COLLIER-SEMINOLE STATE PARK
Park Chapter

BIG CYPRESS REGION

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Collier-Seminole State Park

Park Chapter

Unit Name: Collier-Seminole State Park

Planning Region: Big Cypress

County: Collier

Lease/Management Agreement Number: 3612

Central Park Theme: Nestled within one of the largest mangrove swamps in the world, Collier-Seminole State Park shares stories of preservation and progress within a highly biodiverse landscape.

Total Acreage: 7,270.80

Natural Communities	Acres
Coastal Berm	39
Depression Marsh	6
Dome Swamp	6
Estuarine Unconsolidated Substrate	526
Mesic Hammock	213
Mesic Flatwoods	74
Marl Prairie	46
Mangrove Swamp	3,902
Marine Unconsolidated Substrate	45
Prairie Hammock	66
Rockland Hammock	69
Salt Marsh	782
Scrubby Flatwoods	41
Successional Hardwood Forest	5
Slough	40
Seepage Stream	7
Strand Swamp	561
Wet Flatwoods	721

Altered Land Cover	Acres
Borrow Area	5
Canal/Ditch	8
Clearing/Regeneration	1
Developed	39
Invasive Exotic Monoculture	79

Acquisition: Collier-Seminole State Park was initially acquired on March 8, 1944 through a donation from Lee County Land Company.

Resource Management Component

Hydrology

- Monitor ground and surface water levels secondary to Picayune Strand Restoration Project (PSRP).
- Establish more water quality sampling sites to monitor post-PSRP effects.
- Study the impacts of adjacent agricultural landowners and eliminate future discharge onto park property.
- Collect baseline data that characterizes the Class III Outstanding Florida Waters of the park.
- Collaborate to identify offsite diversion, retention and treatment of poor-quality water before entering the park.
- Assess the park's hydrological restoration needs.
- Restore natural hydrological conditions and functions, including the designing and permitting of projects to facilitate restoration needs, to ± 2,069 acres of natural communities.
- Analyze impacts of park roads on surface drainage, replace nonfunctioning culverts and install additional culverts as needed.

Natural Communities

- Maintain ± 850 acres within the optimum fire return interval within the planning period.
- Develop, implement and update a site-specific restoration plan for ± 105 acres of depression marsh and wet flatwoods.
- Conduct slash pine thinning activities on ± 650 acres of wet/mesic flatwoods.

Imperiled Species

- Develop and update baseline imperiled species occurrence inventory list for flora and fauna.
- Continue existing monitoring protocols for gopher tortoise and Florida bonneted bat.
- Develop and implement monitoring protocols for Florida royal palm, erect prickly-pear cactus and fuzzy-wuzzy air plant.

Invasive and Nuisance Species

- Conduct natural community improvement activities, treating all FISC 1 invasive species, on ± 174 combined acres of strand swamp, wet flatwoods and mesic flatwoods.
- Conduct natural community improvement activities, treating all FISC 1 invasive species, on ± 35 acres of rockland hammock.
- Treat ± 100 acres of non-native plant infestations.
- Reduce cover class of ± 50 acres on an annual basis.
- Remove invasive pythons, feral cats, iguanas and hogs as needed.

Cultural Resources

- Monitor and assess 10 recorded cultural resources.
- Compile reliable documentation for all recorded historic and archaeological resources, ensuring that all known sites are recorded and/or updated in the Florida Master Site File.
- Continue to maintain the Scope of Collections Statement for the park.
- Maintain all recorded sites in good condition.

Land Use Component

Conceptual Land Use

Developed Area

- Repair and resurface park roads and parking areas as needed.
- Repair, replace and expand sidewalks throughout the park to improve access.
- Install low water crossings and culverts as needed.
- Improve park structure resilience.

Blackwater Creek Day Use Area

- Maintain boating and paddling access to the Blackwater River.
- Replace restroom.
- Replace and construct additional picnic pavilions throughout the day-use area.
- Construct a large, screened pavilion.
- Develop and implement an interpretive plan in conjunction with other areas of the park.

Royal Palm Hammock Nature Trail

- Realign and stabilize the trail.

Barron Collier Memorial, Village Site, Blockhouse, and Walking Dredge

- Provide equitable interpretation of this multi-faceted site.

Campground

- Redesign the campground.
- Plan and implement measures for campground resilience.
- Repair campground bathhouses and buildings as necessary.
- Maintain existing group camp in Loop B.

Staff Support Areas

- Replace the entrance station.
- Retrofit or replace staff residences to reasonably safeguard from future flooding.
- Improve park residences and EOT sites infrastructure.
- Renovate utilities in all staff residences.
- Remove and replace one staff residence.
- Add one new staff residence.
- Raise electrical outlets and wiring at the maintenance building.
- Expand pole barns and add utilities as necessary.

Trails

- Evaluate the hiking trail system north of U.S. Highway 41 and identify segments that require armoring.
- Implement armoring and/or stabilization measures as necessary.

Intermediate and Long-term Planning for Hydrological Changes

- Collaborate with stakeholders to monitor, gauge and project receiving hydrology influenced by the greater restoration of Picayune Strand.
- Coordinate and communicate to stakeholders the necessary mitigating measures required to protect park resources.
- Evaluate road and culvert infrastructure to determine long-term efficacy.

Blackwater River

- Coordinate with local, state and federal agencies to install signage on the Blackwater River to aid navigation.
- Designate Mud Bay as a motor exclusion waterway.
- Maintain navigable access to the Gulf.

Optimum Boundary

Acquisition of parcels near the northwest boundary associated with Fiddler's Creek and adjacent agricultural operations should be prioritized to mitigate the increasing water flow into the park.

Parcels east of the golf course and north of the northwestern boundary of the park would help preserve wildlife corridors and prevent future habitat loss.

If acquired, parcels associated with the nearby airboat business could address persistent management issues, as its operations have led to repeated trespassing into park waterways and the creation of unauthorized trails.

INTRODUCTION

LOCATION AND ACQUISITION HISTORY

Collier-Seminole State Park is located in Collier County, approximately 15 miles southeast of Naples. Access to the park is from U.S. Highway 41 (Tamiami Trail). The Big Cypress Region map reflects significant land and water resources existing near the park.

Collier-Seminole State Park was initially acquired on March 8, 1944, through a donation from Lee County Land Company. Currently, the park comprises 7,270.80 acres. The Board of Trustees of the Internal Improvement Trust Fund (Trustees) hold fee simple title to the park, and on January 23, 1968, the Trustees leased (Lease No. 2324) the property to the Department of Environmental Protection's (DEP) Division of Recreation and Parks (DRP) under a 99-year lease. In 1988, Collier-Seminole State Park was assigned a new lease number (Lease No. 3612) without changing any of the terms and conditions of Lease No. 2324. The current lease will expire on January 22, 2067.

Collier-Seminole State Park is designated single-use to provide public outdoor recreation and conservation. There are no legislative or executive directives that constrain the use of this property (see statewide section – management authority and responsibility). A legal description of the park property can be made available upon request to DEP.

SECONDARY AND INCOMPATIBLE USES

In accordance with section 253.034(5), Florida Statutes (F.S.), the potential of the park to accommodate secondary management purposes was analyzed. These secondary purposes were considered within the context of DRP's statutory responsibilities and resource values. This analysis considered the park's natural and cultural resources, management needs, aesthetic values, visitation and visitor experiences. It was determined that no secondary purposes could be accommodated in a manner that would not interfere with the primary purpose of resource-based outdoor recreation and conservation.

DRP has determined that uses such as water resource development projects, water supply projects, stormwater management projects, linear facilities and sustainable agriculture and forestry (other than those management activities specifically identified in this plan) would not be consistent with the management purposes of the park.

In accordance with section 253.034(5), F.S., 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 multiple-use management activities would not be appropriate as a means of generating revenues for land management. Instead, techniques such as entrance fees, concessions and similar measures will be employed on a case-by-case basis as a means of supplementing park management funding. Generating revenue from consumptive uses or from activities that are not expressly related to resource management and conservation is not under consideration.

PURPOSE AND SIGNIFICANCE OF THE PARK

Park Purpose

The purpose of Collier-Seminole State Park is to protect an example of Southwest Florida's unique blend of natural communities and wildlife habitat, a landscape that includes one of the last remaining original stands of royal palm trees in Florida and a portion of one of the largest mangrove swamps in the world. The park also serves as a memorial to Barron Collier and a tribute to the Seminole people.

Park Significance

- The park preserves 18 distinct natural communities, including mesic flatwoods that serve as important habitat for several imperiled species. The rockland hammock is distinctive as it is home to a native stand of royal palms. The vast majority of the park is part of the great mangrove swamp of South Florida.

- Along with 38 imperiled plant species, the park protects notable imperiled mammal and reptile species like the Florida panther, Big Cypress fox squirrel, Florida manatee, American alligator, American crocodile and gopher tortoise.

- Flowing into the Ten Thousand Islands National Wildlife Refuge, the park protects the Blackwater River and Mud Bay that provide sanctuary for several imperiled bird species and the smalltooth sawfish.

- The park's name is derived from Barron Gift Collier, entrepreneur, developer and county namesake, who financed a portion of the Tamiami Trail and donated land for the park, and the Seminole and Miccosukee people whose resilience and lifeways have helped shape the area since the 1700s.

- The park preserves historic structures and sites, notably Grocery Place, which contain prehistoric shell middens and two cisterns from the early 20th century. In addition to the replica blockhouse, built in 1940, the park interprets the Bay City Walking Dredge that was used in the construction of the Tamiami Trail and was officially listed to the National Register of Historic Places in 2013 as a National Historical Mechanical Engineering Landmark.

- As a part of the Great Florida Birding and Wildlife Trail, the park offers numerous public recreation opportunities including RV and primitive campsites, hiking and biking trails, canoe and kayak trails, guided tours, boating that can accommodate watercraft up to 24 feet, salt and freshwater fishing, geocaching and historical interpretation.

Central Park Theme

Nestled within one of the largest mangrove swamps in the world, Collier-Seminole State Park shares stories of preservation and progress within a highly biodiverse landscape.

Internal Classification

Collier-Seminole State Park is classified as a state park in the DRP unit classification system. Balance is sought between the goals of maintaining and enhancing natural conditions and providing various recreational opportunities. Natural resource management activities are aimed at management of natural systems. Development in the park is directed toward providing public access to and within the park, and to providing recreational facilities, in a reasonable balance, that are both convenient and safe. Program emphasis is on interpretation on the natural, aesthetic, and educational attributes of the park.

OTHER DESIGNATIONS

The unit is within the Big Cypress Area of Critical State Concern as defined in section 380.05, F.S. This vast natural landscape contributes to the hydrological and ecological integrity of the greater Everglades basin and is vital to the environmental sustainability of Southwest Florida. The park is also a component of the Florida Greenways and Trails System, administered by the DEP's Office of Greenways and Trails.

All waters within the park have been designated as Outstanding Florida Waters, pursuant to Chapter 62-302, Florida Administrative Code (F.A.C.). Surface waters in this park are also classified as Class III waters (suitable for fish consumption and recreation) by DEP. The park is contiguous with the Cape Romano-Ten Thousand Islands Aquatic Preserve as designated under the Florida Aquatic Preserve Act of 1975 (section 258.35, F.S.).

PARK ACCOMPLISHMENTS

- Designed and constructed a new butterfly garden in front of the historic Blockhouse.
- Created a bypass trail for the 6.5-mile hiking trail, providing more reliable access.
- Established new kiosks for campers that are being used for a newly created self-check-in process.
- Repaired all park facilities damaged by recent hurricanes (i.e., hurricanes Irma, Ian, Helene and Milton).
- Completed Boat Basin improvements, including ADA-compliant fishing dock, floating fishing pier, accessible floating paddlecraft launch dock and boat dock, as well as improved ADA-compliant parking.
- Developed new mobile office spaces, currently being used for a ranger station and administrative functions.
- Added a new campground restroom facility within Loop A.
- Added several new storage facilities including multiple sheds and a large pole barn.
- Installed a new automatic lift in the maintenance area to increase efficiency of park vehicle and equipment maintenance.
- Entered a commercial use agreement with a remote kayak rental concessionaire.
- Obtained four new resource management dedicated positions for FY 2025-26 (OPS and AmeriCorps).

RESOURCE MANAGEMENT COMPONENT

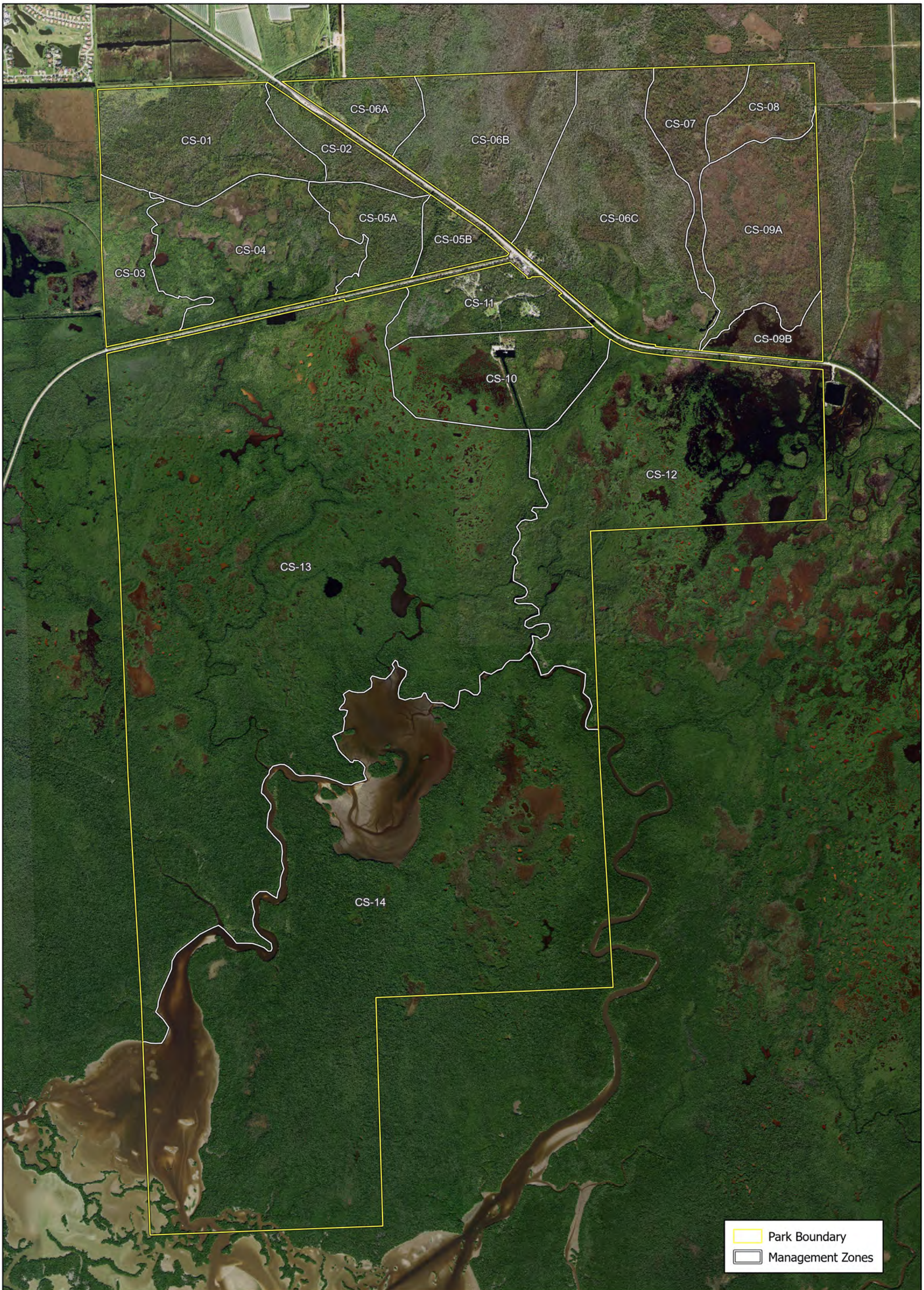
Collier-Seminole State Park Management Zones		
Management Zone	**Acreage**	**Managed with Prescribed Fire**
CS-01	243.47	Yes
CS-02	65.88	Yes
CS-03	116.8	Yes
CS-04	274.37	Yes
CS-05A	96.66	Yes
CS-05B	49.16	Yes
CS-06A	75.79	Yes
CS-06B	243.14	Yes
CS-06C	419.58	Yes
CS-07	106.14	Yes
CS-08	86.09	Yes
CS-09A	241.63	Yes
CS-09B	56.63	Yes
CS-10	219.90	Yes
CS-11	123.59	No
CS-12	682.97	Yes
CS-13	2,236.73	No
CS-14	1,932.28	No

TOPOGRAPHY

Collier-Seminole State Park is in the Caloosahatchee District, and the falls within the Big Cypress and Ten Thousand Islands region respectively. The submerged southern portion of the park lies within a network of coastal swamps and is covered by water at high tide. Topography throughout is subdued, the uplands in the park exceed five feet in elevation only at a few locations. The topography has been altered by borrow canals bordering County Road 92 and U.S. Highway 41, and by a dike enclosing organic soils at a site once used for farming. The dike is in Section 28, T51S, R27E.

SOILS

The U.S. Department of Agriculture's (USDA) Natural Resources Conservation Service (NRCS) identifies 11 different soil types (see Soils Map) in the park (NRCS 1990). Over most of Collier County, a thin blanket of sand and marl, and fine shell of Pamlico Sea origin, covers the limestone. Organic matter has filled natural depressions in the limestone. These sands and their accumulated organic material form the substratum for the biological systems of the county and, before the hydrological disruptions caused by extensive canal building were in direct or close contact with the water table. It is the organic material in the upper layer that yields the acids responsible for dissolution of the underlying limestone. Four of the soil types are characteristic of the wet to mesic flatwoods at the park, these are represented by the Immokalee-Oldsmar-Basinger association; Oldsmar fine sand, limestone substratum; Oldsmar fine sand; and Ft. Drum and Malabar, high, fine sands. Freshwater wetland soils include Ochopee-Pennsucio; Holopaw and Okeelanta; Boca, Riviera, limestone substratum and Copeland fine sands; and Holopaw



COLLIER-SEMINOLE STATE PARK
Management Zones

N

0 2,000 4,000 Feet

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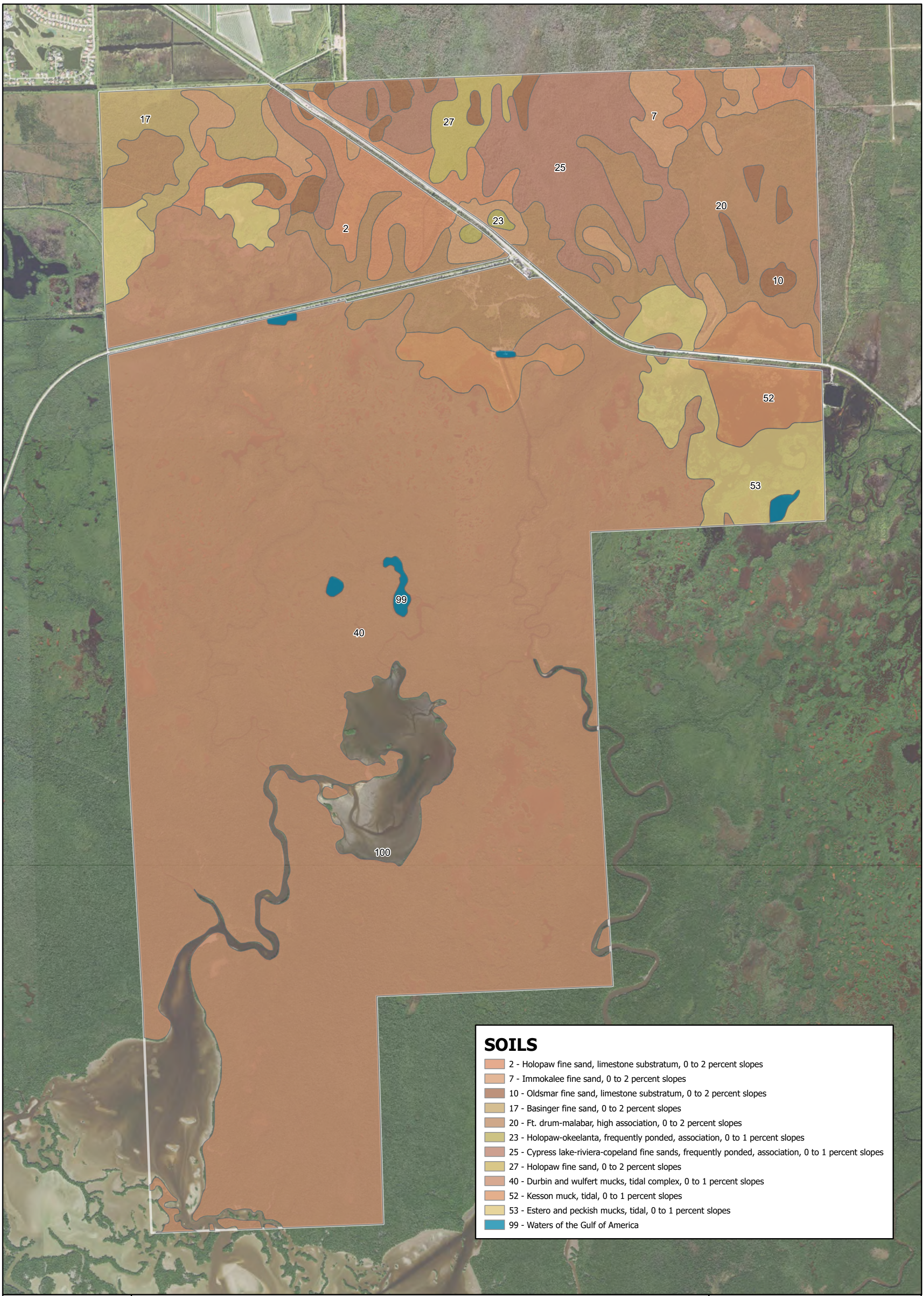

COLLIER-SEMINOLE STATE PARK
Soils

N

0 2,000 4,000 Feet

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fine sands. Soils of the salt marsh and mangrove swamps include Durban and Wulfert mucks; Kesson muck; and Estero and Peckish soils. The parks hammocks are associated with Basinger fine sands.

