami blue butterfly is believed to be a combination of factors with the loss of natural habitat being the most significant. In addition to land development, habitat loss is also caused by invasive non-native species. Even in areas set aside for conservation, introduction of non-native invasive plant species alters and replaces native plant communities, thereby reducing the availability of native plants the butterfly relies on. Habitat fragmentation is another factor believed to have caused the decline of this species since the Miami blue butterfly typically occurs in small, often ephemeral populations that rely on genetic exchange between populations. Barriers to such exchanges, such as urbanized landscapes, increase the vulnerability of each population and can also prevent the butterfly from establishing new populations. One of the least well-understood factors in the decline of the Miami blue butterfly is its obligate relationship with several native ant species most notably *Camponotus* spp. These ants tend the larvae of the Miami blue and other butterflies, defending them from predators in exchange for nutrient-rich liquid secreted by the larvae. Introduced species of ants, especially the South American fire ant (*Solenopsis invicta*) and the elongate twig ant (*Pseudomyrmex gracilis*), appear to compete with and sometimes displace native ant species, and may prey on the eggs and larvae of this and other butterflies. Mosquito spraying is

also believed to have led to the decline of the Miami blue throughout its range and studies have been conducted in the park and on Big Pine Key to test the distance mosquito spray travels in order to establish reintroduction protocols into natural areas throughout its historic range.

Many researchers have been working on this species including Dr. Jaret Daniels, Marc Minno and Dr. Thomas Emmel. A captive breeding program had been established at the University of Florida in Gainesville and several conservation lands including the park were slated for reintroduction sites. However, this population crashed in the January 2010 cold event and there are now not enough individuals on federal land to begin another attempt at captive breeding. Regular surveys are conducted at Bahia Honda and on federal land, and annual surveys as part of the FNAI project include surveying for this species in the park.

Table 2 contains a list of all known imperiled species within the park and identifies their status as defined by various entities. It also identifies the types of management actions that are currently being taken by DRP staff or others, and identifies the current level of monitoring effort. The codes used under the column headings for management actions and monitoring level are defined following the table. Explanations for federal and state status as well as FNAI global and state rank are provided in Addendum 6. Below is a brief discussion of the species found in Table 2 in the order they are listed.

Table 2: Imperiled Species Inventory						
Common and Scientific Name	Imperiled Species Status				Management Actions	Monitoring Level
	FWC	USFWS	FDACS	FNAI		
PLANTS						
Golden leather fern <i>Acrostichum aureum</i>			T	G5, S3	2, 10	Tier 3
Sea lavender <i>Argusia gnaphalodes</i>			E	G4, S3	2, 10	Tier 3
Locust berry <i>Byrsonima lucida</i>			T	G4, G5, S3	2, 10	Tier 3
Myrtle-of-the-River <i>Calypttranthes zuzygium</i>			E	G4, S2	2, 10	Tier 3
Cinnamon bark <i>Canella winterana</i>			E	G5?, S2	2, 10, 12	Tier 3

Table 2: Imperiled Species Inventory						
Common and Scientific Name	Imperiled Species Status				Management Actions	Monitoring Level
	FWC	USFWS	FDACS	FNAI		
Satinleaf <i>Chrysophyllum oliviforme</i>			T	G5, S3	2, 10, 12	Tier 3
Christmas berry <i>Crossopetalum ilicifolium</i>			T	G3, S3	2, 10, 12	Tier 3
Rhacoma <i>Crossopetalum rhacoma</i>			T	G5, S3	2, 10, 12	Tier 3
Varnish leaf <i>Dodonaea elaeagnoides</i>			E	G4Q, S1	2, 10	Tier 3
Milkbark <i>Drypetes diversifolia</i>			E	G4, S2	2, 10, 12	Tier 3
Dollar orchid <i>Prosthechea boothiana</i> var. <i>erythronioides</i>			E	G4? T4? Q	2,10,12	Tier 3
Redberry stopper <i>Eugenia confusa</i>			E	G4, G5, S2, S3	2, 10, 12	Tier 3
Red Stopper <i>Eugenia rhombea</i>			E	G5, S1	2, 10, 12	Tier 3
Princewood <i>Exostema caribaeum</i>			E	G5, S2	2, 10	Tier 3
Wild cotton <i>Gossypium hirsutum</i>			E	G4, G5, S3	2, 10, 12	Tier 3
Lignum vitae <i>Guaiaacum sanctum</i>			E	G2, S1	2, 10, 12	Tier 3
Simpson's apple cactus <i>Harrisia simpsonii</i>			E	G2, S2	2, 10	Tier 3
Manchineel <i>Hippomane mancinella</i>			E	G5, S2	2, 10	Tier 4

Table 2: Imperiled Species Inventory						
Common and Scientific Name	Imperiled Species Status				Management Actions	Monitoring Level
	FWC	USFWS	FDACS	FNAI		
White ironwood <i>Hypelate trifoliata</i>			E	G4, S1	2, 10, 12	Tier 3
Cluster vine <i>Jacquemontia havanensis</i>			E	G5, S1	2, 10, 12	Tier 4
Sky blue vine <i>Jacquemontia pentanthos</i>			E	G4, G5, S2	2, 10	Tier 3
Joewood <i>Jacquinia keyensis</i>			T	G4, S3	2, 10, 12	Tier 3
Keys thatch palm <i>Leucothrinax morrissii</i>			E	G4, G5, S3	2, 10, 12	Tier 3
Wild dilly <i>Manilkara jaimiqui</i>			T	G4, S3	2, 10, 12	Tier 3
Climbing vine fern <i>Microgramma heterophylla</i>			E	G4, G5, S2	2, 10	Tier 3
Semaphore cactus <i>Consolea corallicola</i>			E	G1, S1	2, 12, 14	Tier 5
Fuzzy passion vine <i>Passiflora multiflora</i>			E	G4, S1	2, 10, 12	Tier 3
Mahogany mistletoe <i>Phoradendron rubrum</i>			E	G4, S1	2, 10, 12	Tier 5
Bahama coffee <i>Psychotria ligustrifolia</i>			E	G4, S1	2, 10, 12	Tier 3
Swartz's snout pea <i>Rhynchosia swartzii</i>			E	G3, S1	2, 10	Tier 3
Florida boxwood <i>Schaefferia frutescens</i>			E	G5, S2	2, 10, 12	Tier 3

Table 2: Imperiled Species Inventory						
Common and Scientific Name	Imperiled Species Status				Management Actions	Monitoring Level
	FWC	USFWS	FDACS	FNAI		
Mahogany <i>Swietenia mahagoni</i>			T	G3, G4, S3	2, 10, 12	Tier 3
Florida thatch palm <i>Thrinax radiata</i>			E	G4, G5, S2	2, 10	Tier 3
Banded airplant <i>Tillandsia flexuosa</i>			T	G5, S3	2, 10	Tier 3
West Indian trema <i>Trema lamarckiana</i>			E	G5, S2	2, 10, 12	Tier 3
Worm vine orchid <i>Vanilla barbellata</i>			E	G4, G5, S2	2, 10	Tier 3
INVERTEBRATES						
Florida white <i>Appias drusilla</i>				G5, S2, S3	2, 10, 12	Tier 3
Silver banded hairstreak <i>Chlorostymon maesites</i>				G5, S1	2,10,12	Tier 3
Miami blue butterfly <i>Cyclargus thomasi bethunebakeri</i>	LE	FE		G3, G4, TU, S1	2, 10, 12	Tier 3
Florida purple wing <i>Eunica tatila tatilista</i>				G4, T4, T5, S1	2, 10, 12	Tier 3
Florida tree snail <i>Orthalicus reses nesodryas</i>				G2,T2, S2	2,10,12	Tier 2
Schaus swallowtail butterfly <i>Papilio aristodemus ponceanus</i>	LE	FE		G3, G4, T1, S1	2, 10, 12	Tier 5
REPTILES						
American crocodile <i>Crocodylus acutus</i>	LT	LT		G2, S2	2, 10	Tier 2
Eastern indigo snake <i>Drymarchon corais couperi</i>	LT	LT		G3, S3	2, 10	Tier 2

Table 2: Imperiled Species Inventory						
Common and Scientific Name	Imperiled Species Status				Management Actions	Monitoring Level
	FWC	USFWS	FDACS	FNAI		
BIRDS						
Great white heron <i>Ardea herodias occidentalis</i>				G5T2,S2	2,10	Tier 2
Piping plover <i>Charadrius melodus</i>	LT			G3, S2	2, 10	Tier 2
Antillean nighthawk <i>Chordeiles gundlachii</i>				G4S2	2,10	Tier 2
Kirtland's warbler <i>Dendroica kirtlandii</i>	LE	LE		G1, S1	2, 10	Tier 2
Reddish egret <i>Egretta rufescens</i>	SSC			G4, S2	2, 10	Tier 2
Swallow-tailed kite <i>Elanoides forficatus</i>				G5, S2	2, 10	Tier 2
Merlin <i>Falco columbarius</i>				G5, S2	2, 10	Tier 2
Peregrine falcon <i>Falco peregrinus</i>				G4, S2	2, 10	Tier 2
Southeastern American Kestrel <i>Falco sparverius paulus</i>	LT			G5, T4, S3	2, 10	Tier 2
Magnificent frigatebird <i>Fregata magnificens</i>				G5, S1	2, 10	Tier 2
Wood stork <i>Mycteria americana</i>	LE	LE		G4, S2	2, 10	Tier 2
White-crowned pigeon <i>Patagioenas leucocephala</i>	ST			G3, S3	2, 10	Tier 2
Roseate spoonbill <i>Platalea ajaja</i>	SSC			G5, S2	2, 10	Tier 2
Roseate tern <i>Sterna dougallii dougallii</i>	FT	LT		G4, S1	2, 10	Tier 2
Least tern <i>Sterna antillarum</i>	ST			G4, S3	2, 10	Tier 2

Table 2: Imperiled Species Inventory						
Common and Scientific Name	Imperiled Species Status				Management Actions	Monitoring Level
	FWC	USFWS	FDACS	FNAI		
MAMMALS						
Key Largo woodrat <i>Neotoma floridana smalli</i>	LE	LE		G5, T1, S1	2, 3, 4, 10, 12	Tier 4, Tier 5
Key Largo cotton mouse <i>Peromyscus gossypinus allapaticola</i>	LE	LE		G5, T1Q, S1	2, 10	Tier 4

Management Actions:

1. Prescribed Fire
2. Exotic Plant Removal
3. Population Translocation/Augmentation/Restocking
4. Hydrological Maintenance/Restoration
5. Nest Boxes/Artificial Cavities
6. Hardwood Removal
7. Mechanical Treatment
8. Predator Control
9. Erosion Control
10. Protection from visitor impacts (establish buffers)/law enforcement
11. Decoys (shorebirds)
12. Vegetation planting
13. Outreach and Education
14. Other

Monitoring Level:

- Tier 1. Non-Targeted Observation/Documentation: includes documentation of species presence through casual/passive observation during routine park activities (i.e., not conducting species-specific searches). Documentation may be in the form of Wildlife Observation Forms, or other district specific methods used to communicate observations.
- Tier 2. Targeted Presence/Absence: includes monitoring methods/activities that are specifically intended to document presence/absence of a particular species or suite of species.
- Tier 3. Population Estimate/Index: an approximation of the true population size or population index based on a widely accepted method of sampling.
- Tier 4. Population Census: A complete count of an entire population with demographic analysis, including mortality, reproduction, emigration, and immigration.
- Tier 5. Other: may include habitat assessments for a particular species or suite of species or any other specific methods used as indicators to gather information about a particular species.

Detailed management goals, objectives and actions for imperiled species in this park are discussed in the Resource Management Program section of this component and the Implementation Component of this plan.

Exotic and Nuisance Species

Exotic species are plants or animals not native to Florida. Invasive exotic species are able to out-compete, displace or destroy native species and their habitats, often because they have been released from the natural controls of their native range, such as diseases, predatory insects, etc. If left unchecked, invasive exotic plants and animals alter the character, productivity and conservation values of the natural areas they invade.

Exotic animal species include non-native wildlife species, free ranging domesticated pets or livestock, and feral animals. Because of the negative impacts to natural systems attributed to exotic animals, the DRP actively removes exotic animals from state parks, with priority being given to those species causing the greatest ecological damage.

In some cases, native wildlife may also pose management problems or nuisances within state parks. A nuisance animal is an individual native animal whose presence or activities create special management problems. Examples of animal species from which nuisance cases may arise include venomous snakes or raccoons and alligators in public areas. Nuisance animals are dealt with on a case-by-case basis in accordance with the DRP's Nuisance and Exotic Animal Removal Standard.

Detailed management goals, objectives and actions for management of invasive exotic plants and exotic and nuisance animals are discussed in the Resource Management Program section of this component.

All natural communities within Dagny Johnson Key Largo Hammock Botanical State Park are subject to invasion by non-native plant and animal species. Unlike the mainland, the Florida Keys are under added pressure due to the sub-tropical climate which enables a great number of non-native species to persist. The temperature rarely dips low enough to potentially kill or reduce non-native populations that have escaped into the wild. Therefore, many non-native species that are released into the wild have a greater potential of surviving, and possibly multiplying, in our environment. Case in point is the green iguana (*Iguana iguana*). This large plant-eating reptile is native to Central, South America, and Caribbean. Upon release into our natural areas, it is now actively breeding and spreading throughout the park. Iguanas destroy and impact plant populations critical to the survival of endangered species, as well as other natural habitats in the park.

In 2007 a non-native Burmese python (*Python molurus bivittatus*) was found in the park in management zone KL-02. This python contained two Key Largo woodrats in its stomach. The U.S. Fish and Wildlife Service requested help in keeping more pythons, which are powerful swimmers, from reaching and colonizing Key Largo. A large comprehensive trapping program was in North Key Largo from 2008 to 2012 led by Drs. Reed and Rodda, Dr. Ron Rozar, and Scott Goetz. The United State Geological Survey (USGS) placed 60 traps throughout the Crocodile Lake National Wildlife Refuge and the Dagny Johnson Key Largo Hammock Botanical State Park. The goal of this effort was to intercept and eradicate snakes as they arrive on Key Largo, as well as to prevent colonization throughout the Florida Keys. Python traps

were deployed a total of 74,879 trap nights and only one Burmese python was captured in a trap. Other non-native animals include, but are not limited to, feral and domestic cats (*Felis catus*), fire ants (*Solenopsis invicta*), and the Cuban garden snail (*Zoerysia provisoria*).

Several non-native plant species are more aggressive than others in establishing populations in the park. The more noxious species include sapodilla, portia, scaevola, lather leaf (*Colubrina asiatica*), Brazilian pepper (*Schinus terebinthifolius*), lead tree (*Leucaena leucocephala*), and Australian pine (*Casuarina equisetifolia*). Lather leaf, scaevola, and Australian pine are particularly harmful in that their seeds float, and therefore can wash up and into areas that otherwise would be free of non-native invasion. Birds, animals, wind, and storm events also spread non-native plants. Many of the boundaries of the park are adjacent to private homeowners. This close association with private lands potentially leads to introductions of exotic species from those boundaries. Any exotic plant removals occurring near private lands begin with park staff interacting with the landowners one on one or via letters left at residences. Typically, once landowners are educated to the reasons and means of these removal projects, there are no problems. There have been instances, however, of adjacent landowners having allergies to the herbicides utilized for treatment or were highly against the removal of certain species on their immediate border. In these cases, the park utilizes other means to satisfy stakeholder needs, including mechanical or hand removals instead of herbicides, providing native vegetation to be planted along boundary edges from the park's native plant nursery, and in some cases leaving certain sites untreated.

The park maintains a program to monitor, treat, and locate new and existing non-native plant populations throughout the park. Grant funding from the FWC Invasive Species Program has enabled the park to remove large infestations of non-native plants that would not be possible with local staff resources. Since 2004, 1,051 acres of non-native plant species have been treated within the park.

Table 3 contains a list of the Florida Exotic Pest Plant Council (FLEPPC) Category I and II invasive, exotic plant species found within the park (FLEPPC 2013). The table also identifies relative distribution for each species and management zones in which they are known to occur. An explanation of the codes is provided following the table. For an inventory of all exotic species found within the park, see Addendum 5.

Table 3: Inventory of FLEPPC Category I and II Exotic Plant Species			
Common and Scientific Name	FLEPPC Category	Distribution	Management Zone (s)
PLANTS			
Sisal <i>Agave sisalena</i>	II	2	KL-05, KL-06
Woman's tongue <i>Albizia lebbek</i>	I	2	KL-08
Australian-pine <i>Casuarina equisetifolia</i>	I	2	KL-15, KL-21, KL-11, KL-10, KL-08, KL-06, KL-05, KL-04
Australian pine <i>Casuarina glauca</i>	I	0	KL-03
Coconut palm <i>Cocos nuciferus</i>	II	2	KL-03, KL-04
Lather leaf <i>Colubrina asiatica</i>	I	2	KL-20, KL-18, KL-12, KL-15, KL-02, KL-06, KL-07
		3	KL-13, KL-22
Madagascar rubber vine <i>Cryptostegia madagascariensis</i>	II	2	KL-16, KL-17
Crowsfoot grass <i>Dactyloctenium aegyptium</i>	II	2	All
Laurel fig <i>Ficus microparpa</i>	I	1	KL-04
Brazilian jasmine <i>Jasminum fluminense</i>	I	1	KL-15
Lantana <i>Lantana camara</i>	I	2	KL-01, KL-02, KL-04, KL-06, KL-13
Sapodilla <i>Manilkara zapota</i>	I	2	KL-15, KL-21, KL-11, KL-10, KL-08, KL-06, KL-22, KL-04, KL-16, KL-17, KL-18, KL-19, KL-23, KL-20, KL-13, KL-09, KL-01, KL-07
Melaleuca <i>Melaleuca quinquenervia</i>	I	0	KL-21
Natal grass <i>Melinis repens</i>	I	2	KL-03, KL-04, KL-05, KL-06

Table 3: Inventory of FLEPPC Category I and II Exotic Plant Species			
Common and Scientific Name	FLEPPC Category	Distribution	Management Zone (s)
Burma reed <i>Neyraudia reynaudiana</i>	I	2	KL-10, KL-11
Guinea grass <i>Panicum maximum</i>	II	3	KL-16, KL-18, KL-15, KL-13, KL-11, KL-10, KL-08, KL-06, KL-05, KL-04, KL-03, KL-02, KL-01
Napier grass <i>Pennisetum purpureum</i>	I	2	KL-14
Phoenix date palm <i>Phoenix reclinata</i>	II	1	KL-02
Beach naupaka <i>Scaevola taccada</i>	I	2	KL-04, KL-05, KL-08, KL-10, KL-11, KL-25
Schefflera <i>Schefflera actinophylla</i>	I	2	KL-21, KL-23
Brazilian pepper <i>Schinus terebinthifolius</i>	I	2	KL-15, KL-21, KL-11, KL-10, KL-08, KL-06, KL-22, KL-04, KL-16, KL-18, KL-19, KL-23, KL-20, KL-09, KL-01, KL-07, KL-05, KL-02, KL-12
		3	KL-13
Arrowhead vine <i>Syngonium podophyllum</i>	I	2	KL-06
Seaside mahoe <i>Thespesia populnea</i>	I	2	KL-21, KL-22, KL-16, KL-15, KL-13, KL-09, KL-08, KL-07, KL-06, KL-12, KL-23
Inch plant <i>Callisia fragrans</i>	II	2	KL-23
Lead tree <i>Leucaena leucocephala</i>	II	2	KL-04, KL-10, KL-19, KL-08, KL-22, KL-05, KL-01, KL-7

Table 3: Inventory of FLEPPC Category I and II Exotic Plant Species			
Common and Scientific Name	FLEPPC Category	Distribution	Management Zone (s)
		3	KL-15, KL-03, KL-02, KL-16
		5	KL-17
		6	KL-23
Guinea grass <i>Panicum maximum</i>	II	2	KL-06, KL-10, KL-11
		3	KL-16
Bowstring hemp <i>Sansevieria hyacinthoides</i>	II	2	KL-18, KL-19, KL-12, KL-07, KL-06, KL-21
		3	KL-14, KL-23, KL-13
Wedelia <i>Sphagneticola trilobata</i>	II	2	KL-05
Mahoe <i>Talipariti tiliaceum</i>	II	2	KL-20, KL-18, KL-17
Oyster plant <i>Tradescantia spathacea</i>	II	2	KL-21, KL-20, KL-19, KL-18, KL-12, KL-01, KL-23, KL-08
Washington palm <i>Washingtonia robusta</i>	II	2	KL-02
Chase tree <i>Vitex trifolia</i>	II	2	KL-23

Distribution Categories:

- 0 No current infestation: All known sites have been treated and no plants are currently evident.
- 1 Single plant or clump: One individual plant or one small clump of a single species.
- 2 Scattered plants or clumps: Multiple individual plants or small clumps of a single species scattered within the gross area infested.
- 3 Scattered dense patches: Dense patches of a single species scattered within the gross area infested.
- 4 Dominant cover: Multiple plants or clumps of a single species that occupy a majority of the gross area infested.
- 5 Dense monoculture: Generally, a dense stand of a single dominant species that not only occupies more than a majority of the gross area infested, but also covers/excludes other plants.
- 6 Linearly scattered: Plants or clumps of a single species generally scattered along a linear feature, such as a road, trail, property line, ditch, ridge, slough, etc. within the gross area infested.

Special Natural Features

The special natural feature of the park is the presence of the largest contiguous West Indian hardwood hammock in the continental United States.

Cultural Resources

This section addresses the cultural resources present in the park that may include archaeological sites, historic buildings and structures, cultural landscapes and collections. The Florida Department of State (FDOS) maintains the master inventory of such resources through the Florida Master Site File (FMSF). State law requires that all state agencies locate, inventory and evaluate cultural resources that appear to be eligible for listing in the National Register of Historic Places. Addendum 7 contains the FDOS, Division of Historical Resources (DHR) management procedures for archaeological and historical sites and properties on state-owned or controlled properties; the criteria used for evaluating eligibility for listing in the National Register of Historic Places, and the Secretary of Interior's definitions for the various preservation treatments (restoration, rehabilitation, stabilization and preservation). For the purposes of this plan, significant archaeological site, significant structure and significant landscape means those cultural resources listed or eligible for listing in the National Register of Historic Places. The terms archaeological site, historic structure or historic landscape refer to all resources that will become 50 years old during the term of this plan.

Condition Assessment

Evaluating the condition of cultural resources is accomplished using a three-part evaluation scale, expressed as good, fair and poor. These terms describe the present condition, rather than comparing what exists to the ideal condition. Good describes a condition of structural stability and physical wholeness, where no obvious deterioration other than normal occurs. Fair describes a condition in which there is a discernible decline in condition between inspections, and the wholeness or physical integrity is and continues to be threatened by factors other than normal wear. A fair assessment is usually a cause for concern. Poor describes an unstable condition where there is palpable, accelerating decline, and physical integrity is being compromised quickly. A resource in poor condition suffers obvious declines in physical integrity from year to year. Poor condition suggests immediate action is needed to reestablish physical stability.

Level of Significance

Applying the criteria for listing in the National Register of Historic Places involves the use of contexts as well as an evaluation of integrity of the site. A cultural resource's significance derives from its historical, architectural, ethnographic or archaeological context. Evaluation of cultural resources will result in a designation of NRL (National Register or National Landmark Listed or located in an NR district), NR (National Register eligible), NE (not evaluated) or NS (not significant) as indicated in the table at the end of this section.

There are no criteria for determining the significance of collections or archival material. Usually, significance of a collection is based on what or whom it may represent. For instance, a collection of furniture from a single family and a particular era in connection with a significant historic site would be considered highly significant. In the same way, a high-quality collection of artifacts from a significant archaeological site would be of greater significance. A large herbarium

collected from a specific park over many decades could be valuable to resource management efforts. Archival records are most significant as a research source. Any records depicting critical events in the park's history, including construction and resource management efforts, would all be significant.

The following is a summary of the FMSF inventory. In addition, this inventory contains the evaluation of significance.

Prehistoric and Historic Archaeological Sites

Desired future condition: All significant archaeological sites within the park that represent Florida's cultural periods or significant historic events or persons are preserved in good condition in perpetuity, protected from physical threats and interpreted to the public.

Description: The islands of the Florida Keys have a very rich cultural history. People have been occupying areas within the park for thousands of years. There are varying opinions on the exact date and tribe of people that first occupied the islands, but it is thought that Native Americans began living in the Keys as early as 3000 B.C. There is a site on Key Largo that has radiocarbon dating from 1000 B.C. (Viele 1996). The FMSF lists 21 sites within the park.

MO00127 is located on a coastal berm in the northern portion of this park. It is described as an artifact scatter/shell midden with a historic cistern and homesite. Artifacts located at this site includes aboriginal and historic ceramics, shell food remains, animal bone, a historic cistern, and glades tooled rim. Rising sea levels put this site in jeopardy of being lost to erosion and mangrove intrusion.

MO1340 consists of a riveted tin container with a square cement and coral rock base. This structure is thought to be part of early homesteading activities in north Key Largo.

Only the base remains of a structure is located at MO1342. The east and south walls are in good condition but all the wood and western wall has been destroyed.

MO1965 is a shallow black dirt/shell midden sitting on an exposed coral outcropping completely surround by mangrove swamp. The artifacts located at this site include shell refuse, faunal bone, pottery shards, and a coral tool. Rising sea levels put this site in jeopardy of being lost to mangrove intrusion.

MO1971, MO1972, MO1973, MO1974 and MO1975 are single artifacts or artifact scatter sites. All of these sites were located within an area of the park that underwent a large bout of development and subsequent restoration work. None of these sites were located during the 2014-15 assessment.

MO2050 consists of a pile of ballast stones, scattered rusted iron spikes and wood fragments which are thought to be associated with a historic shipwreck or pioneer homestead. Sediment accumulation and mangrove intrusion due to rising sea levels jeopardize this site.

The black dirt and shell midden MO2051 is located on a berm in the northern portion of the park surrounded by mangrove swamp. Artifacts at this site include pottery shards, shell tools, shell refuse, and faunal bones. Sediment accumulation and mangrove intrusion due to rising sea levels jeopardize this site.

Rubble of a poured concrete cistern are all that remain of MO2053. Sediment accumulation and mangrove intrusion due to rising sea levels jeopardize this site.

MO2054 is an early 1860s plantation or wrecker's house. Artifacts found at this site include stove remains, rusted tools, spikes, black glass, whiskey flasks, fine glass wine goblets, ceramic bottle fragments, and ironware dishes. This site is located within tidal rock barren habitat and due to rising sea levels, this site is in jeopardy due to sediment accumulation and mangrove intrusion.

MO2055 is a shallow depth black dirt and shell midden located on a coastal berm surrounded by mangrove swamp. Shell tools and fragments as well as numerous Strombus celts consist of the artifacts at this site. Sediment accumulation and mangrove intrusion due to rising sea levels jeopardize this site.

MO2056 consists of a shell refuse scatter on a coastal berm at the edge of the mangrove swamp. Sediment accumulation and mangrove intrusion due to rising sea levels jeopardize this site.

A poured concrete cistern, house pilings and wood make up the home site MO2064. This site is located within the transition zone between rockland hammock and Keys tidal rock barren habitats. It is currently in good condition but due to rising sea levels the site is being more inundated with sea water which will start degrading the condition of the site over time.

The MO2071 site complex is a major historic homestead site. Structures visible at the site include two double-walled cisterns, two wells, cinderblock foundation of a possible still, a section of the original pioneer Key Largo "Trail," and extensive glass and ceramic shards.

MO2072 consists of the remains of a historic home site. The site includes rock piles, rock causeway extending eastward in mangroves, two areas of concrete rubble, iron nails, ceramics, and glass bottles. As the site is located within Keys tidal rock barren habitat, rising sea levels will cause site to be more inundated with sea water further degrading the condition of the site over time.

MO2073 is a large prehistoric shell and artifact scatter site. The site is located within the Keys tidal rock barren and transition zone to tropical hardwood hammock. Much of the site has been destroyed due to human development. As the site is located within Keys tidal rock barren habitat, rising sea levels will cause the site to be increasingly inundated with sea water, further degrading its condition.

The park is in need of a comprehensive archeological survey. The majority of the recorded sites in the park were documented between 1982 and 1985, during brief

preliminary observations, mostly trying to stay ahead of development in that era. No comprehensive study has been conducted within the park to date. It is likely additional sites, particularly homestead sites, would be discovered and recorded with a more comprehensive survey.

Condition assessment: The condition of most of the existing recorded sites within the park is fair. Recently, staff has been attempting to geographically locate and record each site with photographs and global positioning software (GPS). Many of the homestead sites have concrete cisterns and/or rock walls that are in need of maintenance. Some areas have been vandalized; however, vegetation and erosion are the main threats to the majority of these sites.

General management measures: Removal of vegetation in and around these sites, and some stabilization to existing walls is needed on most of the homestead sites. Vegetation removal would be minimal, mostly trees and shrubbery that have begun to directly grow "into" the structures. Also, geographic location and photographs should be collected for each site.

Historic Structures

Desired future condition: All significant historic structures and landscapes that represent Florida's cultural periods or significant historic events or persons are preserved in good condition in perpetuity, protected from physical threats and interpreted to the public.

