# MOUND KEY ARCHAEOLOGICAL STATE PARK

Park Chapter

BIG CYPRESS REGION

# TABLE OF CONTENTS

Mound Key Archaeological State Park

Park Chapter

**Unit Name:** Mound Key Archaeological State Park

**Planning Region:** Big Cypress

**County:** Lee

**Lease/Management Agreement Number:** 3630

**Central Park Theme:** Framed in forests of mangrove trees, the shell mounds and ridges of Mound Key Archaeological State Park rise more than 30 feet above the waters of Estero Bay – an enduring sign of the people who inhabited this coastal landscape long before modern settlement.

**Total Acreage:** 127.85

| Natural Communities | Acres |
|---|---|
| Mangrove Swamp | 72 |
| Shell Mound | 56 |

**Acquisition:** Mound Key Archaeological State Park was initially acquired on November 2, 1961, as a donation from the Koreshan Unity, Inc. In 2020, Lee County purchased the last remaining private parcel on the island and leased the 7.9-acre property to the DRP to be managed as part of the park.

## Resource Management Component

### Imperiled Species

- Develop and update baseline imperiled species occurrence inventory lists for flora and fauna.
- Continue existing monitoring protocols for gopher tortoise.
- Monitor and document iguana hackberry, spiny hackberry, and wild cotton.

### Invasive and Nuisance Species

- Create a long-term invasive plant management plan for the park.
- Monitor ± 118 acres already in maintenance condition.
- Reduce cover class of ± 10 acres not in maintenance condition.
- Create a plan to treat royal poinciana on the island.

### Cultural Resources

- Monitor and assess all recorded cultural resources.
- Update the Florida Master Site File on an annual basis.
- Consult with the Division of Historical Resources and the Florida Public Archaeology Network on stabilization strategies for the cisterns.

## Land Use Component

### Conceptual Land Use

- Reduce erosion on archaeologically sensitive terrain and enhance interpretive experience.
- Provide a comprehensive interpretive experience that includes elements of all cultural periods, specifically:
    - Distribute new interpretive elements parkwide according to a detailed conceptual plan.
    - Improve orientation/wayfinding and sense of arrival.

### Optimum Boundary

The entire island lies within the park boundary, and the sovereign submerged lands are protected by the Estero Bay Aquatic Preserve.

The ± 9-acre parcel owned by Lee County and managed by the park extending south from the center point of the island is highly significant. If Lee County should seek fee-simple sale, acquisition by the Trustees should be prioritized.

There are no pertinent expansion opportunities for the park.

# INTRODUCTION

## LOCATION AND ACQUISITION HISTORY

Mound Key Archaeological State Park is located in Lee County. Access to the park is only by watercraft. The Big Cypress Region map also reflects significant land and water resources existing near the park.

Mound Key Archaeological State Park was initially acquired on November 2, 1961, as a donation from the Directors of the Koreshan Unity. Currently, the park comprises 127.85 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. 3630) the property to the Department of Environmental Protection's (DEP) Division of Recreation and Parks (DRP) under a 99-year lease. In 2020, Lee County purchased the last remaining private parcel on the island and leased the 7.9-acre property to DRP to be managed as part of the state park. Lee County and the Trustees leases will expire on January 22, 2067.

Mound Key Archaeological 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 appendix). 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 Mound Key Archaeological State Park is to interpret and preserve the rich cultural heritage and archaeological resources of the island, while providing resource-based outdoor recreation for Florida residents and visitors.

### Park Significance

- The variety of middens present on Mound Key are the result of human activity spanning over 2,000 years, with the largest of three mounds reaching over 32 feet in height, the second highest elevation in Lee County.

- Mound Key has been the location of important settlements throughout early Florida history. This included Calos, the capital city of the Calusa people, and San Antonio de Carlos, the first Jesuit mission in the Americas.

- Post Calusa occupancy, the mound was used by Cuban fisherman, Florida settlers and the Koreshans. Significant cultural resources that represent many of Florida's historical periods are preserved and interpreted through the park.

- Resource-based recreation activities include hiking, scenic canoeing and kayaking opportunities adjacent to local paddling trails in a secluded section of the Estero Bay, surrounded by the Estero Bay Preserve State Park.

- Mound Key is considered home to an exemplary shell mound natural community by the Florida Natural Areas Inventory. Due to its unique ecosystem, the park contains 22 imperiled plant and animal species, including iguana hackberry, wild cotton, gopher tortoise and Florida manatee.

### Central Park Theme

Framed in forests of mangrove trees, the shell mounds and ridges of Mound Key Archaeological State Park rise more than 30 feet above the waters of Estero Bay – an enduring sign of the people who inhabited this coastal landscape long before modern settlement.

### Internal Classification

Mound Key Archaeological State Park is classified as a Special Feature Site in the DRP unit classification system. A special feature site is a discrete and well-defined object or condition that attracts public interest and provides public benefit through interpretive observation and study. A state special feature site is an area that contains such a feature and is set aside for controlled public enjoyment. Special feature sites, for the most part, are either historical or archaeological by type, but they may also have a geological, botanical, zoological or other basis. State special feature sites must be of unusual or exceptional character or have statewide or broad regional significance. Management of special feature sites places primary emphasis on protection and maintenance of the special feature for long-term public enjoyment. Permitted uses are almost exclusively passive in nature and program emphasis is on

interpretation of the special feature. Development at special feature sites is focused on protection and maintenance of the site, public access, safety and the convenience of the user.

## OTHER DESIGNATIONS

The unit is not within an Area of Critical State Concern as defined in section 380.05, F.S., and it is not under study for such designation. The park is a component of the Florida Greenways and Trails System, administered by 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. Surface waters in this park are also classified as Class III waters (suitable for fish consumption and recreation) by the Department. The park is within Estero Bay Aquatic Preserve as designated under the Florida Aquatic Preserve Act of 1975 (section 258.35, F.S.).

## PARK ACCOMPLISHMENTS

- Conducted total park invasive plant treatment in 2014, 2019 and 2022 with funding from the uplands program of the Florida Fish and Wildlife Conservation Commission's (FWC) Invasive Plant Management section.
- Installed new interpretive signage along the trail, detailing history of the island.
- Incorporated the 7.9-acre parcel that had been acquired by Lee County Conservation 20/20, bringing the entire island under state park management in 2021.

# RESOURCE MANAGEMENT COMPONENT

| Mound Key Archaeological State Park Management Zones | | |
|---|---|---|
| **Management Zone** | **Acreage** | **Managed with Prescribed Fire** |
| MK-01 | 45.92 | No |
| MK-02 | 34.45 | No |
| MK-03 | 23.14 | No |
| MK-04 | 24.28 | No |

## TOPOGRAPHY

Mound Key Archaeological State Park is in the Everglades District, specifically in the Big Cypress Province. The topography of this site rises in dramatic contrast to the surrounding region. Unlike other nearby islands and the low-lying mainland to the east, Mound Key is dominated by the steep slopes of several historical man-made shell mounds, one of which attains an elevation of approximately 32 feet (7 meters) above mean sea level. This is the second highest elevation in Lee County. From the sides of the largest mound, several ridges trail away in long, sinuous patterns, sloping downward until, at their extremities, they are only slightly elevated above the surrounding terrain.

## SOILS

The scale at which Mound Key was mapped during surveys by the U.S. Department of Agriculture's Soil Conservation Service only permitted the identification of one soil type: Kesson fine sand, which underlies the fringe of mangroves surrounding the island (see Soils Map). Foot traffic and subsequent water movement over the contours of the mounds are accelerating erosion along a section of the trail on the slope of Mound One located on the south side of the island. Erosion issues will be covered in the Cultural Resource Management Section of this plan.