Currently, there are no soil conservation or erosion issues at this park.

MINERALS

Mineral resources of economic value in southern Florida include limestone, high silica sand, clay, phosphate rock, peat, oil and gas. As implied above under the section on geology, limestone underlies the entire park. The uppermost strata are within a few feet of the ground surface, being covered in most instances by a layer of sand or marl. During the 1980s, seismic explorations, using explosives, were conducted in the park during a search for oil. Presumably, no oil was discovered.

HYDROLOGY

Most of the county is so low and level that drainage is indefinite and sluggish. The coastal region has numerous embayment, rivers, creeks and lagoons that permit tidewater to extend inland, in a northerly direction. Following heavy rains, and during the rainy season in summer, wet prairies, and even the islands within the Big Cypress Swamp may be covered by a few inches to several feet of water.

Drainage has been extensively altered in Collier County, first by highway development, and later by agriculture and urbanization, including the gigantic land sales project of the Gulf American Corporation (now known as Southern Golden Gate Estates).

In this region drainage is seasonal, normally building in the months of heaviest rainfall (June through September), with a peak in the fall and a slow subsidence in the months thereafter, sometimes ceasing altogether, leaving water standing in surface depressions. In very dry years, all surface water is lost to evaporation or absorbed by the porous substrate. During the wettest months, the water historically moved southward as sheet flow, perhaps as slowly as 0.3 feet per second (0.5 miles per day) on its way to estuaries south of the park. However, the historic flow pattern of surface water had been disrupted on a massive scale.

A map published in 1976 shows the historic drainage basins of western Collier County. Collier-Seminole State Park is situated in the Camp Keais Basin, a narrow, elongate feature originating just south of Lake Trafford and extending southward to the saline waters south of U.S. Highway 41.

Historically, the original surface water flow in this basin had been intercepted northwest of the park by the Golden Gate Estates canal grid that discharges the water through the Faka Union Canal into Faka Union Bay. Other tracts in this basin to the north and northwest of the park have been ditched and diked to grow vegetables, thereby potentially displacing a volume of surface water equal to the size of each tract. All these disturbances have rendered the Camp Keais Basin dysfunctional. The Collier County Comprehensive Plan contains a map of drainage basins revised to reflect the current reality imposed by canals on the movement of surface water; in this scheme the land in and around Collier-Seminole State Park, north of U.S. Highway 41, is named the Southern Coastal Basin, while a large region south of U.S. Highway 41 is designated Miscellaneous Coastal Basins. Drainage is also altered by canals along the Tamiami Trail (U.S. Highway 41) from Naples to the southeastern corner of the county and along County Road 92 from Marco Island to Royal Palm Hammock. The highways intersect in the park. The material excavated from the canals became the roadbed.

Groundwater has been affected by man-made canals constructed through, and adjacent to, the park. During the dry season, when surface water drops, the canals facilitate the lowering of groundwater from nearby subsurface strata. This pattern contributes to the shortening of hydroperiods, the consequences of which can be seen in vegetative changes occurring in the park's natural communities; for example, the encroachment of slash pines into communities formerly dominated by cypress. The drainage within the park finds its strongest expression in the Blackwater River. The river first becomes identifiable within the park, north of U.S. Highway 41. It is a creek at this point. It flows under U.S. Highway 41 and thereafter becomes better identified as a stream that widens to a river as it flows southward. Thus, the Blackwater River has a length of about 8 miles. The flow varies seasonally, increasing in volume during periods of greatest rainfall.

The man-made canals within, and adjacent to, the park was originally built to facilitate draining the roads, an agricultural site and residential areas. These canals have lowered the water table, accelerated runoff during the rainy season and reduced hydroperiods. Drainage has also contributed to saltwater intrusion in the park (and in the surrounding countryside). A study by Tabb et al. 1976 states, "We have noted, with special concern, the strong inland flow of tide water through the Blackwater River culvert under the Tamiami Trail. During low groundwater stages, this is a serious point source of contamination of sand-filled basin storage in the southeastern Belle Meade (drainage) Basin as well as the southern end of the Picayune Strand. Finally, although not within the confines of the Golden Gate Estates, some measure of control should be established on the Blackwater River at Collier-Seminole State Park. A control structure (C11) should be considered at the U.S. Highway 41 Bridge to prevent over-drainage of the southeastern portion of the Belle Meade Basin." This and other control measures should be investigated to restore hydroperiods in the park.

The greater Comprehensive Everglades Restoration Project which includes Picayune Strand State Forest is now complete (February 2026). The Rookery Bay National Estuarine Research Reserve (NERR) and the Cape Romano Ten Thousand Islands Aquatic Preserve now serve as the receiving areas for hydrology traversing through Collier-Seminole State Park. The hope has been that the project will generally have a positive impact on the park's natural communities as far as increased water levels and hydroperiods. Unfortunately, this has not been the case. Through observations and collection of well data the park staff have seen negative impacts on hydrology (too much water in CS-01, 02, 04, 5A, 08, 9A and 9B). In addition, excess pumping of water during heavy rain events may send large pulses of water to the park, contributing to conditions ideal for Burmese python habitat, as well as the rapid introduction of non-native invertebrates (e.g., island apple snail, *Pomacea maculata*). Exceedingly high volumes of water reaching the park also reduces the potential denning habitat for the Florida panther (*Puma concolor coryi*) in various management zones.

Water Quantity

Objective: Monitor ground and surface water levels secondary to Picayune Strand Restoration Project (PSRP).

Action:

- Continue data collection and maintenance of the 11 groundwater wells.

Monitoring wells were installed in February 2021 to begin tracking water levels to assess the pre- and post-PSRP. This includes ground water levels and surface water levels, the latter during rainy periods when the ground water apex is at or near the ground surface. A total of 12 wells were installed with DRP funds; one well (well 5) had to be removed from the Native American village. Three of the 11 wells also

record the conductivity of the ground/surface water (wells 4, 6 and 12). The wells are set to record every hour. The well data should be collected every three to six months and every six months the three wells that record conductivity need to be calibrated.

Water Quality

Objective: Monitor water quality.

Actions:

- Establish more water quality sampling sites within the park for post-PSRP effects.
- Study the impacts of adjacent farm discharge on management zones CS-01, CS-02, CS-03, CS-04, CS-05A and CS-06A, and eliminate future discharge onto park property.
- Collect baseline data that characterizes the Class III Outstanding Florida Waters of the park.

A large commercial farm operation adjacent to the northwest section of the park has been allowed to discharge their excess canal water into the park along management zones CS-01 and CS-02. The discharge from the commercial farm, particularly during major rain events, is a point source of contaminants, as are the canals and new conveyance features along U.S. Highway 41 and County Road 92. One problem is that the agricultural field runoff causes nutrient loading in the park's wetlands. Secondly, excess water prevents access for park staff during the rainy season (i.e., July through October). Finally, the discharge serves as a non-native seed source that has introduced new non-native plants to the park (e.g., downy rose myrtle, para grass, castor bean amongst others).

In 2022, five surface water locations were selected to begin monitoring water quality. Initial monitoring efforts at these five locations are largely intended to establish baseline data to determine potential contaminant levels as well as identify future trends. In addition to these five point-source locations, there is a need to establish other surface water monitoring locations to establish baseline water quality data for Outstanding Florida Waters within the park. While DRP does not have the resources or expertise to conduct water quality analysis within the park, interagency partnerships with Collier County, DEP, South Florida Water Management District (SFWMD) or comparable contractual services should be explored to continue this important monitoring need.

Objective: Improve water quality.

Action:

- Collaborate to identify off-site diversion, retention and treatment of poor-quality water flowing from agricultural lands before entering the park.

Adjacent agricultural lands have released excess irrigation water onto park property for several decades along management zones CS-01 and CS-02. More recently, the southwest protection feature intended to exclude agricultural properties from the influx of Picayune water have exacerbated the need to release excess water that accumulates within this confined space during major rain events. Likely impacts include nitrogen, phosphorous, sulfur loading and pesticide runoff. While the long-term effects of agricultural runoff have not been determined, efforts to mitigate the inevitable impacts should be pursued. Acquisition of adjacent private lands by Collier County, state or a nongovernmental organization should be considered to divert the farm run-off and possibly create a storm water treatment area before it reaches any Outstanding Florida Waters. A feasibility study for such a surface

water retention concept was accomplished by SFWMD between 2020-2023 that laid out options in a detailed plan.

Hydrological Alterations

The natural hydrology of most state parks has been impaired prior to acquisition to some degree. 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 the 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: Assess the park's hydrological restoration needs.

Actions:

- Continue to cooperate with state and federal agencies and researchers regarding hydrological research and monitoring programs within the park, particularly those focused on freshwater wetlands, groundwater levels and water quality in associated estuarine waterbodies.
- Continue to monitor, review and comment on proposed land-use/zoning changes within lands bordering the park.

The most significant disruptions to the park's hydrology since the park's inception has been U.S. Highway 41 and County Road 92. These elevated roadways act as dams, reducing the sheet flow of water to the south and southwest respectively. Since the completion of the PSRP in February 2026, two new box culvert locations (3- 12x4 foot on U.S. Highway 41 and 1- 12x4 foot on County Road 92) have been added to increase flows. The culverts along U.S. Highway 41 have had a negative impact on CS-02, 4 and 5A. Extremely large quantities of water are now drained south under U.S. Highway 41 through culverts causing extensive flooding and damage to Old Marco Road which is now overtopped more frequently after normal summer rains. These culverts have a capacity of 200 cubic feet second, which is greater than the flow of the Weeki Wachee River at its spring head. The culverts are concentrated in a small area, so the new culverts do not spread the water out as sheet flow and are a point source of polluted water. One more box culvert still needs to be added along U.S. Highway 41 by the Blackwater River head waters. The few old bridge culverts that do exist (bridges 37, 39, 42, 43 and 44) funnel water quickly into the estuaries without surface waters being filtered through natural processes. The drainage along the two roads also allows saltwater intrusion, which historically would not have taken place.

In management zone CS-01, two man-made features have altered the hydrology. The first feature known as the "bicycle seat feature" is a berm approximately 4,632 feet in length that was created by a farmer in the 1930s as a water protection feature. The berm continues to redirect water on the perimeter and retain water on the interior. The interior portion of this feature was mulched in 2018, and the regrowth has been mixed with native and non-native vegetation. The second hydrological feature is a shallow ditch approximately 7,715 feet along the north side of Old Marco Road. The ditch was a result of Old Marco Road construction in the early 1900s. The alterations listed above have had an impact on the hydroperiod and hardwood encroachment in marshes and have altered surrounding plant communities.

As stated in the last plan, baseline hydrological data, as called for in the 1988 Collier County Comprehensive Plan, are needed on hydrodynamics, topography, flow volumes, and other physical characteristics. The SFWMD should be a part of any actions affecting hydrology. Monitoring the pumping of excess water from an adjacent agricultural field onto the park should continue and management should be alert to any opportunities that present a solution to improve the quantity and quality of this water discharge into the park.

Restoration

Objective: Restore natural hydrological conditions and functions to a combined 2,069 acres of wet flatwoods, strand swamp, marl prairie, mesic hammock, slough and salt marsh.

Action:

- Design and permit projects to facilitate restoration needs.

Filling in or plugging approximately 7,715 feet of ditch along Old Marco Road and installation of additional culverts where there are natural historical flow ways should be studied and implemented as feasible. This would improve the north-south sheetflow and would decrease the chance of erosion along Old Marco Road.

Corresponding management actions south of Old Marco Road would include reducing hardwoods encroachment. The first step would be to treat any hardwoods with herbicides in the marl prairie. Treatment in the prairies should proceed cautiously (i.e., no vehicles) as these ephemeral wetlands are prone to rutting. The second step would be to increase the fire interval as the treatments take place. The condition of natural communities north of U.S. Highway 41 will presumably improve because of the PSRP. The balance for the communities north of U.S. Highway 41 is to increase the hydroperiod duration without significantly altering the pine flatwoods communities where several listed species reside.

Now that the PSRP is complete, it has increased the hydroperiod which has made it difficult for park staff to manage park resources because of wet conditions. As a result, many of the service roads in the park will need low-water crossings, particularly at natural flow ways.

Ditch plugs along the east and west portions of County Road 92 should be considered to more naturally retain water within the greater landscape. Ditch plugs would also serve as barriers to saltwater intrusion into freshwater communities during storm surge events.

Another man-made feature that impacts sheet flow is referenced above as “the bicycle seat.” This is a berm located within management zone CS-01 that was created to exclude water from formerly cultivated land. Consistent with other proposed restoration measures, full removal or the removal of sections should be considered and implemented, as feasible, to help restore a more natural sheet flow. Correspondingly removal or reduction of woody species should occur within the interior of “the bicycle seat.”

DRP should continue to work with lead agencies such as the Florida Fish and Wildlife Conservation Commission (FWC), SFWMD, U.S. Army Corps of Engineers (USACE) and U.S. Fish and Wildlife Service (USFWS), so that Collier-Seminole State Park’s hydrological monitoring and improvement measures are sufficiently evaluated and addressed to the extent feasible.

Objective: Analyze impacts of park roads on surface drainage and provide corrective measures.

Actions:

- Replace nonfunctioning culverts.
- Install additional culverts as needed.

Since the development of the park and its facilities, the hydrology of the rockland hammock community has been altered where it interfaces with park roads elevated above the natural grade. In general, roads cause water to pool on the updrainage side and exclude water from reaching the down-drainage side. This is evident in the campground's "loop A" (camp sites 1-19) where interior roads cause water to back up into the campsites.

Roads within the park have contributed to the invasion of coastal willow and other hardwoods resulting in altered portions of the rockland hammock community. Management actions should include the installation of various size culverts based on a hydrological flow study for this sensitive natural community. The old culverts that do exist are plugged with debris or woody material and are inadequate in size for promoting water flow.

NATURAL COMMUNITIES

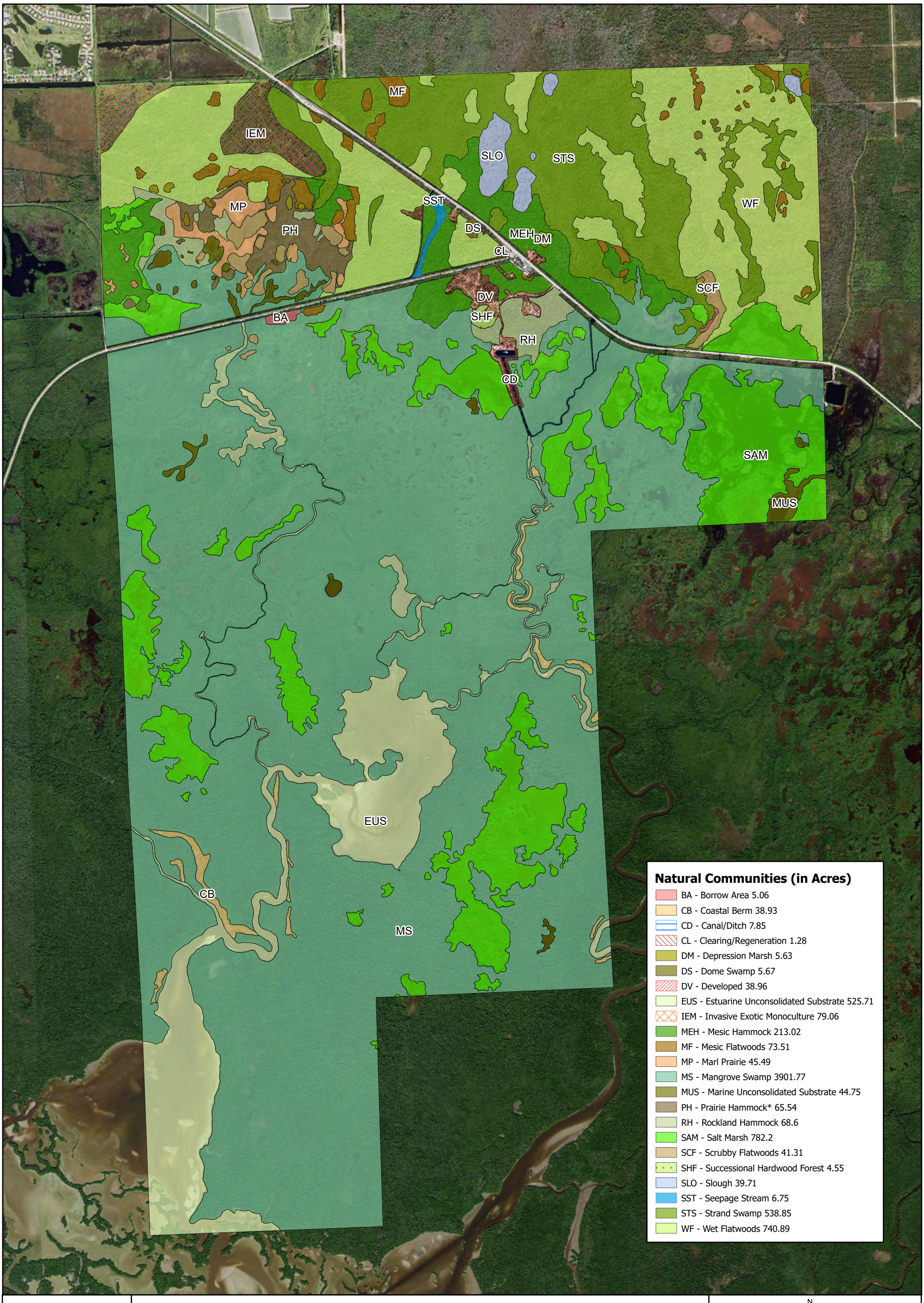
The park contains 18 distinct natural communities as well as altered landcover and developed areas (see Natural Communities Map). A list of known plants and animals occurring in the park is included in the Southwest District Species Matrix appendix.

Coastal Berm

Coastal berm is distinctive but sparsely scattered in small units among mangroves swamp. In South Florida, it can be characterized as a coastal natural community with predominantly xeric plant species, many of which are conspicuously armed with spines or thorns. The xeromorphic features of these plants include reduced leaf surface area, succulence, and as mentioned, spines or thorns. The majority are woody perennials of short stature, between 6 to 15 feet in height. This community type has been recognized in subtropical to tropical regions at similar latitudes around the globe.

The closest ecological counterpart in Florida outside of Collier-Seminole State Park may be in the Cape Sable hammock region of Monroe County, mentioned by Craighead, 1971, in *The Trees of Southern Florida Vol. 1, The Natural Environments and their Succession,* as a possibly distinct plant association within the Cape Sable hammocks. The community was originally described by Harper, 1927, in *Natural Resources of Southern Florida.* He called these communities shore hammocks or cactus thickets. Others have described this community as a thorn woodland. Rzedowski, 1986 in *Vegetacion de Mexico* called it *Bosque espinoso* or Thorn Forest. The examples in the park are too lacking in stature to call a forest; scrub is more appropriate.

This community occurs in the park at three locations–Grocery Place, Old Grove and an unnamed site along the Blackwater River in the southeast corner of the park. This community is to be considered in fair condition. Grocery Place has evidence of human habitation in the early part of the 20th century. No records have been found of habitation at Old Grove. At the Old Grove site, the natural community is re-establishing itself, while at Grocery Place, the clearing dominated by non-native St. Augustine grass



COLLIER-SEMINOLE STATE PARK
Natural Communities - Existing Conditions

N

0 2,000 4,000 Feet

This graphical representation is provided for informational purposes and should not be considered authoritative for navigational, engineering, legal, and other uses.

(*Stenotaphrum secundatum*) is maintained for primitive camping. Grocery Place location has also been infested by lead tree (*Leucaena leucocephala*) and Brazilian pepper (*Schinus terebinthifolia*).

Ongoing chemical treatments have brought the infestation to a maintenance level. Other coastal berm sites have been found to have Brazilian pepper as well. The coastal berm community in the Blackwater River area is represented by narrow strips of small catclaw blackbead along brackish watercourses. Some of the animal species that occur in the coastal berm community include songbirds (e.g., white-crowned pigeon [*Patagioenas leucocephala*] and mangrove cuckoo [*Coccyzus minor]*), small mammals (e.g., raccoon [*Procyon lotor*], opossum [*Didelphis virginiana]*, and river otter [*Lontra canadensis]*) and a variety of snakes (e.g., mangrove water snake [*Nerodia clarkii compressicauda]*).

To ensure the long-term health of this community, ongoing removal of non-native plants is essential. For the community to be considered in a maintenance state, non-native plant coverage must be kept below five percent overall. Surveys for non-native plants should be carried out every two years or assessed through incidental observations to gauge the effectiveness of treatment efforts. Mechanical removal is not feasible due to accessibility issues and high costs. Additionally, since this community does not depend on fire, it should not be used as a management tool.

Mesic Flatwoods

The mesic flatwoods community is present throughout the park interspersed as scattered islands among wet flatwoods and strand swamps. This community is in good to fair condition. Infrequent fire intervals in the past have led to the invasion of shrubby hardwoods such as dwarf live oak (*Quercus minima*), sand live oak (*Quercus geminata*) and dense patches of saw palmetto (*Serenoa repens*). Mesic flatwoods are distinguished from wet flatwoods by the presence of large, contiguous patches of saw palmetto. Some large, pre-disturbance slash pines are present as well. Both communities have slash pines in the overstory, although they are generally more stunted in wet flatwoods. The mesic flatwoods have enough continuous coverage of saw palmetto to give a characteristic “slick” signature on aerial photographs. Although small in proportion, the community is noteworthy because of the slash pine trees that are quite old and of impressive size, even though some trees were removed during the 1960s through selective cutting. The old growth pines can be found in the following management zones CS-02, CS-04, CS-05A, CS-06B, CS-06C, CS-07 and CS-08.