Description: The majority of the structures listed for this park are within the old U.S. Army, Army Air Defense Command facility (ARADCOM HM40 Control Area) MO3343. In the northern portion of the park, along the new and old County Road 905 is the Army Air Defense facility, known locally as the missile base (management zone KL-18). The entire site is approximately 26 acres, and originally contained several parcels that were privately owned prior to condemnation and forced sale to the United States in 1963 and 1964. The facility was used by the Army from 1964 to 1979, and contained the control area including radar and support systems (i.e., radar towers, generators, administration, housing, etc.). The launch area, that contained the actual missiles, was located on the opposite side of County Road 905 within the current boundary of the U. S. Fish and Wildlife Service (ERCE 1991). At this time, the site is completely fenced; however, over the years the fencing has been vandalized and opened in several places.

MO3344 is the HM40 Control Area battery building that served as the primary administrative, housing, dining, and recreational facility.

MO3345 is the HM40 Control Area generator building.

MO3346 is the HM40 Control Area radar control facility.

MO3347 is the HM40 Control Area maintenance shop building. This building is a sheet metal building in deteriorating condition.

MO3348 is the HM40 Control Area guardhouse. It is a small concrete block building in deteriorating condition.

MO3349 is the HM40 Control Area pump house. This small concrete block building is in deteriorating condition but still has some of the wiring/control boxes in place.

MO3350 is the HM40 Control Area paint and oil storage facility. This small concrete block building is in deteriorating condition.

MO3351 is the HM40 Control Area radar tower 1. This metal tower is in deteriorated condition but will be preserved at the site for interpretation of the site. When operable it held either the Target Tracking Radar (TTR), the Target Ranging Radar (TRR), or the Missile Tracking Radar (MTR).

MO3352 is the HM40 Control Area radar tower 2. This metal tower is in deteriorated condition but will be preserved at the site for interpretation of the site. When operable it held either the Target Tracking Radar (TTR), the Target Ranging Radar (TRR), or the Missile Tracking Radar (MTR).

MO3353 is the HM40 Control Area radar tower 3. This metal tower is in deteriorated condition but will be preserved at the site for interpretation of the site. When operable it held either the Target Tracking Radar (TTR), the Target Ranging Radar (TRR), or the Missile Tracking Radar (MTR).

MO3354 is the HM40 Control Area radar tower 4. This reinforced concrete tower is in deteriorated condition but will be preserved at the site for interpretation of the site. When operable it held the low power acquisition radar (LIDAR).

MO3355 is the HM40 Control Area wastewater treatment plant. This building is in deteriorating condition.

MO3356 is the HM40 Control Area recreation court and it is in fair condition.

MO3357 is the HM40 Control Area helicopter pad.

Although listed within the FMSF, MO2086, a historic home structure, no longer remains at the site. It was demolished at an unknown time in the recent past.

Condition assessment: The existing buildings of the Army Air Defense facility are in poor condition. All existing buildings have been severely vandalized and show signs of being stripped of anything that could be removed, as well as random vandalism such as broken windows and doors. Due to the age of the facility, lead has been confirmed within every building and asbestos contaminates have been confirmed within the larger structures. The four metal "towers" cannot be evaluated at this time, structural integrity is not known.

General management measures: The majority of the structures within the Army Air Defense Command facility are targeted for removal. The four existing towers will

likely be left in place to be used for site interpretation. Several large trees which have begun to grow into the base of the towers should be promptly removed.

Collections

Desired future condition: All historic, natural history and archaeological objects within the park that represent Florida’s cultural periods, significant historic events or persons, or natural history specimens are preserved in good condition in perpetuity, protected from physical threats and interpreted to the public.

Description: Dagny Johnson Key Largo Hammock Botanical State Park maintains no historic, natural history, or archaeological objects collections.

Detailed management goals, objectives, and actions for the management of cultural resources in this park are discussed in the Cultural Resource Management Program section of this component. Table 4 contains the name, reference number, culture or period, and brief description of all the cultural sites within the park that are listed in the Florida Master Site File. The table also summarizes each site’s level of significance, existing condition, and recommended management treatment. An explanation of the codes is provided following the table.

Table 4. Cultural Sites Listed in the Florida Master Site File					
Site Name and FMSF #	Culture/Period	Description	Significance	Condition	Treatment
MO127 Dynamite Dock	Glades 1 & 2; Mid 1800's-Late 1900's	Archaeological/Historic	Nr	F	P
MO128 Atlantic Site	Pre-Columbian; Aboriginal	Refuse Mound	Ne	G	P
MO1341 Round Container	19th-20th Century	Historic	Ne	F	P
MO1342 Stacked Rock	19th-20th Century	Historic	Ne	G	P
MO1965 Port Bougainville I	Glades 1 & 2	Archaeological	Nr	G	P
MO1971 Celt	Aceramic Prehistoric	Archaeological	Ns	Na	N/A

Table 4. Cultural Sites Listed in the Florida Master Site File					
Site Name and FMSF #	Culture/Period	Description	Significance	Condition	Treatment
MO1972 Laura	Am. Post-Reconstruction; Spanish-American War	Archaeological	Ns	Na	N/A
MO1973 Frag	Aceramic Prehistoric	Archaeological	Ns	Na	N/A
MO1974 Busycon Adze	Aceramic Prehistoric	Archaeological	Ns	Na	N/A
MO1975 Columella	Prehistoric	Archaeological	Ns	Na	N/A
MO2050 Barbara	Indeterminate Historic	Historic	Ne	P	P
MO2051 Card Sound Road	Glades 2	Archaeological	Ns	G	P
MO2053 Carys Fort	Am. Post-Reconstruction; Spanish-American War	Historic	Ns	P	P
MO2054 Jeffreys	Am. Civil War, Post-Reconstruction; Spanish-American War	Historic	Ne	F	P
MO2055 Goodie	Prehistoric	Archaeological	Nr	G	P
MO2056 Norman	Indeterminate	Archaeological	Ns	G	P
MO2064 North Largo	20th Century American	Historic	Ns	F	P
MO2071 McClellan	Am. Post-Reconstruction; Reconstruction; Spanish-American War; Ww1 & Aftermath	Historic	Nr	G	P

Table 4. Cultural Sites Listed in the Florida Master Site File					
Site Name and FMSF #	Culture/Period	Description	Significance	Condition	Treatment
MO2072 Sunland South	American Boom; Depression; Post- Reconstruction; Spanish American War, Ww1 & Aftermath	Historic	Ns	P	P
MO2073 Gulfstream	Indeterminate	Archeological	Ne	Na	Na
MO2086 Architectural Site #2 (Loquat Drive)	Mid-1920	Historic	Ns	Na	Na
MO3344 HM40 Control Area Battery Building	Air Force/ Army/ Navy/ Military Base 1964	Historic	Ns	P	R
MO3345 HM40 Control Area Generator Building	Air Force/ Army/ Aavy/ Military Base 1964	Historic	Ns	P	R
MO3346 HM40 Control Area Radar Control Facility	Air Force/ Army/ Navy/ Military Base 1964	Historic	Ns	P	R
MO3347 HM40 Control Area Maintenance Shop	Air Force/ Army/ Navy/ Military Base 1964	Historic	Ns	P	R
MO3348 HM40 Control Area Guardhouse	Air Force/ Army/ Navy/ Military Base 1964	Historic	Ns	P	R

Table 4. Cultural Sites Listed in the Florida Master Site File					
Site Name and FMSF #	Culture/Period	Description	Significance	Condition	Treatment
MO3349 HM40 Control Area Pump House	Air Force/ Army/ Navy/ Military Base 1964	Historic	Ns	P	R
MO3350 HM40 Control Area Paint & Oil Storage	Air Force/ Army/ Navy/ Military Base 1964	Historic	Ns	P	R
MO3351 HM40 Control Area Radar Tower 1	Air Force/ Army/ Navy/ Military Base 1964	Historic	Ns	P	P
MO3352 HM40 Control Area Radar Tower 2	Air Force/ Army/ Navy/ Military Base 1964	Historic	Ns	P	P
MO3353 HM40 Control Area Radar Tower 3	Air Force/ Army/ Navy/ Military Base 1964	Historic	Ns	P	P
MO3354 HM40 Control Area Radar Tower 4	Air Force/ Army/ Navy/ Military Base 1964	Historic	Ns	P	P
MO3355 HM40 Control Area Waste Water Treatment	Air Force/ Army/ Navy/ Military Base 1964	Historic	Ns	P	R
MO3356 HM40 Control Area Recreation Court	Air Force/ Army/ Navy/ Military Base 1964	Historic	Ns	F	R
MO3357 HM40 Control Area Helicopter Pad	Air Force/ Army/ Navy/ Military Base 1964	Historic	Ns	P	R

Significance:

NRL	National Register listed
NR	National Register eligible
NE	not evaluated
NS	not significant

Condition:

G	Good
F	Fair
P	Poor
NA	Not accessible
NE	Not evaluated

Recommended Treatment:

RS	Restoration
RH	Rehabilitation
ST	Stabilization
P	Preservation
R	Removal
N/A	Not applicable

RESOURCE MANAGEMENT PROGRAM

Management Goals, Objectives, and Actions

Measurable objectives and actions have been identified for each of the DRP's management goals for Dagny Johnson Key Largo Hammock Botanical State Park. Please refer to the Implementation Schedule and Cost Estimates in the Implementation Component of this plan for a consolidated spreadsheet of the recommended actions, measures of progress, target year for completion and estimated costs to fulfill the management goals and objectives of this park.

While the DRP utilizes the ten-year management plan to serve as the basic statement of policy and future direction for each park, a number of annual work plans provide more specific guidance for DRP staff to accomplish many of the resource management goals and objectives of the park. Where such detailed planning is appropriate to the character and scale of the park's natural resources, annual work plans are developed for prescribed fire management, exotic plant management and imperiled species management. Annual or longer- term work plans are developed for natural community restoration and hydrological restoration. The work plans provide the DRP with crucial flexibility in its efforts to generate and implement adaptive resource management practices in the state park system.

The work plans are reviewed and updated annually. Through this process, the DRP's resource management strategies are systematically evaluated to determine their effectiveness. The process and the information collected is used to refine techniques, methodologies and strategies, and ensures that each park's prescribed management actions are monitored and reported as required by Sections 253.034 and 259.037, Florida Statutes.

The goals, objectives and actions identified in this management plan will serve as the basis for developing annual work plans for the park. The ten-year management plan is based on conditions that exist at the time the plan is developed. The annual work plans provide the flexibility needed to adapt to future conditions as they

change during the ten-year management planning cycle. As the park's annual work plans are implemented through the ten-year cycle, it may become necessary to adjust the management plan's priority schedules and cost estimates to reflect these changing conditions.

Natural Resource Management

Hydrological Management

Goal: Protect water quality and quantity in the park, restore hydrology to the extent feasible and maintain the restored condition.

The natural hydrology of most state parks has been impaired prior to acquisition to one degree or another. Florida's native habitats are precisely adapted to natural drainage patterns and seasonal water level fluctuations, and variations in these factors frequently determine the types of natural communities that occur on a particular site. Even minor changes to natural hydrology can result in the loss of plant and animal species from a landscape. Restoring state park lands to original natural conditions often depends on returning natural hydrological processes and conditions to the park. This is done primarily by filling or plugging ditches, removing obstructions to surface water "sheet flow," installing culverts or low-water crossings on roads, and installing water control structures to manage water levels.

Objective: Conduct/obtain an assessment of the park's hydrological restoration needs.

Action 1 Conduct/ obtain assessments of four areas of the park that require hydrological restoration.

The remaining area of the park that are in need of restoration assessments include the JHT subdivision, Elbow Light Club, Ocean Forest Estates, and the impounded wetland portions of Port Bougainville.

Objective: Restore natural hydrological conditions and functions to approximately 8.0 acres of mangrove swamp and Keys tidal rock barren natural communities.

Action 1 Continue restoration efforts at Carysfort Yacht Club.
Action 2 Continue restoration efforts at Port Bougainville.
Action 3 Monitor restoration sites annually.

As mentioned, the park is currently participating in on-going restoration efforts to restore wetland habitats. In particular, two of these large-scale projects are: (1) the old Carysfort Yacht Club (management zone KL-15), and (2) the old Port Bougainville development site (management zone KL-02). As funding becomes available, and with the appropriate agency permits, clean fill material is deposited into an area until the natural grade is achieved. Continued effort in this process is vital to the long-term goals and objectives of the park.

DRP staff will be responsible for conducting annual monitoring of restoration sites, primarily within the wetland habitats according to agency permit requirements.

Natural Communities Management

Goal: Restore and maintain the natural communities/habitats of the park.

The DRP practices natural systems management. In most cases, this entails returning fire to its natural role in fire-dependent natural communities. Other methods to implement this goal include large-scale restoration projects as well as smaller scale natural communities' improvements. Following are the natural community management objectives and actions recommended for the state park.

Prescribed fire is used to mimic natural lightning-set fires, which are one of the primary natural forces that shaped Florida's ecosystem. Prescribed burning increases the abundance and health of many wildlife species. A large number of Florida's imperiled species of plants and animals are dependent on periodic fire for their continued existence. Fire-dependent natural communities gradually accumulate flammable vegetation; therefore, prescribed fire reduces wildfire hazards by reducing these wild land fuels.

There are no fire-dependent natural communities at Dagny Johnson Key Largo Hammock Botanical State Park.

Natural Community Restoration: In some cases, the reintroduction and maintenance of natural processes is not enough to reach the desired future conditions for natural communities in the park and active restoration programs are required. Restoration of altered natural communities to healthy, fully functioning natural landscapes often requires substantial efforts that may include mechanical treatment of vegetation or soils and reintroduction or augmentation of native plants and animals. For the purposes of this management plan, restoration is defined as the process of assisting the recovery and natural functioning of degraded natural communities to desired future condition, including the re-establishment of biodiversity, ecological processes, vegetation structure and physical characters.

Examples that qualify as natural community restoration, requiring annual restoration plans, include large mitigation projects, large-scale hardwood removal and timbering activities, roller-chopping and other large-scale vegetative modifications. The key concept is that restoration projects will go beyond management activities routinely performed as standard operating procedures such as mowing, reintroduction of fire as a natural process, spot treatments of exotic plants, and small-scale vegetation management.

Following are the natural community/habitat restoration and maintenance actions recommended to create the desired future conditions in the rockland hammock community.

Objective: Conduct habitat/natural community restoration activities on 15 acres of Rockland hammock natural community.

- | | |
|----------|---|
| Action 1 | Update site specific restoration plan. |
| Action 2 | Implement restoration plan. |
| Action 3 | Conduct monitoring events based on recommendations within the restoration plan. |

A restoration plan for restoring rockland hammock habitat has been developed and is in the early stages of implementation. A minimum of 13.6 acres will be restored and replanted with native vegetation specific to the needs of the listed imperiled species found in the Park. The restoration will include the removal of roadbeds throughout the Park and existing structures within the developed areas of Port Bougainville (management zone KL-02) and the Army Air Defense facility (management zone KL-18). In addition, just over two acres (2.0) of upland habitat are currently included in two on-going restoration projects in conjunction with the Keys Environmental Restoration Fund: Carysfort marina site (management zone KL-15) and Port Bougainville marina site (management zone KL-02). Periodic monitoring of the restored areas will be conducted, at least annually, to ensure non-native vegetation is not invading the restoration site.

Natural Community Improvement: Improvements are similar to restoration but on a smaller, less intense scale. This typically includes small-scale vegetative management activities or minor habitat manipulation. Following are the natural community/habitat improvement actions recommended at the park.

Objective: Conduct natural community/habitat improvement activities on 15 acres of Rockland hammock.

- Action 1 Conduct substrate enhancement in restoration areas.
- Action 2 Assist growth of native vegetation through replanting efforts in restoration areas.
- Action 3 Conduct periodic monitoring to ensure the prevention of the spread of non-native species in restoration areas.

In 2009, a restoration project was implemented on 5.7 acres within a developed section of Port Bougainville in the southern end of the park (management zone KL-02). The plan involved depositing a large volume of lime-rock fill in an area that was historically rockland hammock habitat. Unfortunately, the planting plan was not successful and the majority of the 5.7 acres. Substrate enhancement was conducted to re-establish growth of rockland hammock species within the restoration area. Scarification, or loosening of the substrate, as well as the addition of organic material was utilized to assist in the growth of vegetation. Re-seeding and replanting of native plants was conducted in 2014. Once additional restoration projects are conducted within the park similar actions will be taken to enhance barren areas and accelerate improvement of the habitat.

Maintenance of the improved area will require periodic monitoring to ensure non-native species are not invading the restoration site. Long-term maintenance is not expected once the native vegetation has re-established into the area.

Imperiled Species Management

Goal: Maintain, improve, or restore imperiled species populations and habitats in the park.

The DRP strives to maintain and restore viable populations of imperiled plant and animal species primarily by implementing effective management of natural systems. Single species management is appropriate in state parks when the maintenance, recovery or restoration of a species or population is complicated due to constraints associated with long-term restoration efforts, unnaturally high mortality or insufficient habitat. Single species management should be compatible with the maintenance and restoration of natural processes, and should not imperil other native species or seriously compromise park values.

In the preparation of this management plan, DRP staff consulted with staff of the FWC's Imperiled Species Management or that agency's Regional Biologist and other appropriate federal, state and local agencies for assistance in developing imperiled animal species management objectives and actions. Likewise, for imperiled plant species, DRP staff consulted with FDACS. Data collected by the USFWS, FWC, FDACS and FNAI as part of their ongoing research and monitoring programs will be reviewed by park staff periodically to inform management of decisions that may have an impact on imperiled species at the park.

Ongoing inventory and monitoring of imperiled species in the state park system is necessary to meet the DRP's mission. Long-term monitoring is also essential to ensure the effectiveness of resource management programs. Monitoring efforts must be prioritized so that the data collected provides information that can be used to improve or confirm the effectiveness of management actions on conservation priorities. Monitoring intensity must at least be at a level that provides the minimum data needed to make informed decisions to meet conservation goals. Not all imperiled species require intensive monitoring efforts on a regular interval. Priority must be given to those species that can provide valuable data to guide adaptive management practices. Those species selected for specific management action and those that will provide management guidance through regular monitoring are addressed in the objectives below.

Objective: Update baseline imperiled species occurrence inventory lists for plants and animals, as needed.

Objective: Monitor and document 4 selected imperiled animal species in the park.

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|----------|---|
| Action 1 | Staff will continue to participate in the collaborative monitoring efforts of the Key Largo woodrat, the Key Largo cotton mouse, the Schaus swallowtail butterfly and the Miami blue butterfly. |
| Action 2 | Park staff will apply for and obtain imperiled animal species trapping and handling permit for endangered Key Largo woodrat and Key Largo cotton-mouse. |
| Action 3 | Park staff will continue in the development and implementation of a supplemental nest structure and monitoring project within the park for the endangered Key Largo woodrat. |

Annual Schaus swallowtail monitoring efforts will continue with park staff involvement. These efforts might involve field surveys, volunteer coordination, site evaluation for larval and/or adult releases, and intensive site monitoring post releases.

Three areas within the park, to date, have been targeted with deployment of supplemental nest structures. These structures will be photographed biannually in an effort to evaluate site usage. Once staff have been successful in acquiring the USFWS trapping and handling permit, these areas will be trapped annually on a rotational basis for additional evaluation efforts.

Objective: Monitor and document 2 selected imperiled plant species in the park.

- Action 1 Develop monitoring protocols for three selected imperiled plant species including worm vine orchid, manchineel, and Cuban cluster vine.
- Action 2 Implement monitoring protocols for seven imperiled plant species including those listed in Action 1 above.

Park staff will continue the extensive conservation efforts made for mahogany mistletoe and semaphore cactus. Examples of such activities include long term monitoring of tagged individuals, outplanting to new sites, site suitability surveys, and coordination with other agencies and environmental groups in publicizing research.

Objective: Map all imperiled plant species in the park.

- Action 1 Conduct survey efforts to regularly update location of imperiled plant species.

Imperiled species were mapped using a GPS Trimble unit and GIS software. This mapping will need to be updated as warranted due to changes in population distribution or abundance, or as a result of stochastic events that may alter habitat types.

Exotic Species Management

Goal: Remove exotic and invasive plants and animals from the park and conduct needed maintenance control.

The DRP actively removes invasive exotic species from state parks, with priority being given to those causing the ecological damage. Removal techniques may include mechanical treatment, herbicides or biocontrol agents.

Objective: Annually treat 20 acres of exotic plant species in the park.

- Action 1 Annually develop/update exotic plant management work plan.
- Action 2 Implement annual work plan by treating 20 acres in park, annually, and continuing maintenance and follow-up treatments, as needed.

A non-native plant removal plan should be developed outlining the management zones and species targeted for treatment in each area. A follow up plan should be included in the document to ensure the limited resources of staff are utilized to the fullest extent. The exact amount of acreage that will be treated will vary depending on resources and the amount of infestation encountered. Park staff will continue to seek funding for exotic removal contracts and participate in DEP Resource Management Team projects, as well as the DEP District team exotic removal projects. All infestations of Category I and II species will be targeted first for treatment.

Objective: Implement control measures on 3 exotic animal species in the park.

- Action 1 Control measures will focus primarily within developed areas of the park where the presence of feral or stray cats has become a concern.
- Action 2 Continue to capture and remove green iguana species.
- Action 3 Staff will work in conjunction with FWC and USGS on the python project.

Coordinated monitoring efforts of cats with the Crocodile Lake Wildlife Refuge and Dagny Johnson Key Largo Hammock Botanical State Park was initiated in 2013. This monitoring continues and will increase in efforts after the planned restoration efforts at the Port Bougainville site are completed. The animals captured will be turned over to the Monroe County animal control facility.

Training events will be planned for staff and volunteers of the park in the proper capture and removal of exotic reptiles from park property in conjunctions with FWC, FDEP, USGS, and other specialized agency personnel.

Cultural Resource Management

Cultural Resource Management

Cultural resources are individually unique, and collectively, very challenging for the public land manager whose goal is to preserve and protect them in perpetuity. The DRP will implement the following goals, objectives and actions, as funding becomes available, to preserve the cultural resources found in Dagny Johnson Key Largo Hammock Botanical State Park.

Goal: Protect, preserve, and maintain the cultural resources of the park.

The management of cultural resources is often complicated because these resources are irreplaceable and extremely vulnerable to disturbances. The advice of historical and archaeological experts is required in this effort. All activities related to land clearing, ground disturbing activities, major repairs or additions to historic structures listed or eligible for listing in the National Register of Historic Places must be submitted to the FDOS, Division of Historical Resources (DHR) for review and comment prior to undertaking the proposed project. Recommendations may include, but are not limited to concurrence with the project as submitted, pre-

testing of the project site by a certified archaeological monitor, cultural resource assessment survey by a qualified professional archaeologist, modifications to the proposed project to avoid or mitigate potential adverse effect. In addition, any demolition or substantial alteration to any historic structure or resource must be submitted to the DHR for consultation and the DRP must demonstrate that there is no feasible alternative to removal and must provide a strategy for documentation or salvage of the resource. Florida law further requires that DRP consider the reuse of historic buildings in the park in lieu of new construction and must undertake a cost comparison of new development versus rehabilitation of a building before electing to construct a new or replacement building. This comparison must be accomplished with the assistance of the DHR.

Objective: Assess and evaluate 21 of 21 recorded cultural resources in the park.

- Action 1 Complete 21 assessments/evaluations of archaeological sites.
- Action 2 Complete 1 Historic Structures Report (HSR) for historic buildings and cultural landscape. Prioritize stabilization, restoration and rehabilitation projects.

Park staff has already started to locate and provide information on each of the listed sites. Information collected includes, but is not limited to, the condition of the site, photographic points, list of any threats, and geographic positioning system (GPS) points. All information will be documented on appropriate forms and a copy sent to the Division of Historical Resources to be filed appropriately. A copy of all information should be maintained at the park. The park staff will prioritize preservation projects identified by the evaluations.

Objective C: Bring 1 of 21 recorded cultural resources into good condition.

- Action 1 Design and implement regular monitoring program for 1 cultural site.
- Action 2 Create and implement a cyclical maintenance program for each cultural resource.

Site MO1341, Round Container, is a cultural site that could potentially be in need of stabilization if not rehabilitation as well. This site suffers from encroachment by native vegetation and corrosion of portions of the existing structure by exposure. The park should consult with the appropriate agencies/institutions for assistance in the long-term maintenance of this site.

Special Management Considerations

Timber Management Analysis

Chapters 253 and 259, Florida Statutes, require an assessment of the feasibility of managing timber in land management plans for parcels greater than 1,000 acres if the lead agency determines that timber management is not in conflict with the primary management objectives of the land. The feasibility of harvesting timber at this park during the period covered by this plan was considered in context of the

DRP's statutory responsibilities and an analysis of the park's resource needs and values. The long-term management goal for forest communities in the state park system is to maintain or re-establish old-growth characteristics to the degree practicable, with the exception of those communities specifically managed as early successional.

During the development of this plan, an analysis was made regarding the feasibility of timber management activities in the park. It was determined that the primary management objectives of the unit could be met without conducting timber management for this management cycle. Timber management will be re-evaluated during the next revision of the management plan.

Coastal/Beach Management

The DRP manages over 100 miles of sandy beach, which represents one-eighth of Florida's total sandy beach shoreline. Approximately one-quarter of Florida's state parks are beach-oriented parks and account for more than 60 percent of statewide park visitation. The management and maintenance of beaches and their associated systems and processes is complicated by the presence of inlets and various structures (jetties, groins, breakwaters) all along the coast. As a result, beach restoration and nourishment have become increasingly necessary and costly procedures for protecting valuable infrastructure. Beach and inlet management practices affect beaches for long distances on either side of a particular project. DRP staff needs to be aware of and participate in the planning, design and implementation of these projects to ensure that park resources and recreational use are adequately considered and protected.

Dagny Johnson Key Largo Hammock Botanical State Park does not include any beaches. The coastline is primarily made up of mangrove swamp and as the park borders John Pennekamp Coral Reef State Park, it does not manage the 400-foot sovereign submerged areas as is typical with other coastal parks. There are, however, several areas that have had historic human disturbance, which has caused some erosional problems. These problems are being addressed through the various restoration projects that are on-going and planned for the future.

Arthropod Control Plan

All DRP lands are designated as "environmentally sensitive and biologically highly productive" in accordance with Ch. 388 and Ch. 388.4111 Florida Statutes. If a local mosquito control district proposes a treatment plan, the DRP works with the local mosquito control district to achieve consensus. By policy of DEP since 1987, aerial adulticiding is not allowed, but larviciding and ground adulticiding (truck spraying in public use areas) is typically allowed. The DRP does not authorize new physical alterations of marshes through ditching or water control structures. Mosquito control plans temporarily may be set aside under declared threats to public or animal health, or during a Governor's Emergency Proclamation.

The park lies within Monroe County and the local entity in charge of controlling mosquitoes is known as the Florida Keys Mosquito Control District (FKMCD). Due to

the highly rare and sensitive natural communities within the park, man-made control activities of mosquitoes are not permitted. The majority of the park contains undeveloped lands with few developed areas within or adjacent to the park boundary. Unfortunately, over the years there have been several incidents of drift occurring from aerial adult control spraying encroaching into the park. This has led to discrepancies between the FKMCD and the state parks system on the best management practices employed concerning areas adjacent to the parks. Over the years, the FKMCD has made proposals to introduce man-made control activities into the park, and came to a consensus that a small number of areas adjacent to human populated neighbors could receive larvicide application with the goal of reducing other more harmful control methods within these areas. The park naturally contains mosquitoes. However, as stated throughout this Plan, the park also contains extremely rare and sensitive habitats not found anywhere else in the continental United States and the fragile balance of these habitats must be protected.

Sea Level Rise

Potential sea level rise is now under study and will be addressed by Florida's residents and governments in the future. The DRP will stay current on existing research and predictive models, in coordination with other DEP programs and federal, state, and local agencies. The DRP will continue to observe and document the changes that occur to the park's shorelines, natural features, imperiled species populations, and cultural resources. This ongoing data collection and analysis will inform the Division's adaptive management response to future conditions, including the effects of sea level rise, as they develop.

Additional Considerations

The sheer size and geographic distribution of the park makes it very challenging to manage. Currently, public access is through an unmanned location in the southern end of the park (Management Zone KL-01), with entry fees collected by an honor system drop-box. Data collected internally during the past 5 years found that on average, approximately 2,000 people entered the park at this point throughout the year. This data does not account for public entry into the park from other areas, only from the southern entrance known locally as Port Bougainville, named after the last failed private development. The count of individuals is monitored by light beam so the exact number may be significantly higher, or lower than listed. Significant disturbances still exist within this site that are currently being restored, as well as areas targeted for future restoration. Existing trails pass very close to many of these restoration sites, as well as several of the remaining structures. Unfortunately, as to be expected, the presence of these structures and restoration projects has ultimately invited unwanted activities such as leaving the trail and vandalism. In 2011 a new trail system, expanding on the existing trails, was opened to provide a more comprehensive experience of the different natural communities of the site. The opening of this trail will likely increase the number of visitors in the future.