## HYDROLOGY

Mound Key Archaeological State Park is located in Estero Bay within the 13,829-acre Estero Bay Aquatic Preserve. Estero Bay was designated an Outstanding Florida Water effective August 8, 1994. The mangrove swamp and estuarine unconsolidated substrate communities on the island generally maintain salinities indistinguishable from the surrounding Bay. There are no sources of freshwater on the island, and rainwater rapidly percolates through the shell and sand substrate.

### Hydrological Alterations

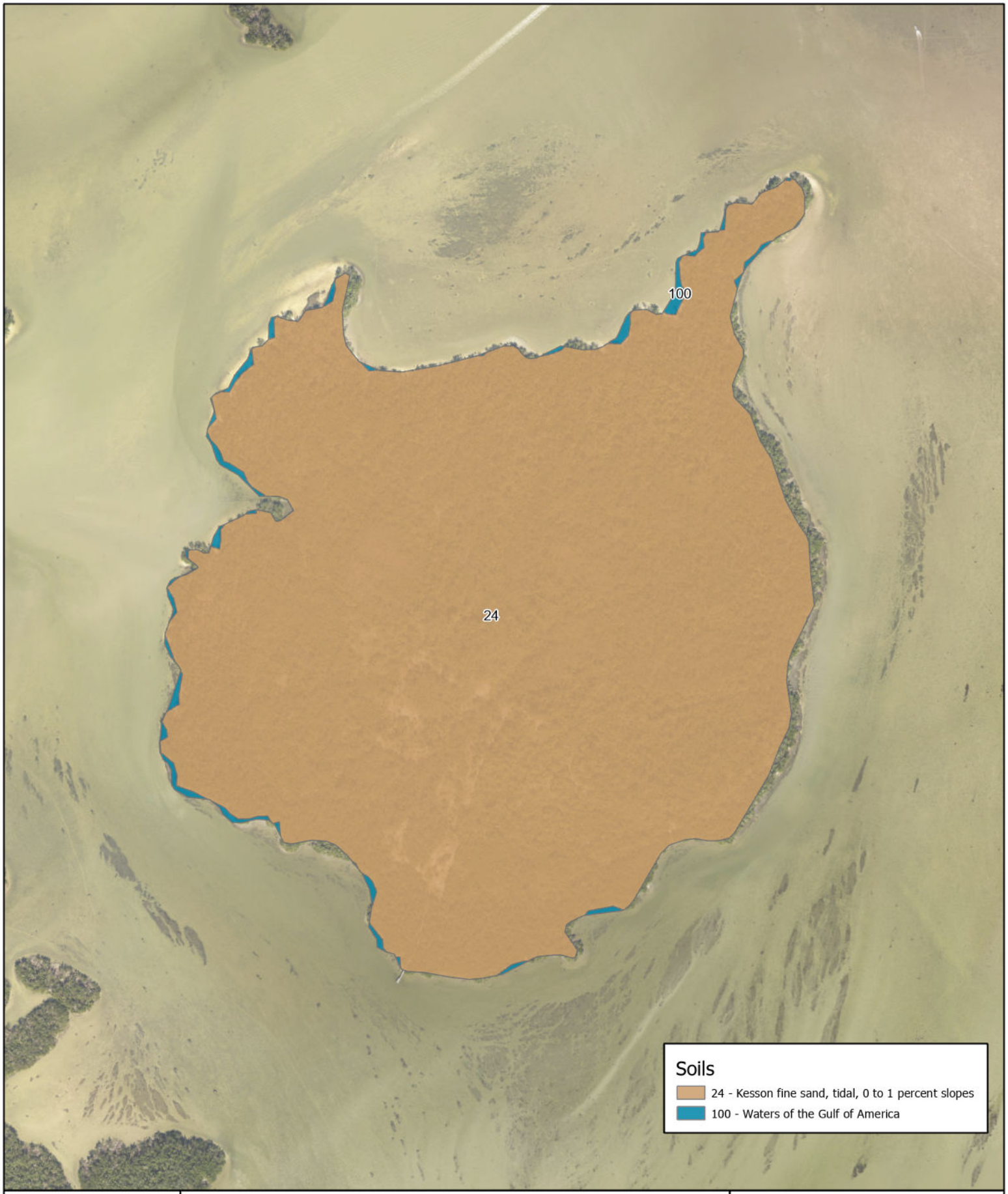
Mound Key is a pre-historic man-made island constructed by the Calusa and includes an extensive structure of mounds, water courts and canals. There is a large canal that was created by the Calusa to bisect the two largest mounds, and it was partially filled in prior to park acquisition. It currently represents a tidally influenced mangrove swamp natural community. Additional areas intentionally engineered by the Calusa on Mound Key include watercourts, which were shallow features built on a foundation of oyster shell that likely served as tidal enclosures or fish traps (Thompson et al. 2020).


# MOUND KEY ARCHAEOLOGICAL STATE PARK
## Management Zones

N

0 500 Feet 1,000

Sources: ESRI; Florida Department of Environmental Protection
This graphical representation is provided for informational purposes and should not be considered authoritative for navigational, engineering, legal, and other uses.




# MOUND KEY ARCHAEOLOGICAL STATE PARK
## Soils

N

0 500 Feet 1,000

Source: Esri, Maxar, Earthstar Geographics, IGN, and the GIS User Community; Florida Department of Environmental Protection, Division of Recreation and Parks

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Additionally, shell material of the middens was mined in the 1920s for construction of the Tamiami Trail. Remnants of the 500-foot-long dredged area can be seen from the northeastern boat access point and adjacent to various locations along the trail leading to Mound Two.

### Coastal Erosion/Sedimentation

Mound Key received over 8 feet of storm surge during Hurricane Ian in 2022, and additional storm surge from hurricanes Helene and Milton in 2024. Large trees fell during all storms with vegetation along the southwestern side of the park eroding and exposing the shell mound beneath. However, much of the island is surrounded by thick layers of mangrove swamp, which protects the uplands from significant erosional issues. One additional source of erosion on the island is the narrow un-stabilized trail that crosses the island. Foot traffic and weather events have resulted in some erosion of the trail along the steep side of Mound One. Stabilization efforts have been considered, including the addition of steps or a staircase.

## NATURAL COMMUNITIES

The park contains two distinct natural communities (see Natural Communities Map). A list of known plants and animals occurring in the park is contained in the Southwest District Species Matrix appendix.

### Mangrove Swamp

The mangrove swamp community encompasses 71.93 acres at Mound Key Archaeological State Park, surrounding the shell mound and generally following the low lying, subtidal areas of Mound Key. The outer fringe is dominated by red mangrove (*Rhizophora mangle*), while the inner portions of the island including the canal and watercourts are dominated by black mangroves (*Avicennia germinans*). White mangroves (*Laguncularia racemosa*) and buttonwood (*Conocarpus erectus*) can be found on the upper tidal edges of the mangrove swamp. Shrub species observed along the upland fringes of the mangrove swamp at Mound Key include bushy seaside oxeye (*Borrichia frutescens*) and christmasberry (*Lycium carolinianum*), vines including gray nicker (*Guilandina bonduc*) and coinvine (*Dalbergia ecastaphyllum*) and herbaceous species such as saltwort (*Batis maritima*), sea blite (*Suaeda linearis*), perennial glasswort (*Salicornia ambigua*) and annual glasswort (*Salicornia bigelovii*). Mangrove swamp is delineated to those areas of the park that are daily tidally influenced, but most likely overlaps the man-made shell mound community within the subsurface strata that surrounds the island.

The condition of the mangrove swamp at Mound Key Archaeological State Park is excellent. The northeastern and northwestern points of the island have fine examples of mangrove swamp, and the inner portions hold some of the best developed examples of black mangroves to be seen anywhere, having trees of large size, widely spaced and densely canopied, over a shaded substrate thickly punctuated by long upward-pointing pneumatophores. These interior black mangroves are bounded by linear-shaped ridges erected by an ancient culture therefore giving rise to their existence. A 1996 National Champion black mangrove (circumference 101 inches, height 43 feet) is located on Mound Key, but further investigation is needed to confirm its condition following the multiple hurricanes in recent years. Park visitors encounter mangrove swamp at both boat and kayak access points and short portions of the trail that cross through remnants of the main canal between Mound One and Two.