Some common and occasional animals that can be seen in this community can range from short-tailed shrew (*Blarina* sp.), hispid cotton rat (*Sigmodon hispidus*), Florida black bear (*Ursus americanus floridanus*), Florida panther, bobcat (*Lynx rufus*), songbird species, snakes (e.g., southern black racer, (*Coluber constrictor priapus),* corn snake (*Pantherophis guttatus)*, eastern (yellow) rat snake (*Pantherophis alleghaniensis)* and eastern diamondback rattlesnake (*Crotalus adamanteus*), birds of prey and gopher tortoise (*Gopherus polyphemus*). An active bald eagle (*Haliaeetus leucocephalus*) nest is found in this community along the western portion of the park in CS-004. A nest identification by FWC has not been established for this nest. Brazilian pepper, Old World climbing fern (*Lygodium microphyllum*) and Caesar weed (*Urena lobata*). Brazilian pepper tends to invade the periphery while Old World climbing fern can be found in scattered clump. Also, some small patches of melaleuca (*Melaleuca quinquenervia*) can be found scattered through this community.

The saw palmetto in overgrown mesic flatwoods should be mechanically thinned and other areas allowed to grow in small pockets above four feet to allow for panther denning sites (personal communication 2012, D. Onorato, FWC). Mechanical treatment should only be done if fire has been excluded beyond the fire return interval. If mechanical work is done in this community, utmost care should be taken because of the gopher tortoise burrows (i.e., surveying and marking burrows).

Mesic flatwoods are closely associated with and often grade into wet flatwoods or scrubby flatwoods. The differences between these communities are generally related to minor topographic changes. Wet flatwoods occupy the lower, wetter areas while scrubby flatwoods occupy the higher, drier areas.

To enhance this community over the long term, regular application of prescribed fire and removal of non-native plants are essential. To maintain the community's health, non-native species coverage should be kept below five percent. Periodic mechanical treatments along service roads and fire breaks in mesic flatwoods will help reduce fire intensity on mature trees. Additionally, thinning pines in mesic flatwoods is necessary to achieve historic density levels, which will be determined by comparing 1940s U.S. Geological Survey (USGS) aerials with current aerials from Collier County. Medium to heavy equipment should be used to manage saw palmetto and oak thickets and restore parts of the mesic flatwoods to their desired future condition. Most mechanical work should focus on management zones CS-06A, CS-06B and CS-06C. Feral hogs (*Sus scrofa*) are not a significant issue in this community, as Florida panthers prey on them, which moderates their population within the park. To maintain the community in a healthy state, non-native species coverage must be kept below five percent.

Mesic Hammock

Mesic hammock is located in the western part of the park, just south of Old Marco Road, in management zones CS-04, CS-05A, CS-6A and CS-6B. It is currently in fair condition. The mesic hammocks here are characterized by clusters of cabbage palm (*Sabal palmetto*) and live oak (*Quercus virginiana*) amid marl prairies or marshlands. They likely represent the prairie mesic hammock variant transitioning into a more coastal hydric hammock near the ecotone with salt marshes. This community (CS-04 and CS-5A) appears to be an advanced successional stage of marl prairie, influenced by the exclusion of fire. The understory is relatively open, featuring plants such as wax myrtle (*Morella cerifera)*, white stopper (*Eugenia axillaris)*, Spanish stopper (*Eugenia foetida)*, marlberry (*Ardisia escallonioides)*, pigeon plum (*Coccoloba diversifolia)*, poison ivy (*Toxicodendron radicans*), both epiphytic and terrestrial orchids and occasional gumbo-limbo (*Bursera simaruba*) trees. If fire exclusion continues, this community could potentially succeed to a rockland hammock, provided there is additional accumulation of humus.

Non-native plants in this community include Brazilian pepper and Old World climbing fern, with Brazilian pepper primarily invading the periphery and climbing fern appearing in scattered clumps. Small patches of melaleuca are also present throughout the area. The community supports various wildlife, including raccoons, opossums, Florida black bears, cotton mice (*Peromyscus gossypinus*), songbirds and several snake species such as black racers, corn snakes, eastern diamondback rattlesnakes and eastern (yellow) rat snakes.

To ensure the long-term enhancement of this community, regular management of non-native plants and occasional prescribed fire treatments are essential. Fire should not be directly applied but should be allowed to naturally burn into the community from adjacent fire-dependent areas. To maintain the community in a healthy state, non-native species coverage must be kept below five percent.

Rockland Hammock

Rockland hammock was the primary reason for the attempted establishment of Lincoln-Lee National Park. The park's founders were particularly attracted to this tropical forest, especially its majestic royal palms, which they sought to protect. Even beyond these iconic palms, rockland hammock remains a notable example of a surviving tropical hardwood forest in southern Florida. Currently, the community is in fair condition. It supports about 35 tree species, including notable northern records like graytwig, (*Schoepfia schreberi*) inkberry (*Exothea paniculata*) and devil's claw (*Pisonia aculeata*). From the nature trail, visitors can view impressive specimens of satinleaf (*Chrysophyllum oliviforme)*, Jamaica dogwood or Florida fishpoison tree (*Piscidia piscipula*) and Simpson's stopper (*Myrcianthes fragrans*). A particularly sizable strangler fig (*Ficus aurea*) grows near the nature trail. However, some trees were cleared during park development for facilities, with possible earlier clearing by settlers or Native Americans. The memorial field, service area, picnic areas and part of the campground were originally part of the rockland hammock. Restoration efforts include natural succession and regular removal of non-native plants.

Non-native species prevalent in the rockland hammock include Brazilian pepper and monk orchid (*Oeceoclades maculata*). Wildlife sightings in this area include Liguus tree snails (*Liguus fasciatus*), bobcats (*Lynx rufus*), Florida black bears, raccoons, songbirds, white-crowned pigeons, eastern diamondback rattlesnakes and black racers.

The hammock was severely impacted by Hurricane Donna in 1960, with many old hardwood trunks still lying on the ground. Hurricane Andrew, which passed south of the park in 1992, affected primarily the laurel oaks (*Quercus laurifolia*), which are susceptible to heart rot and easily toppled by strong winds. Subsequent hurricanes, Charley (2004), Wilma (2005), Irma (2017), Ian (2022), Helene (2024) and Milton (2024) have contributed to canopy damage and storm surge impacts on this natural community.

The park also contains one smaller rockland hammock in the western portion, off Old Marco Road in management zone CS-04. These areas intergrade with mesic hammock and appear to be successional stages of them. The hammocks south of Old Marco Road, while initially resembling mesic hammock due to the presence of oaks and cabbage palms, display understory species indicative of an emerging rockland hammock. Whether these mesic hammocks fully transition to rockland hammock depends on fire occurrence, influenced by moisture retention in the emerging humus layer during dry periods.

To maintain the rockland hammock in good condition, increased monitoring of endemic and imperiled plants, such as gulf graytwig, Paradise tree (*Simarouba glauca*) and hammock false rein orchid (*Habinaria distans*) is necessary. Non-native plants should be removed using chemical and hand methods only; no heavy equipment is permitted. Prescribed fire will not be implemented in this community, and where rockland hammock communities are adjacent to fire-dependent areas, fire

should be excluded if possible. To be considered in maintenance condition, the community must have less than five percent coverage of non-native plants.

Scrubby Flatwoods

The scrubby flatwoods extend across a relatively small part of the park. It is in good to fair condition and represents the driest natural community in the park due to its elevated sandy soils. This community is characterized by dense growths of sand live oak (*Quercus geminata*) and myrtle oak (*Quercus myrtifolia*). However, other scrub oak species typically found in scrubby flatwoods are either absent or present in much lower numbers at this southern latitude. For instance, while dwarf live oak is present, it is not abundant.

Despite its small size, this area supports a range of wildlife, including gopher tortoises (though in limited numbers), southeastern five-lined skinks (*Eumeces inexpectatus*), eastern diamondback rattlesnakes, eastern glass lizards (*Ophisaurus ventralis*), common ground-doves (*Columbina passerina*) and Florida black bears. The scrubby flatwoods are located just north of U.S. Highway 41 in management zones CS-07 and CS-09A. It was partially damaged by a borrow pit excavation in the 1970s. Other significant areas of this community in the park include sites near the borrow pit on the south side of County Road 92 near West Palm Run and along the service road in management zone CS-04 and CS-13.

For long-term enhancement, the community will require ongoing management of non-native plants and periodic application of prescribed fire. To maintain this community in a healthy state, non-native plant coverage should be kept below five percent. Past attempts to use fire to control saw palmetto and oak densities have been unsuccessful, making mechanical treatment necessary. However, mechanical treatment should complement, not replace, prescribed fire. Excessive mechanical treatment could lead to high duff accumulation, which may ignite during prescribed burns in low humidity and soil moisture conditions, potentially causing duff fires. While duff fires can positively impact the habitat by creating open soil patches for gopher tortoises to forage and burrow, smoke management will be a concern. This issue can be mitigated with proper resources and planning.

Wet Flatwoods

The wet flatwoods community is more commonly compared to mesic and scrub communities found within the park. With respect to ground cover, except for the small pockets of the parasitic love vine (*Cassytha filiformis*), this community closely resembles the standard description given to it by the Florida Natural Areas Inventory (FNAI). This community is in good to fair condition. In the park and surrounding region, the demarcation between wet flatwoods and adjoining strand swamps is often indistinct. This blending effect is due in part to disruptions in the hydrological regime followed by the spread of slash pine into adjoining strand swamps. Despite these perturbations, this community remains a remarkably fine example of south Florida flatwoods. In management zone CS-01, the wet flatwoods are impacted by agricultural runoff which provides conditions for non-native plant growth unlike anywhere else in the park. Some of the common non-native plants that occur in this community are Brazilian pepper, Old World climbing fern, java plum (*Syzgium cumini*), melaleuca and Caesar weed. CS-01 also is impacted by a long linear berm (known as the “bicycle seat feature”) from an old, abandoned farm which impounds the summer rain and agricultural runoff. These locations are mentioned in more detail under the altered

land cover section. Animal species that can be seen in this community include Florida panther, Florida black bear, bobcat, marsh rabbit, Big Cypress fox squirrel (*Sciurus niger avicennia*), Osceola wild turkey (*Meleagris gallopavo osceola*), white-tailed deer (*Odocoileus virginianus*), raccoon, woodpecker species, songbirds, Great horned owl (*Bubo virginianus*), eastern screech owl (*Megascops asio*) and a variety of snakes and lizards.

Park staff should continue non-native plant removal and prescribed fire implementation. Prescribed fire has been regularly applied to the wet flatwoods. The herbaceous fuels keep fire intensity low, resulting in minimal young pine mortality. This is evident in management zones CS-01, CS-02, CS-03, CS-07 and CS-08. Currently, the pine densities are too great for all age classes and in the future, thinning will need to take place to enhance this community. Mechanical treatment should be the last resort to avoid soil disturbance. Pine thinning should be done in-house if possible. The pines should be removed off-site and used for park purposes (e.g., firewood).

Depression Marsh

Depression marshes can be encountered throughout the park, with some areas exhibiting higher plant diversity than others. Some depression marshes exhibit more hardwood encroachment which can be attributed to hydrological alterations. Sheet flow of water has been diverted from the park (via canals) for more than 50 years from the attempted development of Picayune Strand State Forest. PSRP is projected to increase water levels and hydroperiods from hydrological model results. In anticipation of these changes, park staff initiated and funded the installation of water level monitoring at 12 (now 11) well locations within the park. These wells collected pre-PSRP project completion and will collect post implementation data used to determine how accurate the modeling is and inform management actions to protect resources. It can be said with some certainty that this project will reduce the encroachment of many hardwoods in wetland communities throughout the park. Overall, the extended hydrology will benefit marsh communities. This community is in good condition. Non-native plants that can be found in this community are Brazilian pepper, Old World climbing fern and melaleuca. Allowing fire from adjacent communities to bleed into the depression marshes will mimic a natural fire regime. Some of the more common animals that can be seen are marsh rabbit (possibly extirpated), hispid cotton rat, marsh rice rat (*Oryzomys palustris*), Southern leopard frog (*Lithobates sphenocephala*), green treefrog (*Hyla cinerea*), Florida water snake (*Nerodia fasciata pictiventris*) and a variety of wading birds.

Long-term enhancement of these communities will require ongoing removal of non-native plants to maintain them at less than two percent of the total plant cover. While prescribed fire is applied to surrounding areas, depression marshes will experience indirect effects from these fires. Depending on water levels, fires may either penetrate completely through the marshes or only burn the edges in some years. Additionally, establishing photo points in various depression marshes across the park will be crucial for evaluating both the positive and negative impacts of the PSRP. To maintain the community in a healthy state, non-native species coverage must be kept below five percent.

Mangrove Swamp

This community occupies most of the park. It is a segment of the greater mangrove swamp of southern Florida, one of the largest in the world. The dominant plants are red mangrove (*Rhizophora mangle)*, black mangrove (*Avicennia germinans*) and white mangrove (*Laguncularia racemosa)*, as well as

buttonwood (*Conocarpus erectus)*. The community appears to be in an original condition, except for the infestation of Brazilian pepper in some locales where the ground is elevated above the reach of high tide. There are many portions of the mangrove forest that will only be accessible for non-native plant treatment through aerial methods (i.e., helicopter as last resort). Most of the Brazilian pepper can be found on the ecotones of mangrove forest and salt marsh. In this bioenergetically rich community, plant diversity is low compared to animal diversity, which is especially high due to the abundance of fish and invertebrate species.

Vertebrate species that can be seen in and around this community include white-crowned pigeon, mangrove cuckoo, raccoon, species of wading birds, gulls, sea turtles, ornate diamondback terrapin (*Malachlemys terrapin macropilota*), river otter and mangrove water snake. This community is in good condition. It occupies part of management zones CS-03, CS-04 and CS-05A. Much of this community can be found in management zones CS-12, CS-13 and CS-14. With increased salinity, this community will progress further into the salt marshes and eventually take over as the dominant community. The southern portions of the mangrove forest (i.e., management zones CS-12, CS-13 and CS-14) will be lost to the rising water and ultimately become open water.

Park staff should continue to treat non-native plants where accessible. Overall, this community should be kept in maintenance condition, with less than five percent cover of non-native plants, which may be difficult to achieve due to the area being inundated by daily tides.

Marl Prairie

Examples of this community occur in the northwestern part of the park, south of Old Marco Road. This community is in good to fair condition. Generally, vegetation in the more northerly parts of the prairie reflects the influence of freshwater sheet flow coming in from the north, whereas the southerly ones, by contrast, show the brackish influence of infrequent tidal surges. To the north, under freshwater influence, sawgrass is more abundant, while in the tidal-influenced marl prairies Gulf Coast spikerush (*Eleocharis cellulosa)*, a salt tolerant species, is evident. In the latter case, FNAI's synonym for marl prairie of "spikerush marsh" is more appropriate. However, the widely scattered and stunted cypress or mangrove trees that FNAI describes as being present are not seen in this park. That community type is more indicative of the Everglades regions of Everglades National Park and Big Cypress National Preserve. In the portion south of Old Marco Road there is a moderate cluster of southern cattails. While cattails are naturally occurring, it may be prudent to limit their advance to keep herbaceous diversity at current levels. This can be attributed to changes in hydrology from the construction of U.S. Highway 41 and County Road 92. This community has been affected by the drainage of fresh water from canals along County Road 92. In addition, the canals allow saltwater intrusion to occur in the southern half of this community that may not have occurred otherwise. As sea levels rise in the future, the marl prairie will no longer exist due to saltwater inundation.

Regular use of prescribed fire will help prevent shrub and hardwood encroachment. To maintain the health of this community, it's crucial to continue non-mechanical treatments for non-native species. Non-native coverage should remain below five percent for the area to be considered well-maintained. This community is highly sensitive to soil disturbance, so large vehicles are prohibited. Only smaller

vehicles like all-terrain vehicles or utility vehicles should be used if all other options have been exhausted and the prairie is exceptionally dry (700 or more Keetch-Byram Drought Index).

Salt Marsh

This graminoid-dominated community of the park is best developed near tidal streams and along the inland boundary of the tidal swamps. Spike rush (*Eleocharis cellulosa*) and cordgrasses dominate tidal marshes at Collier-Seminole State Park. The most accessible example is near the boat basin. This community remains in fair condition, but mangrove trees have drastically encroached at the margins over the past 30 years (personal communication, Ken Alvarez 2003). According to USGS 1940s aerial imagery, the salt marshes in management zone CS-13 were much larger than they exist today.

Due to hydrological alterations, the salt marshes in management zone CS-13 have almost disappeared. The construction of County Road 92 in the 1930s is the best explanation for the change and the rapid progression of mangroves. There is still a fair example of a healthy salt marsh community located in management zone CS-12. There is a small tree island in the northeast corner of this zone that has a small infestation of melaleuca and has been treated several times. Brazilian pepper is the most common non-native plant that can be found throughout the salt marsh community. The Brazilian pepper density and diameter at breast height varies in proximity to the fresh and saltwater zones. Old World climbing fern has been found in a few locations, which makes it a great concern for future infestations in this community. Treatment is difficult in this natural community due to the mucky soils and tidal influences. Many invertebrates are found here such as snails and crabs. Fish and other vertebrates inhabiting this community include raccoons, river otters, hispid cotton rats, marsh rabbits, water snakes and tree frogs.

Long-term, non-native plant removal by non-mechanical methods should continue to be a priority. In addition, fire should be one of the restoration tools used to combat encroaching mangrove species. Vehicles should not be used in this community to minimize impacts on flora and fauna. Access by foot is preferable and, if necessary, an airboat can be occasionally used. Salt marsh community should contain less than 10 percent cover of non-native plants overall to be considered in maintenance condition. Access is unlikely to many of the interior salt marshes; therefore, the overall percentage is higher than any other community in the park.

Slough

This community occurs in only four locations of the park. The sloughs are small and occur north of U.S. Highway 41. One slough is in management zone CS-08 (Little Fakahatchee slough) and the other three are in CS-06B (Moe's slough being the largest). This community is considered to be in good condition. Hydrological flows in this area have been greatly reduced from the attempted development of Golden Gate Estates, now known as Picayune Strand State Forest. Despite hydrological disturbance, the sloughs seem to contain plants indicative of this community. Brazilian pepper has invaded isolated patches, and Old-World climbing fern is increasing.

Ongoing non-mechanical methods are essential for removing non-native plants. To be considered well-maintained, sloughs should have less than five percent non-native plant cover. While prescribed fire should not be applied directly to this community, it can be allowed to burn naturally into the adjacent ecotone. Fires must be carefully planned to prevent prolonged peat fires.

Strand Swamp

This community, where the cypress strands appear discontinuous, may resemble cypress domes. They have suffered from fire exclusion and altered hydroperiods. Regarding the latter, numerous man-made canals in the region have contributed to drainage of the strand swamps. The drainage canals have reduced the residence time for standing water with the most obvious effect being an abnormally large scattering of slash pines among cypress. As aforementioned referring to wet flatwoods, the effects of these changes are more noticeable in those places where strand swamps border wet flatwoods. Brazilian pepper has largely invaded strand swamps. In management zone CS-06B and in the southern portion of CS-06C, Brazilian pepper has almost taken over the ground cover and mid-story. Old World climbing fern has taken a foothold in some locations within management zones CS-02, CS-06A, CS-06B and CS-06C.

Nevertheless, the park's strand swamps represent some of the finest examples of this community in southwestern Florida. This community is in good to fair condition. Although large cypress trees were logged early last century, some old-growth trees remain. A good example is near the headwaters of the Blackwater River, just north of U.S. Highway 41 near the Native American Village. This strand swamp is comprised of huge cypress trees that may be 100 feet tall. It is small to a geographical extent, but in character, it resembles the finest examples seen in the Fakahatchee Strand or Corkscrew Swamp. Generally, the biggest trees reflect where water is the deepest and remains the longest. Animal species that can be seen include freshwater fish species and turtle species, Florida black bear, Florida panther, bobcat, Florida cottonmouth (*Agkistrodon piscivorus conanti)*, wood stork (*Mycteria americana*), raccoon, white-tail deer (*Odocoileus virginianus*), wading birds, songbirds and woodpecker species.

Long-term enhancement efforts will focus on extensive removal of Brazilian pepper and other Florida Invasive Species Control (FISC) category I non-native species from management zone CS-06B and CS-06C. Mechanical removal of non-native plants should be limited to areas within 15 to 20 feet of service roads or fire breaks, as treating this community is challenging due to its wet conditions. To be considered well-maintained, the community should have less than five percent non-native plant cover. Soil disturbance should be minimized to prevent the recruitment of new non-native plants. Fire should not be applied directly to this community; instead, allowing fire from adjacent zones to enter when soil moisture and weather conditions are favorable will help avoid prolonged peat fires and enable natural transitions between the strand swamp and wet flatwoods communities.

Blackwater Stream (Tidal Creek)

This community originates north of U.S. Highway 41 in management zone CS-06C. The swamps and the creeks associated with the stream converge and flow southward until they are met by a tidally influenced portion of the stream near channel marker 56. Seasonal fluctuations in salinity will vary depending on time of year; in the summer months the freshwater flow is greater from U.S. Highway 41 culverts to channel marker 56. This process is almost reversed in the winter months as the fall freshwater flows diminish and the stream tends to increase in salinity. The original flow way was blocked during the construction of the Tamiami Trail in 1928. According to Florida Department of Transportation records, the current box culvert was built in 1955 (bridge 39). The reason behind the shift in the original flow way is not known, but it should be restored. Box culverts or an elevated bridge

should be added to the original location to promote sheet flow into the salt marshes that exist south of U.S. Highway 41 and allow for the filtration of the water southward as it reaches other tidal creeks that have been starved.