The remaining areas of the park extend northeast along County Road 905 for another eight (8) miles (management zones KL-01- KL-19, KL-21 & KL-23). For

most of the distance of the park, there is a utility easement between the roadway and the park boundary. In some areas, the easement is closer to the roadway than others. In response to illegal dumping, poaching, and vandalism, the utility company blocked vehicular access to many of the areas under the easement by installing posts and wire. However, the known presence of abandoned roadways creates the ideal situations for continued illegal poaching, dumping, and vandalism. Therefore, an increased presence of staff and law enforcement along the property boundaries are needed to discourage illegal entry into the park, as well as reducing illegal poaching, dumping, and vandalism.

Resource Management Schedule

A priority schedule for conducting all management activities that is based on the purposes for which these lands were acquired, and to enhance the resource values, is located in the Implementation Component of this management plan.

Land Management Review

Section 259.036, Florida Statutes, established land management review teams to determine whether conservation, preservation and recreation lands titled in the name of the Board of Trustees are being managed for the purposes for which they were acquired and in accordance with their approved land management plans. The considered recommendations of the land management review team and updated this plan accordingly.

Dagny Johnson Key Largo Hammock Botanical State Park was subject to a land management review on November 18, 2010. The review team made the following determinations:

- The land is being managed for the purpose for which it was acquired.
- The actual management practices, including public access, complied with the management plan for this site.

LAND USE COMPONENT

Introduction

Land use planning and park development decisions for the state park system are based on the dual responsibilities of the Florida Department of Environmental Protection (DEP), Division of Recreation and Parks (DRP). These responsibilities are to preserve representative examples of original natural Florida and its cultural resources, and to provide outdoor recreation opportunities for Florida's citizens and visitors.

The general planning and design process begins with an analysis of the natural and cultural resources of the unit, and then proceeds through the creation of a conceptual land use plan that culminates in the actual design and construction of park facilities. Input to the plan is provided by experts in environmental sciences, cultural resources, park operation and management. Additional input is received through public workshops, and through environmental and recreational-user groups. With this approach, the DRP objective is to provide quality development for resource-based recreation throughout the state with a high level of sensitivity to the natural and cultural resources at each park.

This component of the unit plan includes a brief inventory of the external conditions and the recreational potential of the unit. Existing uses, facilities, special conditions on use, and specific areas within the park that will be given special protection, are identified. The land use component then summarizes the current conceptual land use plan for the park, identifying the existing or proposed activities suited to the resource base of the park. Any new facilities needed to support the proposed activities are expressed in general terms.

External Conditions

An assessment of the conditions that exist beyond the boundaries of the unit can identify any special development problems or opportunities that exist because of the unit's unique setting or environment. This also provides an opportunity to deal systematically with various planning issues such as location, regional demographics, adjacent land uses and park interaction with other facilities. Dagny Johnson Key Largo Hammock Botanical State Park is located within Monroe County, adjacent to Key Largo in the Florida Keys.

The population of Monroe County is relatively diverse in terms of demographic characteristics. According to the U.S. Census Data (Census 2013), approximately 32% of residents in the county identify as black, Hispanic or Latino, or another minority group. Over one-third (39%) of residents can be described as youth or seniors (Census 2013). 71% of the population is of working age (16 to 65) (Census 2013). Monroe County ranked third statewide in per capita personal income at \$57,829 (above the statewide average of \$41,497) (U.S. Bureau of Economic Analysis 2014).

The park is located in the Southeast Vacation Region, which includes Broward, Miami-Dade, Monroe, and Palm Beach counties (Visit Florida 2013). According

to the 2013 Florida Visitor Survey, approximately 17.3% of domestic visitors to Florida visited this region. Roughly 87% of visitors to the region traveled to the Southeast for leisure purposes. The top activities for domestic visitors were beach/waterfront and culinary/dining experiences. Summer was the most popular travel season, but visitation was generally spread throughout the year. Most visitors traveled by air (60%), reporting an average of 4.4 nights and spending an average of \$186 per person per day (Visit Florida 2013).

The table below identifies significant resource-based recreation opportunities within 15 miles of Dagny Johnson Key Largo Hammock Botanical State Park.

Table 5. Resource-Based Recreational Opportunities Near Dagny Johnson Key Largo Hammock Botanical State Park								
Name	Biking	Hiking	Swim/ Beach Access	Boating/ Paddling	Fishing	Wildlife Viewing	Overnight Stay	Hunting
John Pennekamp Coral Reef State Park (FDEP)		✓	✓	✓	✓	✓	✓	
Biscayne National Park (USDOJ)		✓	✓	✓	✓	✓	✓	
Homestead Bayfront Park (Miami-Dade County)			✓	✓	✓			
Southern Glades Wildlife and Environmental Area (SFWMD)	✓	✓		✓	✓	✓		✓
Frog Pond Wildlife Management Area (SFWMD)						✓		✓
Everglades National Park (USDOJ)	✓	✓		✓	✓	✓	✓	
Florida Keys Overseas Heritage Trail (FDEP)	✓	✓			✓	✓		

Existing Use of Adjacent Lands

Dagny Johnson Key Largo Hammock Botanical State Park is located on Key Largo, which has an estimated population of around 10,780 (Census 2014). The park consists of the remaining stretch of tropical hammock on the northern end of Key Largo, the largest, contiguous tropical hammock in the United States. Mostly surrounded by conservation lands, the park is a key component of a series of conservation lands meant to protect and conserve the natural resources of northern Key Largo. Like most of the inhabited keys, the park is

connected to the surrounding community by the Overseas Highway and then CR 905. CR 905 runs the length of the western park boundary from the northeast to the southwest with Barnes Sound and Card Sound to the west and the Atlantic Ocean to the east.

North of the park, the private gated community of Ocean Reef Club consists of large, single family and condominium residences with numerous amenities including a private airport and golf club. To the south is the more densely developed section of Key Largo with water oriented residential and commercial developments in an auto-dependent layout characteristic of the Florida Keys. Towards the middle of the park and across CR 905 is a Monroe County Transfer Station. Inholdings include single family residences located along artificial canals at several sites to the east of CR 905, and one private aquaculture facility.

Planned Use of Adjacent Lands

Monroe County is a relatively small county in terms of population in Florida with around 74,000 residents (BEBR). With the inherent environmental limitations on growth present in the Florida Keys, multiple environmental and social conflicts arise when increasing demand for development places a heavy burden on limited land. The vulnerability of the Florida Keys to tropical storm events has encouraged officials to address evacuation efforts throughout Monroe County. By managing growth in Monroe County and thereby preventing too much pressure on the Overseas Highway as the main means of evacuation, officials hope to ensure safe evacuation times for County residents and visitors when threatened by a tropical storm event. County officials have adopted a series of land use regulations that aim to focus growth in areas that are in a better position to support more development. In addition, these regulations deter future growth from occurring in sensitive natural areas that protect numerous listed plant and animal species. This approach also supports efforts to maintain and enhance water quality throughout the Florida Keys National Marine Sanctuary (Monroe County 2000).

Future land use designations to the northeast include Recreation (R), Mixed Use Commercial (MC), Residential Conservation (RC), Residential Medium (RM), Residential High (RH), and Residential Low (RL). To the southwest, Mixed Use Commercial (MC), Institutional (INS), Recreation (R), and Residential Low (RL), Residential Medium (RM), and Residential High (RH) designations are included around Mile Marker 106. Residential Conservation (RC), Residential Medium (RM), Agriculture (A), and Public Facilities (PF) future land use designations exist within the park.

As part of unincorporated Monroe County, North Key Largo has been assigned a Tier I designation, which is meant to discourage future development through a competitive point allocation system as part of the rate of growth ordinance (ROGO) that is meant to manage growth throughout Monroe County.

Migration to, and tourism in, the Florida Keys is expected to remain popular, and the impacts of residential and resort development, including loss of wildlife habitat, water quality impacts, noise, and traffic congestion along U.S. Highway 1 will continue to affect the state park. Division staff should be involved in the development of the Monroe County's comprehensive plan, future land use map and land development ordinances. Staff should also stay well informed about development plans in the surrounding community. Staff will request to be included by the local planning agency in the review of development proposals that may affect the natural, cultural, or recreational resources of the state park.

Greenways and Trails

Florida Greenways and Trails System (FGTS)

The Florida Greenways and Trails System (FGTS) is made up of existing, planned, and conceptual non-motorized trails and ecological greenways that form a connected, integrated statewide network. The FGTS serves as a green infrastructure plan for Florida, tying together the greenways and trails plans and planning activities of communities, agencies, and non-profit organizations throughout Florida. Trails include paddling, hiking, biking, multi-use, and equestrian trails. The Office of Greenways and Trails maintains a priority trails map and gap analysis for the FGTS to focus attention and resources on closing key gaps in the system.

In some cases, existing or planned priority trails run through or are adjacent to state parks, or they may be in close proximity and can be connected by a spur trail. State parks can often serve as trailheads, points-of-interest, and offer amenities such as camping, showers, and laundry, providing valuable services for trail users while increasing state park visitation. The park is a designated component of the Florida Greenways and Trails System, administered by the Department's Office of Greenways and Trails.

Florida Keys Overseas Heritage Trail

The Florida Keys Overseas Heritage Trail (FKOHT) is a multi-use trail that extends from MM 106.5 in Key Largo to MM 0 in Key West parallel to the Overseas Highway. The majority of the trail is located in FDOT right-of-way while the trail is routed across the Florida Keys Historic Bridges, originally constructed by Henry Flagler as part of the East Coast Railroad in the early 1900s, when possible.

The FKOHT is the southernmost segment of the East Coast Greenway, with the northern terminus located in Calais, Maine and the southern terminus in Key West, Florida. The FKOHT passes by numerous exceptional and unique natural communities including rockland hammock, mangroves, Keys tidal rock barren and lagoons. The FKOHT is managed by the DRP in partnership with the FDOT and Monroe County, in addition to each community through which the trail passes.

The FKOHT is a critical component of local transportation infrastructure and is still in development. Additions, expansions, trail widening projects, and bridge rehabilitation efforts are currently underway. Where there is a gap in the trail, the trail then merges with the Overseas Highway shoulder.

In addition, the park is also located along the Florida Circumnavigational Saltwater Paddling Trail that traverses the entire Florida coastline from Perdido Key State Park in Escambia County on the Gulf coast to Fort Clinch State Park in Fernandina Beach on the Atlantic coast.

Property Analysis

Effective planning requires a thorough understanding of the unit's natural and cultural resources. This section describes the resource characteristics and existing uses of the property. The unit's recreation resource elements are examined to identify the opportunities and constraints they present for recreational development. Past and present uses are assessed for their effects on the property, compatibility with the site, and relation to the unit's classification.

Recreational Resource Elements

This section assesses the park's recreational resource elements, those physical qualities that, either singly or in certain combinations, can support various resource-based recreation activities. Breaking down the property into such elements provides a means for measuring the property's capability to support potential recreational activities. This process also analyzes the existing spatial factors that either favor or limit the provision of each activity.

The primary values of the state botanical site as a public resource are the interpretive and environmental education opportunities provided by the unique habitats it contains. The preservation, restoration, and interpretation of the site's botanical resources are the primary goals of the Division's management of this property.

Land Area

The largest natural community at Dagny Johnson Key Largo Hammock Botanical State Park is the sensitive Rockland Hammock. While this community is the highest in elevation at the park, and therefore the most accessible, its sensitive qualities limit recreational opportunities. Low impact recreational opportunities would be feasible in this area including wildlife viewing, hiking, primitive camping, and other non-obtrusive activities. The vast majority of the remaining land area of the park consists of sensitive wetlands that would not support significant human activity. There is potential for improving the connection between the park and the FKOHT and thereby allowing additional bicycling opportunities for park visitors along CR 905.

Water Area

Dagny Johnson Key Largo Hammock Botanical State Park is adjacent to the Atlantic Ocean to the east and surrounded by extensive mangrove stands, the majority of the surrounding water is part of John Pennekamp Coral Reef State Park. Opportunities for saltwater passive recreation activities are prevalent such as snorkeling and paddling. Although there is not any access to a sandy beach due to the surrounding mangroves, other water-based opportunities are prevalent. Paddling is a popular activity on waters around the park, which contain a segment of the Florida Circumnavigational Saltwater Paddling Trail. Without any boat ramps or canoe/kayak launches, paddlers have to put in outside of the park.

Shoreline

The park lacks an accessible shoreline due to the extensive mangrove swamp natural community that traverses the length of the park's shoreline from north to south.

Natural Scenery

The rare natural communities and species that are so prevalent in the park offer a unique experience for park visitors that is not available anywhere else in the United States. Extensive tracts of intact rockland hammock are the most important scenic resource at the park.

Significant Habitat

The park contains excellent examples of rare Keys tidal rock barren, rockland hammock, mangrove swamp, and seagrass bed natural communities. These communities create valuable opportunities for wildlife viewing and nature study. Care will need to be taken to prevent excessive pressure from visitor use in these sensitive areas.

Natural Features

The park is home to the largest, contiguous remaining example of the rockland hammock in the United States. The hammock provides unique opportunities for wildlife viewing and hiking.

Archaeological and Historical Features

Several historical features at the park provide opportunities for interpretation including the remains of a large failed housing development known as Port Bougainville and the remnants of a Cold War era missile base that was part of a regional network meant to defend against the launching of missiles from Cuba.

Assessment of Use

All legal boundaries, significant natural features, structures, facilities, roads and trails existing in the unit are delineated on the base map (see Base Map). Specific uses made of the unit are briefly described in the following sections.

Past Uses

The park has seen a wide variety of human activity prior to its acquisition as a state park. The territory of the Calusa people at times reached the Florida Keys and were politically influential when not in direct control. Several shell middens indicate extensive pre-Columbian influences from indigenous groups.

In the modern era, remnants of several historic homesteads can be found across the island. The most significant past human influences were Cold War era United States Government operations. The Dynamite Pier area was used by the CIA to provide survival training for Cuban exile paramilitary trainees. Prior to that, the Dynamite Pier area of the key was used as an offloading point for dynamite due to the sparsely populated nature of northern Key Largo at the time. Key Largo was also the home of Nike Hercules Missile Site HM - 40. Battery B/2/52 ADA was located on CR 905 adjacent to the Crocodile Lake National Wildlife Refuge. This site was the permanent location of the battery once the Army Air Defense Command (ARADCOM) secured the funds to build permanent missile facilities in the region. The battery's integrated fire control (IFC) area and launch area (LA) are extant (Hach 2004).

Several areas within the Dagny Johnson Key Largo Hammock Botanical State Park were subdivided and developed as residential communities prior to acquisition by the state. Residences acquired through the CARL program are now utilized for staff housing administrative offices. Carysfort Yacht Harbor was an operating recreational vehicle campground and reef access marina facility when it was acquired by the state in the early 1990's. The operation was closed to public access by the Division in 1992 and restoration of the natural communities is underway. A skeet range was located at the north end of the unit prior to state acquisition in the early 1990's.

Future Land Use and Zoning

The DRP works with local governments to establish designations that provide both consistency between comprehensive plans and zoning codes and permit typical state park uses and facilities necessary for the provision of resource-based recreation.

The majority of North Key Largo has been assigned a Tier I designation by Monroe County, which is meant to discourage future development through the competitive point allocation system as part of the rate of growth ordinance (ROGO) that manages growth throughout the Florida Keys.

The current zoning designations that apply to the park include Native Area (NA), a designation that prevents development in preserved natural areas; Improved Subdivision (IS), which accommodates subdivisions that were in existence prior to the adoption of current land development regulations; Offshore Island (OI), a district that protects the natural character of islands not connected to U.S. Highway 1 and ensures the self-containment of

developments; and Conservation (C), designates areas acquired for conservation (Monroe County 2000).

Future land use categories assigned to the park include Conservation (C), which provides for publicly or privately owned lands held primarily for the preservation of natural and historic resources and compatible passive recreational uses; Residential Conservation (RC), a designation that encourages the preservation of open space and natural resources while providing for very low-density residential development; Residential Medium (RM), which accommodates subdivisions in existence prior to the adoption of the current plan; and Public Buildings/Lands (PB), which provides for public buildings and grounds owned by federal, state, and local governments (Monroe County 2015).

Current Recreational Use and Visitor Programs

As a park with a botanical site classification and emphasis placed on the preservation and restoration of natural resources, Dagny Johnson Key Largo Hammock Botanical State Park provides less support facilities and opportunities for recreation than other state parks in the region. However, the opportunities for recreation present offer unparalleled experiences in a unique environment.

With access to one of the largest tropical hardwood hammock stands in the United States, the park attracts many who enjoy wildlife viewing, bicycling, and hiking through unique natural communities that support a wide variety of imperiled plant and animal species. A nature trail provides an opportunity to help interpret the value of the communities found in the park and the role they play in protecting water quality for the coral reefs just offshore to the east.

Dagny Johnson Key Largo Hammock Botanical State Park recorded 40,563 visitors in FY 2014/2015. By DRP estimates, the FY 2014/2015 visitors contributed \$3,516,970 million in direct economic impact, the equivalent of adding 56 jobs to the local economy (FDEP 2015).

Other Uses

The Florida Keys Electric Cooperative holds an easement for power transmission lines adjacent to the eastern right-of-way of CR 905. Additional power and communications line easements exist between the County Road and several residential properties within the state property.

Protected Zones

A protected zone is an area of high sensitivity or outstanding character from which most types of development are excluded as a protective measure. Generally, facilities requiring extensive land alteration or resulting in intensive resource use, such as parking lots, camping areas, shops or maintenance areas, are not permitted in protected zones. Facilities with minimal resource impacts, such as trails, interpretive signs and boardwalks are generally allowed. All decisions involving the use of protected zones are made on a case-by-case basis after careful site planning and analysis.

At Dagny Johnson Key Largo Hammock Botanical State Park, all natural communities have been designated as protected zones. The park's current protected zone is delineated on the Conceptual Land Use Plan. This is consistent with the intent of the state botanical site classification, the importance of preserving and restoring the tropical hammock community, and the presence of a variety of state and federally listed plant and animal species.

Existing Facilities

The park contains three use areas that provide recreational facilities in addition to the 5.34 miles of hiking and bicycle trails along old roadbeds in the northern end of the park. The main entrance to the park is located near the abandoned Port Bougainville development, commonly referred to as Port B. This area contains two use areas, the Port B Day Use Area with access to picnicking and hiking facilities and interpretative information about the park. To the south of the Port B Day Use Area is the Port B Primitive Camping Area, also known as Garden Cove, with a paddle-in campsite that supports users of Segment 16 of the Florida Circumnavigational Saltwater Paddling Trail. Further north is the Nike Base Day Use Area which is a relatively undeveloped use area with access to the .35 mile long Dynamite Trail and the back country trail system.

Support facilities at the park include a restroom and parking lot at the Port B Day Use Area that supports visitors to the park and several staff residences spread throughout the park off CR 905 to the south and to the north in the Residence Area and Administration Area (see Base Map).

Recreation Facilities

Port B Day Use Area
 Picnic Pavilion (Medium)
 Kiosk
 Interpretive Panel
 Nature Trail (.23 miles)
 Port Bougainville Trail (2 miles)

Port B Primitive Camping Area
 Primitive Campground (1 site)

Nike Base Day Use Area
 Dynamite Trail (.35 miles)

Parkwide
 Hiking/Biking Trails (5.34 miles)

Support Facilities

Port B Day Use Area
 Restroom
 Parking Spaces (10)

Residence Area
 Staff Residences (5)

Parkwide
 Staff Residence

Administration Area
 FKOHT Office
 Staff Residence

Conceptual Land Use Plan

The following narrative represents the current conceptual land use proposal for this park. The conceptual land use plan is the long-term, optimal development plan for the park, based on current conditions and knowledge of the park's resources, landscape and social setting (see Conceptual Land Use Plan). The conceptual land use plan is modified or amended, as new information becomes available regarding the park's natural and cultural resources or trends in recreational uses, in order to adapt to changing conditions. Additionally, the acquisition of new parkland may provide opportunities for alternative or expanded land uses. The DRP develops a detailed development plan for the park and a site plan for specific facilities based on this conceptual land use plan, as funding becomes available.

During the development of the conceptual land use plan, the DRP assessed the potential impact of proposed uses or development on the park resources and applied that analysis to determine the future physical plan of the park as well as the scale and character of proposed development. Potential resource impacts are also identified and assessed as part of the site planning process once funding is available for facility development. At that stage, design elements (such as existing topography and vegetation, sewage disposal and stormwater management) and design constraints (such as imperiled species or cultural site locations) are investigated in greater detail. Municipal sewer connections, advanced wastewater treatment or best available technology systems are applied for on-site sewage disposal. Creation of impervious surfaces is minimized to the greatest extent feasible in order to limit the need for stormwater management systems, and all facilities are designed and constructed using best management practices to limit and avoid resource impacts. Federal, state and local permit and regulatory requirements are addressed during facility development. This includes the design of all new park facilities consistent with the universal access requirements of the Americans with Disabilities Act (ADA). After new facilities are constructed, park staff monitors conditions to ensure that impacts remain within acceptable levels.

Potential Uses

Public Access and Recreational Opportunities

Goal: Provide public access and recreational opportunities in the park.

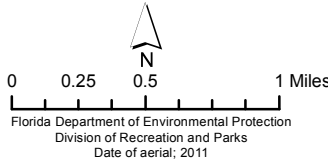
The existing recreational activities and programs of this state park are appropriate to the natural and cultural resources contained in the park and should be continued. New and improved activities and programs are also recommended and discussed below.

Objective: Maintain the park's current recreational carrying capacity of 364 users per day.

The park will continue to provide opportunities for hiking, bicycling, interpretation, and nature observation on its more than seven miles of backcountry trails through tropical hardwood hammock. Interpretive exhibits and programs will continue to be offered at the park. The park's ability to accommodate current visitation levels will be enhanced.

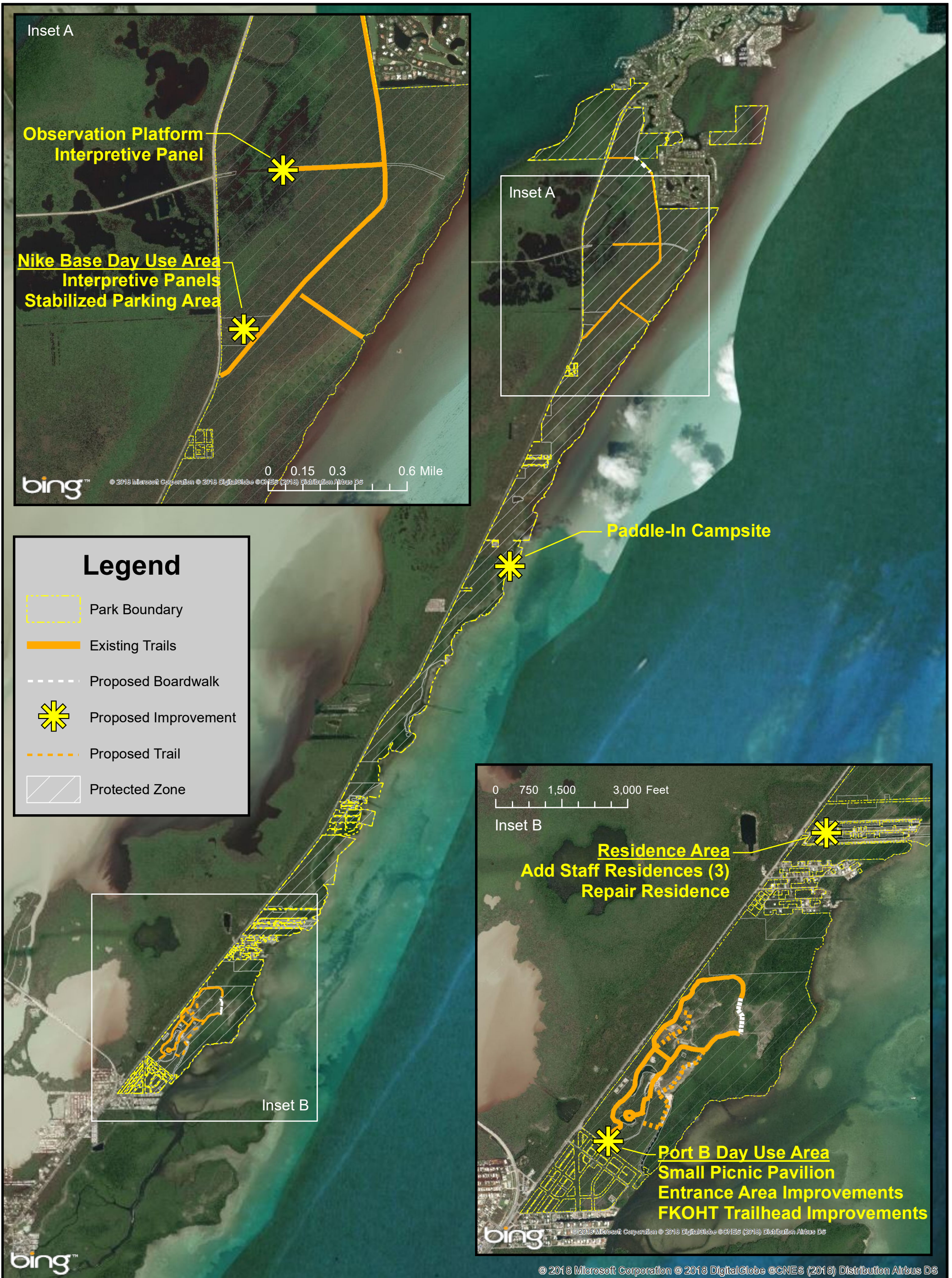


DAGNY JOHNSON KEY LARGO HAMMOCK BOTANICAL STATE PARK



BASE MAP

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DAGNY JOHNSON
KEY LARGO HAMMOCK
BOTANICAL STATE PARK

DRAFT
CONCEPTUAL
LAND USE PLAN

Objective: Expand the park's recreational carrying capacity by 92 users per day.

Extensions to the existing nature trail in the Port B Day Use Area will account for the majority of the estimated additional carrying capacity with an additional .89 miles of trail proposed. A small picnic shelter will also be provided in the Port B Day Use Area. In addition, a paddle-in primitive campsite will be added on the Atlantic coast at the Carysfort site.

As the FKOHT is continually improved, more cyclists will pass by the park and could use park facilities as a rest stop. Encouraging cyclists to visit the park will be an important part of developing a strong relationship between the FKOHT and state parks throughout Monroe County.

Objective: Continue to provide the current repertoire of 2 interpretive, educational, and recreational programs on a regular basis.

Existing interpretive and educational programs offered by the park include volunteer-led walks and the popular Balance of Nature Lecture Series. At Dagny Johnson Key Largo Hammock Botanical State Park, volunteers give a guided walk twice per week during the late fall to early spring that showcases the unique flora, fauna, and history of the park to visitors.

Running weekly from January to March, the Balance of Nature lecture series is sponsored by the park and held in the John Pennekamp Coral Reef State Park auditorium. The event is a local favorite often reaching capacity within the auditorium. The lecture series brings in experts in the environmental field to talk about various topics. The series is in its 25th year as of 2016.

Objective: Develop 1 new interpretive program.

Upon completion of the restoration project at Port Bougainville, an educational kiosk will be constructed in the use area. This kiosk will focus on the history of the park, parkwide restoration efforts, the importance of the rockland hammock, imperiled species of the Hardwood Hammock and the impacts of non-native invasive species in the park, including feral cats and non-native snakes.

Proposed Facilities

Capital Facilities and Infrastructure

Goal: Develop and maintain the capital facilities and infrastructure necessary to implement the recommendations of the management plan.

At Dagny Johnson Key Largo Hammock Botanical State Park, the park's classification as a botanical site prioritizes natural resource preservation and conservation in its management. As such, future development will be considered in a manner that is sensitive to the unique needs of the park. Heavy visitor use, which may lead to the degradation of the parks' natural resources, will not be encouraged at the park.

The existing facilities of this state park are appropriate to the natural and cultural resources contained in the park and should be maintained. New construction, as discussed further below, is recommended to improve the quality and safety of the recreational opportunities, to improve the protection of park resources, and to streamline the efficiency of park operations. The following is a summary of improved facilities needed to implement the conceptual land use plan for Dagny Johnson Key Largo Hammock Botanical State Park.

Objective: Maintain all public and support facilities in the park.

All capital facilities, trails and roads within the park will be kept in proper condition through the daily or regular work of park staff and/or contracted help.

Objective: Improve/repair 3 existing facilities and .89 miles of trail.

Major repair projects for park facilities may be accomplished within the ten-year term of this management plan, if funding is made available. These include the modification of existing park facilities to bring them into compliance with the Americans with Disabilities Act (a top priority for all facilities maintained by DRP). The following discussion of other recommended improvements and repairs are organized by use area within the park.

Port B Day Use Area

The main day use area of the park closest to the community of Key Largo and adjacent to the main entrance will be improved to allow for more formal parking within the park, in place of the current parking area on CR 905, in addition to an expansion of the parks picnic facilities. Parallel parking will be provided along the main park drive in a manner that will take into consideration sensitive natural communities and listed species on either side of the road. The potential for crushed shell or other light imprint improvements to allow for on street parking along the park drive will be discussed as a possible approach to help mitigate negative hydrological impacts. Efforts to minimize the impervious footprint of excessive parking facilities should be undertaken. Nature trails will be extended by .89 miles and a .2 mile boardwalk will connect the trail across the keys tidal rock barren natural community. In addition, a bike repair station and informational panel is planned as part of an FKOHT trailhead.