Management of mangrove swamps at Mound Key State Archaeological Park largely focuses on invasive plant surveys and treatment efforts. Mangrove swamps are sensitive to colonization in the upland


# MOUND KEY ARCHAEOLOGICAL STATE PARK
## Natural Communities - Existing Conditions

N

0 500 1,000 Feet

Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community; Florida Department of Environmental Protection

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

borders by invasive plant species such as Brazilian pepper and other invasive plants whose seeds arrive with the tides, such as beach naupaka (*Scaevola taccada*) and Portia tree (*Thespesia populnea*). Recent management actions have reduced the Brazilian pepper considerably but follow up actions are needed to keep the island in maintenance condition. The presence of other invasives such as carrotwood (*Cupaniopsis anacardioides*), chinaberry and Portia tree should be monitored.

Shell Mound

The shell mound community at Mound Key Archaeological State Park are man-made areas of elevated topography composed entirely of shells (clams, oysters, whelks). The shell mound occupies 55.92 acres at the park, with its highest peak reaching 32 feet above mean sea level. The overstory is dominated by false mastic (*Sideroxylon foetidissimum*), gumbo limbo (*Bursera simaruba*), soapberry (*Sapindus saponaria*) and cabbage palms (*Sabal palmetto*). Strangler fig (*Ficus aurea*) is plentiful around the island, and some tower above the overstory. Other shrubs, such as wild lime (*Zanthoxylum fagara*), saffron plum (*Sideroxylon celastrinum*), white indigoberry (*Randia aculeata*), white stopper (*Eugenia axillaris*) and snowberry (*Chiococca alba*), are present. The smaller native understory trees are mainly Spanish stopper (*Eugenia foetida)* and are quite dense in places. Native ground cover is sparse and often absent over large areas; the well-shaded forest floor is thickly covered with leaf litter. A few imperiled species are only found among the shell mound natural community, including West Indian cock's comb (*Celosia nitida*), iguana hackberry (*Celtis iguanaea*) and spiny hackberry (*Celtis pallida*). Additionally, imperiled gopher tortoises (*Gopherus polyphemus*) are present on the island. The Florida Natural Areas Inventory (FNAI) lists the shell mound at Mound Key as an exemplary site (FNAI 2010).

The flora of Mound Key was originally mapped and described by a graduate student from the University of South Florida from 1973 to 1974 (Cooper 1978). Cooper described the natural communities at that time as tropical hammock and thorn scrub. Thorn scrub description lacks shady canopy and has no leaf litter. The tallest species were small trees and shrubs including Florida swampprivet (*Forestiera segregata)*, buttonwood (*Conocarpus erectus*) and white indigoberry. In Cooper's study, agaves and cacti comprised almost 65 percent of the shrub layer. These thorn scrub areas appear to have diminished over time as the hardwood forested areas increase in size due to natural succession and the discontinuance of certain agricultural practices like livestock grazing and hardwood removal.

The condition of the shell mound is fair due to the presence of non-native and invasive plant species. Non-native and invasive tree species introduced by settlers who lived on the island early in the last century still proliferate despite multiple treatment efforts. Some of the non-native tree species planted by early Koreshan residents include royal poinciana (*Delonix regia*), a showy non-native from Madagascar, avocado (*Persea americana*), sugar apple (*Annona squamosa*), Chinaberry (*Melia azedarach),* guava (*Psidium guajava*), Surinam cherry (*Eugenia uniflora)* and various citrus species. There are isolated patches of invasive plants along the trails including lifeplant (*Kalanchoe pinnata*), which responds well to sunlight and is more likely to be found near the forest edge, as well as royal poinciana saplings, which are numerous in the more shaded areas. Multiple invasive plant treatment projects at the park have targeted Florida Invasive Species Council (FISC) Category I species including Brazilian pepper (*Schinus terebinthifolia*), lantana (*Lantana strigocamera*), Chinaberry*,* guava and Surinam cherry. Continued monitoring and retreatment efforts will be necessary to tackle the extensive residual seed bank left behind by these species.

Additional alterations to the shell mound community at Mound Key Archaeological State Park include a portion of management zones MK-03 and MK-04, which until recently was privately owned and known

as the McGee parcel. For many years, the private owner-maintained goats within their fenced lot. Goats are indiscriminate feeders and actively cleared the parcel of vegetation providing vast openings for invasive species on site. This parcel was purchased by Lee County 20/20 with management of the parcel transferred to DRP in 2021. Currently, royal poinciana saplings and Madagascar rubbervine (*Cryptostegia madagascariensis*) dominate the areas previously cleared by the goats.

Management of the shell mounds at Mound Key Archaeological State Park largely focuses on rare plant surveys, invasive plant surveys and treatment efforts and protection from looting and erosion impacts. DRP staff will continue periodic surveys for rare plants and invasive plant infestations to catch new infestations early. Invasive plant treatment efforts should avoid subsurface disturbances. Of concern are the large royal poinciana stands throughout the park that have turned into a monoculture on the top of Mound Two and sides of Mound One and Two. Treatment will need to include the felling of large trees to prevent toppling and uprooting the mound. In addition, DRP staff will visit the shell mounds as frequently as possible to monitor vandalism and deter visitors from physically disturbing these sites. Erosion should continue to be monitored to ensure the survivorship of this unique habitat type.

## IMPERILED SPECIES

Mound Key Archaeological State Park has a rich diversity of plant and animal life, including a variety of imperiled species that utilize the park for breeding, nesting, resting and feeding grounds. Although the impetus of natural systems management as practiced by DRP is management of natural communities and not individual species, certain species are of particular concern and importance, and merit special management attention. There are 13 imperiled plant species and 19 imperiled animal species that have been documented at Mound Key.

Mound Key provides important habitat to species of interest include spiny hackberry, iguana hackberry and wild cotton (*Gossypium hirsutum*). A master's thesis floristic assessment of Mound Key (Cooper 1978) reported spiny hackberry as sparsely scattered over the island, but recent initial investigations show that this is no longer the case. Iguana hackberry has been documented in one location at the park. It was in good condition despite obvious trauma to a section of it, which appeared to have been trimmed extensively. This plant is monitored regularly by DRP staff on site, especially during post-hurricane assessments to ensure that it has not toppled. Reports exist with GPS coordinates of spiny hackberry at the park, but further investigation is needed to evaluate the continued existence and health of the population.

Wild cotton is doing exceedingly well along the main trail despite being submerged by several feet of water for several hours during Hurricane Ian in 2022 and hurricanes Helene and Milton in 2024. It is flourishing in the open areas of the trail and at some points almost impedes the use of the trail. Research into the genetic diversity of wild cotton completed by Jonathan Wendel under a DRP issued permit found that the population at Mound Key is genetically dissimilar than other known wild, landrace and domesticated cotton populations, and may represent a truly wild population with previously unknown genetic diversity (Ning et al. 2024).

Gopher tortoises persist on the island despite loss of habitat due to the natural succession into a tropical hardwood hammock. In 1992, a survey of burrows was done, and approximately 28 burrows were located. It was assumed that 25 percent of the suitable habitat was traversed, and burrow occupancy rates were 61 percent (Hingtgen 1992). At the time of the survey, there may have been as many as 40 gopher tortoises on Mound Key as signs of reproduction in previous years were also noted. Gopher tortoises prefer open sandy areas for optimal burrow site location, and low growing grasses and forbes

for foraging habitat. Since shell mounds are non-pyric communities, other natural events like large storms and hurricanes need to occur to open the canopy and understory to provide optimal gopher tortoise habitat. In the past two years, Mound Key has received several tropical storm systems that brought with them several feet of storm surge and winds that toppled large trees. Additional non-native hardwood treatment and removal efforts for Royal poinciana plants will be beneficial to gopher tortoises as it will open up the canopy and understory to provide additional burrow space and foraging habitat.