Non-native plants that can be seen along the blackwater stream are limited to Brazilian pepper, Old World climbing fern and some small patches of para grass (*Urochloa mutica*). Most non-native plants take root and survive along the banks or on higher ground during the winter and spring months when water levels are much lower or nonexistent. As the stream progresses southward towards channel marker 56, it is likely that most of the non-natives will be found above the mean high tide mark. Some animals that can be seen include the Florida manatee (*Trichechus manatus latirostris*), river otter, fresh and saltwater fish species, American alligator (*Alligator mississippiensis)*, various turtle species, wading birds, fresh and mangrove salt marsh snakes (*Nerodia clarkii compressicauda*), snails, variety of frog species, various crab species and small mammals. Non-native fish are common in the freshwater portion of this ecosystem including tilapia *(Tilapia mariae)*, black acara *(Cichlasoma bimaculatum)*, brown hoplo *(Hoplosternum littorale)* and walking catfish *(Clarias batrachus*), but also can be seen south of U.S. Highway 41 in the summer months due to high freshwater flows.

Long-term enhancement efforts will require ongoing treatments for non-native plants. To be considered well-maintained, this community should have less than five percent non-native plant cover. A significant project to address is the potential addition of culverts under U.S. Highway 41 to restore the original flow way. Additionally, monitoring for human impacts along the stream, such as wave energy from motorized vessels, is crucial.

Estuarine Unconsolidated Substrate

The most appropriate synonyms for this community are mud flats or tidal flats, with the primary example being found in Mud Bay within the southwest corner of the park where considerable numbers of wading birds, shore birds, and waterfowl congregate during low tide. Although superficially appearing barren, this community is rich in invertebrates and bottom-feeding fish that explain the presence of numerous birds and may also be vital to the smalltooth sawfish (*Pristis pectinata)*. This community is in excellent to good condition.

The only known location of this community is in management zone CS-14. Limiting motorized vessel activity to authorized personnel only would ensure the preservation of this community from further disturbance. Exclusion of motorized vessels for recreational use should be implemented by way of signage along the perimeter and main navigable waterways of Mud Bay. Past incidents of concern include locally operated tours through Mud Bay. Additionally, essential to management of this natural community is the continued monitoring for potential non-native marine invasive species such as Asian green mussel (*Perna viridis)* or lionfish (*Pterois volitans*).

Altered Land Cover Types

Borrow Area

Two borrow pits are located within the park. The first location is south of County Road 92 (3.48 acres) and the second one (0.98 acres) is north of U.S. Highway 41 by the parking area for the 6.5-mile hiking trail.

Canal/Ditch

This landcover type includes the boat basin, dredged canal, and associated spoil berm and canal from Bridge 39 to the Blackwater River.

Successional Hardwood Forest

Closed-canopied forest dominated by fast growing hardwoods including laurel oak (*Quercus hemisphaerica*) and water oak (*Quercus nigra*), often with remnant pines. These forests either invaded natural habitat (i.e., mesic flatwoods or wet flatwoods) due to lengthy fire-suppression or old fields that have succeeded to forest. The subcanopy and shrub layers of these forests are often dense and dominated by smaller individuals of the canopy species. Successional hardwood forests can contain remnant species of the former natural community such as saw palmetto (*Serenoa repens*), gallberry (*Ilex glabra*) and infrequently wiregrass (*Aristida stricta* var. *beyrichiana*). Additionally, species such as beautyberry (*Callicarpa americana*) and muscadine (*Vitis rotundifolia*) are common. Restoration of these forests includes mechanical tree removal and reintroduction of fire apart from the site near the rockland hammock. The successional hardwood forest site near this area used to be part of the rockland hammock but was destroyed for the original park footprint and will likely change again with sea level rise.

Developed

Developed areas include the ranger station, family campground, youth camp, picnic area, boat basin, maintenance area, memorial field, dredge display area, Native American interpretive area, parking lots, the four resident sites and the independent Native America Village (Pa' am Hammock) north of U.S. Highway 41.

Invasive Exotic Monoculture

In management zone CS-01, there is a 32-acre area that can be categorized as non-native monoculture. This area has been treated several times (2007, 2012 and 2015) through grants and will need continued treatments for years to come. The other location is called the "bicycle seat feature" and it is approximately 53 acres in size and in management zone CS-01. This area historically was a prairie which then was settled by a farmer. The farm was surrounded by a man-made berm intended to keep excess water out during the summer months. Within the "bicycle seat" feature are shallow irrigation ditches that extend throughout the site in a northeast to southwest direction. This berm feature still exists and needs to be removed or brought back to grade. The "bicycle seat feature" can also be categorized as non-native monoculture. The monoculture of Brazilian pepper within the "bicycle seat feature" was

mulched in 2018 with DRP funds. These two sites are mostly infested with Brazilian pepper, Old World climbing fern, java plum and some FISC category II plants.

Clearing/Regeneration

The site of a former vehicle repair station is in the eastern portion of management zone CS-05B. A portion of this site is kept open for the purpose of staging equipment and can be categorized as clearing and the remainder of the site has grown into successional hardwood forest.

Other Management Techniques for Altered Lands

Staff will continue to control non-native plant species in altered land cover areas of the park. Defensible space will be maintained around all structures in areas managed with prescribed fire or at risk of wildfires. The long-term goal for these sites is to manage FISC category I and II plants species to a low coverage and reduce them as a source for invading nearby intact natural communities. Mechanical treatments will have to take place to make the biggest impact. The berm around the "bicycle seat feature" will have to be removed to allow water to flow southward. The abandoned field in management zone CS-05B will be partially restored and non-natives will be treated.

Prescribed Fire

Objective: Within 10 years, have 850 acres maintained within the optimum fire return interval.

Actions:

- Develop and update annual burn plan.
- Develop a comprehensive fire management plan for the park.
- Conduct prescribed fire on 339–1,701.36 acres annually.

To achieve this goal, the park will have to carefully plan and prep the zones on a yearly basis. Preparations can range from removing fuels around utility lines, poles, and structures, and prepping fire breaks along management zones so that prescribed fire can be safely applied. Management zones with high fuel loads should be burned under optimal conditions. In addition, ensuring the duff layer will not ignite and continue to burn as to cause a smoke management issue and burning at a moderate to high relative humidity to minimize spotting to adjacent fuels is essential. In most cases, after initial fuel reduction burns have been completed during the non-growing season, all burns should then be conducted during the natural lightning season, subject to staffing and weather constraints. However, non-growing season burns are favorable as a last resort to prevent the zone from going into backlog.

Prescribed Fire Management		
Natural Community	**Acres**	**Optimal Fire Return Interval (Years)**
Wet Flatwoods	726.62	1–4
Salt Marsh	682.92	1–8
Marl Prairie	214.15	1–4
Mesic Flatwoods	69.20	2–5
Scrubby Flatwoods	8.47	3–6
Annual Target Acreage	339–1,701.36	

Most of the upland natural communities of Collier-Seminole State Park require regular fire. The wet flatwoods community requires the shortest fire return interval to reduce encroachment of hardwoods and various shrub species. Other fire dependent communities such as marl prairie and salt marshes require a moderate fire interval. Alternatively, mesic and scrubby flatwoods require the longest fire return interval. Most of the prescribed fire that take place at Collier-Seminole State Park occurs in the winter to late spring. It is difficult to conduct fall and summer burns due to the fact most of the burn zones are still inundated with surface water and prescribed fire weather factors are not favorable.

Wet flatwoods require a regular fire regime in order to naturally thin slash pine. If fire does not accomplish thinning goals, felling operations should be considered to remove pines. Typical ignition patterns should be comprised of flanking and strip head techniques. In areas where old growth pines occur, point source ignition should be used to reduce the possibility of crown consumption. Also, duff layers around old growth pines in wet flatwoods where fire has been excluded should be mitigated by clearing the duff layer prior to conducting prescribed fire. Since the hydrology in and around the park has been altered, dense cabbage palms have encroached into many management zones. Cabbage palm thinning along firebreaks/services roads and under old growth pine trees should be considered with herbicide when heavy equipment is not an option. Most escaped prescribed fires that occur are due to fire brands from cabbage palms drifting across fire lines into receptive fuels. Smoke management will be difficult when burning management zones CS-02, CS-05B, CS-06A, CS-06B, CS-06C, CS-09A, CS-09B and CS-12 because their proximity to U.S. Highway 41 and County Road 92. Similar mechanical fuel reduction measures for other understory live fuels should be implemented along fire lines, particularly along the anticipated downwind edges of burn units. These measures significantly reduce the complexity of prescribed burning in volatile southern rough fuels.

Marl prairies require hot fires to manage encroaching hardwood vegetation. This requires dry conditions with minimal to no surface water so that available fuel continuity is sufficient for fire intensity to build across the landscape. Most of the park's marl prairies have significant woody shrub encroachment due to infrequent fire in the past. Fire applied every one to four years, as indicated in the above table, along with felling of trees and larger woody shrubs by hand crews ahead of scheduled burns, is the recommended approach to improve site conditions. Ultimately, shrubs and trees should cover less than five percent of the prairie landscape. Removal of woody vegetation by means other than hand crews should not be an option, because it may cause soil disturbance and introduce invasive plants.

Mesic and scrubby flatwoods islands that are located within burn zones will receive fire on shorter intervals. If fuel loading is minimal, then mosaic burn patterns or minimal fire consumption typically occurs. Other mesic flatwoods that are isolated and surrounded by strand swamp (e.g., management zones CS-06A, CS-06B and CS-06C) will be burned on a case-by-case basis. The weather and field conditions will have to be conducive to complete the burns. The strand swamp will have to have standing water, since under dryer conditions natural breaks have not prevented fire from burning through them. When burning the mesic flatwood islands, a point source or flanking pattern should be utilized. Due to high fuel loads, some mechanical removal and thinning will have to occur to achieve a better vegetative composition. Within the islands, it is acceptable to leave small locations of tall (3–6 feet in height) saw palmetto for possible Florida panther denning sites (verbal communications 2012, Dr. Dave Onarato, FWC).

Based upon the fire return intervals and acreage figures for the natural communities within the park, between 339 and 1,701 acres should be burned each year to maintain natural community health. This range assumes that certain natural communities (or portions of) may require fire regimes consistent with the lower end of the corresponding fire return interval ranges identified in the above table. An example is marl prairie where woody shrubs and trees have become widespread and firmly established due to a prior period of fire exclusion. Park staffing, funding and weather conditions are all challenges to maintaining natural communities within their optimal fire return intervals. DRP will strive to burn all zones within the recommended fire return intervals. Some fire type acres will be unavailable for burning until preparatory measures such as mechanical fuel reduction or hydrological improvements have been accomplished.

Overall, the park contains five fire dependent communities that support a variety of plants and shrubs. Using prescribed fire, these plants regenerate to provide food and shelter to many animals such as Florida black bear, Florida panther, white-tailed deer (primary food source of the panther), gopher tortoises, Big Cypress fox squirrels, northern bobwhite (*Colinus virginianus*) and wild turkey.

Restoration

Objective: Conduct habitat/natural community restoration activities on 105 combined acres of depression marsh and wet flatwoods.

Actions:

- Develop/update a site-specific restoration plan for 105 combined acres of depression marsh and wet flatwoods.
- Implement the restoration plan.

A depression marsh restoration plan will be developed for the park to guide the staff on the appropriate steps needed to complete this long-term project. Originally this site was a marl prairie, and the feasibility of returning it to that state is unlikely. The site will be converted to a depression marsh instead (found in management zone CS-01). Once a farm site, a berm was constructed to keep the water from inundating agricultural operations. After the farm was abandoned in the 1930s (based on USGS 1940 aerial images), non-native plants such as Brazilian pepper started to invade, and little has been done to restore this site, known locally as the “bicycle seat” feature. Mechanical removal of the Brazilian

pepper and treatment of Old World climbing fern is required. Also, approximately 1,412 meters of a soil berm needs to be removed and brought back to grade. The removal of the berm will require heavy machinery, which should only be attempted in the dry periods of the year (February to May). Treatment of invasive plants should be the next step in the restoration phase of this project. Once initial treatments are complete, on-site native vegetation should be reintroduced to the site. Long-term monitoring will consist of biannual photo points to assess native and non-native plant recruitment. After this site is deemed restored, the reintroduction of fire will be an objective.

Improvement

Objective: Conduct slash pine thinning activities on 650 combined acres of wet flatwoods and mesic flatwoods.

Action:

- Selectively remove pine trees.

Slash pine trees consisting of varying age classes are unnaturally dense in the wet and mesic flatwoods communities. These pinelands would benefit from selective thinning to help establish a more natural pine density and overall basal area. Management zones that would benefit from thinning include CS-01, CS-02, CS-07, CS-08 and CS-09A. Removal of different age classes of pines from these zones will vary based on specific location, however, mature "older growth" individuals should generally be preserved. Younger age classes associated with areas of dense reproduction should be targeted. Exceptions may include overcrowding within mature stands and larger trees along the edges of burn units that restrict access along fire lines. The primary method for removal should be chainsaw felling operations and bucking of timber. While effort may be made to remove some number of felled pines from burn units, it may be more practical or even necessary to leave others in place. To avoid adding an excessive amount of logging slash that could complicate prescribed burning, thinning activities may need to occur gradually, thus exceeding the timeline of this unit management plan. All activities must be sensitive to ground disturbance. For instance, if heavy equipment is used, it should be used during the dryer months where deep rutting can be reasonably avoided.

IMPERILED SPECIES

Imperiled species are those that are tracked by FNAI as critically imperiled (G1, S1) or imperiled (G2, S2), or listed by the USFWS, FWC or the Florida Department of Agriculture and Consumer Services (FDACS) as endangered, threatened or of special concern.

Several important tools have been created by FWC to assist with the conservation and management of Florida's highest priority imperiled wildlife species. These include a list of species of greatest conservation need (FWC 2012). Additionally, FWC has developed a strategic statewide imperiled species management plan for Florida's imperiled species conservation and management (FWC 2016) as well as more specific species action plans.

The wild bird's nest fern (*Asplenium serratum*) is state listed as endangered and is currently known from one location in the park. Surveying for additional populations of this species should occur in the

hammocks, sloughs, and strand swamps at the park. Monitoring of known plants should be continued. This species is vulnerable to poaching by fern collectors.

The leafless bentspur orchid (*Campylocentrum pachyrrhizum*) is state listed as endangered and was confirmed at the park in 2011. This rare species is epiphytic and attached to the trunk of trees in rockland hammock, strands and swamps. This species is vulnerable to orchid poaching and other plant collecting.

Cowhorn orchid (*Cyrtopodium punctatum*) are state listed as endangered, with only one individual plant currently known at the park. Another was observed in the past, but it has not been located since 1998. Additional surveys should be completed to locate other individuals or populations. Surveying should be focused on the strand swamps and marl prairies at the park. This species is a good candidate for population augmentation with immature plants. At nearby Fakahatchee Strand Preserve State Park, collaborative research between Matt Richards (Atlanta Botanical Gardens) and Mike Owen (retired park biologist) was conducted on cowhorn orchid augmentation, in which nursery grown young plants were transplanted and monitored in suitable locations. The project has had encouraging results. In 2018, the park biologist transplanted 10 individual plants from the Fakahatchee Strand Preserve project. Annual surveys have been conducted, revealing only a few have survived from the initial introduction. It is highly recommended to continue this project until there are enough plants to have a stable population. Additionally, restoring the natural hydrological regime will improve the habitat and plausibly increase the survival rate of these orchids. This species is easily detected, therefore, vulnerable to poaching by orchid collectors.

Ghost orchid (*Dendrophylax lindenii*) is state listed as endangered and has been rediscovered (Wilder 2015) in several locations within the park. There was a known location on the north side of the park (Alvarez), but plants have not been recently found. A systematic search of this orchid is needed to determine if this species is in additional locations.

Four state endangered epiphytic *Epidendrum* orchid species are known in the park. These include the dingy-flowered orchid (*E. anceps*), umbelled epidendrum (*E. floridense*), night-scented orchid (*E. nocturnum*)—which is known in only one general location—and the rigid epidendrum (*E. rigidum*). Surveys of the hammocks, swamps and sloughs at the park are needed to locate, map and monitor populations of these species. Poaching by orchid collectors is a major threat to these species.

The hammock false-rein orchid (*Habenaria distans*) has been observed in one location at the park. It is a terrestrial orchid found in hammocks with deep, rich soils, and is state-listed as endangered. In 1998, when this population was first discovered it was considered the only recent observation for the state, with 187 individual plants counted (Owen, Brown and Hattaway, October 1998; Field notes, Owen). The results from population surveys in 2002 and 2003 are unknown. Several more survey efforts have been made (Patel and Owen) in 2006, 2007, 2009, 2011, 2013 and 2015, and no plants were found. However, in 2002, an additional population was found in nearby Fakahatchee Strand Preserve State Park. Within the last decade, destructive storms (i.e., hurricanes Irma and Ian) have led to the demise of this population, but surveys should continue when possible. The destructive rooting of feral hogs is suspected of being the cause for the extirpation of the population of this orchid species in Highlands

County. Hogs degrade their habitat and eat bulbs, tubers and other underground parts of plants. Hogs should be removed from the park to protect the native diversity.

Wild cotton (*Gossypium hirsutum*) was found on the Blackwater River near high ground (coastal berm), several meters off the river, and is state listed as endangered. The last known location was collected by R.A. Hattaway, 1999 (CS0410). The status is unknown, and surveying needs to be completed. In the mid-1900s the USDA worked to eradicate this species in Florida because it was a host to insect pests that could threaten the cultivated cotton crop and industry. USDA has an ongoing program that monitors wild cotton in natural areas for pest insects.

The pineland passionflower (*Passiflora pallens*) is known at three locations in the park. It is a state endangered vine of the rockland hammock, coastal berm and strand swamps of South Florida. The most recent observation in the park was in 2009 (Wilder). According to FNAI, there are 12 populations in the state, with a total of fewer than 10,000 plants (Chafin 2000). During rare plant surveys, populations at the park should be recorded for monitoring.

The Florida royal palm (*Roystonea regia*) is state listed as endangered and can be found in the rockland hammock, sloughs and strand swamp. Frequently used as an ornamental, the park is one of the few places where "wild" royal palms can be observed in native habitat. The exact number of royal palms is not known, but estimates can be placed between 200–400. As of May 2014, a general survey has been done, and a total of 248 palms have been counted. The survey is ongoing and may take several years to complete. Royal palms are emblematic of the park, with trails and creeks named for them. A systematic survey needs to be completed to determine the location of most of the royal palms and the approximate number.

There are several state listed air plant species in the park, including the threatened, northern needleleaf (*Tillandsia balbisiana*); endangered, cardinal air plant (*T. fasciculata)*; threatened, twisted air plant (*T. flexuosa*); endangered, fuzzywuzzy air plant (*T. pruinosa*); endangered, giant airplant (*T. utriculata*); and threatened, soft-leaved wild pine (*T. variabilis*). In April 2014 a survey was conducted for giant airplant (*T. utriculata*) and a little over 100 plants were found. All are threatened by the non-native Mexican bromeliad weevil (*Metamamasius callizona*) which kills larger airplant species. Poaching by plant collectors is also a threat. Because of these threats, populations should be located and monitored.

The smalltooth sawfish is federally listed as endangered. Most of the remaining population is located in Southwest Florida. Estuaries are important for this species and are used as nursery areas for young sawfish, which prefer shallow water. Most of the estuarine waters of the park have been identified and designated as critical habitat for sawfish, including Mud Bay where juvenile sawfish have been observed. Hydrological restoration will soon be completed north of the park and increase freshwater flows to the estuary, which could benefit this species. Threats at the park include habitat degradation by boating activity in shallow water and on mudflats. Propeller scarring by motorboats and shallow water use by airboats and jet skis for tricks (e.g., spinning the airboat in circles on mudflats) are of greatest concern. Sawfish are also threatened with entanglement from marine debris (e.g., derelict crab trap buoy ropes, fishing line and other trash), and their accidental capture by fishermen. The park has informational signs near the boat ramp on the proper way to handle and release sawfish. Designating motorized vessels and airboat exclusion zones through signage; with associated law enforcement presence would benefit the species, particularly in Mud Bay. Additional information on smalltooth sawfish protection and recovery

is available in the 2009 Recovery Plan for the species developed by the National Marine Fisheries Service.

The American crocodile (*Crocodylus acutus*) is federally threatened and has been observed in Mud Bay and the Blackwater River. There have been no specific surveys within the park, but recently there have been sightings reported of crocodile within the park boundaries. The boat basin and the borrow pit off County Road 92 have been the two locales where they have been seen. There are two known local populations of American crocodiles, both of which are found within several miles of Collier-Seminole State Park in Rookery Bay NERR. One of these local crocodile populations has had multiple successful consecutive breeding years, and the hatchlings have been found in and adjacent to the park, with the park likely acting as an important dispersal corridor for hatchlings and juveniles. In the USFWS final rule (USFWS 2007) for the downlisting of the American crocodile population in Florida from endangered to threatened; in the Summary of Factors Affecting the Species; improving natural freshwater flow patterns through hydrologic restoration by improving conditions beneficial for crocodile and their potential habitat at Collier-Seminole State Park was noted.

The state threatened gopher tortoise is present at the park and has been observed in management zones CS-01, CS-04, CS-05A, CS-06B, CS-06C, CS-07, CS-08 and CS-09A. The entire population has not been surveyed, but individuals are observed in the mesic and scrubby flatwoods in areas where soils and depth to water table are suitable for burrows. The population of tortoise at the park is at the fringe of the species range because soils and habitat are not suitable east of the park. In 2020, the park biologist (Maulik Patel) along with The Conservancy of Southwest Florida conducted a gopher tortoise burrow survey in most of the park and out of the 285 burrows found 52 percent were potentially occupied. Gopher tortoise require deep sandy soils that are seldom, if ever, flooded during high water events. Increased hydroperiods and groundwater levels associated with the Picayune Strand Restoration Project could change the distribution of tortoise in the park by reducing the available habitat for burrowing, or isolating tortoise pods (groupings of tortoise) from each other. Tortoise benefit from frequent fires that reduce hardwoods and improve grass and herbaceous forage. Continuing an active prescribed fire program in upland natural communities and reducing hardwoods through mechanical treatment or other methods benefit tortoise and the other species dependent on tortoise burrows. New development at the park in gopher tortoise habitat will need to follow the FWC permitting guidelines, which include a 25-foot protective buffer around tortoise burrows. Development within the 25-foot buffer requires a permit from FWC (FWC 2012, revised 2015).