Residence Area

Approval for three additional staff residences for DRP staff will be pursued with Monroe County into the near future on previously disturbed parcels along Charlemagne Blvd. An existing residence site will be repaired as well.

Parkwide

An observation platform and interpretive panel will be developed in order to highlight the diversity of natural communities at the site of the Old Card Sound Rd. terminus on the eastern shore of Dispatch Slough in the northern portion of the park. A proposed .2 mile boardwalk will connect the shared-use trails at the

northern end of the park across Dispatch Slough adjacent to the Ocean Reef development.

Objective C: Construct 2 new facilities.

Nike Base Day Use Area

The Nike Hercules Missile Site HM-40 has been identified as an important Cold War-era cultural resource that offers a unique opportunity to interpret to the public the range of Cold War-related activities that occurred throughout North Key Largo as part of the Homestead-Miami (HM) Defense Area. While the restoration of natural communities in the area has been identified as a priority, opportunities for interpretation are present and will be developed.

A small stabilized parking area will be provided allowing access to the shared-use paths in the northern section of the park in addition to the Nike Missile Site. Interpretive panels will be placed at the site to commemorate the role the facility played in the Cold War. Natural resource protection will guide the development of these facilities so they can be provided in the least impactful manner.

Parkwide

A primitive paddle-in campsite is proposed to support users of the Florida Circumnavigational Saltwater Paddling Trail. The campsite would include limited signage and a fire ring.

Facilities Development

Preliminary cost estimates for these recommended facilities and improvements are provided in the Ten-Year Implementation Schedule and Cost Estimates (Table 7) located in the Implementation Component of this plan. These cost estimates are based on the most cost-effective construction standards available at this time. The preliminary estimates are provided to assist DRP in budgeting future park improvements, and may be revised as more information is collected through the planning and design processes. New facilities and improvements to existing facilities recommended by the plan include:

Nike Base Day Use Area

Interpretive Panels
Small Stabilized Parking Area

Parkwide

Observation Platform
Interpretive Panel
Paddle-In Campsite
Boardwalk (.2 miles)

Port B Day Use Area

Small Picnic Pavilion
Entrance Area Improvements
Boardwalk (.2 miles)
Nature Trail (.89 miles)
FKOHT Trailhead

Residence Area

Staff Residences (3)

Recreational Carrying Capacity

Carrying capacity is an estimate of the number of users a recreation resource or facility can accommodate and still provide a high quality recreational experience and preserve the natural values of the site. The carrying capacity of a unit is determined by identifying the land and water requirements for each recreation activity at the unit, and then applying these requirements to the unit's land and water base. Next, guidelines are applied which estimate the physical capacity of the unit's natural communities to withstand recreational uses without significant degradation. This analysis identifies a range within which the carrying capacity most appropriate to the specific activity, the activity site and the unit's classification is selected (see Table 6).

The recreational carrying capacity for this park is a preliminary estimate of the number of users the unit could accommodate after the current conceptual development program has been implemented. When developed, the proposed new facilities would approximately increase the unit's carrying capacity as shown in Table 6.

Table 6. Recreational Carrying Capacity

Activity/Facility	Existing Capacity*		Proposed Additional Capacity		Estimated Recreational Capacity	
	One Time	Daily	One Time	Daily	One Time	Daily
Trails						
Nature Trails	10	40	15	60	25	100
Shared Use Trails	75	300	0	0	75	300
Picnicking	12	24	12	24	24	48
Camping						
Primitive	0	0	8	8	8	8
TOTAL	97	364	35	92	132	456

*Existing capacity revised from approved plan according to DRP guidelines.

Optimum Boundary

The optimum boundary map reflects lands considered desirable for direct management by the DRP as part of the state park. These parcels may include public or privately-owned land that would improve the continuity of existing parklands, provide the most efficient boundary configuration, improve access to the park, provide additional natural and cultural resource protection or allow for

future expansion of recreational activities. Parklands that are potentially surplus to the management needs of DRP are also identified. As additional needs are identified through park use, development, and research, and as land use changes on adjacent property, modification of the park's optimum boundary may be necessary.

Identification of parcels on the optimum boundary map is intended solely for planning purposes. It is not to be used in connection with any regulatory purposes. Any party or governmental entity should not use a property's identification on the optimum boundary map to reduce or restrict the lawful rights of private landowners. Identification on the map does not empower or suggest that any government entity should impose additional or more restrictive environmental land use or zoning regulations. Identification should not be used as the basis for permit denial or the imposition of permit conditions.

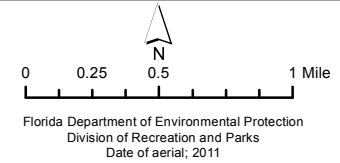
Due to the numerous efforts to develop north Key Largo, numerous inholdings remain to the east of CR 905 often creating a discontinuous system of parcels managed by the park and parcels left over from the original planned subdivisions. By acquiring the selected parcels spread throughout the rockland hammock on the east side of CR 905, around 151 acres in total, the park will be able to better manage the unique and sensitive natural communities of north Key Largo in accordance with the park's purpose for acquisition. At this time, no lands are considered surplus to the needs of the park.



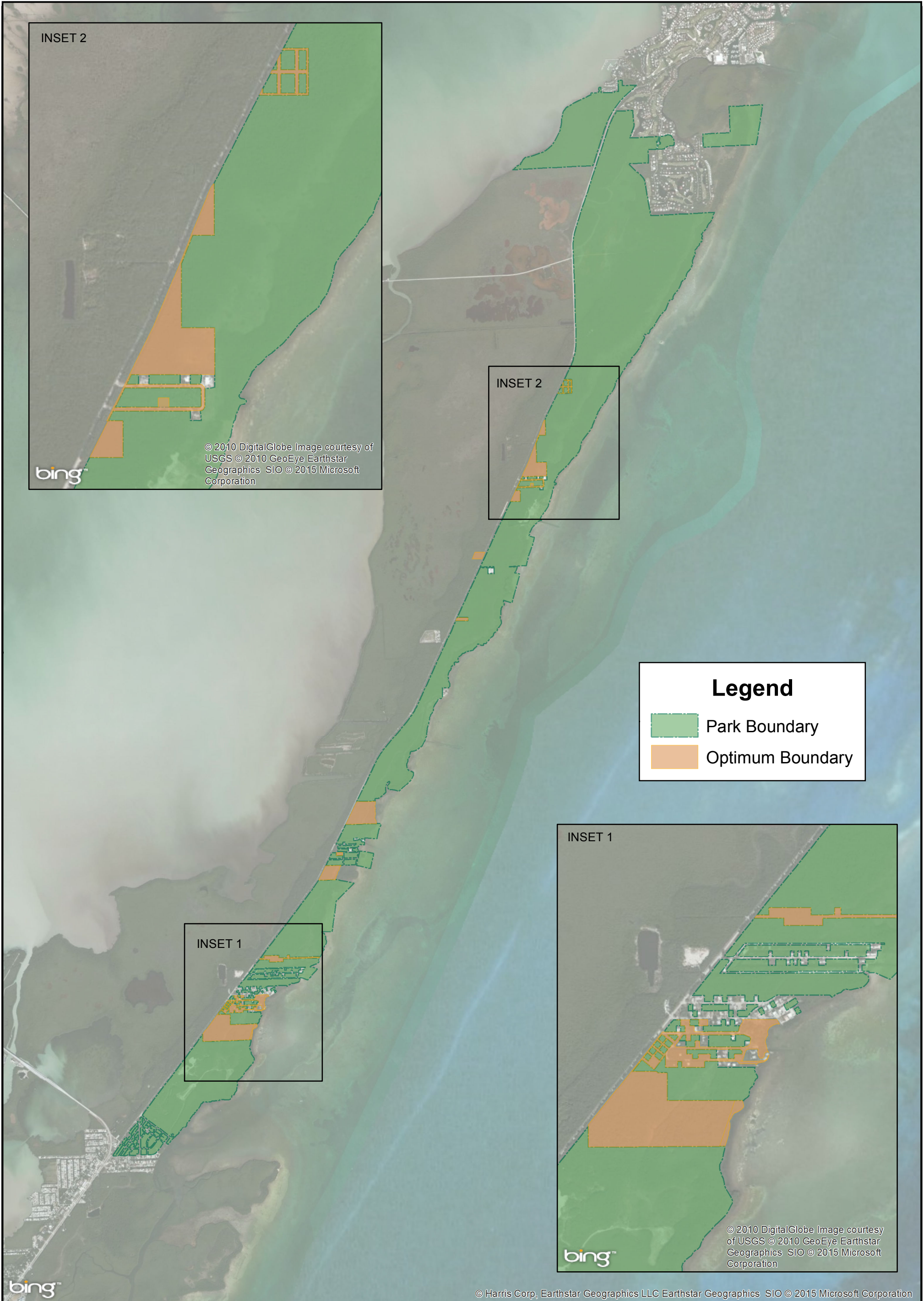
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DAGNY JOHNSON KEY LARGO HAMMOCK
BOTANICAL STATE PARK



OPTIMUM BOUNDARY MAP



Legend

- Park Boundary
- Optimum Boundary

INSET 1

INSET 2

INSET 2

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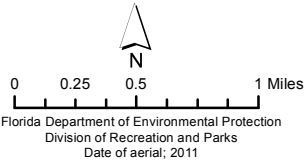
INSET 1

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**DAGNY JOHNSON KEY LARGO HAMMOCK
BOTANICAL STATE PARK**



OPTIMUM BOUNDARY MAP

IMPLEMENTATION COMPONENT

The resource management and land use components of this management plan provide a thorough inventory of the park's natural, cultural and recreational resources. They outline the park's management needs and problems, and recommend both short and long-term objectives and actions to meet those needs. The implementation component addresses the administrative goal for the park and reports on the Division of Recreation and Parks (DRP) progress toward achieving resource management, operational and capital improvement goals and objectives since approval of the previous management plan for this park. This component also compiles the management goals, objectives and actions expressed in the separate parts of this management plan for easy review. Estimated costs for the ten-year period of this plan are provided for each action and objective, and the costs are summarized under standard categories of land management activities.

MANAGEMENT PROGRESS

Since the approval of the last management plan for Dagny Johnson Key Largo Hammock Botanical State Park in 2004, significant work has been accomplished and progress made towards meeting the DRP's management objectives for the park. These accomplishments fall within three of the five general categories that encompass the mission of the park and the DRP.

Acquisition

- 20 new parcels totaling 108.88 acres were added to the park since the approval of the management plan in 2004.
-

Park Administration and Operations

- Landscaping was installed at the park entrance.
- A Park Procedures Manual was created for park staff.
-

Resource Management

Natural Resources

- Phases III and IV of the Carysfort Marina Restoration project were completed through funding provided by the Keys Environmental Restoration Trust Fund. This restoration site totals 9.84 acres of wetlands.
- Completed Phase III and installed a fill plug in the entrance channel of the Port Bougainville Restoration project through funding by the Keys Environmental Restoration Trust Fund. This restoration site totals 8.68 acres of wetlands and 2.82 acres of tropical hardwood hammock.
- Demolished 5 condominium buildings and restored 7.04 acres of tropical hardwood hammock at the Port Bougainville Restoration project area through mitigation by Florida DOT.

Cultural Resources

- Compiled updated information on all cultural and historical sites located within the Master site file and added several new sites.

Recreation and Visitor Services

- Nine interpretive brochures were created with park and resource information.
- Large print documents were created.
- Volunteer handbook created.
- Nursery volunteer team have grown and given away native plants to agency and community partners.

Park Facilities

- Approximately two miles of additional trails opened to day-use visitors.
- Primitive campsite and composting toilet installed for the Florida Circumnavigational Saltwater Paddling Trail.

MANAGEMENT PLAN IMPLEMENTATION

This management plan is written for a timeframe of ten years, as required by Section 253.034 Florida Statutes. The Ten-Year Implementation Schedule and Cost Estimates (Table 7) summarizes the management goals, objectives and actions that are recommended for implementation over this period, and beyond. Measures are identified for assessing progress toward completing each objective and action. A time frame for completing each objective and action is provided. Preliminary cost estimates for each action are provided and the estimated total costs to complete each objective are computed. Finally, all costs are consolidated under the following five standard land management categories: Resource Management, Administration and Support, Capital Improvements, Recreation Visitor Services and Law Enforcement.

Many of the actions identified in the plan can be implemented using existing staff and funding. However, a number of continuing activities and new activities with measurable quantity targets and projected completion dates are identified that cannot be completed during the life of this plan unless additional resources for these purposes are provided. The plan's recommended actions, time frames and cost estimates will guide the DRP's planning and budgeting activities over the period of this plan. It must be noted that these recommendations are based on the information that exists at the time the plan was prepared. A high degree of adaptability and flexibility must be built into this process to ensure that the DRP can adjust to changes in the availability of funds, improved understanding of the park's natural and cultural resources, and changes in statewide land management issues, priorities and policies.

Statewide priorities for all aspects of land management are evaluated each year as part of the process for developing the DRP's annual legislative budget requests. When preparing these annual requests, the DRP considers the needs and priorities of the entire state park system and the projected availability of funding from all sources during the upcoming fiscal year. In addition to annual legislative appropriations, the DRP pursues supplemental sources of funds and staff resources wherever possible, including grants, volunteers and partnerships with other entities. The DRP's ability to accomplish the specific actions identified in the plan will be determined largely by the availability of funds and staff for these purposes, which

may vary from year to year. Consequently, the target schedules and estimated costs identified in Table 7 may need to be adjusted during the ten-year management planning cycle.

Table 7
Dagny Johnson Key Largo Hammock Botanical State Park
Ten-Year Implementation Schedule and Cost Estimates Sheet 1 of 4

NOTE: THE DIVISION'S ABILITY TO COMPLETE THE OBJECTIVES OUTLINED BY THE MANAGEMENT PLAN IS CONTINGENT ON THE AVAILABILITY OF FUNDING AND OTHER RESOURCES FOR THESE PURPOSES.				
Goal I: Provide administrative support for all park functions.				
		Measure	Planning Period	Estimated Manpower and Expense Cost* (10-years)
Objective	Continue day-to-day administrative support at current levels.	Administrative support ongoing	C	\$96,000
Objective	Expand administrative support as new lands are acquired, new facilities are developed, or as other needs arise.	Administrative support expanded	C	\$24,000
Goal II: Protect water quality and quantity in the park, restore hydrology to the extent feasible, and maintain the restored condition.				
		Measure	Planning Period	Estimated Manpower and Expense Cost* (10-years)
Objective	Conduct/obtain an assessment of the park's hydrological needs.	Assessment conducted	ST	\$13,000
Action 1	Conduct/ obtain assessments of four areas of the park that require hydrological restoration.	# Areas assessed	ST	\$13,000
Objective	Restore natural hydrological conditions and function to approximately 8.0 acres of mangrove swamp and Keys tidal rock barren natural communities.	# Acres restored or with restoration underway	LT	\$900,000
Action 1	Continue restoration efforts at Carysfort Yacht Club.	# Miles of ditches filled	LT	\$700,000
Action 2	Continue restoration efforts at Port Bougainville.	# Crossings/culverts installed	LT	\$200,000
Action 3	Monitor restoration sites annually.	# Sites monitored	Current	\$0
Goal III: Restore and maintain the natural communities/habitats of the park.				
		Measure	Planning Period	Estimated Manpower and Expense Cost* (10-years)
Objective	Conduct habitat/natural community restoration activities on 15 acres of Rockland Hammock.	# Acres restored or with restoration underway	ST, LT	\$705,000
Action 1	Update site specific restoration plan.	Plan developed/updated	ST	\$1,000
Action 2	Implement restoration plan.	# Acres with restoration underway	LT	\$702,500
Action 3	Conduct monitoring events based on recommendations within the restoration plan.	# Monitoring events conducted	LT	\$1,500

* 2015 Dollars
 ST = actions within 2 years
 LT = actions within 10 years
 C = long term or short term actions that are continuous or cyclical
 UFN = currently unfunded need

**Table 7
Dagny Johnson Key Largo Hammock Botanical State Park
Ten-Year Implementation Schedule and Cost Estimates Sheet 2 of 4**

NOTE: THE DIVISION'S ABILITY TO COMPLETE THE OBJECTIVES OUTLINED BY THE MANAGEMENT PLAN IS CONTINGENT ON THE AVAILABILITY OF FUNDING AND OTHER RESOURCES FOR THESE PURPOSES.				
Objective	Conduct natural community/habitat improvement activities on 15 acres of Rockland Hammock.	# Acres improved or with improvements underway	ST	\$6,000
Action 1	Conduct substrate enhancement in restoration areas.	Enhancement completed	ST	\$1,500
Action 2	Assist growth of native vegetation through replanting efforts in restoration areas.	Restoration areas replanted	ST	\$2,000
Action 3	Conduct periodic monitoring to ensure the prevention of the spread of non-native species in restoration areas.	# Monitoring events conducted	ST	\$2,500
Goal IV: Maintain, improve, or restore imperiled species populations and habitats in the park.		Measure	Planning Period	Estimated Manpower and Expense Cost* (10-years)
Objective	Update baseline imperiled species occurrence inventory lists for plants and animals, as needed.	# Lists updated	C	\$2,500
Objective	Monitor and document 4 selected imperiled animal species in the park.	# Species monitored	C	\$18,000
Action 1	Staff will continue to participate in the collaborative monitoring efforts of the Key Largo woodrat, the Key Largo cotton mouse, the Schaus swallowtail butterfly and the Miami blue butterfly.	# Species monitored	C	\$4,000
Action 2	Park staff will apply for and obtain imperiled animal species trapping and handling permits for endangered Key Largo woodrat and Key Largo cotton-mouse.	# Permits acquired	C	\$2,000
Action 3	Park staff will continue in the development and implementation of a supplemental nest structure and monitoring project within the park for the endangered Key Largo woodrat.	Project developed	C	\$12,000
Objective	Monitor and document 3 selected imperiled plant species in the park.	# Species monitored	C	\$22,000
Action 1	Develop monitoring protocols for three selected imperiled plant species including worm vine orchid, manchineel, and Cuban cluster vine.	# Protocols developed	C	\$16,000
Action 2	Implement monitoring protocols for seven imperiled plant species including those listed in Action 1 above.	# Species monitored	C	\$6,000
Objective	Map all imperiled plant species in the park.	# Acres mapped	ST	\$3,500
Action 1	Conduct survey efforts to regularly update locations of imperiled plant species.	# Acres mapped	ST	\$3,500

* 2015 Dollars
ST = actions within 2 years
LT = actions within 10 years
C = long term or short term actions that are continuous or cyclical
UFN = currently unfunded need

Table 7

**Dagny Johnson Key Largo Hammock Botanical State Park
Ten-Year Implementation Schedule and Cost Estimates Sheet 3 of 4**

NOTE: THE DIVISION'S ABILITY TO COMPLETE THE OBJECTIVES OUTLINED BY THE MANAGEMENT PLAN IS CONTINGENT ON THE AVAILABILITY OF FUNDING AND OTHER RESOURCES FOR THESE PURPOSES.				
Goal V: Remove exotic and invasive plants and animals from the park and conduct needed maintenance control.				
		Measure	Planning Period	Estimated Manpower and Expense Cost* (10-years)
Objective	Annually treat 20 acres of exotic plant species in the park.	# Acres treated	C	\$511,000
Action 1	Annually develop/update exotic plant management work plan.	Plan developed/updated	C	\$1,000
Action 2	Implement annual work plan by treating 20 acres in park, annually, and continuing maintenance and follow-up treatments, as needed.	Plan implemented	LT	\$510,000
Objective	Implement control measures on 3 exotic and nuisance animal species in the park.	# Species for which control measures implemented	C	\$8,000
Action 1	Control measures will focus primarily within developed areas of the park where the presence of feral or stray cats has become a concern.	#Efforts coordinated	C	\$5,000
Action 2	Continue to capture and remove green iguana species.	Efforts ongoing	C	\$1,500
Action 3	Staff will work in conjunction with FWC and USGS on the python project.	Efforts ongoing	C	\$1,500
Goal VI: Protect, preserve, and maintain the cultural resources of the park.				
		Measure	Planning Period	Estimated Manpower and Expense Cost* (10-years)
Objective	Assess and evaluate 21 of 21 recorded cultural resources in the park.	Documentation complete	LT	\$3,500
Action 1	Complete 21 assessments/evaluations of archaeological sites.	Assessments complete	LT, ST	\$2,500
Action 2	Complete 1 Historic Structures Report (HSR) for historic buildings and cultural landscape. Prioritize stabilization, restoration and rehabilitation projects.	Reports and priority lists completed	LT	\$1,000
Objective	Bring 1 of 21 recorded cultural resources into good condition.	# Sites in good condition	LT	\$65,000
Action 1	Design and implement regular monitoring programs for 1 cultural site.	# Sites monitored	C	\$15,000
Action 2	Create and implement a cyclical maintenance program for each cultural resource.	Programs implemented	C	\$50,000

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 UFN = currently unfunded need

Table 7
Dagny Johnson Key Largo Hammock Botanical State Park
Ten-Year Implementation Schedule and Cost Estimates Sheet 4 of 4

NOTE: THE DIVISION'S ABILITY TO COMPLETE THE OBJECTIVES OUTLINED BY THE MANAGEMENT PLAN IS CONTINGENT ON THE AVAILABILITY OF FUNDING AND OTHER RESOURCES FOR THESE PURPOSES.				
Goal VII: Provide public access and recreational opportunities in the park.				
		Measure	Planning Period	Estimated Manpower and Expense Cost* (10-years)
Objective	Maintain the park's current recreational carrying capacity of 364 users per day.	# Recreation/visitor	C	\$200,000
Objective	Expand the park's recreational carrying capacity by 92 users per day.	# Recreation/visitor	LT	\$50,000
Objective	Continue to provide the current repertoire of 2 interpretive, educational, and recreational programs on a regular basis.	# Interpretive/education programs	C	\$10,000
Objective	Develop 1 new interpretive program.	# Interpretive programs	LT	\$7,000
Goal VIII: Develop and maintain the capital facilities and infrastructure necessary to meet the goals and objectives of this management plan.				
		Measure	Planning Period	Estimated Manpower and Expense Cost* (10-years)
Objective	Maintain all public and support facilities in the park.	Facilities maintained	C	\$270,000
Objective	Improve and/or repair 3 existing facilities and .89 miles of trail.	# Facilities/Miles of Trail	LT	\$2,750,000
Objective	Construct 2 new facilities.	# Facilities	LT	\$90,000
Objective	Expand maintenance activities as existing facilities are improved and new facilities are developed.	Facilities maintained	C	\$70,000
Summary of Estimated Costs				
Management Categories				Total Estimated Manpower and Expense Cost* (10-years)
Resource Management				\$2,257,500
Administration and Support				\$120,000
Capital Improvements				\$2,910,000
Recreation Visitor Services				\$250,000
Law Enforcement Activities				Note: Law enforcement activities in Florida State Parks are conducted by the FWC Division of Law Enforcement and by local law enforcement agencies.

* 2015 Dollars
 ST = actions within 2 years
 LT = actions within 10 years
 C = long term or short term actions that are continuous or cyclical
 UFN = currently unfunded need

Addendum 1—Acquisition History

**Dagny Johnson Key Largo Hammock Botanical State Park
Acquisition History**

LAND ACQUISITION HISTORY REPORT					
Park Name	Dagny Johnson Key Largo Hammock Botanical State Park				
Date Updated	10/21/2015				
County	Monroe				
Trustees Lease Number	3627				
Current Park Size	2805.20 acres				
Purpose of Acquisition	To protect a tropical hardwood hammock and to provide a refuge for rare and unusual plants and animals.				
Acquisition History					
Parcel Name or Parcel DM-ID	Date Acquired	Initial Seller	Initial Purchaser	Size in acres	Instrument Type
MDID 4017 (Initial Acquisition)	7/26/1982	Riley-Field Company	The Board of Trustees of the Internal Improvement Trust Fund of the State of Florida (Trustees)	43.89	Warranty Deed
MDID 11889	6/16/1988	Federal Deposit Insurance Corporation	Trustees	279.13	Special Warranty Deed
MDID 4015	11/9/1984	Helen R. Dilworth	Trustees	225	Warranty Deed
MDID 4218	5/27/1986	Helen R. Dilworth	Trustees	207.16	Warranty Deed
MDID 312990	12/7/1988	By Side Properties, Ltd.	Trustees	336.879	Warranty Deed

**Dagny Johnson Key Largo Hammock Botanical State Park
Acquisition History**

MDID 12966	6/4/1990	Edward R. Titcomb, as Trustee of the Revocable Trust of Rudolph W. Driscoll, dated July 18, 1963, and subsequently amended and restated, as a Beneficiary of the certain Land Trust Agreement dated July 13, 1965.	Trustees	147.354	Quit Claim Deed
MDID 4212	5/26/1990	Katherine F. Shadek	Trustees	230.066	Statutory Warranty Deed
MDID 4208	4/26/1988	Edward B. Knight and Joan T. Knight	Trustees	79.272	Warranty Deed
MDID 11882	9/8/1993	University of Miami	Trustees	78.502	Special Warranty Deed
MDID 4209	04/26/199	Floy V. Thompson	Trustees	69.54	Warranty Deed
MDID 11880	2/5/1993	Michael Oesterle, John Fowler, Alex E. Carlson, and William T. Mixson, as co-Trusttes of the Ralph Oesterle and Hohn Fowler Real Estate Trust	Trustees	59.892	Statutory Warranty Deed
MDID 369176	9/5/1996	Amelia Coury, the Michael S. and Patricia C. Lawrence Trust for their children, Paticia C. Lawrence as Trustee dated February 19, 1976.	Trustees	51.249	Order of Taking
MDID 344050	24/09/1999	Adalberto A. Delgago, individually and as trustee, and Harry F. Knight, in his official capacity as Monroe County Tax Collector,	Trustees	46.065	Order of Taking
MDID 11896	5/14/1992	Key Oargo Beach & Tennis Club, LTD.	Trustees	39.928	Statutory Warranty Deed
MDID 327670	3/24/2000	Joseph Degance, as Trustee, et al.	Trustees	71.838	Order of Taking

**Dagny Johnson Key Largo Hammock Botanical State Park
Acquisition History**

MDID 337782	11/6/1995	Michael Simonhof, et al	Trustees	34.976	Order of Taking
MDID 11895	12/19/1991	Paul S. Jarrett and Mildred M. Jarrett	Trustees	33.8	Statutory Warranty Deed
MDID 11892	12/31/1991	Truxton L. Jackson and Mary Lou Jackson	Trustees	38.8	Statutory Warranty Deed
MDID 11894	12/24/1991	David J. Davis and Ruth M. Davis	Trustees	33.8	Statutory Warranty Deed
MDID 11893	12/23/1991	George Will Robertson and Ellen K. Robertson	Trustees	33.8	Statutory Warranty Deed
MDID 4211	5/26/1990	Arthur J. Shadek	Trustees	55.822	Statutory Warranty Deed
MDID 11898	12/17/1991	Sea to Sound Corporation	Trustees	27.289	Statutory Warranty Deed
MDID 341771	10/24/1994	Graham C. Miller and Martha T. Miller	Trustees	23.819	Statutory Warranty Deed
MDID 4199	3/21/1990	Patricia Schaefer	Trustees	23.607	Warranty Deed
MDID 4197	5/28/1989	William F. Ragen and Mary C. Ragen, as Trustees under Mary C. Ragen Revocable Trust and Individually	Trustees	23.284	Warranty Deed
MDID 359498	2/25/2010	Everett G. West, R. Furman Richardson and UNCIA Trading Corporation	Trustees	21.993	Order of Taking
MDID 365824	2/13/1996	Kalipoli Gika, et al	Trustees	20.428	Order of Taking
MDID 4205	3/21/1990	Patricia Schaefer	Trustees	20.009	Warranty Deed
MDID 341770	6/21/1990	Charles M. Valois and Doria R. Valois	Trustees	19.789	Indenture

**Dagny Johnson Key Largo Hammock Botanical State Park
Acquisition History**

MDID 365823	6/12/1997	Kalipoli Gika, et al	Trustees	19.743	Order of Taking
MDID 4206	3/21/1990	Patricia Schaefer	Trustees	18.952	Quit Claim Deed
MDID 6985	11/16/1990	Marilyn B. Campbell	Trustees	18.093	Statutory Warranty Deed
MDID 4181	1/7/1991	David L. Perlman, as successor Trustee under unrecorded Trust Agreement dated June 26, 1974.	Trustees	18.858	Statutory Warranty Deed
MDID 4185	3/21/1991	Ernest H. Guise	Trustees	16.701	Statutory Warranty Deed
MDID 4184	3/21/1991	Ernest H. Guise	Trustees	13.94	Statutory Warranty Deed
MDID 4188	5/1/1991	John W. Harlee and Elnora B. Harlee	Trustees	13.974	Quit Claim Deed
MDID 4189	5/1/1991	Howard M. Post and Jeanne H. Post	Trustees	13.974	Quit Claim Deed
MDID 4190	5/1/1991	Nicholas/Hendrix/Post Corp.	Trustees	13.974	Quit Claim Deed
MDID 4217	12/30- 31/1986	Charlene Harris; C.T.B. Inc.; and Frank Toppino, Edward Toppino, George Toppino, Paul A. Toppino, and Charles Phillip Toppino , each as to their interest	Trustees	13.221	Warranty Deed
MDID 308	12/31/1986	Frank Toppino, Edward Toppino, Sr. a/k/a Edward Toppino, George Toppino, Paul A. Toppino, and Charles Phillip Toppino each, as their interest	Trustees	13.221	Warranty Deed
MDID 11868	12/30/1986	C.T.B., Inc., Corporation	Trustees	13.221	Warranty Deed
MDID 449	5/11/1987	The Trust For Public Land	Trustees	12.634	Warranty Deed

**Dagny Johnson Key Largo Hammock Botanical State Park
Acquisition History**

MDID 4192	12/20/1990	T.E. Salb, as Trustees and Individually	Trustees	11.759	Statutory Warranty Deed
MDID 359169	6/10/2015	University of Miami	Trustees	11.611	Warranty Deed
MDID 4216	5/2/1986	The Nature Conservancy	Trustees	11.31	Special Warranty Deed
MDID 11891	6/12/1992	John Ordway Duke	Trustees	10.946	Indenture
MDID 11904	10/10/1989	Florida National Bank, N. A (F/K/A Florida National Bank of Miami), as Trustee for the Dade Community Foundation	Trustees	10.376	Special Warranty Deed
MDID 4191	10/31/2015	Joy M. Webster	Trustees	10.32	Warranty Deed

Management Lease

Parcel Name or Lease Number	Date Leased	Initial Lessor	Initial Lessee	Current Term	Expiration Date
Lease Number 3267 (Initial Lease)	11/16/1982	The Board of Trustees of the Internal Improvement Trust Fund of the State of Florida	State of Florida Department of Environmental Protection, Division of Recreation and Parks (DRP)	Thirty (30) years with two (2) subsequent consecutive ten (10) years renewal options.	
U S Fish and Wildlife Service	9/13/1993	United States Department of Interior U.S. Fish and Wildlife Service	DRP	Fifty (50) years as of September 13, 1993	12-Sep-45
Outstanding Issue	Type of Instrument	Brief Description of the Outstanding Issue		Term of the Outstanding Issue	

The Title Insurance policies related to the Board of Trustees of the internal Improvement Trust Fund of the state of Florida acquisitions of these park properties in between 1986 and 2001 identify various restrictions. Detailed information about specific restriction is available from the Office of Park Planning.