The shallow waters of Estero Bay, including the perimeter of Mound Key and the mangrove fringe around it, are designated as critical habitat for juvenile smalltooth sawfish (*Pristis pectinata*). In addition, the same area is currently proposed for Florida manatee (*Trichechus manatus latirostris*) critical habitat designation.

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.

| **Imperiled Species Inventory** | | | | | | |
|---|---|---|---|---|---|---|
| **Common and Scientific Name** | **Imperiled Species Status** | | | | **Management Actions** | **Monitoring Level** |
| | **FWC** | **USFWS** | **FDACS** | **FNAI** | | |
| **PLANTS** | | | | | | |
| Triangle cactus *Acanthocereus tetragonus* | | | T | G5, S3 | 2, 13 | Tier 1 |
| West Indian cock's comb *Celosia nitida* | | | E | G5?, S2 | 2, 13 | Tier 1 |
| Iguana hackberry *Celtis iguanaea* | | | E | G5, S1 | 2, 10, 13 | Tier 2 |
| Spiny hackberry *Celtis pallida* | | | E | G4TNR, S1 | 2, 10, 13 | Tier 2 |
| Florida butterfly orchid *Encyclia tampensis* | | | | G4, S3S4 | 2, 13 | Tier 1 |
| Wild cotton *Gossypium hirsutum* | | | T | | 2,13 | Tier 2 |
| Gulf Coast Florida lantana *Lantana depressa var. sanibelensis* | | | E | G5T1, S1 | 2, 13 | Tier 1 |
| Shell mound prickly-pear cactus *Opuntia stricta* | | | T | G4?, S3S4 | 2, 13 | Tier 1 |

| Imperiled Species Inventory | | | | | | |
|---|---|---|---|---|---|---|
| **Common and Scientific Name** | **Imperiled Species Status** | | | | **Management Actions** | **Monitoring Level** |
| | **FWC** | **USFWS** | **FDACS** | **FNAI** | | |
| Northern needleleaf *Tillandsia balbisiana* | | | T | G4G5, S3 | 2, 13 | Tier 1 |
| Cardinal airplant *Tillandsia fasciculata* | | | E | | 2, 13 | Tier 1 |
| Twisted air plant *Tillandsia flexuosa* | | | T | G5, S3 | 2, 13 | Tier 1 |
| Giant airplant *Tillandsia utriculata* | | | E | G5, S3 | 2, 13 | Tier 1 |
| Florida mayten *Tricerma phyllanthoides* | | | T | G3G5, S3 | 2, 13 | Tier 1 |
| **FISH** | | | | | | |
| Smalltooth sawfish *Pristis pectinata* | FE | E | | G1G3, S1S2 | 13 | Tier 1 |
| **REPTILES** | | | | | | |
| American alligator *Alligator mississippiensis* | FT(SA) | SAT | | G5, S4 | 13 | Tier 1 |
| Gopher tortoise *Gopherus polyphemus* | ST | | | G3, S3 | 2, 13 | Tier 1 |
| **BIRDS** | | | | | | |
| Little blue heron *Egretta caerulea* | ST | | | G5, S4 | 13 | Tier 1 |
| Tricolored heron *Egretta tricolor* | ST | | | G5, S4 | 13 | Tier 1 |
| Magnificent frigatebird *Fregata magnificens* | | | | G5, S1 | 13 | Tier 1 |
| American oystercatcher *Haematopus palliatus* | ST | | | G5, S2 | 13 | Tier 1 |
| Least tern *Sternula antillarum* | ST | | | G4, S3 | 13 | Tier 1 |
| Sandwich tern *Thalasseus sandvicensis* | | | | G5, S2 | 13 | Tier 1 |
| | | | | | | |

| Imperiled Species Inventory | | | | | | |
|---|---|---|---|---|---|---|
| **Common and Scientific Name** | **Imperiled Species Status** | | | | **Management Actions** | **Monitoring Level** |
| | **FWC** | **USFWS** | **FDACS** | **FNAI** | | |
| **MAMMALS** | | | | | | |
| Florida manatee *Trichechus manatus latirostris* | FT | T | | G2G3T2T3, S2S3 | 10, 13 | Tier 1 |

**Management Actions:**

1. Prescribed Fire
2. Invasive Plant Treatment/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: Update baseline imperiled species occurrence inventory lists for plants and animals.***

*Action:*

- Continue to update the imperiled species list for the park.

Update imperiled species list as necessary to add or remove species in compliance with current FWC or U.S. Fish and Wildlife Service (USFWS) listing status and update any accepted nomenclature changes.

## Fauna

***Objective: Continue to monitor one selected animal species in the park.***

*Action:*

- Complete a gopher tortoise survey at the park to assess overall population health.

DRP staff will survey and monitor or seek assistance in surveying and monitoring the park's gopher tortoise population per FWC's established protocols. There has been an observed decline in gopher tortoises at the park due to storm surge events and habitat change caused by natural succession within the shell mound community to a dense tropical hardwood hammock. Gopher tortoise surveys will be used to assess the current population size and identify further management actions.

**Flora**

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

*Actions:*

- Continue to monitor existing populations of iguana hackberry.
- Establish survey and monitoring protocols for iguana hackberry, spiny hackberry and wild cotton.

Park and district staff will continue to monitor the known iguana hackberry population at the park for overall health, especially following hurricane events. Additional surveys will be completed to identify new or existing populations of spiny hackberry and wild cotton at the park. Monitoring protocols for all three species to document overall population health will be established for these species. Areas not known to contain the plants will be incorporated into the surveying efforts as resources allow.

## INVASIVE SPECIES

Invasive plants have been prevalent on Mound Key. From plantings by the earliest of settlers to the more modern invasion of Brazilian pepper and Madagascar rubbervine, the native vegetation has been under constant pressure. Several full island treatments funded by the FWC Invasive Plant Management section have been completed on site including in 2014, 2019 and 2022. Most of these treatment efforts focused on Brazilian pepper, Surinam cherry, Lantana, guava and chinaberry, among a few others. Life plant and False sisal (*Agave sisalana*) continue to spread along the trails despite continuous treatment by park staff and volunteers. Madagascar rubber vine originated in management zone MK-03 on the privately owned McGee parcel and has now spread to additional areas of the park. Early 20th century settlers known as the Koreshans planted several non-native species for shade, fruit or aesthetics, which are not as aggressive as Brazilian pepper but still capable of spreading from where they are planted. These include sugar apple and avocado.