Eastern indigo snake (*Drymarchon couperi*) is federally listed as threatened. Indigo snake have not been seen in the park for several years, but there are suitable upland areas for them. They are habitat generalists and all natural community types are used by these snakes. Protection of gopher tortoise and their burrows is important for indigo snake. The biggest threat to this wide-ranging species is roadways in and around the park, since road mortality is a leading cause of this species decline.

Park visitors should also be educated, so they do not deliberately kill indigo and other snake species protected at the park. Indigo snake benefit from habitat management similar to gopher tortoise. The 2019 Five-year Review is a detailed source of information on the species (USFWS 2019).

Short-tailed hawk (*Buteo brachyurus*) is a rare, small, year-round resident hawk in Florida that has not been listed by the state or USFWS but is considered by FNAI as critically imperiled (S1) in this state. Breeding in the United States is limited to Florida, with an estimation of around 200 nesting pairs. This species is more abundant in the park in the winter, when individuals from Florida north of Lake

Okeechobee migrate and winter in south Florida. This species nests in forested wetlands, including shorelines of lakes or streams, baygall, swamps, and mangroves in unaltered landscapes (Meyer 2005). In March 2013, a light and dark morph pair was observed rising on a midmorning thermal and soaring over the mangroves along the Blackwater River. A pair observed together in March 2026 could be an indicator of nesting. Another individual has been seen on the north side of the park in management zone CS-06B. Short-tailed hawk show nesting site fidelity and return to the previous year's nest. Nesting activity monitoring for short-tailed hawk should be conducted in annually in February and March.

Swallow-tailed kite (*Elanoides forficatus*) is listed by FNAI as imperiled (S2) in the state. Kite are regularly observed in the air at the park during the spring and summer nesting season. In April 2013, the first nest recorded at the park was observed along the park's north boundary in a bald cypress tree (*Taxodium distichum)*. Overall, the park has a considerable amount of potential nesting habitat. If nests are found some resource management activities could be modified to protect the nest, such as reducing the fuels and decreasing fire intensity around nest trees.

The bald eagle (*Haliaeetus leucocephalus*) is no longer considered imperiled, having been delisted in 2007. However, there are still special nest protection measures that were developed and implemented as part of the delisting process. In the spring of 2013, there was one known active bald eagle nests at the park. This nest was found in 2009 and is thought to be an alternate nest to FWC nest ID CO-011. During the nesting season (October 1 through May 15), activities near the nest are restricted. Prescribed fire and non-native plant removal can only occur prior to the eagle incubating the eggs in the nest or until after fledging of the eaglets. Following the guidelines established in the Bald Eagle Management Plan (FWC 2008), there are two buffers that are established by the distance from the nest tree. The most restrictive of these is the area within 330 feet of the nest tree where no "new" activities during the nesting season are allowed. Land management activities and recreational use are prohibited, so hiking trails that fall within the buffer are closed, unless the nesting eagles can be monitored to ensure that activities do not disturb them. The buffer also limits the use of prescribed fire during the nesting season, since prescribed fire is also not allowed within 330 feet of the nest tree. A less-restricted buffer is 330 to 660 feet from the nest tree. In this buffer the use of heavy equipment, chainsaws and other activities is not allowed during nesting. The area covered for each nest by the 330-foot buffer is 7.85 acres, and the 660-foot buffer is 31.4 acres. One trail route at the park was successfully adjusted to allow for additional vegetative buffering between a nest tree and recreational users. The eagles have moved to another nest tree since the trail re-route because hurricane Irma knocked the original tree down. The nest is more than 660 feet from any public trails, therefore disturbing the nesting pair should not be an issue. When the park conducts a prescribed fire; prep (i.e., clearing vegetation and scraping to mineral soil) should be done around the tree to protect the nest and the tree from catching fire.

Trails that are closed in the park to protect nesting eagles fall under the state eagle rule (Rule 68A-16.002., F.A.C.), which states that "On public land, it is unlawful for any person to knowingly enter any area posted as closed for the protection of bald eagles, their nests, or their nest trees, except the staff or authorized agents of the managing public entity for that area, or as authorized."

Several listed wading birds are observed in the marshes, mangroves and waterways of the park, but are not known to breed at the park. These include the limpkin (*Aramus guarauna*), great white heron (*Ardea herodias occidentalis*), little blue heron (*Egretta caerulea*), reddish egret (*E. rufescens*), snowy egret (*E. thula*), tricolored heron (*E. tricolor*), white ibis (*Eudocimus albus*), wood stork and roseate spoonbill (*Platalea ajaja*). The little blue heron, reddish egret, tricolored heron and roseate spoonbill met the state's species for threatened status listing, a management plan was adopted for these four species, and

they are listed as threatened instead of state species of special concern (FWC 2016). The limpkin, snowy egret and white ibis did not meet the threatened listing criteria, and they were delisted when the species action plans were developed and the rule changed for these species (FWC 2016, 2017). The wood stork is federally listed as threatened. The great white heron subspecies is imperiled in the state according to FNAI. No special resource management or monitoring is being conducted for these species, but the removal of trash and fishing debris (e.g., line, lures, hooks) around the boat basin and other waterways, and along the shoreline of the Blackwater River benefit these species by reducing the risk of accidental entanglement causing injury or death. The exact number of wading birds is unknown at this time, but there has been a steady decline based on the annual Christmas bird count. The major threat that will impact these populations in the near and foreseeable future is the invasion into the park by Burmese python (*Python bivittatus*). There are passive python eradication programs currently in place, which is supplemented with a systematic removal program conducted by professional contractors working for government agencies.

White-crowned pigeon, a state threatened species, are occasionally observed in the rockland hammocks and have been documented through the annual Christmas bird count. White-crowned pigeon feed on the fruit from the diverse assemblage of native tree and shrub species found in the "tropical" rockland hammocks. Much of the rockland hammock at the park had been severely invaded with Brazilian pepper, but non-native removal projects have been under way since 2009. Non-native plant removal projects that enhance the rockland hammock by improving the community through reduction of competition by non-native species with native fruit-bearing trees and shrubs should benefit white-crowned pigeon. In addition to the preferred feeding habitat, the park has numerous mangrove islands and islets that are free of raccoons and human disturbance for nesting (FNAI 2001).

Red-cockaded woodpecker (*Picoides borealis*) is a federally endangered species that were observed and recorded in 2009 and 2010 during the Christmas bird count. Both were in mesic to wet flatwoods in the northwestern part of the park south of U.S. Highway 41. During a visit to the park in April 2013, Kim Dryden, USFWS, suggested that there were good quality fire-maintained mesic and wet flatwoods for red-cockaded woodpecker foraging and nesting habitat. The park would be a good candidate for reintroduction of red-cockaded woodpecker or there is a chance of the park being colonized by birds from the nearby Belle Meade population that is approximately five miles from the park (Dryden pers. comm. 2013). Maintaining optimum open conditions with low groundcover, few trees or shrubs in the understory, and a widely spaced mature slash pine canopy through the frequent use of prescribed fires is essential for having available habitat for this species.

The Florida panther (*Puma concolor coryi*) is federally endangered with a population that is slowly increasing in numbers and expanding in range. Panther at the park are recorded with some regularity through staff and visitor observations, wildlife cameras and tracking collared individuals by researchers. The main cause of deaths to these big cats is road mortality. The panther crossing speed zone was established in 2007 based on data collected from FWC. The speed zone occurs between the park west and east boundaries off U.S. Highway 41. Additionally, as of March 2016, panther crossing signs have been added to County Road 92, but no speed zone has been established for this area. Park staff should pursue this with Collier County's Transportation Management Services Department. Increased slow speed zone enforcement needs to take place during the evening and night hours. Two female panther have been killed (vehicle impact) in the same location (0.5 miles east of the park entrance on U.S. Highway 41) since the signs were installed. The first panther killed was a four-year-old female (FP158) on May 22, 2010. The second panther killed was a two and a half-year-old female (FP196) on October 6, 2012. A third was killed on October 8, 2015, 0.9 miles west of the County Road 92 and U.S. Highway 41

intersection on U.S. Highway 41. This female (UCFP 251) had three kittens (four months old) and only one was rescued and brought to West Palm Beach Zoo as a permanent resident. Outreach and education will help the general preservation of these big cats.

Frequent prescribed fires are crucial to maintaining the local white-tailed deer population, the main prey item for panther. Also, non-native plant removal is very important to improve habitat for foraging deer. Research and monitoring panther is conducted by other agencies.

The Big Cypress fox squirrel is a state threatened subspecies that is occasionally observed north of U.S. Highway 41, with rare sightings south of the highway. The population at the park has not been monitored, so density and abundance are unknown. Fox squirrel benefit from frequently burned pine flatwoods that have open conditions, with a mosaic of other natural communities including rockland and mesic hammocks, and forested hardwood and cypress wetlands, to provide a year-round food source and shelter. In addition to burning frequently to reduce and control shrubby vegetation, the removal of non-native plants that increase the acreage of preferred habitat, should benefit squirrel within the park. Burmese python are a threat, and their removal should benefit fox squirrel and other species in the park.

Florida manatee is federally listed as threatened. Manatee are seen periodically in the boat basin and the Blackwater River. Manatee at the park should benefit by improved signage along waterways and increased enforcement of speed zones that are also designated to protect recreational users in canoes and kayaks. Boat strikes are the biggest threat to manatees. Education and outreach will also improve protection of the manatees.

Florida black bear is no longer listed in Florida but is still tracked by FNAI (S4) and managed by FWC. Black bear are observed, and tracks are found with increasing frequency in the northern part of the park. Two simple inferences can be drawn to explain the sightings: increased protection and habitat loss from adjacent lands. Besides habitat loss, future road construction/widening will have an impact on the species. Also, in the future, increased human to bear encounters will be due to development encroaching eastward towards park boundaries. The park has diverse natural communities, and areas suitable for winter dens. Black bear at the park are considered part of the Big Cypress subpopulation that has an estimated population range of 761–1,452 bears (FWC 2019). The park represents only a small but highly significant portion of the home range for Florida black bear. No special resource management measures are being implemented specifically for bear, but keeping the pyric natural communities burned at the recommended fire return interval for saw palmetto berry production and preventing catastrophic fire from burning the forested wetland communities should benefit visiting black bear. Other measures to benefit black bear at the park would be to provide educational material on living with bear, preventing the illegal harvest of saw palmetto berries, and installing bear proof trash receptacles to prevent the accidental feeding of bear. Three educational (living with bear) signs are installed in the park as of 2015.

The table below 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 the Southwest District FNAI Element Tracking Codes appendix.

Imperiled Species Inventory						
Common and Scientific Name	**Imperiled Species Status**				**Management Actions**	**Monitoring Level**
	FWC	**USFWS**	**FDACS**	**FNAI**		
PLANTS						
Golden leather fern *Acrostichum aureum*			T	G5, S3	1, 2	Tier 1
Wild bird's nest fern *Asplenium serratum*			E	G4, S1	2	Tier 1
Pine pink *Bletia purpurea*			T		1, 2	Tier 1
Leafless bentspur *Campylocentrum pachyrrhizum*			E	G4?, S1	2, 4	Tier 1, Tier 2
Narrow-leaved strap fern *Campyloneurum angustifolium*			E	G4G5, S1	10	
Iguana hackberry *Celtis iguanaea*			E	G5, S1	10	
Satinleaf *Chrysophyllum oliviforme ssp oliviforme*			T		2	Tier 1
Cowhorn orchid; Cigar orchid *Cyrtopodium punctatum*			E	G5?, S1	1, 2, 4	Tier 1, Tier 2
Ghost orchid *Dendrophylax lindenii*		UR	E	G1, S1	2, 4	Tier 1
Needleroot airplant orchid *Dendrophylax porrectus*			T		10	
Guiana-plum *Drypetes lateriflora*			T		2	Tier 1
Dingy-flowered epidendrum *Epidendrum anceps*			E		2, 4	Tier 1
Umbelled epidendrum *Epidendrum difforme*			E		2, 4	Tier 1
Night-scent orchid *Epidendrum nocturnum*			E	G4G5, S2	2, 4	Tier 1
Rigid epidendrum *Epidendrum rigidum*			E		2, 4	Tier 1
Wild cotton *Gossypium hirsutum*			T		2	Tier 1
Hammock false-rein orchid *Habenaria distans*			E	G5, S1	2	Tier 1, Tier 2

Imperiled Species Inventory						
Common and Scientific Name	**Imperiled Species Status**				**Management Actions**	**Monitoring Level**
	FWC	**USFWS**	**FDACS**	**FNAI**		
Chiggery grapes *Heliotropium verdcourtii*			E		10	
Pine lily; Catesby's lily *Lilium catesbaei*			T		1, 2, 4	Tier 1
Simpson's stopper *Myrcianthes fragrans*			T		2	Tier 1
Giant sword fern *Nephrolepis biserrata*			T		2	Tier 1
Hand fern *Ophioglossum palmatum*			E	G4, S3	2	Tier 1
Erect prickly-pear cactus *Opuntia stricta*			T		2	Tier 1
Pineland passionflower *Passiflora pallens*			E	G3G4, S2	2	Tier 1
Snowy orchid; Bog torch *Platanthera nivea*			T		1, 2, 4	Tier 1
Pale-flowered polystachya *Polystachya concreta*			E		2, 4	Tier 1
Florida royal palm *Roystonea regia*			E	G2G3, S2	2	Tier 1, Tier 2
Fakahatchee ladies' tresses *Sacoila lanceolata var. paludicola*				G4T1, S1	10	
Beachberry; Inkberry *Scaevola plumieri*			T		2	Tier 1
Mullein nightshade *Solanum donianum*			T		1, 2	Tier 1
Lace-lip ladies' tresses *Spiranthes laciniata*			T		10	
West Indian mahogany *Swietenia mahagoni*			T	G3G4, S3	2	Tier 1
Northern needleleaf *Tillandsia balbisiana*			T		2, 10, 14	Tier 1
Cardinal air plant *Tillandsia fasciculata*			E		2, 10, 14	Tier 1
Twisted air plant *Tillandsia flexuosa*			T	G5, S3	2, 10, 14	Tier 1

Imperiled Species Inventory						
Common and Scientific Name	**Imperiled Species Status**				**Management Actions**	**Monitoring Level**
	FWC	**USFWS**	**FDACS**	**FNAI**		
Fuzzywuzzy air plant *Tillandsia pruinosa*			E	G4, S1	2, 10, 14	Tier 1
Giant air plant *Tillandsia utriculata*			E		2, 10, 14	Tier 1
Soft-leaved wild pine *Tillandsia variabilis*			T		2, 10, 14	Tier 1
FISH						
Smalltooth sawfish *Pristis pectinata*	FE	E		G1G3, S1S2	4, 10	Tier 1
REPTILES						
American alligator *Alligator mississippiensis*	FT(S/A)	SAT		G5, S4	4, 8, 10, 13	Tier 1
American crocodile *Crocodylus acutus*	FT	T		G2, S2	8, 10, 13	Tier 1
Eastern indigo snake *Drymarchon couperi*	FT	T		G3, S2?	1, 10, 13	
Gopher tortoise *Gopherus polyphemus*	ST			G3, S3	1, 2, 7, 8, 10, 13	Tier 1
BIRDS						
Florida burrowing owl *Athene cunicularia floridana*	ST			G4T3, S3	1, 10	
Short-tailed hawk *Buteo brachyurus*				G4G5, S1	1, 2	Tier 1, Tier 2
Crested caracara *Caracara cheriway*	FT	T		G5, S2	1	Tier 1
Piping plover *Charadrius melodus*	FT	T		G3, S2	10	
Little blue heron *Egretta caerulea*	ST			G5, S4	4, 8	Tier 1, Tier 2
Reddish egret *Egretta rufescens*	ST			G4, S2	4, 8	Tier 1, Tier 2
Tricolored heron *Egretta tricolor*	ST			G5, S4	4, 8	Tier 1, Tier 2
Swallow-tailed kite *Elaniodes forficuatus*				G5, S2	1, 7	Tier 1, Tier 2

Imperiled Species Inventory						
Common and Scientific Name	**Imperiled Species Status**				**Management Actions**	**Monitoring Level**
	FWC	**USFWS**	**FDACS**	**FNAI**		
Merlin *Falco colombarius*				G5, S2	1	
Peregrine falcon *Falco peregrinus*				G4, S2	1	Tier 1, Tier 2
American oystercatcher *Haematopus palliates*	ST			G5, S2	2, 4, 8	Tier 1, Tier 2
Caspian tern *Hydroprogne caspia*				G5, S2	8	Tier 1, Tier 2
Red-cockaded woodpecker *Leuconotopicus borealis*	FE	E, PT		G3, S2	1, 10	
Wood stork *Mycteria americana*	FT	T, DL		G4, S2	4, 8	Tier 1, Tier 2
White-crowned pigeon *Patagioenas leucocephala*	ST			G3, S3	2	Tier 1, Tier 2
Roseate spoonbill *Platalea ajaja*	ST			G5, S2	4, 8	Tier 1, Tier 2
Snail kite *Rostramus sociabilis*	FE	E		G4G5, S2	4	Tier 1, Tier 2
Least tern *Sternula antillarum*	ST			G4, S3	8	Tier 1
Sandwich tern *Thalasseus sandvicensis*				G5, S2	8	Tier 1
MAMMALS						
Florida bonneted bat *Eumops floridanus*	FE	E		G1, S1	10	
Florida panther *Puma concolor cougar*	FE	E		G5T1, S1	1, 2, 10, 13	Tier 1, Tier 4
Big Cypress fox squirrel *Sciurus niger avicennia*	ST			G5T2, S2	1, 2, 8	Tier 1, Tier 2
Florida manatee *Trichechus manatus latirostris*	ST	T		G2G3T2T3, S2S3	4, 10, 13	Tier 1, Tier 2

Management Actions:

1. Prescribed Fire
2. Non-native Plant Removal
3. Translocation/Augmentation
4. Hydrological Maintenance/Restoration
5. Nest Boxes/Artificial Cavities
6. Hardwood Control
7. Mechanical Treatment
8. Predator Control

9. Erosion Control
10. Protection from Visitor Impacts
11. Decoys (Shorebirds)
12. Vegetation Planting
13. Outreach/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. [If referenced in table, provide discussion in narrative]

Inventory

Objective: Develop/update baseline imperiled species occurrence inventory lists for plants and animals.

Action:

- Continue to inventory the park to update imperiled species inventory lists.

Additional surveys of imperiled plant and animal species are needed at Collier-Seminole State Park to ensure that all imperiled species are documented. DRP will enlist the assistance of academic researchers and staff from other agencies during development of species occurrence inventory lists, especially where necessary for certain taxonomic groups.

Fauna

Objective: Continue existing monitoring protocols for two selected imperiled animal species.

Action:

- Park staff will implement monitoring protocols for two selected imperiled animal species including the gopher tortoise and Florida bonneted bat.

In 2020, the park biologist, along with The Conservancy of Southwest Florida, conducted a gopher tortoise burrow survey in most of the park, and out of the 285 recorded burrows, 52 percent were potentially occupied. There are a few more areas within the park left to survey for gopher tortoise burrows. The park has approximately nine acres of scrubby flatwoods and 60 acres of mesic flatwoods where both gopher tortoise and their associated burrows have been recorded. The park's gopher tortoise populations are generally isolated from one another which will make it easier to identify the individuals. U.S. Highway 41 divides the park creating northern and western sections, further isolating the two populations. Every two to five years gopher tortoise burrow surveys should be conducted to determine if the park's prescribed fire program is beneficial. There are a few locations where gopher tortoise have been observed along management zones CS-06B and CS-06C, but fire management is difficult in this area due to high fuel loads and access. The scrubby or mesic flatwoods in the locations within these zones are flanked or surrounded by strand swamp. Periodic mechanical treatment of fuels needs to occur to increase the habitat value for the gopher tortoise; otherwise, the community may not be able to support gopher tortoise. Where prescribed fire is easier to implement, its use will continue according to recommended fire return intervals for scrubby flatwoods and mesic flatwoods. If feasible,

marking and/or tagging gopher tortoise would help record movement patterns and population densities.

The Florida bonneted bat is known to occur in the park, but there is very little data available as to preferred habitat, roosting location, and population densities. Park staff should monitor Florida bonneted bat by conducting night surveys. One option is to install bat houses that may attract bonneted bat to roost, but how often they use roosts has not been fully explored and determined. Installing bat houses in non-public sites within the park should be chosen to mitigate any health-related impacts (e.g., guano).

Adjust resource management approach/measures as more information becomes available – through park monitoring program or cooperating research. Coordinate with agencies such as FWC and USFWS if more detailed studies need to be conducted.

Flora

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

Action:

- Park staff will develop and implement monitoring protocols for three selected imperiled plants species including Florida royal palm, erect prickly-pear cactus and fuzzy-wuzzy air plant.

Florida royal palm is the symbol of this park and can be observed in the rockland hammock and strand swamp, but the population size is unclear. It has been estimated that 200-300 royal palms occur in the park. As of May 2014, a general survey has been done, and a total of 248 palms have been counted. The survey is ongoing and may take several years to complete.

Most of the palms occur in the rockland hammock at various heights and densities, therefore the main threat to the palms is non-native plants not fire. Though poaching is a concern, incidents of this nature have not been documented at the park. Through passive observation, park staff has noticed that some native populations of Brazilian free-tailed bats (*Tadarida brasiliensis*) roost in the Royal palms.