Addendum 2—Advisory Group Members and Report

**Dagny Johnson Key Largo Hammock Botanical State Park
And
John Pennekamp Coral Reef State Park
Advisory Group Members and Report**

List

**Dagny Johnson Key Largo Hammock Botanical State Park
And
John Pennekamp Coral Reef State Park
Advisory Group Members and Report**

Report

Addendum 3—References Cited

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Addendum 4—Soil Descriptions

Dagny Johnson Key Largo Hammock Botanical State Park Soil Descriptions

(2) Pennekamp gravelly muck, 0 to 2 percent slopes, extremely stony – The Pennekamp series consists of well-drained soils that are shallow to rippable coral limestone bedrock. The depth to bedrock is 4 to 16 inches. These soils formed in material weathered from the coral limestone bedrock. They generally have a thin overburden of sapric material. They are on uplands. Slopes range from 0 to 2 percent. The taxonomic class is loamy-skeletal, carbonatic, isohyperthermic Lithic Rendolls.

This soil is on tropical hammocks in the upland of the upper keys. About 10 percent of the surface of this soil is covered with stones that are dominantly 10 to 20 inches in diameter. Individual areas are subject to rare flooding from hurricanes and other tropical storms. Elevations are dominantly 5 to 15 feet above sea level, according to National Geodetic Vertical Datum of 1929. The mean annual temperature is about 78 degrees F, and the mean annual precipitation is about 50 inches.

The Pennekamp soil is dominant in this map unit. Soils in areas on the keys between Upper Matecumbe Key and Big Pine Key are more sandy than the Pennekamp soil; however, uses and interpretations are the same as those of the Pennekamp soil. Areas that have different uses and interpretations are rare and generally are adjacent to the boundaries of the map unit.

Soils that are associated with the Pennekamp soil are the moderately well drained, organic Matecumbe soils in the slightly lower position on the landscape and the poorly drained, marly Cudjoe, Lignumvitae, and Key West soils and very poorly drained, organic Islamorada, Key Largo, and Tavernier soils in the significantly lower positions on the landscape.

The Pennekamp soil is well drained. It has a seasonal high water table at a depth of 3.5 to 5.0 feet during the wet periods of most years. Permeability is moderately rapid.

Most areas of this soil support native vegetation and are used as habitat for tropical hammock species. Some areas have been developed for residential, urban or recreation use. Characteristic vegetation for the soils in the survey area include; poisonwood, wild tamarind, gumbo limbo, strangler fig and wild coffee.

Depth to bedrock and the flooding are severe limitations affecting most uses of this soil, including most kinds of building site and recreational development and salinity facilities.

(3) Matecumbe muck, occasionally flooded - The Matecumbe series consists of moderately well drained soils that are very shallow to rippable coral or oolitic limestone bedrock. The depth to limestone or coral limestone bedrock is 2 to 9 inches. These soils formed in organic material in varying stages of decomposition. Slopes are 0 to 1 percent. The taxonomic class is Euic, isohyperthermic Lithic Tropofolists.

This soil is on tropical hammocks in the uplands throughout the keys. Individual areas are subject to occasional flooding from hurricanes and other tropical storms. Elevations are less than 15 feet above sea level, according to National Geodetic

Dagny Johnson Key Largo Hammock Botanical State Park Soil Descriptions

Vertical Datum of 1929. The mean temperature ranges from 74 to 78 degrees F, and the mean annual precipitation ranges from 50 to 65 inches.

The Matecumbe soil is dominant in this map unit. Areas that have different uses and interpretations are rare and generally are adjacent to the boundaries of the map unit.

Soils that are associated with the Matecumbe soil are the well drained, mineral Key Vaca and Pennekamp soils in the higher positions on the landscape; the somewhat poorly drained, marly Saddlebunch soils in the landscape positions similar to those of the Matecumbe soil; and the poorly drained, marly Cudjoe, Key West, and Lignumvitae soils and very poorly drained, organic Islamorada, Key Largo, and Tavernier soils in the lower positions on the landscape.

The Matecumbe soil is moderately well drained. It has a seasonal high water table at a depth of 1.5 to 3.0 feet during the wet periods of most years. Permeability is rapid.

Most areas of this soil support native vegetation and are used as habitat for woodland wildlife. Some areas have been developed for residential, urban, or recreational use. Characteristic vegetation for the soils in the survey area include; poisonwood, wild tamarind, mahogany, tree cactus, crabwood, thatch palms, satinleaf, paradise tree, and stopper.

Depth to bedrock, the flooding, and an excessive amount of humus are severe limitation affecting most uses of this soil, including most kinds of building site and recreational development and sanitary facilities.

(4) Rock outcrop – Tavernier complex, tidal – The Tavernier series consists of very poorly drained soils that are shallow to rippable coral limestone bedrock. The depth to bedrock is dominantly 3 to 16 inches but ranges to 20 inches. These soils formed in sapric material. The taxonomic class is Euic, isohyperthermic, shallow Lithic Troposaprists

This map unit is in mangrove swamps throughout the keys. Individual areas are subject to daily flooding by tides. Elevations are less than 2 feet above sea level, according to National Geodetic Vertical Datum of 1929. The mean annual temperature is about 75 degrees F, and the mean annual precipitation is about 55 inches.

Approximately 60 percent of this map unit consists of areas of exposed bedrock. These areas are dominantly 1 to 4 inches above the surface of the surrounding soils and range from approximately 2 feet to more than 200 feet in diameter. The Tavernier soil is dominant in about 35 percent of this map unit. Areas that have different uses and interpretations are rare and generally are adjacent to the boundaries of this map unit.

Soils that are associated with the Tavernier soil are the very poorly drained, organic Islamorada and Key Largo soils in landscape positions similar to those of the

Dagny Johnson Key Largo Hammock Botanical State Park Soil Descriptions

Tavernier soil; the poorly drained, marly Cudjoe, Lignumvitae, and Key West soils in the slightly higher positions on the landscape; and the moderately well drained, organic Matecumbe soils and somewhat poorly drained, marly Saddlebunch soils in the significantly higher positions on the landscape.

The Tavernier soil is very poorly drained. The seasonal high water table is at or near the surface during much of the year. Permeability is rapid.

Most areas of this map unit support native vegetation and are used for wetland wildlife. Some areas have been developed for residential, urban, or recreational use. Characteristic vegetation for the soils in the survey area include; red mangrove, black mangrove, and saltwort.

The flooding, the depth to bedrock and the wetness are severe limitation affecting most uses of this map unit, including most kinds of building site and recreational development.

(5) Islamorada muck, tidal – The Islamorada series consists of very poorly drained soils that are moderately deep to rippable coral or oolitic limestone bedrock. The depth to bedrock is 20 to 50 inches. These soils formed in sapic material. Slopes are less than 1 percent. Taxonomic class is Euic, isohyperthermic Lithic Troposaprists.

This soil is dominantly on the upper keys in mangrove swamps. Individual areas are subject to daily flooding by tides. Elevations are dominantly at or below sea level, according to National Geodetic Vertical Datum of 1929. The mean annual temperature is about 75 degrees F, and the mean annual precipitation is about 50 inches.

The Islamorada soil is dominant in this map unit. Areas of the Tavernier soils are also included. These soils have bedrock within a depth of 20 inches. Other areas that have different uses and interpretations are rare and generally are adjacent to the boundaries of the map unit.

Soils that are associated with the Islamorada soils are the very poorly drained, organic Key Largo and Tavernier soils in landscape positions similar to those of the Islamorada soil; the poorly drained, marly Cudjoe, Lignumvitae, and Key West soils in the slightly higher position on the landscape; and the moderately drained, organic Matecumbe soils and somewhat poorly drained, marly Saddlebunch soils in the significantly higher positions on the landscape.

The Islamorada soil is very poorly drained. The seasonal high water table is at or near the surface during much of the year. Permeability is rapid.

Most areas of this soil support native vegetation and are used as habitat for wetland wildlife. Some areas have been developed for residential or recreation use. Characteristic vegetation for the soils in the survey area include; red and black mangrove.

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The wetness, the flooding, and depth to bedrock are severe limitations affecting most uses of this soil, including most kinds of building site and recreational development.

(6) Keylargo muck, tidal – The Key Largo series consists of very poorly drained soils that are deep to rippable coral or oolitic limestone bedrock. The depth to bedrock is 50 to 90 inches. These soils formed in sapric material. Slopes are less than 1 percent. The taxonomic class is Euic, isohyperthermic Typic Troposaprists.

This soil is dominantly on the upper keys but can occur throughout the keys. It is in mangrove swamps. Individual areas are subject to daily flooding by tides. Elevations are dominantly at or below sea level, according to National Geodetic Vertical Datum of 1929. The mean annual temperature is about 75 degrees F, and the mean annual precipitation is about 50 inches.

The Key Largo soil is dominant in the map unit. Areas that have different uses and interpretations are rare and generally are adjacent to the boundaries of the map unit.

Soils that are associated with the Key Largo soils are the very poorly drained, organic Islamorada and Tavernier soils in the landscape positions similar to those of the Key Largo soil; the poorly drained, marly Cudjoe, Lignumvitae and Key West soils in the slightly higher position on the landscape; and the moderately well drained, organic Matecumbe soils and somewhat poorly drained, marly Saddlebunch soils in the significantly higher positions on the landscape.

The Key Largo soil is very poorly drained. The seasonal high water table is at or near the surface during much of the year. Permeability is rapid.

Most areas of this soil support native vegetation and are used as habitat for wetland wildlife. A few areas have been developed for residential or recreation use. Characteristic vegetation for the soils in the survey areas include; red and black mangrove.

The wetness, an excessive amount of humus, and the flooding are severe limitations affecting most uses of this soil, including most kinds of building site and recreational development.

(7) Udorthents-Urban land complex - This map unit is constructed upland areas adjacent to areas of water throughout the keys. Individual areas are subject to rare flooding from hurricanes and other tropical storms. Elevations vary, depending on the thickness of the fill material, but they are dominantly 3 to 10 feet above sea level, according to National Geodetic Vertical Datum of 1929.

The Udorthents dominantly consist of crushed oolitic limestone or coral bedrock that has been spread over the original soil material. They commonly are about 32 inches of extremely gravelly sand underlain by about 40 inches of marl. The marl is underlain by coral bedrock. Other areas of soils are underlain by muck and other soil material. Houses and other urban structures cover up to 40 percent of most

Dagny Johnson Key Largo Hammock Botanical State Park Soil Descriptions

areas of the Udorthents; however, the soils can still be observed. Soils that are associated in this map unit are all of the other soils that are in the Keys.

The Udorthents are moderately well drained. They have a seasonal high water table at a depth of 2 to 4 feet during wet periods of most years. Permeability is variable.

This map unit generally supports no vegetation. The stones and droughtiness are severe limitations affecting any kind of landscaping activity. The Udorthents were developed for urban use, and many areas are being used for this purpose.

The stones, seepage, and the wetness are moderate or severe limitations affecting most uses of this map unit, including most kinds of building site and recreational development.

**Dagny Johnson Key Largo Hammock Botanical State Park
Soil Descriptions**

Addendum 5—Plant and Animal List

Dagny Johnson Key Largo Hammock Botanical State Park- Plants

Common Name	Scientific Name	Primary Habitat Codes (for designated species)
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PTERIDOPHYTES

Lacy bracken fern	<i>Pteridium aqlinum</i> var. <i>caudatum</i>	
Asian sword fern*	<i>Nephrolepis brownie</i>	
Long strap fern	<i>Campyloneurum phyllitidis</i>	
Climbing fine fern	<i>Microgramma heterophylla</i>	RH
Golden polypody	<i>Phebodium auerum</i>	
Resurrection fern	<i>Pleopeltis polypodioides</i> var. <i>michauxiana</i>	
Whisk fern	<i>Psilotum nudum</i>	
Golden leather fern	<i>Acrostichum auerum</i>	RH
Giant leather fern	<i>Acrostichum danaeifolium</i>	
Chinese ladder brake*	<i>Pteris vittata</i>	
Southern shield fern	<i>Thelypteris kunthii</i>	
Shoestring fern	<i>Vittaria lineata</i>	

MONOCOTYLEDONS

Caribbean agave*	<i>Agave angustifolia</i>	
False sisal	<i>Agave decipiens</i>	
Sisal hemp*	<i>Agave sisalana</i>	
Asparagus Fern	<i>Asparagus aethiopicus</i>	
Central American sisal	<i>Furcraea cabuya</i>	
Spanish bayonet	<i>Yucca aloifolia</i>	
Spider lily	<i>Hymenocallis latifolia</i>	
American evergreen*	<i>Syngonium podophyllum</i>	
Christmas palm*	<i>Adonidia merrillii</i>	
Bamboo palm*	<i>Chamaedorea seifrizii</i>	
Coconut palm*	<i>Cocos nucifera</i>	
Keys thatch palm	<i>Leucothrinax morrissii</i>	RH
Senegal date palm*	<i>Phoenix reclinata</i>	
Cabbage palm	<i>Sabal palmetto</i>	
Saw palmetto	<i>Serenoa repens</i>	
Queen palm*	<i>Syagrus romanzoffiana</i>	
Florida thatch palm	<i>Thrinax radiata</i>	RH, DV
Washingtonia palm*	<i>Washingtonia robusta</i>	
Aloe*	<i>Aloe vera</i>	
Reflexed wild pine	<i>Tillandsia balbisiana</i>	RH
Common wild pine	<i>Tillandsia fasciculata</i>	
	var. <i>densispica</i>	RH, KTRB
Banded air plant	<i>Tillandsia flexuosa</i>	RH, KTRB
Silvery wild pine	<i>Tillandsia paucifolia</i>	RH, KTRB
Ball moss	<i>Tillandsia recurvate</i>	
Wild pine	<i>Tillandsia setacea</i>	
Spanish moss	<i>Tillandsia usneoides</i>	
Giant wild pine	<i>Tillandsia utriculata</i>	RH, KTRB
Basket plant*	<i>Callisia fragrans</i>	
Oyster plant*	<i>Tradescantia spathacea</i>	
Wondering jew*	<i>Tradescantia zebrine</i>	

Dagny Johnson Key Largo Hammock Botanical State Park- Plants

Common Name	Scientific Name	Primary Habitat Codes (for designated species)
Jamaica swamp sawgrass	<i>Cladium jamaicensis</i>	
Baldwin's flatsedge*	<i>Cyperus croceus</i>	
Swamp flatsedge	<i>Cyperus ligularis</i>	
Flatleaf flatsedge	<i>Cyperus planifolius</i>	
Manyspike flatsedge	<i>Cyperus polystachyos</i>	
.....	<i>Cyperus compressus</i>	
.....	<i>Cyperus flavescens</i>	
.....	<i>Cyperus odoratus</i>	
.....	<i>Cyperus ovatus</i>	
Hurricane grass*	<i>Fimbristylis cymosa</i>	
Marshy fimbry	<i>Fimbristylis spadicea</i>	
Florida Keys nutrush	<i>Scleria lithosperma</i>	RH
Butterfly orchid	<i>Encyclia tampensis</i>	RH
Eulophia*	<i>Eulophia graminea</i>	
Toothed Habenaria	<i>Habenaria floribunda</i>	
Monk orchid*	<i>Oeceoclades maculata</i>	
Dollar orchid	<i>Prosthechea boothiana</i>	RH
Wormvine orchid	<i>Vanella barbellata</i>	RH
Bluestem	<i>Andropogon glomeratus</i> var. <i>pumilis</i>	
Hillsboro three awn.....	<i>Aristida purpurascens</i> var. <i>tenuispica</i>	
Pitted beardgrass*	<i>Bothriochola pertusa</i>	
Southern sandbur	<i>Cenchrus echinatus</i>	
Coastal sandbur	<i>Cenchrus spinifex</i>	
Bermuda grass*	<i>Cynodon dactylon</i>	
Crowsfoot grass*	<i>Dactyloctenium aegyptium</i>	
Southern crabgrass.....	<i>Digitaria ciliaris</i>	
Saltgrass	<i>Distichlis spicata</i>	
Indian goosegrass*.....	<i>Eleusine indica</i>	
Gophertail lovegrass*	<i>Eragrostis ciliaris</i>	
Elliott's lovegrass	<i>Eragrostis elliotii</i>	
*	<i>Eragrostis amabilis</i>	
Pinewood fingergrass	<i>Eustachys petraea</i>	
Thatching grass*	<i>Hyparrhenia rufa</i>	
Wild bamboo.....	<i>Lasiacis divaricate</i>	
Spangletop	<i>Leptochloa dubia</i>	
Natal grass*	<i>Melinis repens</i>	
Keygrass	<i>Monanthochloe littoralis</i>	
Muhly grass	<i>Muhlenbergia capillaris</i>	
Burmareed*	<i>Neyraudia reynaudiana</i>	
Basket grass	<i>Oplismenus hirtellus</i>	
Fall Panicgrass	<i>Panicum dichotomiflorum</i> var. <i>bartowense</i> ...	
Guinea grass*	<i>Panicum maximum</i>	
Coral paspalum	<i>Paspalum blodgettii</i>	
Blue crown	<i>Paspalum caespitosum</i>	
Thin paspalum	<i>Paspalum setaceum</i>	
Seashore paspalum	<i>Paspalum vaginatum</i>	

Dagny Johnson Key Largo Hammock Botanical State Park- Plants

Common Name	Scientific Name	Primary Habitat Codes (for designated species)
Fountain grass*	<i>Pennisetum purpureum</i>	
Itch grass*	<i>Rottboellia cochinchinensis</i>	
Bowstring hemp*	<i>Sansevieria hyacinthoides</i>	
Wire bluestem	<i>Schizachyrium gracile</i>	
Cimson bluestem	<i>Schizachyrium sanguineum</i>	
Coral foxtail	<i>Setaria macrosperma</i>	
Knotroot foxtail	<i>Setaria parviflora</i>	
Cordgrass	<i>Spatina patens</i>	
Gulf cordgrass	<i>Spartina spartinae</i>	
Dropseed	<i>Sporobolus domingensis</i>	
Smutgrass*	<i>Sporobolus indicus</i> var. <i>indicus</i>	
West Indian dropseed*	<i>Sporobolus indicus</i> var. <i>pyramidalis</i>	
Whorled dropseed	<i>Sporobolus pyramidatus</i>	
Seashore dropseed	<i>Sporobolus virginicus</i>	
St. Augustine grass	<i>Stenotaphrum secundatum</i>	
Signal grass	<i>Urochloa adspersa</i>	
Tropical signal grass*	<i>Urochloa distachya</i>	
Zoysia grass*	<i>Zoysia pacifica</i>	

DICOTYLEDONS

Sixangle foldwing	<i>Dicliptera sexangularis</i>	
Shoreline seapurslane	<i>Sesuvium portulacastrum</i>	
Chaff flower	<i>Alternanthera flavescens</i>	
Saltbush	<i>Atriplex pendandra</i>	
Samphire	<i>Blutaparon vermiculare</i>	
Glasswort	<i>Salicornia bigelovii</i>	
Perennial glasswort	<i>Sarcocornia perennis</i>	
Sea blite	<i>Suaeda linearis</i>	
Poisonwood	<i>Metopium toxiferum</i>	
Brazilian pepper tree*	<i>Schinus terebinthifolia</i>	
Poison ivy	<i>Toxicodendron radicans</i>	
Pond apple	<i>Annona glabra</i>	
Madagascar periwinkle*	<i>Catharanthus roseus</i>	
Madagascar rubbervine*	<i>Cryptostegia madagascariensis</i>	
Cynanchum	<i>Seutera angustifolium</i>	
Leafless cynanchum	<i>Orthosia scoperia</i>	
Devil's Potato	<i>Echites umbellatus</i>	
Wild allamanda	<i>Pentalinon luteum</i>	
Frangipani*	<i>Plumeria rubra</i>	
Mangrove vine	<i>Rhabdadenia biflora</i>	
Rubber vine	<i>Funastrum clausum</i>	
Ragweed	<i>Ambrosia artemisiifolia</i>	
False willow	<i>Baccharis angustifolia</i>	
False mallow	<i>Baccharis halimifolia</i>	
Spanish needles	<i>Bidens alba</i>	
Seaoxeye daisy	<i>Borrichia arborescens</i>	

Dagny Johnson Key Largo Hammock Botanical State Park- Plants

Common Name	Scientific Name	Primary Habitat Codes (for designated species)
Silver seaoxeye daisy.....	<i>Borrchia frutescens</i>	
Straggler daisy*	<i>Calyptocarpus vialis</i>	
Jack-in-the-bush	<i>Chromolaena odorata</i>	
Horseweed	<i>Conyza canadensis var. pusilla</i>	
Little ironwood*	<i>Cyanthillium cinereum</i>	
Dog fennel.....	<i>Eupatorium capillifolium</i>	
Narrowleaf yellowtop	<i>Flaveria linearis</i>	
Clustered yellowtop	<i>Flaveria trinervia</i>	
Achicoria azul*	<i>Launaea intybaceae</i>	
Melanthera	<i>Melanthera nivea</i>	
Climbing hemp.....	<i>Mikania scandens</i>	
Feverfew*	<i>Parthenium hysterophorus</i>	
Cinchweed.....	<i>Pectis glaucescens</i>	
Rosy camporweed	<i>Pluchea baccharis</i>	
Camphorweed+.....	<i>Pluchea carolinensis</i>	
Camphorweed.....	<i>Pluchea odorata</i>	
Seaside goldenrod	<i>Solidago sempervirens</i>	
Spiny sowthistle*	<i>Sonchus asper</i>	
Wedelia*	<i>Sphagneticola trilobata</i>	
Annual saltmarsh aster	<i>Symphyotrichum subulatum</i>	
Perennial saltmarsh aster	<i>Symphyotrichum tenuifolium</i>	
Tridax*	<i>Tridax procumbens</i>	
Black mangrove	<i>Avicennia germinans</i>	
Saltwort	<i>Batis maritima</i>	
Yellow elder*	<i>Tecoma stans</i>	
Sea lavender.....	<i>Argusia gnaphaloides</i>	KTRB
Strongbark	<i>Bourreria succulent</i>	
Geiger.....	<i>Cordia sebestena</i>	
Scorpions tail	<i>Heliotropium angiospermum</i>	
Seaside heliotrope	<i>Heliotropium curassavicum</i>	
Soldierbush	<i>Myriopus volubilis</i>	
Limber caper.....	<i>Cynophalla flexuosa</i>	
Jamaican caper	<i>Quadrella cynophallophora</i>	
Pepperweed.....	<i>Lepidium virginicum</i>	
Gumbo limbo	<i>Bursera simaruba</i>	
Hedge cactus*	<i>Cereus repandus</i>	
Simpson's applecactus	<i>Harrisia simpsonii</i>	RH
Cochineal cactus*	<i>Opuntia cochenillifera</i>	
Semaphore cactus	<i>Opuntia corallicola</i>	KTRB
Prickly pear cactus.....	<i>Opuntia stricta</i>	KTRB
Princess of the night cactus*	<i>Selenicereus pteranthus</i>	
Cinnamon bark.....	<i>Canella winterana</i>	RH
Papaya	<i>Carica papaya</i>	
Australian pine*	<i>Casuarina equisetifolia</i>	
Australian pine*	<i>Casuarina glauca</i>	
Quail berry	<i>Crossopetalum ilicifolium</i>	RH, KTRB

Dagny Johnson Key Largo Hammock Botanical State Park- Plants

Common Name	Scientific Name	Primary Habitat Codes (for designated species)
Rhacoma	<i>Crossopetalum rhacoma</i>	RH
Doctor vine	<i>Hipporatea volubilis</i>	
Mayten	<i>Maytenus phyllanthoides</i>	
Florida boxwood	<i>Schaefferia frutescens</i>	RH
West Indian trema	<i>Trema lamarckiana</i>	RH, SA
Trema	<i>Trema micrantha</i>	
Green buttonwood	<i>Conocarpus erectus</i>	
White mangrove	<i>Laguncularia racemosa</i>	
Moon vine	<i>Ipomoea alba</i>	
.....	<i>Ipomoea imperati</i>	
Blue morning glory	<i>Ipomoea indica</i>	
Railroad vine	<i>Ipomoea pes-caprae brasiliensis</i>	
Saltmarsh morning glory	<i>Ipomoea sagittata</i>	
Little bell*	<i>Ipomoea triloba</i>	
Morning glory	<i>Ipomoea violacea</i>	
Cuban clustervine	<i>Jacquemontia havanensis</i>	RH, KTRB
Devil's backbone*	<i>Kalanchoe daigremontiana</i>	
.....	<i>Kalanchoe delagoensis</i>	
Life plant*	<i>Kalanchoe pinnata</i>	
Foxtail copperleaf*	<i>Acalypha alopecuroidea</i>	
Sacatrapo	<i>Caperonia castaneifolia</i> *	
Sandmat	<i>Euphorbia blodgettii</i>	
Everglade key sandmat	<i>Euphorbia conferta</i>	
Sandmat	<i>Euphorbia hirta</i>	
Sandmat	<i>Euphorbia hypericifolia</i>	
Coastal sandmat	<i>Euphorbia mesembrianthemifolia</i>	
Eyebane	<i>Euphorbia ophthalmica</i>	
Mendez's sandmat*	<i>Euphorbia mendezii</i>	
Croton*	<i>Codiaeum variegatum</i>	
Spurge*	<i>Euphorbia graminea</i>	
Crabwood	<i>Gymnanthes lucida</i>	
Manchineel	<i>Hippomane mancinella</i>	RH
Wild poinsettia	<i>Euphorbia cyathophora</i>	
Wild poinsettia	<i>Euphorbia heterophylla</i>	
Caster bean*	<i>Ricinus communis</i>	
Cinnecord+	<i>Vachellia choriophylla</i>	RH
Sweet acacia+	<i>Vachellia farnesiana</i>	
Pineland acacia	<i>Vachellia pinetorum</i>	
Women's tongue*	<i>Albizia lebeck</i>	
White moneywort*	<i>Alysicarpus vaginalis</i>	
Grey nickerbean	<i>Caesalpinia bondoc</i>	
Baybean	<i>Canavalia rosea</i>	
Low rattlebox	<i>Crotalaria pumila</i>	
Browne's indian rosewood	<i>Dalbergia brownii</i>	
Coinvine	<i>Dalbergia ecastaphyllum</i>	
Royal poinciana*	<i>Delonix regia</i>	