The most invasive and highest priority is royal poinciana, which has become the dominant hardwood on the top of Mound Two and sides of Mound One and presents a clear danger to the mound itself if the trees topple. A monoculture of saplings is invading the undergrowth, and the seed source is from the overstory of the mature royal poinciana trees. The dense undergrowth has begun to overtake native understory plant species competing for space. Removal of the trees and saplings will be difficult to undertake, and mechanical treatment will be the preferred method to ensure that dead trees do not topple and expose the sensitive shell mound beneath.

| Invasive Plant Species | | | |
|---|---|---|---|
| **Species Name *Scientific Name* - Common Name** | **FISC Category** | **Distribution** | **Zone ID** |
| False Sisal<br>*Agave sisalana* | II | Single Plant or Clump | MK-01, MK-02, MK-03, MK-04 |
| Madagascar rubbervine<br>*Cryptostegia madagascariensis* | II | Scattered Plants or Clumps | MK-02, MK-03 |
| Bowstring hemp<br>*Dracaena hyacinthoides* | II | Dense Monoculture | MK-01 |
| Surinam Cherry<br>*Eugenia uniflora* | I | Single Plant or Clump | MK-01 |
| Cathedral Bells, Life Plant<br>*Kalanchoe pinnata* | II | Scattered Plants or Clumps | MK-01, MK-03, MK-04 |
| Lantana<br>*Lantana strigocamera* | I | Scattered Plants or Clumps | MK-03, MK-04 |
| Chinaberry<br>*Melia azedarach* | II | Scattered Plants or Clumps | MK-04 |
| Balsampear<br>*Momordica charantia* | II | Single Plant or Clump | MK-03, MK-04 |
| | | Scattered Plants or Clumps | MK-01, MK-02 |
| Castor bean<br>*Ricinus communis* | II | Single Plant or Clump | MK-02 |
| Brazilian pepper<br>*Schinus terebinthifolia* | I | Single Plant or Clump | MK-01, MK-02, MK-03, MK-04 |
| Portia Tree<br>*Thespesia populnea* | I | Single Plant or Clump | MK-01, MK-02, MK-03, MK-04 |

**Invasive Plant Treatment**

***Objective: Create a long-term invasive plant management plan for the park.***

*Actions:*

- Identify the major vectors and pathways for invasive plants at the park and reduce incoming propagules where possible.
- Regularly update surveys to reflect accurate infestation levels of each management zone.
- 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.

***Objective: Monitor and maintain 118 gross acres of habitat already in maintenance condition as needed.***

*Actions:*

- Survey all maintenance areas yearly for new infestations.

- Treat areas where invasive plant spread is imminent (e.g., after prescribed fire, mechanical or other disturbance).
- Document treatments and update surveys in DRP's Natural Resource Tracking System (NRTS).

***Objective: Reduce coverclass on 9.8 acres not in maintenance.***

*Actions:*
- Survey and treat for rapid spread of invasive 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 NRTS.

The average number of acres of invasive plants to be treated annually during this 10-year plan period will depend on the infestation densities and distributions assessed during annual surveys. Mound Key is small enough that surveys can be completed across all management zones on an annual basis. Annual treatment goals will be set each June based on management zone surveys. As the goals are determined, a treatment calendar for the year will be defined to ensure that the target species are treated when the control work will be most effective. Brazilian pepper should continue to be treated aggressively. Surinam cherry, papaya and citrus have spread moderately and guava has been a most prolific colonizer.

***Objective: Targeted treatment of 1 non-native plant species***

*Action:*
- Create a plan and treat royal poinciana across the island.

A non-native plant species of primary concern is royal poinciana, which has spread rapidly over the island in the last decade. Royal poinciana is not a FISC categorized invasive species but is nonetheless becoming a monoculture in the understory of all management zones. Large seed pods blanket the floor threatening to prevent growth of other grasses and forbes. As long as the parent trees exist on the island, no amount of sapling and seed pod hand removal will be adequate. The larger royal poinciana trees pose a hazard to the archaeological integrity of the mounds. Toppling of larger trees will cause damage and exposure to the shell mounds, and open areas for further erosion and invasive species invasion. Removal of these large trees could be completed by park staff or more desirably by contactors. Killing the trees in place should be avoided as it would not reduce the risk of damage to the mound if the trees were to topple. Felling and removing the trees from the island or mulching them in place would be a better solution. Testing different strategies to limit the impact to the mound or phasing the treatment efforts could be considered in the overall treatment plan.

## CULTURAL RESOURCES

### Prehistoric and Historic Archaeological Sites

Mound Key Archaeological State Park contains two archaeological sites recorded in the Florida Master Site File (FMSF) including #8LL2 and #8LL3. Mound Key is classified as a single archaeological site listed as FMSF 8LL2. The site consists of a network of canals, water courts and mounds of varying complexity. Within the boundary of site 8LL2, there is another site known as Mound Key Burial Mound, FMSF 8LL3.

Mound Key is remarkable for the large size of its shell middens, one of which rises to a height of 30 feet. These structures attest to a continuous period of use by the Calusa culture since the Caloosahatchee I period (500 BCE – 500 CE). The history of Mound Key is significant to the period of European contact. Scholars believe that in the 16th century, it was the headquarters for a Native American confederation which extended across the southern peninsula and to the Keys of Florida, an opinion derived from documents of that period which chronicle a brief attempt to project Spanish authority onto the West Coast of Florida.

In 1566, Pedro Menendez de Aviles, while cruising the southwest coast of Florida, maneuvered his shallow-draft brigantine through a narrow passage between two barrier islands. He found an expanse of water, which fits the description of present-day Estero Bay. Here he met the cacique (chief) of the Calusa nation whose village was situated in the middle of the embayment on a small island. It measured about half a league in circumference. Spanish records name this place the Bay of Carlos, which in the Native American language was called Escampaba, after the cacique. The Spanish erected on Mound Key a fort named San Antonio and a settlement of 36 houses, constructed of thatch and wood. The Jesuit mission on Mound Key was the first of that order anywhere in Spain's New World Empire. The Spaniards had to withdraw in 1569 after a violent clash in which the cacique and a score of his followers fell. Contact between the Calusa and the settlement at St. Augustine continued sporadically during the following century. There was at least one other failed attempt to convert the indigenous peoples of this region. Throughout this entire time period, the Calusa population steadily shrank due to exposure to European diseases.

With the Calusa gone, Spanish fishermen came and lived alone or in small, scattered settlements to catch and dry fish for the Cuban market. Some of the fishing families lived on Mound Key in the 1700s and early 1800s, until they began to be displaced by arriving Americans. Frank M. Johnson was the first settler formally occupying the island under the Homestead Act. At one time there were 11 buildings, simple gardens and cattle on the island. An interview with a former resident of the island revealed that as many as 17 families lived there at one time, and there was a small, wooden schoolhouse. Most residents moved away after the 1926 hurricane, which destroyed all the structures on the island. The last resident left in 1940.

The overall condition of Mound Key (FMSF 8LL2) is good and there are no major threats to the stability of the site. There are some minor issues with erosion as a result of visitor-use trails, visitor-made trails and vegetation clearing. However, the site in general remains in stable condition. Stabilization and additional safety precautions should be implemented regarding two concrete cisterns (which are in Fair condition) located in the southeast and southwest areas of Mound Key. These cisterns are from later periods of occupation, likely from the Koreshan and Johnson family periods. Erosion of the mound and cistern sites is the primary concern. Continual monitoring should be completed to assess erosion levels on site. In addition, the Florida Department of State's Division of Historical Resources (DHR) should be consulted regarding any proposed erosion control measures prior to implementation. Other issues that should be monitored are tree falls, as the damage done by large trees falling over can potentially disturb archaeological remains over a large area. The removal of larger trees such as royal poinciana in particularly sensitive areas would be ideal and should be accomplished where possible. Non-native or invasive trees will be the priority for removal, with sick or damaged native trees as the second priority.

Animal intrusion on the island is minimal, and currently the only ground disturbance resulting from animal activity is the result of a small population of gopher tortoises on the island. Other issues related to animal intrusion involve spillover activity from the former privately held McGee parcel and the population of domesticated goats that lived in the fenced-in area. The area occupied by the goats has

had much of the vegetation stripped, and as such, rainfall washes through this area into Mound Key State Park. Looting activity is minimal, particularly in the last 10–15 years. The only identified looter pits were in the Torrence report (Torrence et al. 1994). These pits were scouted as part of this unit management plan update and remain relatively stable. On Mound Six, there was a need identified for sandbagging of a small (roughly 1 meter in diameter) looter or erosion pit on the periphery of the mound. These pits should be monitored in order to ensure further erosion does not take place. Minor looting from visitors likely takes place as artifacts become visible along the trail, but this activity has not been observed by park staff.