Erect prickly-pear cacti can be found in coastal berm communities within the park (Township 52 South Range 27 East). The exact population and densities of erect prickly-pear cacti throughout the park are unknown currently. Annual surveys should be conducted to determine the exact population and locals of this plant. Once all the cacti have been cataloged surveys should be done every two to five years, due to the difficulty of site locations.

Fuzzy-wuzzy air plant generally can be found in small, isolated pockets in hammocks and strand swamps. Random surveys have been carried out to locate some of the population, but more thorough surveys should be conducted during the dryer months (February to June) to allow for easy access. The PSRP may aid in the recovery of populations of the fuzzy-wuzzy air plant within the park. It is important that the surveys are conducted annually to measure the benefits and impact of the PSRP.

Other Imperiled Species Considerations

Although the American bird's nest fern is considered extirpated from the park, the rockland hammock community should be surveyed at least once during this planning cycle to locate any new occurrences. The rockland hammock is not a fire dependent community so, the threat of fire is not an issue. Park staff should be trained in the fern's identity to avoid impacting any previously unknown individuals during non-native plant treatments.

Similarly, hammock false-rein orchid is considered extirpated, having previously occurred in the rockland hammock. The main threat to this plant is the invasion of non-native plants such as Brazilian pepper and African spotted orchid. Eventually sea level rise will impact this area and prevent any restoration efforts. A general survey was conducted in September 1998 (M. Owen, B. Hattaway and P.M. Brown) and a total of four populations were identified. The total number of individuals ranged from 187–200. The next survey was conducted in September 2002 (M. Owen and A. Bishop), but the number of individuals recorded is unknown. It is therefore unknown whether this small population was in decline in 2002 or if this trend began sometime after. Since flowering generally occurs in September, any surveys should be conducted around this time.

INVASIVE SPECIES

Most of the park's communities are infested with various species and concentrations of non-natives. Where highly competitive non-native plants have become established, annual removal plans will be developed to eliminate them from the natural communities they have invaded. Currently there are several highly non-native plant species that are being treated at Collier-Seminole State Park. Some of the more prominent FISC category I and II plants found in the park include, Brazilian pepper, melaleuca, Old World climbing fern, air potato (*Dioscorea bulbifera*), para grass, cogon grass and java plum. FISC category II plants in the park include lead tree, castor bean (*Ricinus communis*), golden pothos (*Epipremnum pinnatum*), guinea grass (*Panicum maximum*) and wedelia (*Sphagneticola trilobata*).

Invasive plants, particularly those mentioned above, pose a significant threat to the natural communities at Collier-Seminole State Park. Park staff have obtained grants for the removal of some of the non-native plants listed and continue to maintain these sites. Eradication of aquatic non-native plants poses another issue as the park is surrounded by canals which act as conduits for future invasions from adjacent lands (private and public).

From 2008–2012, two new plants were discovered and treated aggressively. Castor bean was discovered in 2008 in management zone CS-01, where it persists. It has also appeared along the service road where the adjacent Farm (6L's) discharges their excess water. The second plant found in 2010 is rose myrtle (*Rhodomyrtus tomentosa*), located in management zones CS-01, CS-06A and CS-06B. At this time, it appears more individual plants have been found in the park.

Treatment challenges involve difficult access and extended hydroperiods caused by the canals. Unlike other state parks, Collier-Seminole State Park has very limited roadways which prevent access to some areas of the park. Furthermore, many non-native plant treatments must be done by hand because limited access prohibits mechanical treatment. All non-native plant surveys are completed in conjunction with treatment efforts. Recent park protocols have required surveys every two years. These include surveys of entire management zones as well as revisiting known infestation sites.

Invasive Plant Species			
Common Name ***Scientific Name***	**FISC Category**	**Distribution**	**Zone ID**
Air-potato *Dioscorea bulbifera*	I	Scattered Dense Patches	CS-11
		Linearly Scattered	CS-05B, CS-11
Bowstring hemp *Dracaena Hyacinthoides*	II	Single Plant or Clump	CS-11
Pothos *Epipremnum pinnatum*	II	Scattered Dense Patches	CS-11, CS-05B
West Indian marsh grass *Hymenachne amplexicaulis*	I	Single Plant or Clump	CS-08
		Scattered Plants or Clumps	CS-08
		Linearly Scattered	CS-06B
Cogon grass *Imperata cylindrical*	I	Scattered Plants or Clumps	CS-01, CS-03, CS-04, CS-06A, CS-07
		Scattered Dense Patches	CS-01, CS-06A, CS-06B
Lead tree *Leucaena leucocephala*	II	Single Plant or Clump	CS-11
		Scattered Plants or Clumps	CS-13
		Linearly Scattered	CS-13, CS-14
Peruvian primrose-willow *Ludwigia peruviana*	I	Single Plant or Clump	CS-05B, CS-08
		Linearly Scattered	CS-01, CS-02, CS-03, CS-07, CS-08, CS-09A
Old World climbing fern *Lygodium microphyllum*	I	Single Plant or Clump	CS-06A, CS-09B, CS-11, CS-12
		Scattered Plants or Clumps	CS-01, CS-02, CS-04, CS-05A, CS-05B, CS-06A, CS-06B, CS-06C, CS-07, CS-08
		Scattered Dense Patches	CS-01, CS-02, CS-03, CS-05A, CS-06B, CS-07, CS-09A
		Dominant Cover	CS-01
		Linearly Scattered	CS-02
Melaleuca, paper bark *Melaleuca quinquenervia*	I	Single Plant or Clump	CS-01, CS-05A, CS-05B, CS-08
		Scattered Plants or Clumps	CS-01, CS-02, CS-05A, CS-05B, CS-07
		Scattered Dense Patches	CS-09A, CS-09B, CS-12
Balsampear *Momordica charantia*	II	Single Plant or Clump	CS-01
Sword fern *Nephrolepis cordifolia*	I	Scattered Plants or Clumps	CS-11

Invasive Plant Species			
Common Name ***Scientific Name***	**FISC Category**	**Distribution**	**Zone ID**
		Linearly Scattered	CS-11
Burma reed *Neyraudia reynaudiana*	I	Linearly Scattered	CS-05B
Downy rose-myrtle *Rhodomyrtus tomentosa*	I	Single Plant or Clump	CS-01, CS-02, CS-06A,
Castor bean *Ricinus communis*	II	Scattered Plants or Clumps	CS-01
Brazilian pepper *Schinus terebinthifolius*	I	Single Plant or Clump	CS-05B
		Scattered Plants or Clumps	CS-01, CS-04, CS-05A, CS-05B, CS-06A, CS-06B, CS-06C, CS-07, CS-08, CS-09A, CS-10, CS-11
		Scattered Dense Patches	CS-01, CS-02, CS-03, CS-04, CS-05A, CS-06A, CS-06B, CS-06C, CS-09B, CS-10, CS-12
		Dominant Cover	CS-02, CS-03, CS-06A, CS-06B, CS-11
		Dense Monoculture	CS-05A, CS-06A
		Linearly Scattered	CS-02, CS-13, CS-14
Wedelia *Sphagneticola trilobata*	II	Linearly Scattered	CS-01, CS-11, CS-12
Arrowhead vine *Syngonium podophyllum*	I	Single Plant or Clump	CS-05B
		Scattered Plants or Clumps	CS-11
		Scattered Dense Patches	CS-05B, CS-11
Java plum *Syzgium cumini*	I	Single Plant or Clump	CS-01, CS-06A, CS-07, CS-09A
		Scattered Plants or Clumps	CS-01, CS-02
Caesar's weed *Urena lobata*	I	Single Plant or Clump	CS-04, CS-05B, CS-06A, CS-07, CS-09B
		Scattered Plants or Clumps	CS-01, CS-06B, CS-06C, CS-07, CS-08, CS-09A, CS-11
Para grass *Urochloa mutica*	I	Scattered Plants or Clumps	CS-01
		Scattered Dense Patches	CS-01, CS-06A
		Linearly Scattered	CS-01, CS-03, CS-06A, CS-06B, CS-08

Invasive Plant Treatment

Objective: Conduct natural community/habitat improvement activities on 174 combined acres of strand swamp, wet flatwoods and mesic flatwoods.

Action:

- Treat all FISC category I invasives.

There are two portions of strand swamp that need improvement. Most of the upper story plants still exist, but the mid to lower levels of vegetation have almost disappeared. The first area is in management zones CS-06A and CS-06B. The staff has been working on eradicating FISC category I non-native for several years, but progress is slow. Brazilian pepper and Old World climbing fern are the two most common non-native plants that are in the improvement site. Basal bark and foliar treatment with herbicides should take place during the dryer months (January to June) to make access easier and to eliminate the possibility of non-target damage to native vegetation and invertebrates. In addition, there shall be no mechanical treatment in the strand swamp.

The mesic flatwoods in management zone CS-06A and CS-06B are also inundated with Brazilian pepper and Old World climbing fern. Basal bark and foliar treatment should take place in the drier months for non-native vegetation. In 2017, some of the mesic flatwood islands received mechanical treatments with DRP funds. In the future, the park should use mechanical treatment when necessary if prescribed fire cannot be implemented at the desired fire return interval. Upon general observation the community would need very little replanting of native vegetation. Some slash pine thinning may need to occur in some isolated locations, because the pines are dense and of the same age class. Some cabbage palm thinning via chemical treatment should occur in these areas to restore it. At minimum one photo point per management zones and community type should be established to determine the progress and success of the habitat improvement project.

The second site is in management zone CS-02. The two communities affected at this location are strand swamp and wet flatwoods. The three non-native plants that can be found are listed from greatest to least abundant: Brazilian pepper, Old World climbing fern and java plum. Basal bark and foliar treatments should take place during the dryer months (January to June) to allow for treatment of non-native and to eliminate the possibility of non-target damage to native vegetation and invertebrates and allow easier access. To eliminate ground disturbance and reduce the further spread or introduction of new non-native plants, no mechanical treatment will be used. A minimum of one photo point should be established per community type to determine if the project is successful based on the regeneration of native vegetation versus non-native vegetation.

Objective: Conduct natural community/habitat improvement activities on 35 acres of rockland hammock.

Action:

- Treat all FISC I invasives.

The rockland hammock site, which contains the Royal Palm Hammock Nature Trail, has been disturbed since the inception of the park. The area can be broken into two locations within management zone CS-10. The first location is part of an ongoing treatment of invasive plants that started with funding from

FWC in 2009 and a second treatment was conducted in 2013 with the same funding source. The Brazilian pepper cover class in this 30-acre location ranges from five percent to 90 percent. The second location is to the east of the boat basin road and picnic area. This location is approximately five acres in size and has a cover class of 50 to 90 percent. Treatment has been implemented and is ongoing. Herbicide treatments should only take place during the dryer months (January to June). Both locations have a good native seed source which will help in the long-term for the recruitment of native vegetation after several basal bark and foliar treatments take place. Each of the two locations should have a minimum of one photo point to assess the success of the project. This community is ranked G2 S2 according to FNAI; mechanical treatments and other impactful land management measures should be avoided.

Objective: Annually treat 100 gross acres of non-native plants.

Actions:

- Identify the major vectors and pathways for non-native plants at the park and reduce incoming propagules where possible.
- Document areas of high (50–100 percent), medium (6–50 percent) and low (1–5 percent) infestation.
- Develop an early detection rapid response protocol for new infestations.
- Develop a species-specific action plan for each management zone with a prioritization framework.
- Evaluate and update plan on an annual basis and adapt to changing conditions.

Regular updates of non-native plant coverage surveys will guide future treatment locations and priorities. In general, there will continue to be emphasis on the retreatment of existing treatment areas. In addition, each year staff will develop maps to execute treatment of infestations that will serve the overall goal of expanding the areas in maintenance condition.

Objective: Annually reduce cover class in 50 acres of the park.

Actions:

- Survey and treat after prescribed fire for rapid spread of non-native species.
- Treat medium infestations with staff and volunteers where available.
- Reduce high infestations with additional labor sources (e.g., contract funding, strike teams) and plan for passive or active restoration.
- Document treatments and update surveys in DRP's Natural Resource Tracking System.

Invasive and Nuisance Animal Control

Objective: Implement control measures on four non-indigenous/nuisance animals to protect native species and habitats.

Actions:

- Remove pythons as needed.
- Remove feral cats, iguanas and feral hogs as needed.

The park will continue to remove four non-native animal species from the park, including feral hogs, iguanas, feral cats and Burmese pythons (or other large constrictor snake species). Non-native animals are removed or euthanatized from the park by following FWC guidelines, DRP's operations manual and recommendations from the American Veterinary Medical Association.

Three of the four animals mentioned are at a low level of concern for the park. The Burmese python poses the biggest threat to the native wildlife, therefore regular capture and removal surveys should be conducted. Work in the winter months is more productive, because the snakes are not very tolerant of prolonged cold weather patterns. Pythons will bask along man-made berms after the cold weather has passed. Rivers, creeks (Wall 1921) and especially man-made canals are the optimal location to find the snakes. Park staff will create and adapt a plan to capture and remove the snakes based on the latest information. All FWC guidelines and permitting requirements should be followed. Once the snakes are captured, they will be taken to a FWC sanctioned location.

Python research has been conducted in south Florida for several years and in Southwest Florida, for five years, but at a slower pace. The research topics have focused on diet, method of movement (canals), preferred habitats, trapping methods and population dynamics. Since pythons are relatively new to the area (the first python captured at the park was in 2003) there are many unknown variables regarding the python natural history. Because resources are limited, the park (or researchers) should focus on the preferred habitat, method of travel and trapping methods. This will ultimately increase the chance of capture and removal of these non-native snakes.

CULTURAL RESOURCES

Park History

Collier-Seminole State Park is historically significant not only for its natural beauty but also for its association with Native American peoples. The park lies within an area historically associated with the Seminole and Miccosukee cultures. Evidence suggests that a portion of the park was a village site, believed to have been inhabited by the Miccosukee Tribe. Further investigation may yield greater insight that lends to interpretive opportunities.

The Seminole people originally migrated from Georgia and Alabama during the 18th century, while the Miccosukee are a distinct group that historically resided in the Florida panhandle. Over time, these tribes intermingled, leading to the Seminole-Miccosukee community in the region. While the park has not been definitively identified as a specific settlement for one tribe or another, the area's proximity to the Everglades present a high probability for such an occurrence, providing essential resources like food, water and shelter.

Archaeological evidence of early indigenous use in the area includes artifacts such as pottery shards, shell tools and remnants of dwellings. These remains point to a well-established, permanent village life along the waterways, where the Native Americans would have relied on fishing, hunting and gathering. The environment was also a rich hunting ground for game such as deer and wild boar.

Collier-Seminole State Park is named after Barron Collier and the Seminole Indians who lived in the area. Barron Collier was a prominent figure in the history of Southwest Florida. Born in 1873, Collier played an integral role in the development of the region during the early 20th century. As a businessman, he made significant contributions to the expansion of infrastructure in Florida, including the establishment of roads and railways that opened the Everglades and Southwest Florida for settlement and development.

The Barron Collier Memorial, located within the park, commemorates his efforts in developing the area, particularly his role in establishing a key road that traversed the region. The road was essential for connecting isolated communities, making access to the Everglades easier and encouraging the

settlement of nearby areas. His financial investments also included land development projects and the promotion of potential agriculture in the Everglades.

In the 1940s, Barron Collier's contributions were recognized through the establishment of Collier-Seminole State Park, with the memorial dedicated to his legacy. The Barron Collier Memorial is an important historic structure within the park, marking Collier's impact on both the landscapes and people of Southwest Florida.

Archaeological Sites

Southwest Florida and the Ten Thousand Islands have a rich archaeological record and cultural history with some of the most significant archaeological sites predating Spanish contact. The Florida Master Site File (FMSF) lists 10 sites within the park. Of these, two are archaeological sites, Grocery Place (CR00034), and the recently recorded Old Grove Midden (CR01313). Grocery Place is a multi-component site located on a rise at the mouth of Royal Palm Hammock Creek. It consists of a shell and black-dirt midden that contains aboriginal pottery dating between 500 BCE and 900 CE, and perhaps later. Two cisterns remain from the homesteading era in the late 19th or early 20th century. Initials and the date "1914" are carved into one of the cisterns. A map in the park file shows a spot of elevated land upstream from Grocery Place that is referred to as the "Old Grove." Historic descriptions of Old Grove are vague and inconsistent in describing the location other than along Royal Palm Hammock Creek, between Grocery Place and the Blackwater River. In 2013, during field work on a predictive cultural sensitivity model, the Alliance for Integrated Spatial Technologies at the University of South Florida visited the "Old Grove" site and determined it to be a unspecified prehistoric shell midden, that was later recorded with the FMSF as a new archaeological site, Old Grove Midden (Collins 2013).

The condition of Grocery Place would be rated as fair because erosion over the past several years has washed away part of the shell bank. Park staff has placed bags of concrete along the edge of the water to create a "sea wall" to prevent one of the cisterns from washing away. Future monitoring of the site is needed, and additional stabilization work may be required. Transporting supplies for any construction in this location is difficult due to shallow bays and sandbars in the river that limit navigation by large vessels.

Another concern is vandalism from day and overnight access on the site without authorization. Due to the remote location, it is difficult to document acts of vandalism or unauthorized camping. Additionally, several species of non-native plants including lead tree and Brazilian pepper are found on the site.

During the 2013 mapping of the visible extent of shell at the Old Grove Midden site, no other cultural material was observed. The Old Grove Midden site will need to be assessed annually with the Grocery Place site. The site would also benefit from a professional archeological survey to determine its significance and cultural period.

In 2013, the Alliance for Integrated Spatial Technologies at the University of South Florida were contracted as part of a DRP District 4 and 5 project to perform predictive modeling of cultural resource potential in state parks. During this project aerial LiDAR data and ground truthing was used to refine maps and update the FMSF locations for archaeological and historical sites (Collins 2013). The model identified 314 acres within the park as high sensitivity for archaeological resources.

Grocery Place and Old Grove Midden have not been evaluated for listing in the National Register of Historic Places (NRHP) and further study would be required.

Continued monitoring of both sites is needed to determine the effects of non-native plant removal currently being conducted, and to further monitor for erosion and vandalism. An archaeological survey would be beneficial to determine the age and extent of previous human occupation. Although Grocery Place is already an established primitive camping area, limited use should be continued to prevent further erosion or damage to the site or eliminating Grocery Place as a primitive campsite altogether, to protect the cultural resource.

Historic Structures/Sites

The other active, historic structures and sites listed on the FMSF for Collier-Seminole State Park include the Bay City Walking Dredge (CR00138), Old Marco Road (CR01088), Blockhouse (CR01089), Barron Collier Memorial (CR01090), Shop (CR01517), Myers property (CR01518) and Recreation Hall (CR01521).

Additionally, the park itself is listed as a separate site file (CR000125). A previous attempt in 1970 to list the entire park a nationally registered site was based on the excellent preservation of a full range of south Florida land types (e.g., scrub cypress, pine, open prairie, mangrove, etc.), along with the presence of the Collier Memorial, the walking dredge and the Blockhouse. This nomination was ultimately denied in 1971, and the entire park is not currently listed on the NRHP. During the early stages of development of Collier-Seminole State Park in the late 1940s and early 1950s, Collier County constructed the Blockhouse and the Barron Collier Memorial, as well as the campground. The boat basin and maintenance compound were constructed in the 1960s.

The Bay City Walking Dredge (CR00138) was used in the construction of the Tamiami Trail, and it remained near the park after the highway's completion in 1928. It was later moved into what is now Collier-Seminole State Park a few years later. The dredge and was listed as a National Historic Mechanical Engineering Landmark by the American Society of Mechanical Engineers in 1993. As of May 2013, the dredge has been placed on the NRHP. The construction of Tamiami Trail is uniquely connected with the history of Collier County and Southwest Florida, and therefore the dredge is a significant historical structure connected to the history of the county and state. It is believed that this is the last remaining walking dredge of this type used in the early 20th century.

Old Marco Road (CR01088) is a linear historic road that is located within the boundary of Collier-Seminole State Park for 1.5 miles. Built around 1916, the road went from Royal Palm Hammock to Marco Junction, what is today Shell Island Road. The road surface is dirt and was never paved. It is estimated the road was abandoned in the 1950s due to the establishment of the park, and the more stable road surface of the Tamiami Trail. The remaining length of road is in good condition and serves as the major access for maintenance of the natural park areas as well as part of a 3.5-mile bicycle trail – Prairie Hammock Trail.

The Blockhouse (CR01089) is the oldest building in the park, built in 1940. It is believed that it was built by Collier County for the early development of the park. Hurricane Donna flooded the county courthouse in Everglades City and destroyed much of the county records in 1960. The style of architecture was used to commemorate the Third Seminole War from 1855-1858 that took place in Collier County. Although not a replica of typical fort construction from the period, it is a stylized version of the construction used during that time. It is believed that D. Graham Copeland was instrumental in the construction of the Blockhouse because of his interest in the history of that era and his efforts in locating historic sites within Collier County. The building originally served as the caretaker's residence but had various other functions over the years. Presently, it houses park interpretive displays downstairs

and serves as office space and storage upstairs. The Blockhouse should be reviewed for the possibility of being a National Register site.

The Barron Collier Memorial (CR01090) is in the original area of the park that was set aside as preservation land by Barron Collier. Mr. Collier wanted the park to become a national park, but the offer was declined by the federal government. Barron Collier died in 1939, and soon after, Collier County began planning the development of the park. A memorial to Barron Collier was unveiled on January 1, 1941, by Collier County Chairman D. Graham Copeland. The park was donated to the state two years later and opened as a state park in 1947. There were other features on the Memorial field in conjunction with the Barron Collier Memorial that no longer remain, including lime rock pillars and a reflection pond. The four bronze plaques installed on lime rock pedestals are in storage.

The Shop (CR01517), currently known as "Old Shop," was built in 1969 and it is still being used by the park to store vehicles/equipment and other maintenance related items. It is not considered culturally significant, but it is considered historic because it is over the 50-year threshold.