Dagny Johnson Key Largo Hammock Botanical State Park- Plants

Common Name	Scientific Name	Primary Habitat Codes (for designated species)
Wild tantan.....	<i>Desmanthus virgatus</i>	
Beggarweed.....	<i>Desmodium incanum</i>	
Florida beggarweed*	<i>Desmodium tortuosum</i>	
.....	<i>Desmodium triflorum</i>	
Coral bean.....	<i>Erythrina herbacea</i>	
Florida hammock milkpea	<i>Galactia striata</i>	
Trailing indigo*	<i>Indigofera spicata</i>	
.....	<i>Indigofera tinctoria</i>	
.....	<i>Indigofera suffruticosa</i>	
Lead tree*	<i>Leucaena leucocephala</i>	
Wild tamarind	<i>Lysiloma latisiliquum</i>	
Bush bean*	<i>Macroptilium lathyroides</i>	
Sweet clover*	<i>Melilotus albus</i>	
Sensitive plant	<i>Neptunia pubescens</i>	
Jerusalem thorn*	<i>Parkinsonia aculeate</i>	
Yellow poinciana*	<i>Peltophorum pterocarpum</i>	
Jamaican dogwood	<i>Piscidia piscipula</i>	
Black bead.....	<i>Pithecellobium keyense</i>	
Cat claw.....	<i>Pithecellobium unguis-cati</i>	
Rhynchosia	<i>Rhynchosia minima</i>	
Swartz's snout pea	<i>Rhynchosia swartzii</i>	RH, CB, DV
Rose of plymouth	<i>Sabatia stellaris</i>	
Sickle pod*	<i>Senna obtusifolia</i>	
Necklace pod	<i>Sophora tomentosa</i> var. <i>truncate</i>	
Pencil flower	<i>Stylosanthes hamate</i>	
Tame tamarind*	<i>Tamarindus indica</i>	
Hairy pod cow pea	<i>Vigna luteola</i>	
Virginia live oak	<i>Quercus virginiana</i>	
Marsh gentian	<i>Eustoma exaltatum</i>	
Marsh pink.....	<i>Sabatia sellaris</i>	
Ghost plant.....	<i>Voyria parasitica</i>	
Scaevola*.....	<i>Scaevola taccada</i>	
Doctor vine.....	<i>Scaevola taccada</i>	
Jamaican weed.....	<i>Nama jamaicensis</i>	
Beauty berry.....	<i>Callicarpa americana</i>	
Queen's wreath*	<i>Vitex trifolia</i>	
Lancewood	<i>Ocotea coriacea</i>	
Avocado*	<i>Persea americana</i>	
Locust berry	<i>Byrsonima lucida</i>	PR
Indian mallow	<i>Abutilon permolle</i>	
Eyebright Ayenia	<i>Ayenia euphrasiifolia</i>	
Slippery burr.....	<i>Corchorus siliquosus</i>	
Wild cotton	<i>Gossypium hirsutum</i>	SA, DV, KTRB
Bladder mallow	<i>Herissantia crispa</i>	
Hibiscus*	<i>Hibiscus rosa-sinensis</i>	
Sida.....	<i>Sida ciliaris</i>	

Dagny Johnson Key Largo Hammock Botanical State Park- Plants

Common Name	Scientific Name	Primary Habitat Codes (for designated species)
Sida.....	<i>Sida ulmifolia</i>	
Portia*	<i>Thepesia populnea</i>	
Waltheria	<i>Waltheria indica</i>	
Mahogany.....	<i>Swietenia mahagoni</i>	RH, SA, DV
Chinaberry.....	<i>Melia azedarach</i> *	
Stranger fig	<i>Ficus aurea</i>	
Council Tree*	<i>Ficus altissima</i>	
Benjamina fig*	<i>Ficus benjamina</i>	
Short leaf fig.....	<i>Ficus citrifolia</i>	
Indian laurel fig*	<i>Ficus microarpa</i>	
Wax myrtle.....	<i>Myrica cerifera</i>	
Marlberry	<i>Ardisia escallonioides</i>	
Myrsine	<i>Myrsine cubana</i>	
Spicewood.....	<i>Calypttranthes pallens</i>	
Myrtle-of-the-river.....	<i>Calypttranthes zuzygium</i>	RH
White stopper	<i>Eugenia axillaris</i>	
Redberry stopper.....	<i>Eugenia confusa</i>	RH
Spanish stopper	<i>Eugenia foetida</i>	
Red stopper	<i>Eugenia rhombea</i>	RH
Melaleuca*	<i>Melaleuca quinquenervia</i>	
Red spiderling	<i>Boerhavia diffusa</i>	
Bougainvillea*	<i>Bougainvillea glabra</i>	
Blolly	<i>Guapira discolor</i>	
Pisonia	<i>Pisonia aculeata</i>	
Jasmine*	<i>Jasminum dichotomous</i>	
.....	<i>Jasminum fluminense</i>	
Southern gaura	<i>Guara angustifolia</i>	
Saltmarsh foxglove.....	<i>Agalinis maritima</i>	
Blue heart	<i>Buchnera americana</i>	
Lady's sorrel	<i>Oxalis corniculata</i>	
Mexican prickly poppy	<i>Argemone mexicana</i>	
Fuzzy passion vine.....	<i>Passiflora multiflora</i>	RH, SA, DV
Corky stem passion vine.....	<i>Passiflora suberosa</i> var. <i>multiflora</i>	
Leaf flower*	<i>Phyllanthus amarus</i>	
Leaf flower*	<i>Phyllanthus tenellus</i>	
Blood berry.....	<i>Rivina humilis</i>	
Water hyssop.....	<i>Bacopa monnieri</i>	
Plantain*	<i>Plantago major</i>	
Fire cracker bush*	<i>Russelia equisetiformis</i>	
Carolina sea lavender.....	<i>Limonium carolinianum</i>	
Pigeon plum.....	<i>Coccoloba diversifolia</i>	
Seagrape.....	<i>Coccoloba uvifera</i>	
Purslane.....	<i>Portulaca pilosa</i>	
Purslane.....	<i>Portulaca oleracea</i>	
Pink baby's breath	<i>Talinum fruticosum</i> *.....	
Milk bark	<i>Drypetes diversifolia</i>	RH

Dagny Johnson Key Largo Hammock Botanical State Park- Plants

Common Name	Scientific Name	Primary Habitat Codes (for designated species)
Guiana plum	<i>Drypetes lateriflora</i>	
Latherleaf*	<i>Colubrina asiatica</i>	
Soldierwood.....	<i>Colubrina elliptica</i>	
Chew stick.....	<i>Gouania lupuloides</i>	
Black ironwood.....	<i>Krugiodendron ferreum</i>	
Darling plum.....	<i>Reynosa septentrionalis</i>	
Red mangrove	<i>Rhizophora mangle</i>	
Snowberry.....	<i>Chiococca alba</i>	
Pine snowberry	<i>Chiococca parvifolia</i>	
Black torch	<i>Erithalis fruticosa</i>	KTRB
One-nerved ernodea	<i>Ernodea cokeri</i>	
Beach creeper	<i>Ernodea littoralis</i>	
Princewood	<i>Exostema caribaeum</i>	RH, DV
Seven year apple+	<i>Genipa clusiifolia</i>	
Everglades velvetseed.....	<i>Guettarda elliptica</i>	
Rough velvetseed	<i>Guettarda scabra</i>	
Scarlet bush	<i>Hamelia patens</i>	
Yellowroot	<i>Morinda royoc</i> var. <i>patens</i>	
Bahama coffee	<i>Psychotria ligustrifolia</i>	RH, DV
Wild coffee	<i>Psychotria nervosa</i>	
Randia	<i>Randia aculeata</i>	
Buttonwood weed.....	<i>Spermacoce remota</i>	
Buttonwood weed*	<i>Spermacoce verticillata</i>	
Torchwood.....	<i>Amyris elemifera</i>	
Key lime*	<i>Citrus aurantiifolia</i>	
Orange jessamine*	<i>Murraya paniculata</i>	
Lime berry*	<i>Triphasia trifolia</i>	
Wild lime	<i>Zanthoxylum fagara</i>	
Water pimpernel.....	<i>Samolus ebracteatus</i>	
Balloon vine.....	<i>Cardiospermum corindum</i>	
Varnish leaf	<i>Dodonaea elaeagnoides</i>	RH
2 winged varnish leaf+	<i>Dodonaea viscosa</i>	
Inkwood.....	<i>Exothea paniculate</i> var. <i>viscosa</i>	
White ironwood	<i>Hypelate trifoliata</i>	RH
Spanish lime*	<i>Melicoccus bijugatus</i>	
Soap berry	<i>Sapindus saponaria</i>	
Satinleaf.....	<i>Chrysophyllum oliviforme</i> var. <i>saponaria</i>	
Wild dilly	<i>Manilkara jaimiqui emarginata</i>	RH, KTRB
Sapodilla*	<i>Manilkara zapota</i>	
Saffron plum.....	<i>Sideroxylon celastrinum</i>	
Mastic	<i>Sideroxylon foetidissimum</i>	
Willow bustic.....	<i>Sideroxylon salicifolium</i>	
Grey twig	<i>Schoepfia chrysophylloides</i>	
Goat weed.....	<i>Capraria biflora</i>	
Paradise tree	<i>Simarouba glauca</i>	
Trumpet flower*	<i>Datura metel</i>	

Dagny Johnson Key Largo Hammock Botanical State Park- Plants

Common Name	Scientific Name	Primary Habitat Codes (for designated species)
Christmas berry	<i>Lycium carolinianum</i>	
Black nightshade	<i>Solanum americanum</i>	
Bahama nightshade	<i>Solanum bahamense</i>	
Mullein nightshade.....	<i>Solanum donianum</i>	
Potato tree	<i>Solanum erianthum</i>	
West Indian pink root.....	<i>Spigelia anthelmia</i>	
Bay cedar	<i>Suriana maritima</i>	
Rust weed	<i>Polypremum procumbens</i>	
Joewood.....	<i>Jacquinia keyensis</i>	KTRB
Yellow alder*	<i>Turnera ulmifolia</i>	
Florida pellitory	<i>Parietaria floridana</i>	
Artillery plant	<i>Pilea microphylla</i>	
Fiddlewood	<i>Citharexylum spinosum</i>	
Golden dewdrop*	<i>Duranta erecta</i>	
Lantana*	<i>Lantana camara</i>	
Lantana.....	<i>Lantana involucrata</i>	
Creeping charlie	<i>Phyla nodiflora</i>	
Velvet burr	<i>Priva lappulaceae</i>	
Blue porterweed.....	<i>Stachytarpheta jamaicensis</i>	
Mahogany mistletoe.....	<i>Phoradendron rubrum</i>	RH
Virginia creeper	<i>Parthenocissus quinquefolia</i>	
Muscadine grape	<i>Vitis rotundifolia</i>	
Hog plum	<i>Ximenia americana</i>	
Lignum vitae.....	<i>Guaiacum sanctum</i>	RH
Caltrop.....	<i>Kallstroemia maxima</i>	
Puncture vine*	<i>Tribulus cistoides</i>	

Dagny Johnson Key Largo Hammock Botanical State Park- Animals

Common Name	Scientific Name	Primary Habitat Codes (for designated species)
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CHITONS

West Indian fuzzy chiton *Acanthopleura granulata* MCNS

GASTROPODS

Black horn snail..... *Batillaria minima* MS
 Gray peanut-snail..... *Cerion incanum*..... KTRB, RD
 Dominican forest snail..... *Drymaeus dominicus* RH
 Multilined tree snail *Drymaeus multilineatus*
 Liguus tree snail..... *Liguus fasciatus* RH
 Bleedingtooth nerite *Nerita peloronta*..... MCNS
 Stock Island tree snail..... *Orthalicus reses nesodryas*..... RH
 Florida tree snail *Orthalicus floridensis*
 Slug species..... *Veronicella floridana* DV
 Garden zachrysia* *Zachrysia provisoria* RH, DV

CRUSTACEANS

Mangrove tree crab..... *Aratus pisonii* MS
 Mangrove root crab *Goniopsis cruentata*..... MS
 Great land crab *Cardisoma guanhumi*..... MS
 Common land hermit crab *Coenobita clypeatus* RH
 Land crab species *Gecarcinus sp.* MS
 Sand fiddler crab..... *Uca pugilator* MS

BETLES

Prioninae *Stenodontes chevrolatis*..... RH
 Macrotomini *Stenodontes dasytomus dasytomus*..... RH
 Mallaspini *Derancitrus scabrosus* RH
 Cerambycidae *Ataxia spinicauda* RH
 *Euryscelis suturalis*..... RH
 *Hippopsis lemniscata* RH
 *Methis pusilla* RH
 *Neoclytus cordifer* RH
 *Placosternus difficilis* RH
 *Psyrassa pertenuis* RH
 *Styloleptus biustus biustus*..... RH
 Methiini *Oeme rigida rigida*..... RH
 Eburini *Eburia stigma* RH
 *Eburia stroheckeri*..... RH
 Elaphidionini *Anelaphus inermis*..... RH
 *Anelaphus subtropicus*..... RH
 *Customerus flavus* RH
 *Elaphidion cryptum* RH
 *Elaphidion irroratum*..... RH
 *Elaphidion mucronatum* RH
 *Linsleyonides albomaculatus*..... RH
 Iribionini *Heterachthes sablensis* RH

Dagny Johnson Key Largo Hammock Botanical State Park- Animals

Common Name	Scientific Name	Primary Habitat Codes (for designated species)
Curiini	<i>Plectromerus dentipes</i>	RH
Obrini	<i>Obrium glabrum</i>	RH
	<i>Obrium maculatum</i>	RH
Callichromatini	<i>Plinthocoelium suaveolens suaveolens</i>	RH
Clytini	<i>Neoclytus cordifer</i>	RH
Herteropsini	<i>Heterops dimidiata</i>	RH
Laminiiae	<i>Ataxini Ataxia falli</i>	RH
Pogonocherini	<i>Egytus dasycerus floridanus</i>	RH
Onciderini	<i>Oncideres cingulata</i>	RH
Hippopsini	<i>Hippopsis lemniscata</i>	RH
	<i>Spalacopsis filum costulatum</i>	RH
Acanthocinini	<i>Alcicion umbraticum</i>	RH
	<i>Lagocheirus araneiformis stroheckeri</i>	RH
	<i>Leptostylopsis albofasciatus</i>	RH
	<i>Leptostylopsis argentatus</i>	RH
	<i>Leptostylopsis planidorsus</i>	RH
	<i>Leptostylopsis terraecolor</i>	RH
	<i>Sternidus schwarzi</i>	RH
	<i>Styloleptus minuens minuens</i>	RH
	<i>Urgleptes kissingeri</i>	RH
Cicindelidae	<i>Cicindela marginata</i>	RH
Carabidae	<i>Calasoma splendidum</i>	RH
	<i>Panagaeus crucigerus</i>	RH
	<i>Pesimachus subsalcatu</i>	RH
	<i>Plochionus amadus</i>	RH
Buprestidae	<i>Acmaeodera confusa</i>	RH
	<i>Acmaeodera margine notata</i>	RH
	<i>Actenodes auronotata</i>	RH
	<i>Chrypbothris tranquebarica</i>	RH
	<i>Chrypbothris sexfasciata</i>	RH
	<i>Polycesta abdita</i>	RH
	<i>Polycesta angulosa</i>	RH
	<i>Poratyndoris suturellis</i>	RH
Elateridae	<i>Dicrepidius rannicormis</i>	RH
	<i>Hapsodrilus phypodermus</i>	RH
	<i>Lacon mexicanus</i>	RH
	<i>Neotricophorus carolinensis</i>	RH
Cleridae	<i>Lecontella brunnea</i>	RH
	<i>Monophylla terminata</i>	RH
	<i>Neorthopleura thoracica</i>	RH
	<i>Tarostenus univittatus</i>	RH
Meloidae	<i>Nemognatha punctulata</i>	RH
Oedemeridae	<i>Oxycopsis floridana</i>	RH
	<i>Oxycopsis vittata</i>	RH
Lampyridae	<i>Lampyrus pinelli</i>	RH
Lycidae	<i>Lycus lateralis</i>	RH

Dagny Johnson Key Largo Hammock Botanical State Park- Animals

Common Name	Scientific Name	Primary Habitat Codes (for designated species)
Scarabacidae	<i>Euphoria limbalis</i>	RH
	<i>Pelidnota lutea</i>	RH
	<i>Phileurus castaneus</i>	RH
	<i>Rutela formosa</i>	RH
Chrysomelidae	<i>Anomoea laticlaira angustata</i>	RH
	<i>Ciriburius equestris</i>	RH
Anthibidae	<i>Ischnocerus infuscatus</i>	RH
	<i>Toxonotus fasciculatus</i>	RH
Curalionidae	<i>Myrimax dichnous</i>	RH
	<i>Pachnoaus litus</i>	RH
Histeridae	<i>Acritus ignobilis</i>	RH
	<i>Onalodes ruficlavis</i>	RH
	<i>Teretriosoma virens</i>	RH
Laemophloeidae	<i>Laemophloeus lecontei</i>	RH
	<i>Lathropus vernalis</i>	RH
	<i>Placonotus politissimus</i>	RH
Passandridae	<i>Catogenus rufus</i>	RH
Silvanidae	<i>Ahasverus rectus</i>	RH
Plant Lice	<i>Aphaloxoida masonici</i>	RH
	<i>Hetropsylla cubana</i>	RH
	<i>Heteropsyllae quassiae</i>	RH
	<i>Psuedophaeopteron sp.</i>	RH
	<i>Trioza sp.</i>	RH

FLIES

Mosquito	<i>Anopheles atropos</i>	DV, MS, RH
Mosquito	<i>Culex nigripalpus</i>	RH, DV
Mosquito	<i>Culex quinquefasciatus</i>	RH, DV
Mosquito	<i>Culex bahamensis</i>	RH, DV
Mosquito	<i>Deinocerites cancer</i>	RH, DV
Mosquito	<i>Aedes aegypti</i>	
Mosquito	<i>Anopheles crucians</i>	
Mosquito	<i>Culex erraticus</i>	
Mosquito	<i>Culex iolambdis</i>	
Mosquito	<i>Ochlerotatus tortolis</i>	
Mosquito	<i>Ochlerotatus triseriatus</i>	
Mosquito	<i>Psotophora johnstonii</i>	
Mosquito	<i>Uranotaenia iowii</i>	
Mosquito	<i>Ochlerotatus condolegens</i>	
Mosquito	<i>Ochlerotatus infirmatus</i>	
Black saltmarsh mosquito	<i>Ochlerotatus taeniorhynchus</i>	MS

BUTTERFLIES AND MOTHS

Gulf fritillary	<i>Agraulis vanillae</i>	RH, RD
Florida white	<i>Appias drusilla</i>	RD, DV, RH
Monk skipper	<i>Asbolis capucinus</i>	DV, RH, RD

Dagny Johnson Key Largo Hammock Botanical State Park- Animals

Common Name	Scientific Name	Primary Habitat Codes (for designated species)
Great southern white	<i>Ascia monuste</i>	RH, RD
Polydamas swallowtail	<i>Battus polydamas</i>	RD
Brazilian skipper	<i>Calpododes ethlius</i>	RH, RD
Amethyst Hairstreak	<i>Chlorostrymon maesites</i>	RH, DV, RD
Southern skipperling	<i>Copaeodes minima</i>	RD, DV
Monarch	<i>Danaus plexippus</i>	DV, RD
Julia heliconian	<i>Dryas iulia largo</i>	DV, RD
Fulvous hairstreak	<i>Electrostrymon angelia</i>	RD
Florida duskywing	<i>Ephyriades brunnea floridensis</i>	PR
Horace's duskywing	<i>Erynnis horatius</i>	DV, RD
Atala	<i>Eumaeus atala</i>	MH
Florida purplewing	<i>Eunica tatila</i>	RH
Variiegated fritillary	<i>Euptoieta claudia</i>	RD
Barred yellow	<i>Eurema daira</i>	DV, RD
Little yellow	<i>Eurema lisa</i>	DV, RD
Sleepy orange	<i>Eurema nicippe</i>	DV, RD
Mimosa Yellow	<i>Eurema [Pyrisitia] nise</i>	RH, RD
Zebra longwing	<i>Heliconius charitonius</i>	, RD
Miami blue	<i>Hemiargus thomasi bethunebakeri</i>	RD, DV
Ceraunus blue	<i>Hemiargus ceraunus</i>	RD
Schaus swallowtail butterfly	<i>Heraclides aristodemus ponceanus</i>	RH, RD
Fiery skipper	<i>Hylephila phyleus</i>	DV, RD
Common buckeye	<i>Junonia coenia</i>	RD
Mangrove buckeye	<i>Junonia evarete</i>	MS
Tropical buckeye	<i>Junonia genoveva</i>	MS, RD, DV
Lyside sulphur	<i>Kricogonia lyside</i>	RD
Cassius blue	<i>Leptotes cassius</i>	RD
Clouded skipper	<i>Lerema accius</i>	RD
Eufala skipper	<i>Lerodea eufala</i>	RD
Ruddy daggerwing	<i>Marpesia petreus</i>	RD, RH
Dainty sulphur	<i>Nathalis iole</i>	RD
Ocola skipper	<i>Panoquina ocola</i>	RD
Obscure skipper	<i>Panoquina panoquinoides</i>	RD
Black swallowtail	<i>Papilio polyxenes</i>	DV
Giant swallowtail	<i>Papilio cresphontes</i>	RD, RH, DV
Mangrove skipper	<i>Phocides pigmalion</i>	MS, CS
Cloudless sulphur	<i>Phoebis sennae</i>	RD
Orange-barred sulphur	<i>Phoebis philea</i>	RD
Large orange sulphur	<i>Phoebis agarithe</i>	RD, DV, RH
Phaon crescent	<i>Phyciodes phaon</i>	RD, DV
Pearl crescent	<i>Phyciodes tharos</i>	RD
Baracoa skipper	<i>Polites baracoa</i>	DV, RD
Whirlabout	<i>Polites vibex</i>	DV, RD
Hammock skipper	<i>Polygonus leo</i>	RH, RD
Checkered white	<i>Pontia protodice</i>	DV, RD
Tropical checkered skipper	<i>Pyrgus oileus</i>	DV, RD

Dagny Johnson Key Largo Hammock Botanical State Park- Animals

Common Name	Scientific Name	Primary Habitat Codes (for designated species)
Malachite.....	<i>Siproeta stelenes</i>	DV, RD, RH
Mallow scrub-hairstreak	<i>Strymon istapa (=columella)</i>	RD
Gray hairstreak	<i>Strymon melinus</i>	RD
Dorantes longtail.....	<i>Urbanus dorantes</i>	RD
Long-tailed skipper	<i>Urbanus proteus</i>	RD
Red admiral	<i>Vanessa atalanta</i>	RD
Painted lady.....	<i>Vanessa cardui</i>	RD
American lady	<i>Vanessa virginiensis</i>	RD

Moths

.....	<i>Achyra rantalis</i>	RH
.....	<i>Acrolophus walsinghami</i>	RH
.....	<i>Adaina simplicius</i>	RH
.....	<i>Aethes seriatana</i>	RH
.....	<i>Alarodia slossoniae</i>	RH
.....	<i>Alatuncusia bergii</i>	RH
.....	<i>Anarta florida</i>	RH
.....	<i>Ancylostoma stercorea</i>	RH
.....	<i>Antiblemma filaria</i>	RH
.....	<i>Apogeshna stenialis</i>	RH
.....	<i>Argyrotaenia amatana</i>	RH
.....	<i>Aristotelia roseosuffusella</i>	RH
Black witch moth.....	<i>Ascalapha odorata</i>	CB, RH, RD
.....	<i>Atteva aurea</i>	RH
.....	<i>Automeris io</i>	RH
.....	<i>Banisia furva</i>	RH
.....	<i>Blepharomastix achroalis</i>	RH
.....	<i>Bleptina</i> sp. B.....	RH
.....	<i>Bleptina</i> sp.a	RH
.....	<i>Calidota laqueata</i>	RH
.....	<i>Cautethia grotei</i>	RH
.....	<i>Characoma nilotica</i>	RH
.....	<i>Chrysaugine</i> undescribed species	RH
.....	<i>Clemensia albata</i>	RH
.....	<i>Collomena filifera</i>	RH
.....	<i>Concana mundissima</i>	RH
.....	<i>Conchylodes diphteralis</i>	RH
.....	<i>Condica bahamica</i>	RH
.....	<i>Coxina cinctipalpis</i>	RH
.....	<i>Cryptothelea gloverii</i>	RH
.....	<i>Diacme mopsalis</i>	RH
.....	<i>Dichogama redtenbacheri</i>	RH
.....	<i>Dichrorampha manilkara</i>	RH
.....	<i>Disclisioprocta stellata</i>	RH
.....	<i>Dypterygia ligata</i>	RH
.....	<i>Elaphria agrotina</i>	RH

Dagny Johnson Key Largo Hammock Botanical State Park- Animals

Common Name	Scientific Name	Primary Habitat Codes (for designated species)
	<i>Epimecis matronaria</i>	RH
	<i>Epipagis forsythae</i>	RH
	<i>Episimus augmentanus</i>	RH
	<i>Episimus kimballi</i>	RH
	<i>Erinnyis ello</i>	RH
	<i>Ethmia confusella</i>	RH
	<i>Eublemma cinnamomea</i>	RH
	<i>Eublemma minima</i>	RH
	<i>Eublemma recta</i>	RH
	<i>Eupyrrhoglossum sagra</i>	RH
	<i>Eutelia pyrastis</i>	RH
	<i>Galleria mellonella</i>	RH
	<i>Givira anna</i>	RH
	<i>Hellula phidilealis</i>	RH
	<i>Hemerophila diva</i>	RH
	<i>Hemeroplanis scopulepes</i>	RH
	<i>Heterocampa cubana</i>	RH
	<i>Heterocampa zayasi</i>	RH
	<i>Hexeris enhydris</i>	RH
	<i>Hypena vetusialis</i>	RH
	<i>Hypenula cacuminalis</i>	RH
	<i>Hypsipyla grandella</i>	RH
	<i>Idaea insulensis</i>	RH
	<i>Idaea pervertipennis</i>	RH
	<i>Iridopsis ephyraria</i>	RH
	<i>Lactura pupula</i>	RH
	<i>Laetilia coccidivora</i>	RH
	<i>Leucania incognita</i>	RH
	<i>Lymire edwardsii</i>	RH
	<i>Lypotigris fusalis</i>	RH
	<i>Macalla thyrissalis</i>	RH
	<i>Macaria aequiferaria</i>	RH
	<i>Madoryx pseudothyreus</i>	RH
	<i>Magusa orbifera</i>	RH
	<i>Marilopteryx lutina</i>	RH
	<i>Mea skinnerella</i>	RH
Puss moth	<i>Megalopyge opercularis</i>	RH
	<i>Melipotis contorta</i>	RH
	<i>Melipotis famelica</i>	RH
	<i>Melipotis jucunda</i>	RH
	<i>Melipotis prolata</i>	RH
	<i>Metallata absumens</i>	RH
	<i>Microphysetica hermeasalis</i>	RH
	<i>Mimophobetron pyropsalis</i>	RH
	<i>Motya abseuzalis</i>	RH
	<i>Nelphe carolina</i>	RH

Dagny Johnson Key Largo Hammock Botanical State Park- Animals

Common Name	Scientific Name	Primary Habitat Codes (for designated species)
.....	<i>Nepheloleuca floridata</i>	RH
.....	<i>Nystalea eutalanta</i>	RH
.....	<i>Nystalea indiana</i>	RH
.....	<i>Oiketicus abbotii</i>	RH
.....	<i>Omiodes rufescens</i>	RH
.....	<i>Omiodes stigmosalis</i>	RH
.....	<i>Ommatochila mundula</i>	RH
.....	<i>Oxydia cubana</i>	RH
.....	<i>Paectes arcigera</i>	RH
.....	<i>Palpusia goniopalpia</i>	RH
.....	<i>Parachma ochracealis</i>	RH
.....	<i>Parapoynx aleonalis</i>	RH
.....	<i>Penestola bufalis</i>	RH
.....	<i>Penestola simplicialis</i>	RH
.....	<i>Penthesilia difficilis</i>	RH
.....	<i>Pero lastima</i>	RH
.....	<i>Philagraula slossoniae</i>	RH
.....	<i>Plumegesta largalis</i>	RH
.....	<i>Pococera species</i>	RH
.....	<i>Pococera species</i>	RH
.....	<i>Polygrammodes elevata</i>	RH
.....	<i>Protambulyx strigilis</i>	RH
.....	<i>Pseudosphinx tetrio</i>	RH
.....	<i>Pterocypha floridata</i>	RH
.....	<i>Rhectocraspeda periusalis</i>	RH
.....	<i>Rifargia bichorda</i>	RH
.....	<i>Selensia sueroides</i>	RH
.....	<i>Sericoptera virginaria</i>	RH
.....	<i>Simplicia cornicalis</i>	RH
.....	<i>Sphacelodes vulneraria</i>	RH
.....	<i>Steniodes mendica</i>	RH
.....	<i>Syllepsis marialis</i>	RH
.....	<i>Synchlora cupedinaria</i>	RH
.....	<i>Synclera jarbusalis</i>	RH
.....	<i>Syntomeida epilais</i>	RH
.....	<i>Tampa dimediatella</i>	RH
.....	<i>Tetraschistis leucogramma</i>	RH
.....	<i>Tortyra slossonia</i>	RH
.....	<i>Turissa multilinea</i>	RH
.....	<i>Uresiphita reversalis</i>	RH
.....	<i>Xanthopastis regnatrix</i>	RH
.....	<i>Xubida panalope</i>	RH
.....	<i>Zale lunata</i>	RH
.....	<i>Zamagiria arctella</i>	RH