The Mound Key site (8LL2) was listed on the National Register of Historic Places in 1970 under Criterion D for its ability to yield significant information about the past, even before professional archaeological excavations had been conducted. Professional historical research and surface collection of artifacts by locals, visitors and professional and avocational archaeologists since the late 19th century had indicated that Mound Key was a principal Calusa settlement and the probable site where Pedro Menendez de Aviles, the Spanish governor of Florida, first contacted the Calusa in 1565. Mound Key's National Register listing was amended in 1996, when a broader range of archaeological resources (1150 BCE to CE 1945) was recognized. Additionally, a more detailed evaluation of the significance of Mound Key was included in the National Register listing. Even though Mound Key had been heavily impacted in the past by shell mining for road construction and looting, the site retains enough of its physical integrity to be significant.

Subsequent research, including topographic mapping and a reconnaissance-level archaeological survey of the island in 1994 by Florida Museum of Natural History staff, supports the contention that Mound Key was the site of Calos, the capital of the Calusa domain. The island's location, setting and geographical features appear to correlate with 16th and 17th century Spanish accounts of the settlement. Mound Key contains archaeological deposits associated with all five Caloosahatchee cultural periods (referring to the region's native population), from approximately 100 CE to early/mid-18th century. The Calusa were a populous, sedentary people whose economic base centered on their abundant estuarine/ marine environment. Unlike other sedentary Florida indigenous populations that relied on the food surplus produced by cultivation, the Calusa sustained themselves primarily through fishing, supplementing their diet with hunting and gathering wild plant foods. According to Spanish accounts, the Calusa were socially stratified, governed by a king or high chief and comprised of a few noble and military elites that enjoyed privileges the majority of commoners did not.

Mound Key was also the site of the mission/fort of San Antonio de Carlos, established by the Spanish in 1567 and re-established by Franciscans in 1697. According to Spanish accounts, the town of Calos had an indigenous population of approximately 1,000 people in the 16th and 17th centuries. Spaniards built a house and occupied 36 native houses on one of the major mounds, located across from the mound containing the king's large house. San Antonio was the first Jesuit mission in the New World—Spain's first attempt to convert Florida's indigenous population to Christianity, which the Calusa repeatedly resisted over the next two centuries. San Antonio was also a fort used by the Spanish military to subdue resistance to their domination. Spain executed Carlos, the king of the Calusa in 1567 and his successor Felipe in 1568, along with a number of other Calusa leaders.

The expansive shell mound/midden complex with its mounds, ridges, platforms, canals and water courts, given the expansive time span represented by the island's archaeological resources, includes valuable information on how the Calusa adapted to sea level fluctuations and what the transition to ever increasing cultural complexity entailed. The site also contains valuable information about interactions

between this indigenous population and the colonizing Spaniards and how the Calusa adapted to, changed in the face of, and resisted Spain's domination.

Mound Key also contains archaeological resources related to the historic past that followed the Calusa's departure. Cuban families who were fisher folk settled the western side of the island in the mid-18th century. European American settlers homesteaded on the island in the late 19th century and early decades of the 20th century. Of local renowned were Frank and Mollie Johnson, who were granted the entire island in 1891. Mollie Johnson, of native and European descent, was a well-known medicine woman who provided remedies to locals and visiting aristocrats alike. She is credited with fiercely protecting the island's archaeological resources.

Additionally, there are two concrete cisterns located in the southwest and southeast areas of the island, respectively. These cisterns are related to the later period of American settlement on the island. The cisterns have been classified as archaeological sites, rather than as historic structures due to the number of surface scatters surrounding the respective cisterns.

Oral history informants recall 11 dwellings on the island in the early 20th century, including families associated with the Koreshan community located in nearby Estero. These settlers also subsisted primarily on fishing, although a mid-20th century aerial photograph reveals that most of the island's uplands were under cultivation. The significance of the island's post-CE 1750 archaeological resources has not been officially evaluated yet nor have these resources been adequately documented. They hold the potential, however, to yield information about a variety of aspects of life on the island during its more recent history.

Mound Key Archaeological State Park includes an unknown number of potentially archaeologically significant unmarked human burials. If unmarked human burials are encountered, Chapter 872, F.S., will apply. Park staff should notify the Park Manager, the medical examiner, local law enforcement and the DHR's Bureau of Archaeological Research.

In 2013, the Alliance for Integrated Spatial Technologies at the University of South Florida was contracted to perform predictive modeling of cultural resource potential in state parks. During this project, aerial LiDAR data was used to refine maps showing the complex surface elevations of the park (Collins 2013). The model identified all upland areas within the park as high sensitivity for archaeological resources.

| **Cultural Sites Listed in the Florida Master Site File** | | | | | |
|---|---|---|---|---|---|
| **Site Name and FMSF #** | **Culture/Period** | **Description** | **Significance** | **Condition** | **Treatment** |
| Mound Key 8LL2 | Calusa/ Caloosahatchee I-V | Archaeological Site | NRL | G | P |
| Mound Key Burial Mound 8LL3 | Calusa/ Caloosahatchee I-V | Prehistoric Burial Mound | NE | G | P |

| Significance: | Conditions: | Recommended Treatment: |
|---|---|---|
| NRL - National Register Listed | G - Good | RS - Restoration |
| NRE - National Register Eligible | F - Fair | RH - Rehabilitation |
| LS - Locally Significant | P – Poor | ST - Stabilization |
| NE - Not Evaluated | | P - Preservation |
| NS - Not Significant | | R – Removal |

## Condition Assessment

***Objective: Monitor and assess all the recorded cultural resources.***

*Actions:*

- Assess/evaluate and update FMSF for two recorded cultural resources.
- Consult with DHR and the Florida Public Archaeology Network on stabilization strategies for the cisterns.

The FMSF information for Mound Key should be updated annually or whenever a major change is observed at the site, including following tropical storms events. Additional research efforts would ideally consist of large-scale archaeological work throughout the seven primary mounds, followed by restoration of the mounds for visitor interpretation. Smaller projects can also be conducted as volunteers and partnerships with other institutions become available (such as Florida Gulf Coast University).

Oral interviews with any surviving members of the later periods of occupation on Mound Key should be conducted or updated before these resources disappear. The administrative and cultural history of Mound Key has been fairly well documented in past Unit Management Plans and in past archaeological and historical reports. Updates to these reports, as they are discovered, are added to the park's in-house archives on Mound Key.

Collections of objects recovered archaeologically from Mound Key are kept in a number of different collections at several different institutions. No collections from Mound Key are maintained by park personnel.

Assessments and evaluations of the various features of Mound Key should be conducted as often as possible. The individual features of the site (mounds one through seven, cisterns, water courts) should be assessed twice a year. Mound Six and Mound Seven (where past looting activity has taken place) should be assessed carefully to ensure that new activity is not taking place. Primary threats to Mound One and Mound Two are from visitors crossing the island on the main trail. However, this trail is assessed by park personnel at least once a month. Private individuals and visitors have alerted the park to inappropriate activity occurring on Mound Key in the past, although not necessarily related to looting.

Prioritization of restoration or preservation of the features on Mound Key will occur on a case-by-case basis depending on the evolving needs of each mound and feature. The park should consult with DHR on stabilization strategies for the two cisterns and methods to address safety related issues associated with the features. Previous trails leading to the cisterns have been obscured by downed tree limbs and vegetation displaced by the hurricanes in 2022 and 2024.