The Myers property (CR01518) was originally constructed circa 1939 as a residence for the Myers family. It was later acquired by the state of Florida in 2002. It is currently being used as a park residence and was recently damaged by Hurricane Ian (2022) and Hurricane Helene (2024). Several renovations have been made to the house, and it is now considered in good condition. However, the building sits in an area that is well known for flooding. If it floods again, consideration should be given to either elevate the entire structure or demolish and replace it with a residence more resilient to hurricanes. This site was determined to not be culturally significant by the Florida Department of State's Division of Historical Resources (DHR) in 2023 when the hurricane-related renovations were made to the property.

The Recreation Hall (CR01521) was one of the original park buildings constructed in 1956. It was used as a screened recreation area and bathroom combination building in the campground area. It is currently still being used today for the same purpose as when it was originally developed.

In addition, there are four cultural/historical sites listed on the FMSF known as Royal Palm Hammock Station (CR00658), Highway US-41/Tamiami Trail (C00R927), Tamiami Trail Canal (CR00928) and the Royal Palm Hammock (CR00933) that currently serves as a bar/restaurant and gas station. These areas are surrounded by park lands, but currently outside the park's management and responsibility.

Two other inactive sites are also currently listed on cultural resource roster on the FMSF – Camp Restroom (CR01519), previously known as building 013017 bathhouse; also, Bathhouse (CR01520), previously known as building 013004 bathhouse. Both buildings have been demolished and replaced, but they will need to be removed from the active cultural resource roster on the FMSF.

Collections

The park has a small collection of natural and cultural objects that have been retained due to their relevance to the natural and cultural landscape of the park. Specific objects in the park's Scope of Collections include the historic Walking Dredge along with the bronze plaques and the Seminole War history that were mounted on the limestone rock pedestals that once existed on the Memorial Field.

Additionally, the park has historical archives which are comprised of binders of newspaper clippings from past events and historical paintings and photographs of the park.

The overall condition of the park's collection is good, owing to storage in a climate-controlled environment in the Blockhouse. Future concerns include the natural deterioration of the outside historical structures. These structures will need periodic cleaning and inspection.

The park maintains a Scope of Collections Statement, which details objects in trust to the park. Most of these objects are kept in storage, upstairs in the blockhouse, which is climate controlled to prevent deterioration of the items. In 2011, the park's collection of historical VHS video tapes was taken to the state park archives in Tallahassee for preservation and copying and is still in the process.

Cultural Sites Listed in the Florida Master Site File					
Site Name and FMSF #	**Culture/Period**	**Description**	**Significance**	**Condition**	**Treatment**
Grocery Place CR00034	Historic/Prehistoric/ Unspecified	Archaeological Site	NE	F	ST
Collier-Seminole State Park CR00125	Historic/Unspecified	Historic District	NE	G	P
Bay City Walking Dredge CR0138	Historic/Unspecified	National Historic Mechanical and Engineering Landmark	NRL	G	P
Old Marco Road CR01088	Historic/Unspecified	Historic Road	NE	G	P
The Blockhouse CR01089	Historic/Unspecified	Historic Structure	NE	G	P
Barron Collier Memorial CR01090	Historic/Unspecified	Monument	NE	G	P
Old Grove Midden CR01313	Prehistoric/Unspecified	Archaeological Site	NE	F	P
Shop CR01517	Historic/Unspecified	Historic Structure	NS	G	P
Myers Property CR01518	Historic/Unspecified	Historic Structure	NS	G	P
Recreation Hall CR01521	Historic/Unspecified	Historic Structure	NE	G	P

Significance:
NRL - National Register Listed
NRE - National Register Eligible
LS - Locally Significant
NE - Not Evaluated
NS - Not Significant

Condition:
G – Good
F – Fair
P – Poor

Recommended Treatment:
RS - Restoration
RH - Rehabilitation
ST - Stabilization
P - Preservation
R - Removal

Condition Assessment

Objective: Monitor and assess all the recorded cultural resources in the park.

Action:

- Assess/evaluate ten recorded cultural resources.

The park staff will locate, assess, and evaluate the 10 known cultural resource sites in the park (see Cultural Resources Table) for condition and threats, and will document recommendations that will allow for long-term preservation and integrity of the sites. All cultural sites should be monitored at least annually.

Priority would be for National Register sites, sites eligible for listing on the National Register, and sites of local significance. Of the six sites to be evaluated, in order of significance, are: The Bay City Walking Dredge, The Blockhouse, The Barron Collier Monument, Old Marco Road, Grocery Place and Old Grove Midden. All these sites have local and statewide historical significance. Grocery Place is also an archaeological site. The only site listed on the NRHP is the Bay City Walking Dredge. The Blockhouse should be considered for listing on the NRHP.

Historical structures Reports are recommended for the park cultural sites to prioritize repair, restoration and rehabilitation projects identified by the historic structures report. Assessment will examine each site with a discussion of threats to the site conditions caused by natural erosion; bicycle or pedestrian damage; looting; construction damage; animal and plant damage; or other factors that may contribute to the deterioration of the site. The evaluation will include an attempt to compare the current condition with past evaluations using historical documentation and photographs, photo points, high resolution scanning or similar techniques.

To ensure ongoing recognition, protection and management of cultural resources, there should always be at least one staff member at the park who is a certified archaeological resource monitor. In addition, park management should ensure that all personnel have sufficient training to provide adequate protection for the park's cultural resources, both documented and undocumented.

Documentation of Recorded Sites

Objective: Compile reliable documentation for all recorded historic and archaeological resources.

Actions:

- Ensure all known sites are recorded or updated in the FMSF.
- Maintain the park's Scope of Collections Statement.

The park has recorded all known sites in the FMSF and will continue to record and update the FMSF and add additional sites as they are discovered.

The longitude/latitude and GPS points will need to be verified for the sites to ensure that the FMSF has the most accurate description. The park staff will continue to research and seek additional information on the sites to update the FMSF.

Further investigation is recommended along the Blackwater River, Palm Creek and Mud Bay to determine if any additional archaeological sites exist.

The park has historical literature and oral history material collected in the past and in the park library. In 2011, several VHS video tapes made of oral history interviews were taken to the state park archive office located in Tallahassee at the facility within Lake Jackson Mounds Archaeological State Park for preservation and digitization.

The park does have a scope of collections statement and will continue to update and verify the information.

There will need to be a survey done of Grocery Place and Old Grove Midden. Although recorded in the FMSF, little is known of these sites before the settlement period. The age and cultural period of these sites are not verified, but it is known to be a shell mound that dates before recorded history.

Preservation Measures

Objective: Maintain all recorded sites in good condition.

Actions:

- Bring one of 10 recorded cultural resources into good condition.
- Develop and implement cyclical monitoring and maintenance plans for nine of the 10 recorded sites.

While all cultural sites have a monitoring history, improvements can be made with a consistent program of monitoring and implementing DHR recommended maintenance strategies when needed. The sites/structures listed on the park's cultural resource roster are in fair to good condition. Since these areas are the main components of the park and historical attractions, continued care is important for their preservation.

As it relates to managing the cultural resources, an Archaeological Resource Management (ARM) assessment should be completed on an annual basis for nine of the 10 FMSF recorded sites. No ARM annual assessment is needed for the entire park as a whole (CR00125), but it should be conducted for all the other active sites in the FMSF. This includes an ARM qualified staff member doing the following on an annual basis: completing a historic condition assessment checklist, providing comments on this form as it relates to the park's listed cultural sites, providing pictures, updating the FMSF/DHR on an annual basis upon completion of the ARM assessments, submitting a Compliance Review State Lands Consultation form and submitting to DHR for consultation for any needed repairs, renovations, restoration, major changes or non-standard maintenance-related activities, performing any required maintenance activity based on DHR guidance and updating DHR/FMSF upon completion of work. To compliment the ARM assessment process, developing a more comprehensive cultural resource management plan should be considered for each of the nine active site IDs in the FMSF (CR00034, CR00138, CR01088, CR01089, CR01090, CR01313, CR01517, CR01518 and CR01521).

Notable Cultural Resource Concerns

The Bay City Walking Dredge is a NRHP site and popular historical attraction. This site would need to be the top priority due to its significant cultural and historical status. The park staff has conducted several projects to help preserve the Dredge in the past few years, but this is one site in particular that would

benefit from a written management plan. Specific conditions that should be considered for the walking dredge include painting and applying rust treatment to the structure on a 10-year cyclical plan. Also, the A-frame timbers should be consistently monitored for signs of insect infestation (i.e., termites). It should also be monitored for deterioration due to normal weathering. A roof may be needed in the future to provide better protection.

The Blockhouse would be the second priority and is the oldest building in the park, dating to 1940. Major renovation was conducted in 2006, which helped stabilize and restore the structure. The park has purchased scaffolding to clean the outside of the building and is currently in the process of renovating the visitor center on the first floor. A plan for monitoring and preserving the current state of the structure would be beneficial. Specific maintenance techniques should include continued chinking as needed, checking for signs of water intrusion/damage, consistently monitoring for signs of insect infestation (i.e., termites) and considering sanding the existing paint and using a natural clear coat to more closely resemble a blockhouse of this era. The building is periodically cleaned, but no pressure cleaning or harsh chemicals should be used to preserve the integrity of the structure.

Grocery Place is in fair condition, and the site needs additional evaluation to identify future actions and guide long term management. Grocery Place has undergone significant erosion and weathering, and the park staff constructed a wall to help preserve and stabilize a historic water cistern and the shell bank that was eroding into the creek. A plan to further stabilize and preserve this site is needed, with the help of an archaeological assessment park staff will have better guidance to complete this task. Continued use as a primitive camping site will have to be evaluated. Perhaps a permitting system should be considered.

Old Marco Road undergoes both prescribed burning and non-native removal on a routine basis to maintain the natural habitat. A program can be created for Old Marco Road, although the maintenance tools used to implement a program for this resource are already practiced with the prescribed burning and non-native removal. Protection of Old Marco Road is to be continued with the current methods of preservation from use of prescribed burning and non-native removal. A plan to assess and monitor the needs of the resource would be beneficial. Additional culverts to aid in sheet flow and to help protect the historic road should be considered in strategic locations.

The Barron Collier Memorial would benefit from a plan to monitor and maintain it as a cultural resource. The most significant threat would be from vandalism and weathering.

SPECIAL MANAGEMENT CONSIDERATIONS

Sea Level Rise

Sea level rise will impact the park in the coming decades. If current projections of 3 to 9 feet of sea level rise by 2100 are correct; large portions of the park south of U.S. Highway 41 will succeed to submerged wetlands with open water estuarine characteristics. Mangrove communities that currently exist will become open water, salt marsh communities will transition to mangrove and wet flatwood communities will succeed to freshwater marsh. Areas north of U.S. Highway 41 may succeed to mangrove and salt marsh communities. Parkwide, major community succession may displace threatened and endangered flora and fauna, with plausible extirpations.

Arthropod Control Plan

Collier-Seminole State Park does not have an Arthropod Control Plan. The park is outside of the jurisdiction of the Collier County Mosquito Control District such that a control plan is not necessary.

Additional Considerations

Wildlife protection and public safety have always been a concern of management within the Wilderness Area. Problems in the past have occurred from local ecotour operators using the Blackwater River, Palm River, Mud Bay and Palm Bay as destinations for wildlife viewing. These same waterways are designated as critical habitat for the imperiled smalltooth sawfish. Local ecotour operations have disturbed the general tranquility of these waterways and can cause safety issues. Local law enforcement and FWC have been made aware of these issues, but proper speed zones and exclusion zones should be established for enforcement to occur.

Watercraft such as airboats, jet skis and compact catamarans are the most common method of tour operations in the local area, and each pose a different challenge.

Acoustic disturbances from airboats detract from the peaceful nature of the wilderness area. Maneuverable in very shallow waters, airboats are capable of accessing areas that other watercraft cannot, resulting in a multitude of impacts to unconsolidated marine substrate, seagrass beds and mud flats. In the past, erosion has been caused by airboat activity departing from the nearby town of Goodland. In response, the eroding shoreline at Grocery Place has been stabilized and the airboat operator has been instructed not to enter the park.

Jet skis and compact catamarans can cause excessive wave energy that has led to erosion and near swamping of non-motorized watercraft (e.g., paddlecraft). As mentioned above, this is an issue with unauthorized ecotour operators from the Goodland and Marco Island area. Park visitor safety and wildlife impacts are the main concerns with jet ski and compact catamaran operation within the wilderness area.

Park staff should consider limiting the operation of these types of watercrafts in the park through daily permit limitations or possibly prohibiting them all together.

LAND USE COMPONENT

VISITATION

At Collier-Seminole State Park, visitors are invited to walk through one of the last natural stands of royal palm and explore the great mangrove swamp of Southwest Florida via paddlecraft. Other outdoor recreational opportunities include hiking, camping, and wildlife viewing. The park is a destination for nature enthusiasts, particularly during the cooler months when outdoor conditions in Southwest Florida are more appealing. A wide variety of wildlife, including several imperiled species, are routinely encountered in this exceptional blend of temperate and tropical native plant communities.

The park is home to a National Historic Mechanical Engineering Landmark, the last existing Bay City Walking Dredge. Built in 1924, it was used to help build the Tamiami Trail (U.S. Highway 41) through a portion of the Big Cypress swamp, providing a much-needed link between Tampa and Miami and opening Southwest Florida to travel. In addition to the dredge, the Seminole War representational blockhouse, the Barron Collier Memorial and Native American elements offer cultural interpretive opportunities.

Florida Circumnavigational Saltwater Paddling Trail (CT)

Segment 13, a 68-mile portion of the CT from Lovers Key/Bowtie Island to Everglades City, runs through the nearby Rookery Bay NERR and Ten Thousand Islands National Wildlife Refuge. While this segment does not extend through Collier-Seminole State Park, a 13.5-mile designated paddling trail within the park, the Blackwater River Paddling Trail, provides connection to the CT. Along this loop trail is one primitive campsite, Grocery Place, on the north side of Palm Bay. The campsite is utilized by paddlers of both the park loop and CT. The Blackwater Creek Paddling Trail is the primary means of access through the 4,760-acre wilderness area.

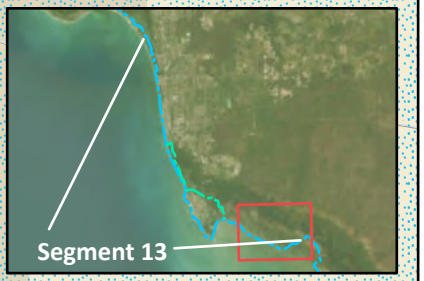
Trends

Seasonal trends are apparent at Collier-Seminole State Park. During the summer months, the park experiences hot and muggy conditions with mosquitoes and other uninvited insects often becoming an unbearable nuisance. Park attendance during these months significantly declines relative to months with milder temperatures. Ideal months to visit the park are from November through April, with the park experiencing its highest usage between January and March. Annually, the park welcomes approximately 65,000 visitors.

Economic Impact

Attendance over the 10-year period from FY 2015-16 through FY 2024-25 totaled 661,207 visitors. By DRP estimates, the visitors contributed $82,065,777 in direct economic impact. Visitor spending supported a cumulative total of approximately 1,172 one-year job equivalents over the 10-year period. (DEP 2015-2025).

Emergency Contact Info:
911
Collier County Sheriff: (239) 774-4434
Everglades NP 24-hour Search and Rescue: (305) 247-7272
FWC 24-hour wildlife emergency/BUI hotline: 1-888-404-3922



Camp White Horse 2

(25.8678, -81.5723)

Camp Gullivan 2

(25.8726, -81.5808)

Tiger Key Campsite ENP

(25.8340, -81.4925)

Permit required from Visitor Center. No advanced reservations; arrive in person up to 24 hrs in advance.

ENP Visitor Center

(25.8457, -81.3871)

Hog Camp

(25.8599, -81.5536)

Camp Gullivan 1

(25.8657, -81.5793)

White Horse Key Campsite

(25.8578, -81.5658)

Camp Lulu Key Campsite

(25.8339, -81.5092)

Picnic Key Campsite ENP

(25.8247, -81.4861)

Permit required from Visitor Center. No advanced reservations; arrive in person up to 24 hrs in advance.

Fakahatchee Strand Preserve State Park
Turtle Key
Santina Bay
Four Brothers Key
White Horse Key
Panther Key
Faka Union River
Ten Thousand Islands National Wildlife Refuge
Gomez Point
Cape Romano-Ten Thousand Islands Aquatic Preserve
Round Key
Ferguson River
Lane Cove
West Pass Bay
Everglades
Everglades City
Jentgen Parcel
Everglades Channel
Russell Key
Russell Pass
West Pass
Russell Bay
Gaskin Bay
Everglades National Park
Picnic Key
Tiger Key
Sandfly Island
Stop Keys
Indian Key Pass
Indian Key
Kingston Key

Florida Circumnavigational Saltwater Paddling Trail

Segment 13: Rookery Bay/Ten Thousand Islands (Map 5 of 5)

Begin: Lovers Key/Bowtie Island
End: Everglades City

Distance: 68 miles (depending on route)
Duration: 4 days

0 0.75 1.5 3 Miles

Disclaimer: This guide is intended as an aid to navigation only. A Global Positioning System (GPS) unit is required and persons are encouraged to supplement these maps with NOAA charts or other maps.
Updated: 12/2022

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EXISTING FACILITIES AND INFRASTRUCTURE

Developed Area

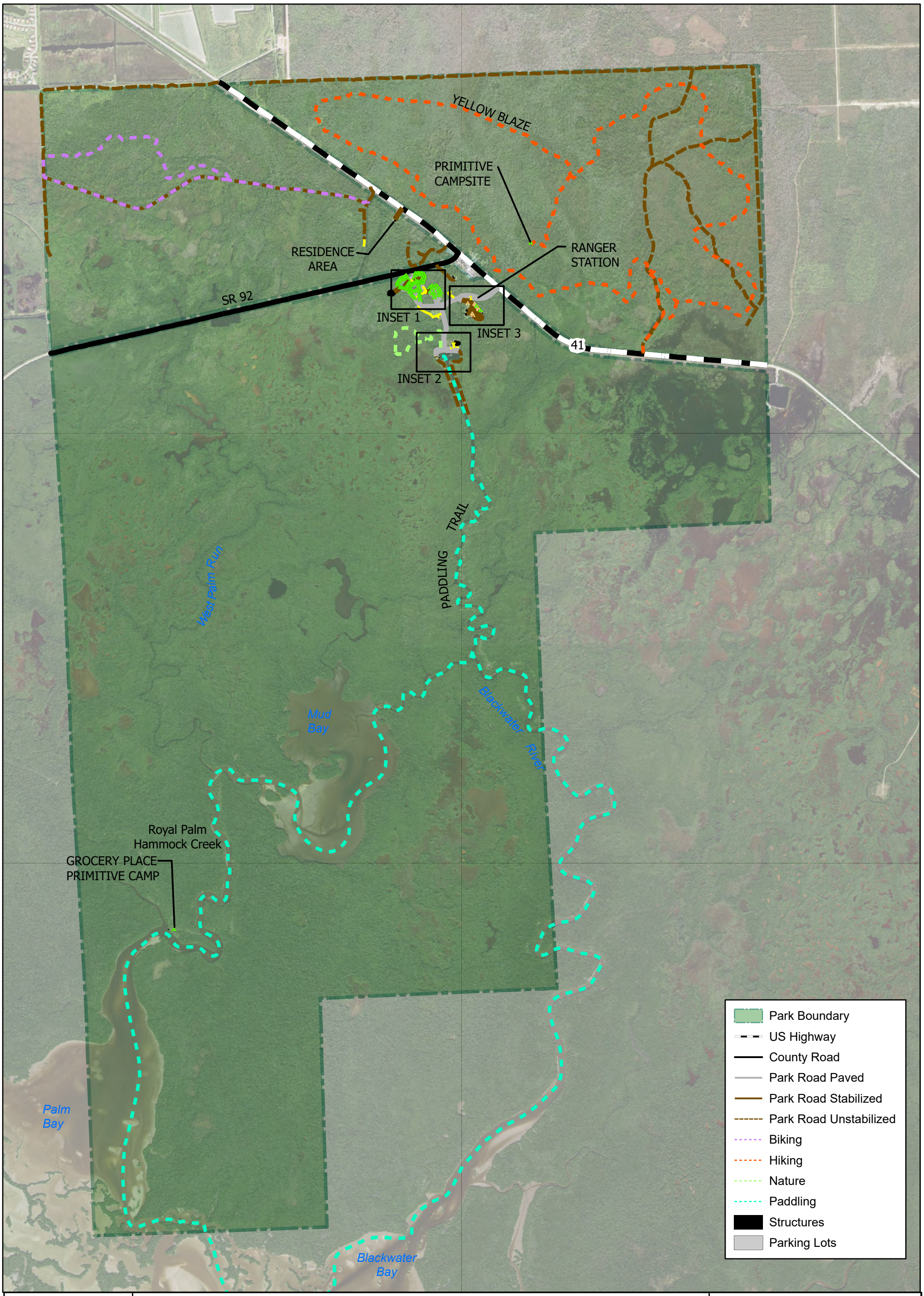
The vast majority of Collier-Seminole State Park is in natural condition, with only a 39-acre area of recreational and operational development. The existing recreation and support facilities are concentrated around the San Marco Road (County Road 92) and Tamiami Trail (U.S. Highway 41) intersection. When entering the park from U.S. Highway 41, most of the support facilities for park staff are located south of the ranger station and are accessed by a paved service road. There are two ranger residences and one shed, which are to the north of the ranger station accessed from County Road 92 or U.S. Highway 41. Passing the ranger station, the paved park road branches, with the north branch leading to the campgrounds, and the south branch leading to the boat basin picnic area. The latter provides boating and paddling access to the Blackwater River. Facilities include a restroom, shed, picnic pavilions, playground, boat ramp, paddlecraft launch and the Royal Palm Hammock trailhead. North of County Road 92 and U.S. Highway 41, shared-use trails provide access into the park's various flatwoods communities for hiking, off-road cycling and wildlife viewing. Repeated hurricanes and inundation events have stressed infrastructure in the developed area of the park such that various improvements are needed to better serve both visitors and staff.