Dagny Johnson Key Largo Hammock Botanical State Park- Animals

Common Name	Scientific Name	Primary Habitat Codes (for designated species)
ANTS, BEES AND WASPS		
Honey bee*	<i>Apis mellifera</i>	CS, RD, DV
Florida carpenter ant.	<i>Camponotus floridanus</i>	DV, RD
Red imported fire ant*	<i>Solenopsis invicta</i>	DV, RD
Wasp	<i>Adelencyrtus odonaspidis</i>	RH
	<i>Aenasius</i> spp.	RH
	<i>Aeptencyrtus bruchi</i>	RH
	<i>Adelencyrtus odonaspidis</i>	RH
	<i>Aenasius</i> spp.	RH
	<i>Aeptencyrtus bruchi</i>	RH
	<i>Ageniaspis</i> sp.	RH
*	<i>Ameromyzobia bulginskayae</i>	RH
	<i>Anagyrus</i> spp.	RH
	<i>Apoanagyrus diversicornis</i>	RH
	<i>Blepyrus</i> sp.	RH
	<i>Cheiloneurus</i> spp.	RH
	<i>Copidosoma</i> spp.	RH
	<i>Helegonatopus pseudophanes</i>	RH
	<i>Meromyzobia</i> sp.	RH
	<i>Metaphycus</i> spp.	RH
	<i>Neodusmetia sangwani</i>	RH
	<i>Ooencyrtus</i> spp.	RH
	<i>Pseudaphycus</i> sp.	RH
*	<i>Psyllaephagus yaseeni</i>	RH
	<i>Syrphophagus aphidivorus</i>	RH
	<i>Syrphophagus</i> sp.	RH

SPIDERS

Silver argiope	<i>Argiope argentata</i>	CB, KTRB, RD
Black-and-yellow argiope	<i>Argiope aurantia</i>	CS, RD
Dewdrop spider species	<i>Argyrodes nephilae</i>	RH
Tropical orb-weaver	<i>Eriophora ravilla</i>	CS, RD
Spiny orb-weaver	<i>Gasteracantha cancriformis</i>	CB, RH, DV, RD
Giant crab spider*	<i>Heteropoda venatoria</i>	DV
Orchard orb-weaver	<i>Leucauge venusta</i>	RH, MS
Golden silk orbweaver	<i>Nephila clavipes</i>	RH, RD, DV
Harvestman species	<i>Vonones ornata</i>	MAH, DV

WHIPSCORPIONS

Spotted tailless whipscorpion	<i>Phrynus marginemaculata</i>	RH
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AMPHIBIANS

Southern toad	<i>Bufo terrestris</i>	RH, DV
American green treefrog	<i>Hyla cinerea</i>	RH
Cuban treefrog*	<i>Osteopilus septentrionalis</i>	RH

Dagny Johnson Key Largo Hammock Botanical State Park- Animals

Common Name	Scientific Name	Primary Habitat Codes (for designated species)
REPTILES		
American crocodile	<i>Crocodylus acutus</i>	MS, MCNS
Striped mud turtle	<i>Kinosternon bauri</i>	MS
Florida box turtle	<i>Terrapene carolina</i>	RH
Green anole	<i>Anolis carolinensis</i>	CB, DV, RH, RD
Brown anole*	<i>Anolis sagrei</i>	RH, DV
Northern brown basilisk*	<i>Basiliscus vittatus</i>	RH
Six-lined racerunner	<i>Cnemidophorus sexlineatus sexlineatus</i>	RH
Black spiny-tailed iguana*	<i>Ctenosaura similis</i>	RH, DV
Florida Keys mole skink	<i>Eumeces egregius egregius</i>	RH, KTRB
Southeastern five-lined skink	<i>Eumeces inexpectatus</i>	CB, DV, RH, RD
Tokey gecko*	<i>Gecko gecko</i>	RH, DV
Indo-Pacific gecko*	<i>Hemidactylus garnotii</i>	RH, DV
Tropical house gecko*	<i>Hemidactylus mabouia</i>	DV
Great green iguana*	<i>Iguana iguana</i>	CB, DV, RH, MS, RD
Florida reef gecko	<i>Sphaerodactylus notatus</i>	CB
Florida cottonmouth.....	<i>Agkistrodon piscivorous conanti</i>	RH
Southern black racer.....	<i>Coluber constrictor Priapus</i>	
Eastern diamondback rattlesnake	<i>Crotalus adamanteus</i>	RH
Southern ringneck snake	<i>Diadophis punctatus punctatus</i>	RH
Eastern indigo snake.....	<i>Drymarchon corais couperi</i>	RH
Corn snake	<i>Elaphe guttata guttata</i>	RH, DV, RD
Yellow rat snake	<i>Elaphe obsoleta quadrivittata</i>	RH, DV
Scarlet kingsnake	<i>Lampropeltis triangulum elapsoides</i>	RH
Eastern coachwhip.....	<i>Masticophis flagellum flagellum</i>	RH
Eastern coral snake	<i>Micrurus fulvius fulvius</i>	RH
Mangrove water snake	<i>Nerodia fasciata compressicauda</i>	MS
Rough green snake	<i>Opheodrys aestivus</i>	RH
.....	<i>Tantilla oolitica</i>	
BIRDS		
Blue-winged teal	<i>Anas discors</i>	CD
Red-breasted merganser	<i>Mergus serrator</i>	Offshore
Ruddy duck	<i>Oxyura jamaicensis</i>	CD
Common loon	<i>Gavia immer</i>	Offshore
Rhode Island red*	<i>Gallus gallus domesticus</i>	RD, DV, RH
Pied-billed grebe	<i>Podilymbus podiceps</i>	CD
Northern gannet.....	<i>Morus bassanus</i>	Offshore
American white pelican	<i>Pelecanus erythrorhynchos</i>	MS, Offshore
Brown pelican	<i>Pelecanus occidentalis</i>	MS, Offshore
Double-crested cormorant	<i>Phalacrocorax auritus</i>	MS, Offshore
Magnificent frigatebird	<i>Fregata magnificens</i>	MS, Offshore
Great egret.....	<i>Ardea alba</i>	RD, DV, MS
Great blue heron	<i>Ardea herodias</i>	MS
Great white heron	<i>Ardea herodias occidentalis</i>	MS

Dagny Johnson Key Largo Hammock Botanical State Park- Animals

Common Name	Scientific Name	Primary Habitat Codes (for designated species)
Cattle egret	<i>Bubulcus ibis</i>	RD, DV
Green heron	<i>Butorides virescens</i>	CD, MS
Little blue heron	<i>Egretta caerulea</i>	CD, MS
Reddish egret	<i>Egretta rufescens</i>	MS, CD
Snowy egret	<i>Egretta thula</i>	MS, CD
Tricolored heron	<i>Egretta tricolor</i>	CD, MS
Least bittern	<i>Ixobrychus exilis</i>	CIS
Black-crowned night-heron	<i>Nycticorax nycticorax</i>	MS
Yellow-crowned night-heron	<i>Nyctanassa violacea</i>	MS, CD
Roseate Spoonbill	<i>Platalea ajaja</i>	MS
White ibis	<i>Eudocimus albus</i>	MS, CD, DV
Wood stork	<i>Mycteria americana</i>	MS
Turkey vulture	<i>Cathartes aura</i>	RD, DV, RH
Black vulture	<i>Coragyps atratus</i>	Offshore
Osprey	<i>Pandion haliaetus</i>	MS, RH, DV
Sharp-shinned hawk	<i>Accipiter striatus</i>	RD, RH, DV
Red-tailed hawk	<i>Buteo jamaicensis</i>	RD, RH, DV
Red-shouldered hawk	<i>Buteo lineatus</i>	RD, RH, DV
Broad-winged hawk	<i>Buteo platypterus</i>	RD, RH, DV
Northern harrier	<i>Circus cyaneus</i>	RD, RH
Swallow-tailed kite	<i>Elanoides forficatus</i>	OF
Bald eagle	<i>Haliaeetus leucocephalus</i>	RD, RH
Peregrine falcon	<i>Falco peregrinus</i>	RD, DV
American kestrel	<i>Falco sparverius</i>	RD, DV
American coot	<i>Fulica americana</i>	CD
Clapper rail	<i>Rallus crepitans</i>	MS
Piping plover	<i>Charadrius melodus</i>	CB, MCNS
Semipalmated plover	<i>Charadrius semipalmatus</i>	CB, MCNS
Killdeer	<i>Charadrius vociferus</i>	CB, MCNS
Wilson's plover	<i>Charadrius wilsonia</i>	CB, MCNS
Black-bellied Plover	<i>Pluvialis squatarola</i>	CB, MCNS
Black-necked stilt	<i>Himantopus mexicanus</i>	MCNS
American avocet	<i>Recurvirostra americana</i>	MCNS
Spotted sandpiper	<i>Actitis macularius</i>	MCNS
Ruddy turnstone	<i>Arenaria interpres</i>	MCNS
Sanderling	<i>Calidris alba</i>	MCNS
Dunlin	<i>Calidris alpina</i>	MCNS
Western sandpiper	<i>Calidris mauri</i>	MCNS
Least sandpiper	<i>Calidris minutilla</i>	MCNS
Semi-palmated sandpiper	<i>Calidris pusilla</i>	MCNS
Short-billed dowitcher	<i>Limnodromus griseus</i>	MCNS
Lesser yellowlegs	<i>Tringa flavipes</i>	MCNS
Greater yellowlegs	<i>Tringa melanoleuca</i>	MCNS
Willet	<i>Tringa semipalmata</i>	MCNS
Solitary sandpiper	<i>Tringa solitaria</i>	MCNS
Caspian tern	<i>Hydroprogne caspia</i>	MCNS

Dagny Johnson Key Largo Hammock Botanical State Park- Animals

Common Name	Scientific Name	Primary Habitat Codes (for designated species)
Laughing gull	<i>Leucophaeus atricilla</i>	MCNS
Herring gull	<i>Larus argentatus</i>	MCNS
Ring-billed gull	<i>Larus delawarensis</i>	MCNS
Sooty tern	<i>Onychoprion fuscatus</i>	Offshore
Black skimmer	<i>Rynchops niger</i>	MCNS
Least tern	<i>Sternula antillarum</i>	MCNS
Roseate tern	<i>Sterna dougallii</i>	MCNS
Common tern	<i>Sterna hirundo</i>	MCNS
Forster's tern	<i>Sterna forsteri</i>	Offshore
Royal tern	<i>Thalasseus maximus</i>	MCNS, Offshore
Sandwich tern	<i>Thalasseus sandvicensis</i>	Offshore
Common ground-dove	<i>Columbina passerina</i>	DV, RD
Key West quail-dove	<i>Geotrygon chrysia</i>	RH
White-crowned pigeon	<i>Patagioenas leucocephala</i>	RH, RD
Eurasian collared dove*	<i>Streptopelia decaocto</i>	DV
White-winged dove*	<i>Zenaida asiatica</i>	DV
Zenaida dove	<i>Zenaida aurita</i>	RH, DV
Mourning dove	<i>Zenaida macroura</i>	RH, RD, DV
Mangrove cuckoo	<i>Coccyzus minor</i>	RH, DV
Burrowing owl	<i>Athene cunicularia</i>	CB
Barn owl	<i>Tyto alba</i>	CB, RH
Eastern screech-owl	<i>Megascops asio</i>	DV, RH
Chuck-will's-widow	<i>Anrostomus carolinensis</i>	RH
Common nighthawk	<i>Chordeiles minor</i>	RD, DV
Ruby-throated hummingbird	<i>Archilochus colubris</i>	RH, DV
Belted kingfisher	<i>Megaceryle alcyon</i>	MS
Red-bellied woodpecker	<i>Melanerpes carolinus</i>	CB, RH, DV
Yellow-bellied sapsucker	<i>Sphyrapicus varius</i>	RH, DV
Great-crested flycatcher	<i>Myiarchus crinitus</i>	DV, RD, RH
La Sagra's flycatcher	<i>Myiarchus sagrae</i>	RD, RH
Gray kingbird	<i>Tyrannus dominicensis</i>	RH, RD, DV
Eastern kingbird	<i>Tyrannus tyrannus</i>	RH, RD, DV
Black-whiskered vireo	<i>Vireo altiloquus</i>	MS, RH
White-eyed vireo	<i>Vireo griseus</i>	RH
Fish crow	<i>Corvus ossifragus</i>	RD, DV
Blue jay	<i>Cyanocitta cristata</i>	CS, RD, DV
Barn swallow	<i>Hirundo rustica</i>	RD
Blue-gray gnatcatcher	<i>Polioptila caerulea</i>	RH, RD, DV
Gray catbird	<i>Dumetella carolinensis</i>	RH, DV, RD
Bahama mockingbird	<i>Mimus gundlachii</i>	RH, DV, RD
Northern mockingbird	<i>Mimus polyglottos</i>	RH, RD, DV
Brown thrasher	<i>Toxostoma rufum</i>	RH
Loggerhead Shrike	<i>Lanius ludovicianus</i>	
European starling*	<i>Sturnus vulgaris</i>	RD, DV
Black-throated blue warbler	<i>Setophagacaerulescens</i>	DV, RH
Yellow-rumped warbler	<i>Setophaga coronata</i>	DV, RH

Dagny Johnson Key Largo Hammock Botanical State Park- Animals

Common Name	Scientific Name	Primary Habitat Codes (for designated species)
Prairie warbler	<i>Setophaga discolor</i>	DV, RH
Yellow-throated warbler	<i>Setophaga dominica</i>	RH, DV
Kirtland's warbler	<i>Setophaga kirtlandii</i>	RH, KTCB
Palm warbler.....	<i>Setophaga palmarum</i>	RH, DV, RD
Yellow warbler	<i>Setophaga petechia</i>	DV, RH
Blackpoll warbler	<i>Setophaga striata</i>	DV, RH
Cape May warbler.....	<i>Setophaga tigrina</i>	DV, RH
Black-throated green warbler ...	<i>Setophaga virens</i>	RH
Common yellowthroat	<i>Geothlypis trichas</i>	RH, MS, KTCB
Worm-eating warbler	<i>Helmitheros vermivorus</i>	RH
Black-and-white warbler.....	<i>Mniotilta varia</i>	DV, RH, KTCB
Northern parula.....	<i>Setophaga americana</i>	RH, DV, RD
Ovenbird	<i>Seiurus aurocapilla</i>	RH, DV
Louisiana waterthrush.....	<i>Parkesia motacilla</i>	RH
Northern waterthrush.....	<i>Parkesia noveboracensis</i>	RH, MS
American redstart.....	<i>Setophaga ruticilla</i>	RH, DV
Northern cardinal	<i>Cardinalis cardinalis</i>	RH, DV, RD
Blue grosbeak	<i>Passerina caerulea</i>	RH
Painted bunting	<i>Passerina ciris</i>	RH, RD, DV
Indigo bunting	<i>Passerina cyanea</i>	RH, RD, DV
Rose-breasted grosbeak.....	<i>Pheucticus ludovicianus</i>	DV, RH
Red-winged blackbird.....	<i>Agelaius phoeniceus</i>	RH, DV, RD
Bobolink.....	<i>Dolichonyx oryzivorus</i>	DV, RD
Brown-headed cowbird.....	<i>Molothrus ater</i>	CS
Boat-tailed grackle	<i>Quiscalus major</i>	BD
Common grackle	<i>Quiscalus quiscula</i>	MTC
Rufous-sided towhee.....	<i>Pipilo erythrophthalmus</i>	RH
American goldfinch	<i>Spinus tristis</i>	DV, RH

MAMMALS

Coyote	<i>Canis latrans</i>	RH, DV, RD
Virginia opossum.....	<i>Didelphis virginiana</i>	RH, DV
Marsh rabbit	<i>Sylvilagus palustris</i>	RH, KTRB
Least Shrew.....	<i>Cryptotis parva</i>	RH
House mouse*	<i>Mus musculus</i>	RH, DV
Key Largo woodrat	<i>Neotoma floridana smalli</i>	RH
Key Largo cotton mouse	<i>Peromyscus gossypinus allapaticola</i>	RH
Black rat*	<i>Rattus rattus</i>	RH, KTRB, DV
Eastern gray squirrel.....	<i>Sciurus carolinensis</i>	DV, RH
Domestic cat*	<i>Felis catus</i>	RH, DV, KTRB
Bobcat	<i>Lynx rufus</i>	RH, RD
Raccoon	<i>Procyon lotor</i>	RH, RD, DV
Gray fox.....	<i>Urocyon cinereoargenteus</i>	RH, RD

Primary Habitat Codes

TERRESTRIAL

Beach Dune	BD
Coastal Berm	CB
Coastal Grassland	CG
Coastal Strand	CS
Dry Prairie	DP
Keys Cactus Barren	KCB
Limestone Outcrop	LO
Maritime Hammock	MAH
Mesic Flatwoods	MF
Mesic Hammock	MEH
Pine Rockland	PR
Rockland Hammock	RH
Sandhill	SH
Scrub	SC
Scrubby Flatwoods	SCF
Shell Mound	SHM
Sinkhole	SK
Slope Forest	SPF
Upland Glade	UG
Upland Hardwood Forest	UHF
Upland Mixed Woodland	UMW
Upland Pine	UP
Wet Flatwoods	WF
Xeric Hammock	XH

PALUSTRINE

Alluvial Forest	AF
Basin Marsh	BM
Basin Swamp	BS
Baygall	BG
Bottomland Forest	BF
Coastal Interdunal Swale	CIS
Depression Marsh	DM
Dome Swamp	DS
Floodplain Marsh	FM
Floodplain Swamp	FS
Glades Marsh	GM
Hydric Hammock	HH
Keys Tidal Rock Barren	KTRB
Mangrove Swamp	MS
Marl Prairie	MP
Salt Marsh	SAM
Seepage Slope	SSL
Shrub Bog	SHB
Slough	SLO
Slough Marsh	SLM
Strand Swamp	STS

Primary Habitat Codes

Wet Prairie WP

LACUSTRINE

Clastic Upland Lake..... CULK
Coastal Dune Lake..... CDLK
Coastal Rockland Lake CRLK
Flatwoods/Prairie..... FPLK
Marsh Lake MLK
River Floodplain Lake RFLK
Sandhill Upland Lake..... SULK
Sinkhole Lake SKLK
Swamp Lake SWLK

RIVERINE

Alluvial Stream..... AST
Blackwater Stream BST
Seepage Stream..... SST
Spring-run Stream..... SRST

SUBTERRANEAN

Aquatic Cave..... ACV
Terrestrial Cave..... TCV

ESTUARINE

Algal Bed EAB
Composite Substrate..... ECPS
Consolidated Substrate ECNS
Coral Reef ECR
Mollusk Reef EMR
Octocoral Bed EOB
Seagrass Bed ESGB
Sponge Bed ESPB
Unconsolidated Substrate EUS
Worm Reef EWR

MARINE

Algal Bed MAB
Composite Substrate..... MCPS
Consolidated Substrate MCNS
Coral Reef MCR
Mollusk Reef MMR
Octocoral Bed MOB
Seagrass Bed MSGB
Sponge Bed MSPB
Unconsolidated Substrate MUS
Worm Reef MWR

Primary Habitat Codes

ALTERED LANDCOVER TYPES

Abandoned field	ABF
Abandoned pasture.....	ABP
Agriculture.....	AG
Canal/ditch	CD
Clearcut pine plantation	CPP
Clearing	CL
Developed	DV
Impoundment/artificial pond.....	IAP
Invasive exotic monoculture	IEM
Pasture - improved	PI
Pasture - semi-improved	PSI
Pine plantation	PP
Road	RD
Spoil area	SA
Successional hardwood forest	SHF
Utility corridor	UC

MISCELLANEOUS

Many Types of Communities	MTC
Overflying	OF

Addendum 6—Imperiled Species Ranking Definitions

Imperiled Species Ranking Definitions

The Nature Conservancy and the Natural Heritage Program Network (of which FNAI is a part) define an element as any exemplary or rare component of the natural environment, such as a species, natural community, bird rookery, spring, sinkhole, cave or other ecological feature. An element occurrence (EO) is a single extant habitat that sustains or otherwise contributes to the survival of a population or a distinct, self-sustaining example of a particular element.

Using a ranking system developed by The Nature Conservancy and the Natural Heritage Program Network, the Florida Natural Areas Inventory assigns two ranks to each element. The global rank is based on an element's worldwide status; the state rank is based on the status of the element in Florida. Element ranks are based on many factors, the most important ones being estimated number of Element occurrences, estimated abundance (number of individuals for species; area for natural communities), range, estimated adequately protected EOs, relative threat of destruction, and ecological fragility.

Federal and State status information is from the U.S. Fish and Wildlife Service; and the Florida Fish and Wildlife Conservation Commission (animals), and the Florida Department of Agriculture and Consumer Services (plants), respectively.

FNAL 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 fabricated 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 or local throughout its range (21-100 occurrences or less than 10,000 individuals) or found locally in a restricted range or vulnerable to extinction of other factors.
- G4 apparently secure globally (may be rare in parts of range)
- G5 demonstrably secure globally
- GH of historical occurrence throughout its range may be rediscovered (e.g., ivory-billed woodpecker)
- GX believed to be extinct throughout range
- GXC extirpated from the wild but still known from captivity or cultivation
- 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)

Imperiled Species Ranking Definitions

- 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.
- GU due to lack of information, no rank or range can be assigned (e.g., GUT2).
- G?..... Not yet ranked (temporary)
- S1..... Critically imperiled in Florida 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.
- S2..... Imperiled in Florida 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.
- S3..... Either very rare or local throughout its range (21-100 occurrences or less than 10,000 individuals) or found locally in a restricted range or vulnerable to extinction of other factors.
- S4..... apparently secure in Florida (may be rare in parts of range)
- S5..... demonstrably secure in Florida
- SH of historical occurrence throughout its range, may be rediscovered (e.g., ivory-billed woodpecker)
- SX..... believed to be extinct throughout range
- SA..... accidental in Florida, i.e., not part of the established biota
- SE..... an exotic species established in Florida may be native elsewhere in North America
- SN regularly occurring but widely and unreliably distributed; sites for conservation hard to determine
- SU due to lack of information, no rank or range can be assigned (e.g., SUT2).
- S?..... Not yet ranked (temporary)
- N Not currently listed, nor currently being considered for listing, by state or federal agencies.

LEGAL STATUS

FEDERAL

(Listed by the U. S. Fish and Wildlife Service - USFWS)

- 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 that is in danger of extinction throughout all or a significant portion of its range.
- 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 that is likely to become an endangered species within the near future throughout all or a significant portion of its range.

Imperiled Species Ranking Definitions

- PT Proposed for listing as Threatened Species.
- C Candidate Species for addition to the list of Endangered and Threatened Wildlife and Plants. Defined as those species for which the USFWS currently has on file sufficient information on biological vulnerability and threats to support proposing to list the species as endangered or threatened.
- E(S/A) Endangered due to similarity of appearance.
- T(S/A) Threatened due to similarity of appearance.
- EXPE, XE..... Experimental essential population. A species listed as experimental and essential.
- EXPN, XN.... Experimental non-essential population. A species listed as experimental and non-essential. Experimental, nonessential populations of endangered species are treated as threatened species on public land, for consultation purposes.

STATE

ANIMALS .. (Listed by the Florida Fish and Wildlife Conservation Commission - FWC)

- FE Federally-designated Endangered
- FT Federally-designated Threatened
- FXN..... Federally-designated Threatened Nonessential Experimental Population
- FT(S/A) Federally-designated Threatened species due to similarity of appearance
- ST..... Listed as Threatened Species by the FWC. 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 therefore is destined or very likely to become an endangered species within the near future.
- SSC..... Listed as Species of Special Concern by the FWC. 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 that, in the near future, may result in its becoming a threatened species.

Imperiled Species Ranking Definitions

PLANTS (Listed by the Florida Department of Agriculture and Consumer Services - FDACS)

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.

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.

Addendum 7—Cultural Information

Management Procedures for Archaeological and Historical Sites and Properties on State-Owned or Controlled Properties (revised March 2013)

These procedures apply to state agencies, local governments, and non-profits that manage state-owned properties.

A. General Discussion

Historic resources are both archaeological sites and historic structures. Per Chapter 267, Florida Statutes, *'Historic property' or 'historic resource' means any prehistoric district, site, building, object, or other real or personal property of historical, architectural, or archaeological value, and folklife resources. These properties or resources may include, but are not limited to, monuments, memorials, Indian habitations, ceremonial sites, abandoned settlements, sunken or abandoned ships, engineering works, treasure trove, artifacts, or other objects with intrinsic historical or archaeological value, or any part thereof, relating to the history, government, and culture of the state.'*

B. Agency Responsibilities

Per State Policy relative to historic properties, state agencies of the executive branch must allow the Division of Historical Resources (Division) the opportunity to comment on any undertakings, whether these undertakings directly involve the state agency, i.e., land management responsibilities, or the state agency has indirect jurisdiction, i.e. permitting authority, grants, etc. No state funds should be expended on the undertaking until the Division has the opportunity to review and comment on the project, permit, grant, etc.

State agencies shall preserve the historic resources which are owned or controlled by the agency.

Regarding proposed demolition or substantial alterations of historic properties, consultation with the Division must occur, and alternatives to demolition must be considered.

State agencies must consult with Division to establish a program to location, inventory and evaluate all historic properties under ownership or controlled by the agency.

C. Statutory Authority

Statutory Authority and more in depth information can be found at:
<http://www.flheritage.com/preservation/compliance/guidelines.cfm>

D. Management Implementation

Even though the Division sits on the Acquisition and Restoration Council and approves land management plans, these plans are conceptual. Specific information regarding individual projects must be submitted to the Division for review and recommendations.

Management Procedures for Archaeological and Historical Sites and Properties on State-Owned or Controlled Properties (revised March 2013)

Managers of state lands must coordinate any land clearing or ground disturbing activities with the Division to allow for review and comment on the proposed project. Recommendations may include, but are not limited to: approval of the project as submitted, cultural resource assessment survey by a qualified professional archaeologist, modifications to the proposed project to avoid or mitigate potential adverse effects.

Projects such as additions, exterior alteration, or related new construction regarding historic structures must also be submitted to the Division of Historical Resources for review and comment by the Division's architects. Projects involving structures fifty years of age or older, must be submitted to this agency for a significance determination. In rare cases, structures under fifty years of age may be deemed historically significant. These must be evaluated on a case by case basis.

Adverse impacts to significant sites, either archaeological sites or historic buildings, must be avoided. Furthermore, managers of state property should make preparations for locating and evaluating historic resources, both archaeological sites and historic structures.

E. Minimum Review Documentation Requirements

In order to have a proposed project reviewed by the Division, certain information must be submitted for comments and recommendations. The minimum review documentation requirements can be found at:

http://www.flheritage.com/preservation/compliance/docs/minimum_review_documentation_requirements.pdf .

* * *

Questions relating to the treatment of archaeological and historic resources on state lands should be directed to:

Deena S. Woodward
Division of Historical Resources
Bureau of Historic Preservation
Compliance and Review Section
R. A. Gray Building
500 South Bronough Street
Tallahassee, FL 32399-0250

Phone: (850) 245-6425

Toll Free: (800) 847-7278

Fax: (850) 245-6435

Eligibility Criteria for National Register of Historic Places

The criteria to be used for evaluating eligibility for listing in the National Register of Historic Places are as follows:

- 1) Districts, sites, buildings, structures, and objects may be considered to have significance in American history, architecture, archaeology, engineering, and/or culture if they possess integrity of location, design, setting, materials, workmanship, feeling, and association, and:
 - a) are associated with events that have made a significant contribution to the broad patterns of our history; and/or
 - b) are associated with the lives of persons significant in our past; and/or
 - c) embody the distinctive characteristics of type, period, or method of construction, or that represent the work of a master, or that possess high artistic values, or that represent a significant and distinguishable entity whose components may lack individual distinction; and/or
 - d) have yielded, or may be likely to yield, information important in prehistory or history.

- 2) Ordinarily cemeteries, birthplaces, or graves of historical figures; properties owned by religious institutions or used for religious purposes; structures that have been moved from their original locations; reconstructed historic buildings; properties primarily commemorative in nature; and properties that have achieved significance within the past 50 years shall not be considered eligible for the *National Register*. However, such properties will qualify if they are integral parts of districts that do meet the criteria or if they fall within the following categories:
 - a) a religious property deriving its primary significance from architectural or artistic distinction or historical importance; or
 - b) a building or structure removed from its original location but which is significant primarily for architectural value, or which is the surviving structure most importantly associated with a historic person or event; or
 - c) a birthplace or grave of an historical figure of outstanding importance if there is no appropriate site or building directly associated with his productive life; or
 - d) a cemetery which derives its primary significance from graves of persons of transcendent importance, from age, distinctive design features, or association with historic events; or

Eligibility Criteria for National Register of Historic Places

- e) a reconstructed building, when it is accurately executed in a suitable environment and presented in a dignified manner as part of a restoration master plan, and no other building or structure with the same association has survived; or a property primarily commemorative in intent, if design, age, tradition, or symbolic value has invested it with its own exceptional significance; or
- f) a property achieving significance within the past 50 years, if it is of exceptional importance.