## SPECIAL MANAGEMENT CONSIDERATIONS

### Arthropod Control Plan

All the DRP lands are designated as “environmentally sensitive and biologically highly productive” in accordance with section 388.4111, F.S. If a local mosquito control district proposes a treatment plan, DRP works with the local mosquito control district to achieve consensus. By policy of DEP since 1987, aerial adulticiding is not allowed, but larviciding and ground adulticiding (truck spraying in public use areas) is typically allowed. DRP does not authorize new physical alterations of marshes through ditching or water control structures.
In 1995, an agreement between the Lee County Mosquito Control District (LCMCD) and DEP allowed a three-year experimental use of Abate, with monitoring by Mote Marine Laboratory, after which Abate use would continue unless “substantial adverse impacts to non-targets” were shown by Mote. The experiment concluded with a finding of no significant impacts, and the use of Abate was authorized in a formal amendment to the arthropod management plan (AMP) in 1999.

Even though the 1987 AMP only allowed Bti, the 1999 amendment to the AMP stated that “the use of methoprene, Bti, and monomolecular films…remains unchanged. All other chemicals used on designated lands will be reported.” Because of the heightened concern with the toxicity of Abate, the 1995 agreement defined the low marsh “recurring breeding areas” as those which needed regular treatment and high marsh “non-recurring areas” as those which only needed occasional treatment. The types of habitats were mapped, ground truthed and adopted by mutual consent. The 1999 amendment did not institute these designations but rather identified “treatment areas” and “non-treatment areas.” The amendment required an annual meeting between LCMCD and DEP staff, prior to the treatment season, to review maps and decide which acreages should be classified in the two categories for that year.

In 2017, DEP approved limited aerial adulticiding in state parks within Lee County, with specific restrictions and excluding Cayo Costa State Park. Additionally, the use of Spinosad was authorized in designated areas, with its use subject to reevaluation every five years.

Mosquito control plans temporarily may be set aside under declared threats to public or animal health, or during a declared state of emergency.

# LAND USE COMPONENT

## VISITATION

Once the capital for the Calusa Indians, Mound Key Archaeological State Park is a remote island located in Estero Bay, near the mouth of the Estero River. The park is accessible only by watercraft and there are no recreational facilities currently available. Two nearby public boat launches are available at Koreshan Historic State Park and Lovers Key State Park. Mound Key has the second highest elevation in Lee County due to the steep slopes of several mounds, offering unique viewsheds of Estero Bay and Fort Myers Beach. A nature trail traverses the island, providing access to a portion of the mound complex.

The park is a popular canoeing and boating destination. The Great Calusa Blueway, a 190-mile paddling trail through the waters and tributaries of Lee County, brings paddling traffic through Estero Bay. The island offers opportunities for wildlife observation and nature study. Saltwater fishing is well-established within the surrounding Estero Bay Aquatic Preserve.

### Florida Circumnavigational Saltwater Paddling Trail (CT)

Segment 12, an approximately 40-mile portion of the CT from Cayo Costa State Park/Cabbage Key to Lovers Key/Bowtie Island, features several state parks including Mound Key Archaeological. Paddlers accessing the Great Calusa Blueway on the inside of San Carlos Island can take a quick detour to explore Estero Bay Aquatic Preserve, important nursery grounds for hundreds of recreational and commercial fish and invertebrate species. Visitors may even spot one of five species of sea turtle, Florida manatees and bald eagles before reaching Mound Key, where they can enjoy a hike through large Calusa middens.

### Trends

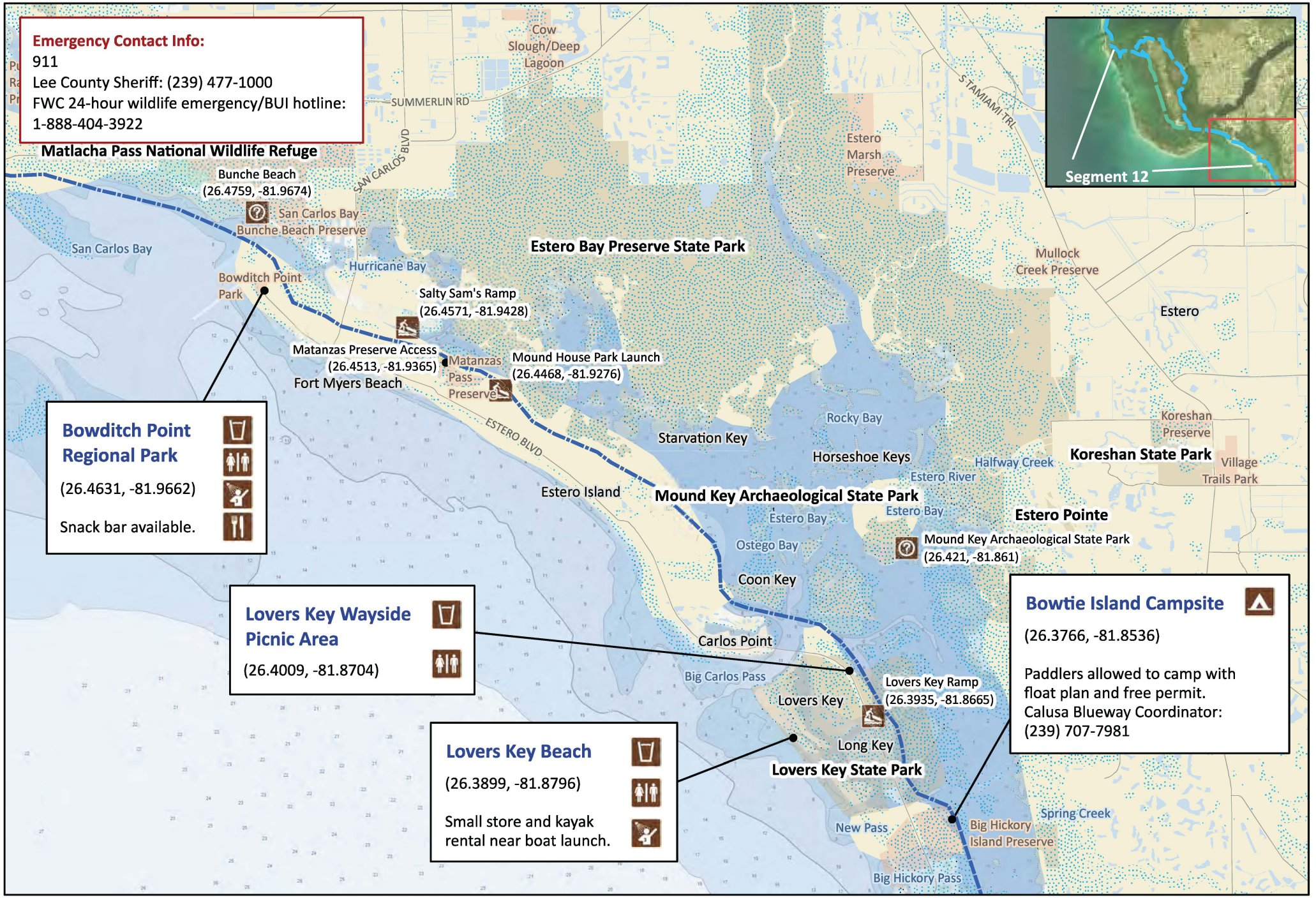
Visitation at Mound Key Archaeological State Park tends to be relatively low year-round; a trail counter is the primary method to record attendance, with no formal entrance or honor box on the island. The cooler months are more popular for accessing this paddling destination as mosquitoes can be an unwelcome nuisance during the hot and rainy summer season.

### Economic Impact

Attendance over the 7-year period from FY 2015-16 through FY 2021-22 totaled 26,908 visitors. By DRP estimates, the visitors contributed $2,827,519 in direct economic impact. Visitor spending supported a cumulative total of approximately 40 one-year job equivalents over the seven-year period (DEP 2015-2025). Attendance data has not been available since FY 2021-22 due to loss of infrastructure during hurricane events.

## EXISTING FACILITIES AND INFRASTRUCTURE

A nature trail of approximately one-half mile traverses the island connecting the two landing areas. The primary access is on the northwest side accommodating shallow draft powerboats. The secondary access is on the southeast for paddlecraft only. Interpretive signage at each of the trail access points warns visitors not to disturb or remove artifacts. Three interpretive panels along the trail provide information about Calusa traditions. There are no other facilities on-site.