Backcountry

The remainder of the park—which is largely designated as a state park wilderness area—is considered backcountry, consisting of minimal upland. Accessible from an engineered boat basin, Blackwater River winds 8 miles through mangrove swamp before opening to a broader landscape of tidal flats and further estuarine habitats. Limited primitive camping is available at Grocery Place. Paddlers and boaters may access Ten Thousand Islands National Wildlife Refuge and coastal portions of Everglades National Park. State park management in the backcountry is passive, and visitors are not supported by park infrastructure.

Facilities Inventory

Camping Area	
Campground (104 campsites)	1
Bathhouse	3
Dump Station	1
Restroom	0
Recreation Hall	1
Primitive Campground	2
Developed Group Camp	1
Boat Basin and Picnic Area	
Picnic Pavilion (2 of 4 destroyed by hurricane)	4
Restroom	1
Floating Dock	1
Concession Kiosk	1
Paved Parking area (approximately 71 spaces)	1
Storage Shed	1
Boat Ramp	1
Floating Paddlecraft Launch	1
Playground	1



COLLIER-SEMINOLE STATE PARK
Existing Facilities - Page 1 of 2

N

0 2,050 4,100 Feet

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INSET 1

BATHHOUSE
LIFT STATION
RESIDENCE
EOT SITE
DUMP STATIONS
LIFT STATION
BAY CITY
WALKING DREDGE
BATHHOUSE
YOUTH CAMP
AREA
SCREEN ROOM
/BATHHOUSE
KISKOS
KIOSK
KIOSK
BLOCKHOUSE/
INTERPRETIVE ROOM
BARRON COLLIER
MEMORIAL

INSET 2

NATURE TRAIL
LIFE STATION
PLAYGROUND
RESTROOM
PAVILIONS
KIOSK
SHED
PAVILIONS
PIER/
DOCK
KIOSK
BOAT
RAMP
FLOATING DOCK
DOCK &
KAYAK/CANOE
LAUNCH

INSET 3

RADIO TOWER
RANGER
STATION
EOT SITE
EOT SITE
SHED
SHEDS
LIFT
STATION
RESIDENCES
SHEDS
SHED
SHEDS
WORKSHOPS
AUTO LIFT
POLE BARNS

COLLIER-SEMINOLE STATE PARK
Existing Facilities - Page 2 of 2

N

0 100 200 Feet

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Interpretive Kiosk	2
Royal Palm Hammock Nature Trail/Boardwalk (mileage)	0.75
Interpretive Site	
Blockhouse/Interpretive Room	1
Barron Collier Memorial	1
Bay City Walking Dredge	1
Paved Parking Area (approximately 19 spaces)	3
Interpretive Panel	3
Interpretive Kiosk	2
Support Facilities	
Maintenance Building	2
Pole Barn	3
Ranger Station	1
Residence	4
Volunteer RV Campsite	13
Employee-Owned Trailer Site (EOT)	3
Laundry Building	1
Storage Structure	12
Parkwide	
Prairie Hammock Trail (mileage)	3.5
Prairie Hammock Trail Unimproved Parking Area (approximately 20 spaces)	1
Strand Swamp Trail (mileage)	5.0
Flatwoods Trail (mileage)	3.0
Blackwater River/Royal Palm Hammock Paddling Trail (mileage)	13.5
Wilderness Area Designation (acreage)	4,760

CONCEPTUAL LAND USE PLAN

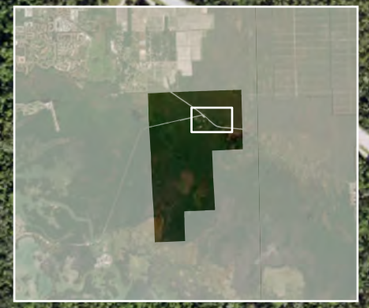
Entrance Area

Objective: Implement resilient entrance/payment infrastructure.

Actions:

- Evaluate the need for a replacement ranger station.
- Determine feasibility of kiosk payment system.

The park ranger station was demolished after impacts from multiple flood events. Replacement of the former ranger station may be considered within the former footprint; however, multiple variables may indicate an alternative solution. Seasonality of visitation, vulnerability to flooding and high cost of off-grade construction are limiting factors. Alternatively, kiosk payment systems could be installed at both day use and overnight areas. If kiosk payment systems at these locations are infeasible, then resilient ranger station concepts are indicated. A mobile ranger station that could be relocated to high ground during storm events may be feasible. If either a permanent or mobile ranger station option is selected the former footprint is the only suitable site.



1. Campground - Redesign campground and implement resilience measures. Repair infrastructure. Maintain existing group camp.
2. Entrance Area/Roads and Sidewalks/Landscaping - Implement resilient entrance/payment infrastructure. Safeguard park infrastructure to enhance resilience. Restore tree canopy.
3. Cultural Sites - Provide equitable interpretation.
4. Royal Palm Hammock Nature Trail - Redevelop the trail, including realignment and improved stabilization.
5. Blackwater River Day Use Area - Maintain river access, replace restroom and existing pavilions, construct new pavilions, improve interpretation.
6. Blackwater River - Install navigational signage, maintain Gulf access. Mud Bay motor exclusion designation.
7. Trail System (North of U.S. 41) - Evaluate the trail system and implement armoring and stabilization measures as necessary.
8. Staff Support Areas - Provide functional and resilient facilities to support park operations.

COLLIER-SEMINOLE STATE PARK
Conceptual Land Use Plan

N

0 500 Feet 1,000

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Roads and Sidewalks

Objective: Improve park infrastructure and visitor opportunities.

Actions:

- Repair and resurface park roads and parking areas as needed.
- Repair, replace and expand sidewalks throughout the park to improve access.
- Install low water crossings and culverts along roads as needed.

Repeated hurricanes and inundation events have stressed infrastructure in the developed area of the park such that various improvements are needed to better serve both visitors and staff.

Throughout the park, roads, sidewalks and parking areas must be repaired, resurfaced or upgraded to promote pedestrian safety and accessibility. Improving pedestrian connectivity between sites within the developed area of the park should be prioritized.

In addition, replanting trees lost in previous hurricanes is needed to provide additional shade and improved aesthetics throughout the campground and Blackwater Creek Day Use Area.

To improve park access for resource management, visitor services and provide better defensibility for wildfires, low water crossings are necessary throughout the park. Where roads bisect wetlands or otherwise disrupt sheetflow, culverts are needed throughout the park to improve water flow.

Landscaping

Objective: Restore tree canopy.

Action:

- Replace trees in developed areas lost in recent hurricanes.

Replanting trees lost in previous hurricanes is needed to provide additional shade and improved aesthetics throughout the campground and Blackwater Creek Day Use Area.

Blackwater River Day Use Area

Objective: Provide water access, trail access, interpretation, picnicking, and supporting facilities.

Actions:

- Maintain boating and paddling access to the Blackwater River.
- Replace restroom.
- Replace and construct additional picnic pavilions throughout the day-use area.
- Construct a large, screened pavilion.
- Develop and implement an interpretive plan in conjunction with other areas of the park.

Concession services currently provide rental opportunities for various paddlecraft. The large multi-slip dock along the northern wharf functions well for launching and recovery of motorized vessels – both rentals and park boats in separate areas. The park citizen support organization offers guided paddling

tours from the western side of the boat basin. Both docks are in good condition but may require maintenance and upgrades within the planning period.
The day use area restroom serves users of the boat basin, picnic facilities and trails. The current facility is undersized and has experienced flooding with tropical events. A new facility should be planned and constructed within the same general location.

The boat basin currently features two picnic pavilions, as two others were removed secondary to irreparable damages from recent storm events. It is necessary to replace the remaining aging pavilions and to rebuild the two that were previously removed. Additional picnic pavilions will be considered during this planning process and if deemed necessary, may also be constructed in other areas of the boat basin and throughout the park. There is an additional need for a large, screened picnic pavilion to serve larger groups and family gatherings. Screening would allow the facility to be utilized throughout the year. Outdoor grills should accompany the structure in proximal convenience.

In-depth interpretive planning is recommended to determine the most effective way to connect the diverse visitors to this park to the significance and relevant themes in this use area. The Blackwater River Boat Basin area could include the interpretation of the abundant water-based recreational opportunities through the great mangrove swamp of South Florida and its connections to the transportation lifeways of indigenous communities. The park is the westernmost boundary of the greater Everglades watershed, and interpretation should cover the ecological significance of the region. The type, design, quantity and placement of interpretive elements to deepen understanding and improve orientation will be specified during this planning process.

Royal Palm Hammock Nature Trail

Objective: Redevelop the Royal Palm Hammock Nature Trail.
Action:
- Realign and stabilize the trail.

The Royal Palm Hammock Nature Trail, prior to post-hurricane closure, provided a popular interpretive walk through the native royal palm hammock – a significant natural feature of regional significance that contributed to the park's establishment. Hurricane Ian significantly damaged or destroyed boardwalk segments of the trail. Trail redevelopment will include reconstruction of boardwalks or on-grade stabilization measures. As an alternative to costly and complex boardwalk construction, walking beams perched on perpendicular block supports may facilitate reliable low-impact access to increasingly saturated points of interest along the trail. Such beams situated slightly off-grade allow for the passage of surface water and deter erosion-causing trampling of sensitive terrain. Of larger scale concern is the successional change to this area of the park associated with the evolving climate. This may warrant reconfiguration or realignment of the trail that will be adaptive to rapidly changing soil conditions.

Barrion Collier Memorial, Village Site, Blockhouse, and Walking Dredge

Objective: Provide equitable interpretation of this multi-faceted site.

Action:
- Develop and implement parkwide interpretive planning that equally acknowledges and interprets the Native American and early 20th century history of the site.

Interpretive planning is recommended to determine the most effective way to connect visitors to the park's significance and themes. Given the park namesake, special emphasis must be placed on Seminole and Miccosukee history to today, and on the beneficial and complex aspects of Barron Collier's reimagining of Southwest Florida.

The park includes multiple interpretive areas that are short, walkable distances from one another, informally along an interpretive trail. The Barron Collier Memorial area could highlight how Collier reimagined Florida's last frontier and transformed wilderness into resorts while simultaneously preserving this park land and the royal palms. The Village Site area could emphasize indigenous lifeways in our shared environment. It may include a Seminole and Miccosukee chickee to exemplify successful adaptation, survival, culture and tradition. The Blockhouse—a stylized version of a Seminole War fort to commemorate lives lost—could provoke reflection on resistance and removal during the Seminole War period and resilience today. The Historic Bay City Walking Dredge area could better showcase the technologically revolutionary design of the dredge and the feat of the Tamiami Trail construction that forever changed South Florida and Seminole and Miccosukee culture.

The type, design, quantity and placement of interpretive elements to deepen understanding and improve orientation will be specified during this planning process. Interpretive planning in these areas should be undertaken in conjunction with the Boat Basin Day Use Area.

Campground

Objective: Improve resilience, functionality and natural aesthetics, while improving the resource-based camping experience.

Actions:

- Redesign the campground.
- Plan and implement measures for campground resilience.
- Repair campground bathhouses and buildings as necessary.
- Maintain existing group camp in Loop B.

The entire campground contains 104 campsites, is regularly congested and is highly subject to flooding associated with seasonal rains or tropical cyclones. Consideration should be given to reducing the number of campsites to prevent overcrowding and improve the overall visitor experience. As all areas within the campground are comparably low and flood-prone and the current configuration functions well, any replacement structures or resurfacing of roads should adhere to the original footprints. Reconfiguration of selected sites can be considered to better accommodate large recreational vehicles. Natural buffering should be encouraged between sites to provide privacy and more appealing sightlines.

While major redevelopment is deemed impractical, measures should be implemented to improve resilience, thereby enhancing durability and accelerating recovery time following future flood events. Given ground saturation and flood projections, the cost and complexity of reconstructing campground buildings off-grade is considered infeasible. Practical resilience-oriented reinvestments in the campground are limited to detachable utility pedestals in order to alleviate repeated malfunctions due to flooding.

The campground bathhouses and buildings need various repairs and renovations to address ongoing maintenance challenges, improve safety and functionality and extend the longevity of the facilities. These upgrades will include structural repairs, interior and exterior refurbishments and replacement of aging fixtures and systems.

An early park group camp was previously developed in a remote location, near the east end of Old San Marco Road. While this location's separation from the main campground is a desirable aspect for the intended immersive experience, concerns include flood risk due to the hydrological changes previously mentioned, as well as the challenges of providing necessary support facilities. It was determined that a more practical and feasible location for a youth camp would be the clearing immediately west of the campground. This location is relatively high and well-drained and is within reasonable walking distance from the campground bathhouses while maintaining visual separation and buffering behind a near contiguous tree line.

Staff Support Areas

Objective: Provide functional and resilient facilities to support park operations.

Actions:

- Retrofit or replace staff residences to reasonably safeguard from future flooding.
- Improve park residences and EOT sites infrastructure.
- Renovate utilities in all staff residences.
- Remove and replace one staff residence.
- Add one new staff residence.
- Raise electrical outlets and wiring at the maintenance building.
- Expand/add pole barns and add utilities as necessary.

There are currently four staff residences, three of which have experienced significant flooding and corresponding damage. All four residences need to be evaluated to determine the feasibility of elevating these structures well above the height of historic flood waters. If raising a given structure is deemed impractical, then replacement is suggested, either in situ or within vicinity.

Various park residences and EOT infrastructure require replacement, repair or upgrades. These improvements include, but are not limited to, new roofs, windows, fencing and interior necessities, as well as related support facilities such as sheds and screened enclosures.

Utilities such as electrical and plumbing within the staff residences are antiquated and in need of upgrade/replacement to meet required serviceability. These upgrades should be implemented for any structures where effective flood mitigation measures are deemed feasible.
The Myers property residence is prone to flooding during every significant storm event. If it floods again, the residence should either be raised or demolished and replaced with a more storm-resistant residence.

One new staff residence is planned near the Myers property with ingress/egress from County Road 92. Sewer connection for ranger residences is also planned to discontinue septic tank dependence.

The park's two maintenance facilities are important structures supporting operational and maintenance needs. The old maintenance building experienced flooding during Hurricane Ian (2022) and Hurricanes Helene (2024) and Milton (2024). The new maintenance building only experienced flooding during Hurricane Ian. Similar to the campground discussion points, resiliency measures for the maintenance building should aim to improve durability and speed of recovery following future flood events. Raising electrical outlets and wiring should be considered. If replacement of the current maintenance building is warranted due to damage, a new four-bay facility with full bathroom is sanctioned. This new facility would be constructed either in-situ or in close vicinity within the established maintenance area.

Additional pole barns and extension features should be considered to protect equipment typically stored outdoors in the maintenance area. Also, consider adding utilities to pole barns as needed.

Trails

Objective: Make trail improvements to enhance hiking experience and reduce impacts to natural resources.

Actions:

- Evaluate the hiking trail system north of U.S. Highway 41 and identify segments that require armoring.
- Implement armoring and/or stabilization measures as necessary.

The park maintains an adventurous system of hiking trails north of U.S. Highway 41, where hikers can experience a variety of quintessential Southwest Florida natural communities, including strand swamp, wet flatwoods, slough, rockland hammock and marl prairie. While most portions of this trail network are holding up well, staff have identified segments that are frequently inundated and subject to erosion. In effort to improve sustainability and eliminate or reduce alterations to hydrology or other natural processes, such trail segments should be improved. Improvements may include appropriate fill material to once again match the surface of the trail to the adjacent grade, installation of low boardwalk segments or on-grade armoring with environmentally compatible materials.

Intermediate and Long-term Planning for Hydrological Changes

Objective: Coordinate and plan for the protection of natural resources, facilities and infrastructure as a consequence of immanent hydrological changes.

Actions:

- Collaborate with stakeholders to monitor, gauge and project receiving hydrology influenced by the greater restoration of the Picayune Strand.
- Coordinate and communicate to stakeholders the necessary mitigating measures required to protect park resources.
- Evaluate road and culvert infrastructure to determine long-term efficacy.

While the ongoing USACE and SFWMD coordinated hydrological restoration work within the Picayune Strand State Forest is a net-positive environmental benefit to the region, the resulting increase in the volume of surface water that moves into the park must be addressed. Intermediate and longer-term planning must address three key factors.

The first is the sheer increase in surface sheetflow (movement of water across the landscape). As the hundreds of miles of canals and ditches associated with the former Golden Gate residential development are filled or plugged in this broader Everglades restoration project, sheet flow to the south and southwest is dramatically increased. While this is generally considered ecologically favorable, major municipal, residential and right-of-way development over the past six decades has resulted in far less contiguous natural area over which historic sheet flow can spread out as the water slowly moves towards the Gulf. In turn, disproportionately higher volumes of sheetflow are predicted within the park, impacting facilities and infrastructure, as well as the integrity of natural communities such as wet and mesic flatwoods, prairie hammock and marl prairie.

The second key factor is the inevitable influx of contaminants into the park from agricultural lands to the north, if left unmitigated. While the overarching objective of the PSRP is to restore the greater region's hydrology, non-conservation lands where an increase in surface water input is deemed undesirable must be excluded. This includes agricultural lands just north of the park that will be protected from potential flooding by a system of berms or levies. These exclusionary measures, however, will not preclude rainwater from accumulating behind the berms during heavy rain events. As this water is inevitably released, it will carry with it high nutrient loads as well as pesticides and other chemicals. There is a need to buffer park lands by creating a naturalized retention area to receive and attenuate influxes of water from agricultural lands to the north. It is estimated that an area of approximately 75 to 100 acres, with a functioning littoral perimeter, would be required to effectively mitigate contaminants before the water continues its journey via overflow and sub-surface flow into the park. Possible locations for such a water quality assurance project are discussed below in the optimum boundary section.

The third key factor that warrants consideration is movement of surface water through the park. More water entering the park has the potential to cause flooding if the system of internal roads and culverts is inadequate. Roadside swales, culverts and other drainage infrastructure must be evaluated and modified to allow water to move through the park and decrease the potential for flooding.

Blackwater River

Objective: Maintain sustainable navigation along the river.

Actions:

- Coordinate with Collier County, FWC and the U.S. Coast Guard (USCG) to install signage on Blackwater River to aid navigation.
- Designate Mud Bay as a motor exclusion waterway.
- Maintain navigable access to the Gulf.

To help regulate boat speeds and maintain safe passage for all boaters, DRP will coordinate with Collier County, FWC and USCG to designate the Blackwater River as idle speed pursuant to Chapter 62-D, F.A.C., and install regulatory signage to enforce this. Further, in subsequent process, interagency measures will be undertaken to establish a motor exclusion zone through Mud Bay. This will be consistent with the parameters of a wilderness area that is intended for maximizing the ecological integrity and natural aesthetic of the subject acreage, not allowing for traverse by motorized means. Accordingly, only paddlecraft will navigate these shallow waters, which may also reduce the frequency of strandings among visitors (i.e., motorized vessels have been prone to running aground).

Mangrove trimming, debris removal and permitting are needed for several miles along the navigable waterway of the Blackwater River through the park, south from the Blackwater River Boat Basin. This will not only ensure access from the park to the Ten Thousand Islands and the Gulf, but it will allow required resources to more easily reach backcountry visitors in emergency situations.

Backcountry Camping

Longstanding patterns of erosion, ground saturation, and vandalism of historic cultural features at Grocery Point necessitate an alternative site for backcountry camping within the wilderness area of the park. Although the park is not formally part of the CT, it is accessible from the CT and offers a distinctive experience for paddlers of the CT who may divert from the main route or overnight paddlers embarking from Collier-Seminole State Park. Where accessible upland spaces are scarce in the park, raised primitive camping platforms similar to designs utilized in Everglades National Park (and other federal public lands that offer long-distance paddling trails) are recommended. Precise quantity and locations are to be determined through permitting process and collaboration with representatives of paddling organizations. Such platforms are small, accommodating up to three small tents. Overhead shelter on platforms is common among analogous installations but is not a necessary feature. As the proposed platforms would be primitive and located within the wilderness area, no electrical or water utilities are to be provided. Advantages include reliability for campers, separation of campers from sensitive habitat and simplicity of repairs if damaged by storms.

OPTIMUM BOUNDARY

The optimum boundary for Collier-Seminole State Park should be expanded strategically to include several key parcels that would serve to enhance both ecological protection and long-term water management. Parcels near the northwest boundary associated with Fiddler's Creek and the large commercial farm have been identified. Acquisition of these parcels would offer integral management strategies to mitigate the increasing water flow into the park post-PSRP, discussed in the Hydrology section of the Resource Management Component. These parcels could be repurposed into a stormwater retention and treatment area to handle increased water flow from northern restoration efforts and filter runoff from surrounding agricultural lands.

At the same time, careful attention should be given to conflicting land uses and ongoing development pressures. The abandoned agricultural fields, directly east of the golf course and north of the northwestern boundary of the park, are currently proposed for development. Including such parcels within the optimum boundary would help preserve wildlife corridors and prevent further habitat loss. Additionally, incorporating the nearby airboat business into the boundary could address persistent management issues, as its operations have led to repeated trespassing into park waterways and the creation of unauthorized trails, including disturbances near sensitive rookery areas. By bringing these lands within the park boundary, park staff could better regulate access, reduce ecological damage and ensure the long-term integrity of the park's habitats.

Specific acquisitions of interest include parcels adjacent to the northwest boundary of the park, in the vicinity of Fiddler's Creek, with potential for water capture to offset impacts of high volumes or offsite water with impaired quality entering the park. Candidate parcels may include abandoned agricultural fields that would buffer the core acreage of the park from non-conservation land uses and offer the potential for ecological restoration or improvement.

Existing Park Boundary
Other Existing Conservation Lands

Optimum Boundary
ARC-Approved Additions
Proposed Additions

COLLIER-SEMINOLE STATE PARK
Optimum Boundary

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