Preservation Treatments as Defined by Secretary of Interior's Standards and Guidelines

Restoration is defined as the act or process of accurately depicting the form, features, and character of a property as it appeared at a particular period of time by means of the removal of features from other periods in its history and reconstruction of missing features from the restoration period. The limited and sensitive upgrading of mechanical, electrical and plumbing systems and other code-required work to make properties functional is appropriate within a restoration project.

Rehabilitation is defined as the act or process of making possible a compatible use for a property through repair, alterations and additions while preserving those portions or features that convey its historical, cultural or architectural values.

Stabilization is defined as the act or process of applying measures designed to reestablish a weather resistant enclosure and the structural stability of an unsafe or deteriorated property while maintaining the essential form as it exists at present.

Preservation is defined as the act or process of applying measures necessary to sustain the existing form, integrity and materials of an historic property. Work, including preliminary measures to protect and stabilize the property, generally focuses upon the ongoing maintenance and repair of historic materials and features rather than extensive replacement and new construction. New exterior additions are not within the scope of this treatment; however, the limited and sensitive upgrading of mechanical, electrical and plumbing systems and other code-required work to make properties functional is appropriate within a preservation project.

Preservation Treatments as Defined by Secretary of Interior's Standards and Guidelines

Addendum 8 —Land Management Review

Dagny Johnson Key Largo Hammock Botanical State Park Land Management Review

Name of Site: Dagny Johnson Key Largo Hammocks Botanical State Park

County: Monroe County

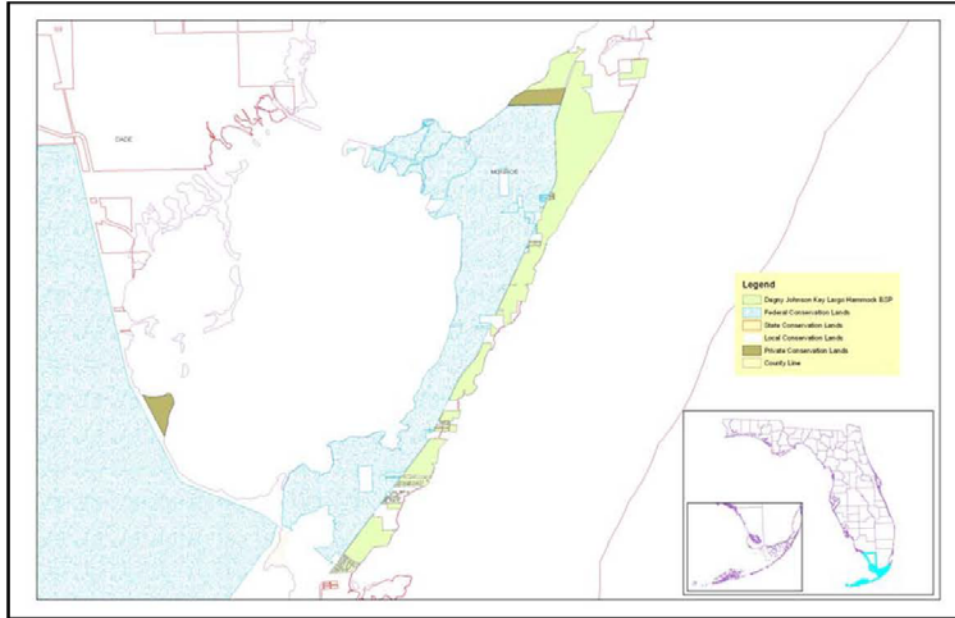
Managed by: Department of Environmental Protection
Division of Recreation and Parks

Acres: 2420.61 Acres
Area Reviewed: Entire Tract

Review Date: 11/18/10

Management Plan Approval Date:

2/23/06



Review Team Determination

Managed in accordance with acquisition purpose? Yes = 5, No = 0



Management practices, including public access, in compliance with the management plan? Yes =5, No = 0



Categories	Management Plan Review	Field Review
Natural Communities	1.00	4.86
Listed Species	0.86	4.75
Natural Resource Survey	0.95	4.61
Cultural Resources	0.88	3.75
Prescribed Fire	N/A	N/A
Restoration	1.00	5.00
Exotic Species	0.92	4.46
Hydrology	1.00	4.58
Groundwater Monitoring	N/A	N/A
Surface Water Monitoring	0.80	4.40
Resource Protection	0.85	3.60
Adjacent Property Concerns	0.84	4.40
Public Access & Education	1.00	4.23
Management Resources	N/A	4.50
Managed Area Uses	1.00	N/A
Buildings, Equipment, Staff & Funding	N/A	2.40

Dagny Johnson Key Largo Hammock Botanical State Park Land Management Review

Consensus Commendations to the Managing Agency

The following commendations resulted from discussion and vote of the review team members.

1. The team commends the manager and staff for their extensive restoration accomplishments at Port Bouganville and Carysfort sites. (VOTE: 5+, 0-)



2. The team commends the manager and staff for their excellent interagency cooperative efforts to address resources, management issues including exotic species control, listed species monitoring and protection. (VOTE: 5+, 0-)



3. The team commends the DRP park staff for their management actions and invasive plant treatment efforts which have achieved well-maintained natural communities. (VOTE: 5+, 0-)



4. The team commends the DRP biologist and the staff for their extraordinary effort to out plant and monitor the imperiled mahogany mistletoe and semaphore cactus in the rockland hammock. (VOTE: 5+, 0-)



5. The team commends the DRP staff for cooperative efforts to maintain, enhance Key Largo cotton mouse, Largo woodrat, including the captive breeding program and feral cat. (VOTE: 5+, 0-)



Consensus Recommendations to the Managing Agency

The following recommendations resulted from a discussion and vote of review team members. The management plan must include responses to the recommendations identified below.

1. The team recommends that DRP identify additional sources of expanded law enforcement support for the park. (VOTE: 5+, 0-)



Managing Agency Response: Agree. The management plan update will address law enforcement needs. The Division must request additional assistance through the Division of Law Enforcement or from a local law enforcement agency. However, no new law enforcement can be assigned to this or any other park unit unless they are appropriated by the Legislature or reassigned from other units. Funding is determined annually by the Florida Legislature.

2. The team recommends that DRP coordinate with DHR location of cultural sites at the park and determine the appropriate level of monitoring as well as a source for funding additional survey work. (VOTE: 5+, 0-)



Managing Agency Response: Agree. Management will continue to request funding allocation for a Level Two Archeological Survey.

Field Review Checklist Findings

The following items received high scores on the review team checklist, which indicates that management actions exceeded expectations.

- Natural Communities, regarding coastal berm, coastal rock barren, pine rockland, rockland hammock, and marine tidal swamp.

Dagny Johnson Key Largo Hammock Botanical State Park Land Management Review

- Listed Species, regarding animal inventory, Key Largo woodrat, Key Largo cotton mouse, Schaus swallow tail butterfly, liguus tree snail, plant inventory, mahogany mistletoe, and semaphore cactus.
- Natural Resource Survey, regarding listed species or habitat monitoring, other non-game species or habitat monitoring, other habitat management effects monitoring, and invasive species survey/monitoring.
- Cultural Resources, regarding cultural resource surveys, protection and preservation.
- Restoration of Ruderal Areas, regarding dredging and filling marine tidal swamp and rockland hammocks.
- Non-Native, Invasive & Problem Species, regarding prevention and control of plants, animals and pests/pathogens.
- Hydrologic/Geologic Function, regarding roads/culverts, channels/basins, and water level alterations.
- Surface Water Monitoring, regarding surface water quality.
- Resource Protection, regarding boundary surveys, gates/fencing, and signage.
- Adjacent Property Concerns, regarding expanding development, cat colonies, and inholdings/additions.
- Public Access & Education, regarding roads, parking, interpretive facilities and signs, recreational opportunities, management of visitor impacts, and environmental education/outreach.
- Management Resources, regarding waste disposal, sanitary facilities and buildings.

Items Requiring Improvement Actions in the Management Plan

The following items received low scores on the review team checklist, which indicates that the text noted in the Management Plan Review does not sufficiently address this issue (less than .5 score on average.). Please note that overall good scores do not preclude specific recommendations by the review team requiring remediation. The management plan must include responses to the checklist items identified below:

1. Discussion in the management plan regarding Listed Species, specifically the White Crowned Pigeon.

Managing Agency Response: Agree: The management plan update will include a discussion on current listed species.

Items Requiring Improvement Actions in the Field

The following items received low scores on the review team checklist, which indicates that management actions noted during the Field Review were not considered sufficient (less than 2.5 score on average). Please note that overall good scores do not preclude specific recommendations by the review team requiring remediation. The management plan must include responses to the checklist items identified below:

1. Resource Protection, specifically the increase of Law Enforcement Presence, including documentation in the management plan.

Managing Agency Response: Agree. The management plan update will address law enforcement needs. The Division must request additional assistance through the Division of Law Enforcement or from a local law enforcement agency. However, no new law enforcement can be assigned to this or any other park unit unless they are appropriated by the Legislature or reassigned from other units. Funding is determined annually by the Florida Legislature.

2. The need for Management Resources, specifically Equipment, Staff and Funding, with documentation in the management plan.

Dagny Johnson Key Largo Hammock Botanical State Park Land Management Review

Managing Agency Response: Agree. If it is determined that additional staff are needed at the time of the next unit management plan revision, it will be included in the plan. However, no new staff can be assigned to this or any other park unit unless they are appropriated by the Legislature or reassigned from other units. Funding is determined annually by the Florida Legislature and funds are allocated to the 160 state parks according to priority needs.

Division of Recreation and Parks Manager and Key Staff Present:

- Pat Wells, Park Manager
- Trudy Ferraro, Park Biologist

Addendum 9—Habitat Restoration

Dagny Johnson Key Largo Hammock Botanical State Park Topographic Upland and Submerged Resource Restoration Sites

Introduction

The topography of Dagny Johnson Key Largo Hammock Botanical State Park has been altered throughout the Park at various times since the Upper Keys have been inhabited. Typically, the types of alterations in the Park that have occurred prior to State of Florida ownership, include but are not limited to: paved roadways, mechanical clearing of vegetation, dredging activities such as borrow pits, canals and basins, and filling of low lying areas such as wetlands and transitional habitats. Such activities have caused significant damage to the overall health of the ecosystem. Clearing and building activities cause habitat fragmentation, not only removing critical nesting and foraging places, it can also impair the movement of some species restricting them to smaller areas. A prime example of this is the endangered Key Largo Woodrat, the population of which is now segmented into seven distinct genotypes due to the separation of groups of rats from C-905, and the various development areas. Dredging and filling activities alter the precarious system of underground porous Key Largo limestone rock, thus disrupting the geology of the area enough to cause extensive saltwater intrusion into the freshwater upwellings which are an extension of the Biscayne Aquifer. In addition, these development and dredging activities have created large nutrient sinks, trapping nutrient rich materials within the deep canals and basins. When large storm events occur in the upper keys, the nutrients are washed out into the surrounding waters polluting the near shore seagrass beds and coral reef habitats and severely effecting water quality.

It is the mission of the Florida Park Service to provide resource-based recreation while preserving, interpreting, and restoring natural and cultural resources. To this end, the park has made the restoration of these natural features a high priority. Numerous restoration activities have occurred over the last 10 years, although more is still needed to return this sensitive area back to its natural historic state. Below is list of the major topographically altered sites in Dagny Johnson Key Largo Hammock Botanical State Park, from south to north, a brief history of the site, what restoration actions have occurred, what is actively being conducted, and what work is still needed.

1. Management Zone KL-03: Port Bougainville

(Real estate #00563133-000100, Alternative key #8667493)

The Port Bougainville parcel was acquired by the State of Florida in the early 1980's and at the time was the second largest purchase through the Conservation and Recreational Land (CARL) program. Previous to acquisition the site had been in the beginning phases of a large residential development. Management of the land was split between FDEP Rec & Parks and USFWS. The approximately 250 acre portion, ocean-side of C-905, went to the Dagny Johnson Key Largo Hammock Botanical State Park while the bay-side portion went under the management of the Crocodile Lake National Wildlife Refuge.

There have been numerous restoration efforts in this area, most of which have been the result of cooperative efforts with the Keys Environmental

Dagny Johnson Key Largo Hammock Botanical State Park Topographic Upland and Submerged Resource Restoration Sites

Restoration Fund which received mitigation moneys to be used for restoration efforts within the Florida Keys. A brief description of all efforts follows (Figure 1).

- 1994 – KERF Phase I: Scrape-down of fill material within 1.67 acres of black mangrove wetland habitat, fill deposited into marina basin
- 2003 – KERF Phase II: All dock stringers and pilings removed from the basin and the marina headquarters building demolition. Clean fill materials were placed into the boat basin, and all other building materials (insulation, wiring, etc.) were taken to a landfill for disposal
- 2008 – KERF Phase III: Removal of a 4.12 acre fill “mountain” of up to 28 feet in height, and an additional fill removal of 0.51 acres from the road leading out to the “mountain.” All fill material removed during the scrape-down phases was placed into the marina basin, and contours of historic habitats have been recreated based on pre-disturbance site photographs and current ecotones
- 2009 – FDOT: Demolishment of condominium buildings, filling of north and south ‘pit’ areas with materials from the US1 improvement project, and native species plantings***
- 2009 – KERF Planting event: road scrape-down and filled basin wetland habitats were planted with a total of 552 purchased black, white and red mangroves, and 138 saltmarsh and transitional wetland plants donated by the KL nursery
- 2009 – FDEP Planting event: hammock species planting islands

***To date the vegetation material that was planted in the ‘pit’ area has been found to be stunted and very little natural recruitment has occurred. For this reason park staff worked with FDOT in 2012 to conduct a removal of all the planted vegetation north of the access road running through the ‘pit’ area. Once completed DOT contracted machinery to till the substrate loosening up the fill and better promoting natural recruitment. Unfortunately this activity was conducted in conjunction with heavy rain events and the fill compacted down once again. Next mulch was brought in from a variety of sources and placed in the northern ‘pit’ area to a depth of approximately 18 inches. This mulch was then tilled into the underlying fill to create a better soil layer. This area was replanted in the spring of 2014, after the mulch had time to ‘cook-down’.

Current Restoration Efforts

A current phase of restoration is slated to begin in March 2016. This phase will see the removal of the remaining buildings/structures and fill associated with the initial development. Most of the old roads in the area will also be removed, except for the section located in the current day-use section which will be minimized to twelve feet. The areas will be graded down to match surrounding natural elevations. (Figure 2) All acceptable materials which are produced in the course of demolition will be used to fill in the remaining open marina basin and

Port Bougainville Past Restoration Overview



Figure 1: Restoration efforts by area

Dagny Johnson Key Largo Hammock Botanical State Park Topographic Upland and Submerged Resource Restoration Sites

and entrance channel. Due to the healthy hardwood hammock lying adjacent to the site, only one site, the Restaurant & Tunnel location, is slated to be planted using native stock grown in the Park's Native Plant Nursery. Natural recruitment will occur quite readily in the other areas.

Remaining restoration needs

There are three main areas remaining for restoration activities. They are as follows (Figure 3).

- Marina basin & entrance channel: This is the remaining portions of dredged marina basin and entrance channel. All areas will be filled and graded to match surrounding elevations of red mangrove, transitional wetland, and hardwood hammock habitat. This area has all needed permits to continue filling as material and monies become available.
- Impounded wetlands: This is a dredged area within the hardwood hammock habitat created during the development period of Port Bougainville. This area is not deep enough to hold water permanently but low enough that an artificial wetland has been created. This area is currently in the beginning phases of the permitting process.
- Dredged lakes: These are artificial "lakes" which were dredged out of hardwood hammock habitat during the development of period of Port Bougainville. These lakes will need to be filled and graded to match surrounding natural elevations. No restoration steps have been initiated for this area to date. **All non-permitted areas will be assembled into one large restoration package to be permitted together and then phased out as monies and/or materials become available.*

2. Management Zone KL-08: JHT Subdivision

(Real estate #00564912-000300, -000200, -000100; Alternative key #1691721, 1691739, 1691712)

This project area, approximately 3.0 acres, includes a dredged channel that has been plugged and portions of filled upland and wetland habitats, which were all part of platted potential development areas (Figure 4). Restoration goals include the scrap down and subsequent filling of material to historic hardwood hammock, transitional and wetland elevations. Replanting of native upland and transitional plant stock will also take place in the absence of natural recruitment. Current depths of fill and channel are unknown. No restoration steps have been initiated for this area to date. **All non-permitted areas will be assembled into one large restoration package to be permitted together and then phased out as monies and/or materials become available.*

**Dagny Johnson Key Largo Hammock Botanical State Park
Topographic Upland and Submerged Resource Restoration Sites**

3. Management Zone KL-08: Elbow Light Club

(Real estate #s 00564911-000501, -000616; Alternative key #s 1691691, 8738099)

This project area, approximately 1.2 acres, contains a dredged channel and basin within a subdivision which has three privately held lots and two residences (Figure 5). Restoration goals for this area include the filling of the dredged basin and entrance channel to controlling depths that will support marine plants while still being usable by boats. Canal and basin shallowing procedures will follow the standard protocols that are currently being established by the Florida Keys National Marine Sanctuary. Re-vegetation of terrestrial and marine plants will also occur in the absence of natural recruitment. Current depths of fill and channel are unknown. No restoration steps have been initiated for this area to date. **All non-permitted areas will be assembled into one large restoration package to be permitted together and then phased out as monies become available.*

4. Management Zone KL-10, KL-11: Ocean Forest

(Real estate # 00564913-000600, -000700, -000800; Alternative key #1691992, 1692000, 1692018)

Ocean Forest Estates is a subdivision that was historically dredged and filled in preparations of a large development. Based on aerial photographs, it appears that the dredging activities occurred sometime in the 1970s. Prior to 1970, the area contained various native habitats including rockland hardwood hammock, salt marsh wetlands and a mangrove shoreline. The development project consisted of dredging native upland and wetland habitat to create a boat basin and entrance channel. The resulting dredged spoil was placed in the adjacent hardwood hammock (Figure 6).

In 1990 the State of Florida acquired the Ocean Forest Estates property and incorporated the parcel into what is now the Dagny Johnson Key Largo Hammock Botanical State Park. The restoration goals of this site are to restore the area to historic elevation there-by creating increased quality habitat and also improving water quality by filling in the deep canal and entrance channel. Due to the size and scope of the project it is likely that it will proceed in phases. Restored hammock areas will be planted with "islands" of native vegetation, allowing for natural recruitment between the islands. Wetland habitats will be allowed to recruit vegetation naturally. This project is partially permitted and the park is seeking coordination with remaining agencies to finalize permits.

5. Management Zone KL-16: Carysfort Marina

(Real estate # 00081980-000300, Alternative key #8698097)

The Carysfort Marina property was acquired in 1993 by the State of Florida. In the 1980's the site had been partially developed with the intent on creating a multi-family residential facility with marina, but prior to acquisition the property was only actively serving as a marina and campground.

Port Bougainville Current Restoration



Legend





-  Building-foundation
-  Building fill
-  Asphalt-partially asphalt
-  Asphalt road - minimizing 12'

Figure 2: Currently scheduled restoration locations.

Port Bougainville Restoration Remaining



Remaining Restoration

- Remaining upland restoration: approx. 10.66 acres
- Remaining transitional wetland restoration: approx. 1.72 acres
- Remaining mangrove restoration: approx. 1.14 acres

Figure 3: Remaining restoration locations.

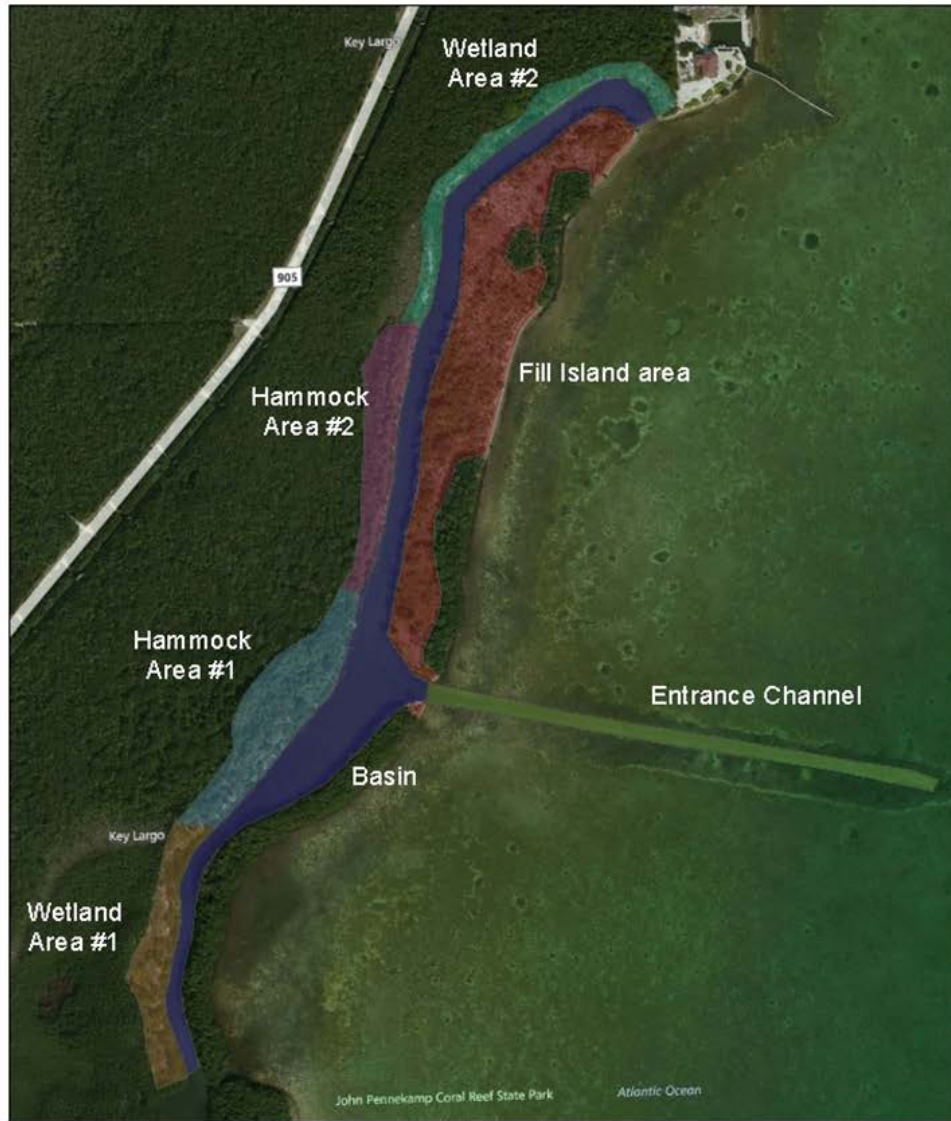


Figure 4: JHT Subdivision needed restoration locations.



Figure 5: Elbow Light Club needed restoration locations.

Ocean Forest Estates - Needed Restoration



Filled Areas

Hammock Area #1	3.2 acres	67,200 cu yrds
Hammock Area #2	2.0 acres	64,320 cu yrds
Wetland Area #1	1.8 acres	17,280 cu yrds
Wetland Area #2	2.5 acres	19,200 cu yrds
Fill Island	9.9 acres	182,400 cu yrds

Dredged Areas

Basin	9.6 acres	45,365.99 cu yds
Entrance Channel	4.96 acres	99,004.10 cu yds

Figure 6: Ocean Forest Estates fill and dredged areas.

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There have been numerous restoration efforts in this area, most of which have been the result of cooperation efforts with the Keys Environmental Restoration Fund which received mitigation monies to be used for restoration efforts within the Florida Keys. A brief description of these efforts follows. (Figure 7)

- 1997 – DEP Planting event: Park staff constructed native plant islands throughout the upland portion of the property
- 1999 – KERF Plug installation: Clean-fill material was deposited in the basin channel entrance and contoured to the existing shoreline until the fill rose above the surface of the water.
- 2001 – KERF Phase I: Scrape down of fill material within 9.87 acres within the north and south sections of the property. The fill was deposited within the deep front basin.
- 2004 – KERF Phase II: Additional scrape down of fill material and subsequent filling of the front basin occurred, on approximately 12.41 acres. Inert material located during excavation, which was left over from the campground development was removed from site and taken to the local land fill. A berm edge was left around the perimeter to provide a buffer to the newly filled basin from erosive wave action to allow for the establishment of the mangroves.
- 2010 – KERF Phase III: The protective berm along with additional fill material was removed and deposited into the front basin. Fill material was also purchased to bring the majority of the front basin up to historic depths.
- 2010 – FDOT fill: 5,433 cubic yards of clean fill material was received and deposited in the remaining basin section.
- 2013 – KERF Phase IV: Scrape down of fill material within the wetland portion of the project area between the two basins and surrounding the back basin occurred, with the fill material being deposited into the back basin. Final contouring of the front basin area also occurred.

Remaining restoration needs

The remaining restoration efforts needed at this site include the filling and contouring of the back basin. This would include 1.02 acres of wetland restoration and 1.96 acres of hardwood hammock restoration if the basin is completely filled (Figure 8). The approximate fill amount needed to complete this project is 115,000 tons of material. This area has all needed permits to continue filling as material and monies become available.

6. Management Zone KL-18: US Army Nike Hawk Missile Radar Site (Real estate #'s 00080840-000000, 00080850-000000; Alternative key #'s 1088048, 1088056)

The Nike Radar Site is a 12 acre parcel of land located just south of the three way intersection of CR 905 and Card Sound Road. It contains the remnants of a Nike Radar military facility which was fully operational between June 1965 and June

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1979. The State of Florida acquired the property in June of 1987. Since that time no restoration has occurred besides the treating of non-native plant species.

Current Restoration Efforts

The restoration goal of this site is to remove all building structures, walkways, parking lot, basketball court, etc. The access road through the site to old CR-905 will be minimized to a 10 foot width. All associated fill will also be removed and the area graded down to match surrounding natural elevations. All radar towers will remain in place to mark the area's historical significance in North Key Largo. Due to the adjacent healthy hardwood hammock, no vegetative plantings are planned. The project area currently has all necessary permits and is ready to begin upon monies becoming available.

7. Management Zone KL-19,20,21,22: Dispatch Slough

(Real estate #'s00080340-000000; Alternative key #'s 1087432)

The Dispatch Slough restoration project was completed in July 1999 and consisted of the removal of three sections roadbeds; Old CR-905 where it crossed the slough on the north end, old Card Sound Rd where it crossed the slough on the south, and the east end of old Card Sound Rd which was within the mangrove habitat. The goals of the site were "to restore the hydrology of the slough feature as closely as possible to its original (pre-development) condition and to restore wetland habitat within the areas of old roadbed resulting in movement, foraging, nesting and resting areas for wildlife including birds, fish, reptiles and amphibians." This project removed 2,240 linear feet of roadbed and helped to restore tidal flow to 257 acres of Dispatch Slough. (Figure 10)

8. Management Zone KL-18 and JP-S2: Dynamite Docks

(Real estate #'s00080820-000000, 00080820-000100; Alternative key #'s1088005, 8663331)

Dynamite Docks was constructed in 1935 to provide an offloading site for materials, such as dynamite, for a shipping company. Once it was acquired by the state and placed under the management of the park, a restoration plan was enacted to return this area to its natural state. The goals of the project were to remove all roads and associated fill, mooring piles, and spoil pits. Fill would also be placed in the entrance channel and basin to match the surrounding seagrass bed (Figure 11). Restoration of this area not only resulted in the enhancement of the associated habitats but increased water flow in the area and raised the water quality. At the completion of the project, which occurred in December of 1994, the very seaward end of the road was left, with the intention of leaving suitable habitat for nesting least terns. A large hole adjacent to this island also remains.

Future Restoration Work

Since the completion of the project, there has been no successful nesting of least terns on the island. The main cause of this is thought to be from too much pressure

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from individuals utilizing the island during nesting season, even with signage posted. Therefore, to completely restore this site, the remaining island would need to be excavated and placed into the large hole bringing the whole area to the natural depth contour of the surrounding submerged lands.



Carysfort Marina Restoration: 32.08 Acres of Wetland Restoration







-  Phase I, 2001: 9.87 Acres
-  Phase II, 2004: 12.41 acres
-  Phase III, 2010, 4.58 acres
-  2010 Fill from FDOT Restoration of Lois Ryan Rd: 0.13 acre
-  Phase IV, 2013: 5.09 acres (does not include final contouring of front basin)
-  Shallow open water pool: 0.04 acre

Figure 7: Overview of restoration activities at Carysfort Marina.

Caryfort Marina Restoration, Work Remaining



Remaining Restoration:
1.02 acres of wetland restoration
1.96 acres of hammock restoration







-  Saltmarsh Wetland elevations, filling: 0.27 acre
-  Saltmarsh elevations, no change needed: 0.04 acre
-  Buttonwood elevations, filling: 0.64 acre
-  Buttonwood elevation contouring: 0.11 acre
-  Tropical Hardwood Hammock elevations, filling: 1.96 acres
-  Access road

Figure 8: Remaining restoration needs at Carysfort Marina.

Nike Radar Site - Current Restoration



Figure 9: Currently identified restoration activities at the Nike Radar Site.

Dispatch Slough - Past Restoration Project



Figure 10: Dispatch Slough project locations.