# Florida Circumnavigational Saltwater Paddling Trail

## Segment 12: Pine Island/Estero Bay (Map 3 of 3)

Begin: Cayo Costa State Park
End: Lovers Key/Bowtie Island

Distance: 38.3-41.5 miles
Duration: 2-3 days

0 0.75 1.5 3 Miles



Updated: 12/2/2024

N

**Facilities Inventory**

| | |
|---|---|
| Historic Site | 1 |
| Interpretive Kiosk | 3 |
| Nature Trail (Approximately 0.50 miles) | 1 |

## CONCEPTUAL LAND USE PLAN

***Objective: Reduce erosion on archaeologically sensitive terrain and enhance interpretive experience.***

*Actions:*

- Realign and expand the park trails.
- Stabilize existing segments of trail.

Current visitor access conditions on Mound Key are primitive, offering minimal infrastructure to accommodate use and interpret its ecological, archaeological and historic complexity. Access is currently limited to a single trail that traverses the island in a northwest to southeast alignment. The straight ascents of the mounds (i.e., without switchback or meander) with moderate visitor use has resulted in trenching on trail segments that are infeasible to remediate without trail realignment. Additionally, the current trail configuration offers only limited perspective for visitors such that the prominence of the mounds is not apparent. Alternative configurations may diversify vantage points of the prehistorically engineered topography. The following conceptual details have been evaluated through past planning processes and may be considered for eventual implementation. Alternative alignments that are not detailed may also be considered.

Boardwalks would serve to make the park more accessible to all users, allow visitors to traverse the wet areas sustainably and safely along the trail and minimize erosional impacts to the archaeologically sensitive terrain of the island. Feasibility and logistics must be further evaluated through subsequent site planning processes. If feasible, boardwalks would start from the northwest landing and extend along the trail as far as topography will allow. Construction methods would need to be minimally invasive, likely relying upon floating or only superficially mounted substructure.

Heavy foot traffic is contributing to mound erosion, and measures need to be taken to mitigate this. Wooden or composite steps up the steeper section of the paths are recommended. This would take place under guidance from DHR and DRP's Bureau of Natural and Cultural Resources. Additional trail improvements may include appropriate fill material or on-grade stabilization with ecologically/archeologically compatible materials.

Significant improvements to accessibility and the scope of experience are proposed:

*Paddlecraft Landing and Island Trailhead*

The existing paddlecraft landing on the southeast shoreline of the island should remain designated for nonmotorized watercraft. A trailhead with interpretive and orientation signage should be provided at this paddlecraft landing, similar to that at the northwest access. Minimal physical changes are anticipated, as the landing generally functions well. A slight enlargement of staging/gathering space for paddlers may need to be provided through selective trimming of bordering vegetation. Modifications to the landing surface are not anticipated.


# MOUND KEY ARCHAEOLOGICAL STATE PARK
## Existing Facilities

N

0 500 Feet 1,000

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

Parkwide - Realign and expand the park trails, stabilize existing segments. Distribute new interpretive elements and improve orientation/ wayfinding and sense of arrival.


# MOUND KEY ARCHAEOLOGICAL STATE PARK
## Conceptual Land Use Plan

N

0 400 800 Feet

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

*Island Trail*

Circulation improvements will utilize as much of the existing trail as feasible. Potential diversions from the existing trail may be recommended for segments that traverse the mounds.

All modifications or additions to the trail network will be carefully aligned and field-verified to avoid exposing sensitive cultural resources. Final alignments and design of all trail circulation improvements must be in conjunction with field surveys that identify rare, threatened, or endangered plant species. Any abandoned existing trail segments will be restored to an appropriate natural communities.

As proposed in the 2003 Approved Unit Management Plan, boardwalks are proposed along limited segments of trail where necessary to traverse environmentally sensitive and/or flood-prone areas. To stabilize existing trail where erosion is problematic, techniques such as edge containment and placement of new surface gravel may be necessary. Any newly introduced gravel must be clearly distinguishable from archaeological deposits.

Modifications of the trails traversing the two main mounds are proposed in order to reduce impacts to the archaeological resource caused by erosion-prone trail segments (i.e., steep ascents in a straight line) and improve accessibility to both Mound One and Mound Two by re-aligning the western approach trail.

For the tops of both Mound One and Mound Two, noting that Mound One is the steepest, access is recommended by out-and-back spur trails. For the steepest segments, stairs may be necessary to mitigate currently observed erosion.

Adjustment of the existing main/arterial trail alignment would offer a flatter gradient, increasing accessibility while reducing erosion, and avoiding the center point of both mound tops by skirting the northern perimeters of the mounds. Reaching the archaeologically sensitive mound tops would then only be by way of the potentially less-trafficked spur trails rather than the highly trafficked main trail. This new alignment would entail a new crossing over the central canal.

Two additional potential spur trails should be considered. On the eastern portion of the island, stemming from the main trail could include traverse of the historic Koreshan-era agricultural site, where the landcover is already altered. On the northern portion of the island, a loop between the water courts may also be viable to interpret a currently inaccessible area. Selective understory clearing in some areas along existing and proposed trail segments should be evaluated to remove invasive vegetation and enhance viewsheds for aesthetic and interpretive purposes.

***Objective: Provide a comprehensive interpretive experience that includes elements of all cultural periods.***

*Actions:*

- Distribute new interpretive elements parkwide according to a detailed conceptual plan.
- Improve orientation/wayfinding and sense of arrival.

Interpretive planning is recommended to determine the most effective way to connect visitors to the significance and relevant themes and should convey a deeper understanding of the people who inhabited this small island that has played such a large role in Florida's cultural history.

Given the remote nature of Mound Key and lack of daily staff presence, increased visitor engagement through interpretation is essential and provides numerous benefits, including enhancing the visitor

experience and supporting preservation and education efforts. Three interpretive kiosks are located near the beginning of the half-mile hike encountered upon arrival at the northwest boat landing/primary entrance. The kiosks are weathered and should be considered for replacement with updated interpretive content as well as improved spatial distribution. The type, design, quantity and placement of interpretive elements to deepen understanding and improve orientation will be specified during this planning process. Relevant interpretive themes include Calusa culture, ethnobotany, Spanish period fort and mission and Koreshan settlement.

As a supplement or alternative to signage, another interpretive approach that is becoming more widely implemented in parks and has proven to be effective is the use of QR codes. Recognizing sparse cellular service at this remote location as a limiting factor, visitors could scan QR codes placed at significant locations along the trail, providing instant access to detailed information such as the history, significance and cultural context of specific locations or items. QR codes could also link to interactive content such as virtual tours of Mound Key or three-dimensional models of artifacts, increasing comprehension for visitors. With QR codes, less reliance on physical signs or printed materials means fewer environmental impacts and less vandalism. The digital nature could also ensure that information remains up to date without requiring continuing physical replacement of signs.

Clear directional signage should be installed to discourage the use of social or spur trails. Additionally, signage should be placed at the south landing to indicate a motor exclusion zone, maintaining the landing for paddlecraft. Motorized vessels should be directed to the park's northwest landing area. Formalization of the northwest landing area is also recommended, which requires navigating a difficult to find narrow inlet to reach shore. A piling with directional signage at the inlet entrance would help guide visitors to their destination.

## OPTIMUM BOUNDARY

The entire island lies within the park boundary, and the sovereign submerged lands are protected by the Estero Bay Aquatic Preserve. The 7.9-acre parcel owned by Lee County and managed as part of the park extending south from the center point of the island is of high significance. If Lee County should seek fee-simple sale, Trustees acquisition should be prioritized. There are no pertinent expansion opportunities for this park.