



Green Heart of the Everglades Interim Land Management Plan



Green Heart of the Everglades
Management Area
Interim Land Management Plan

(2024 through 2029)

August 2024

Land Stewardship Section
South Florida Water Management District
3301 Gun Club Road
West Palm Beach, Florida 33406

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ABBREVIATIONS

CARL	Conservation and Recreation Lands
District	South Florida Water Management District
FDHR	Florida Division of Historical Resources
FE	Federally-designated Endangered
FFS	Florida Forest Service
FISC	Florida Invasive Species Council
FNAI	Florida Natural Areas Inventory
FT	Federally-designated Threatened
FT(S/A)	Federally-designated Threatened because of similarity of appearance
FY	Fiscal Year
FWC	Florida Fish and Wildlife Conservation Commission
PSGHA	Public Small Game Hunting Area
SE	State-designated Endangered
ST	State-designated Threatened
TIITF	Board of Trustees of the Internal Improvement Trust Fund
USACE	United States Army Corps of Engineers
USDA	United States Department of Agriculture
USFWS	United States Fish and Wildlife Service

1. EXECUTIVE SUMMARY

In 2023, the South Florida Water Management District (District) was authorized to use funds from the General Appropriations Act, §197 of Chapter 2022-156, Laws of Florida (House Bill 5001) to acquire environmentally sensitive lands to conserve and protect water resources in the region. The District used these funds to acquire fee title interest for 11,053 acres in Collier County. This area is known as the Green Heart of the Everglades (GHOTE) and will be managed by the District as the Green Heart of the Everglades Management Area (GHOTE MA).

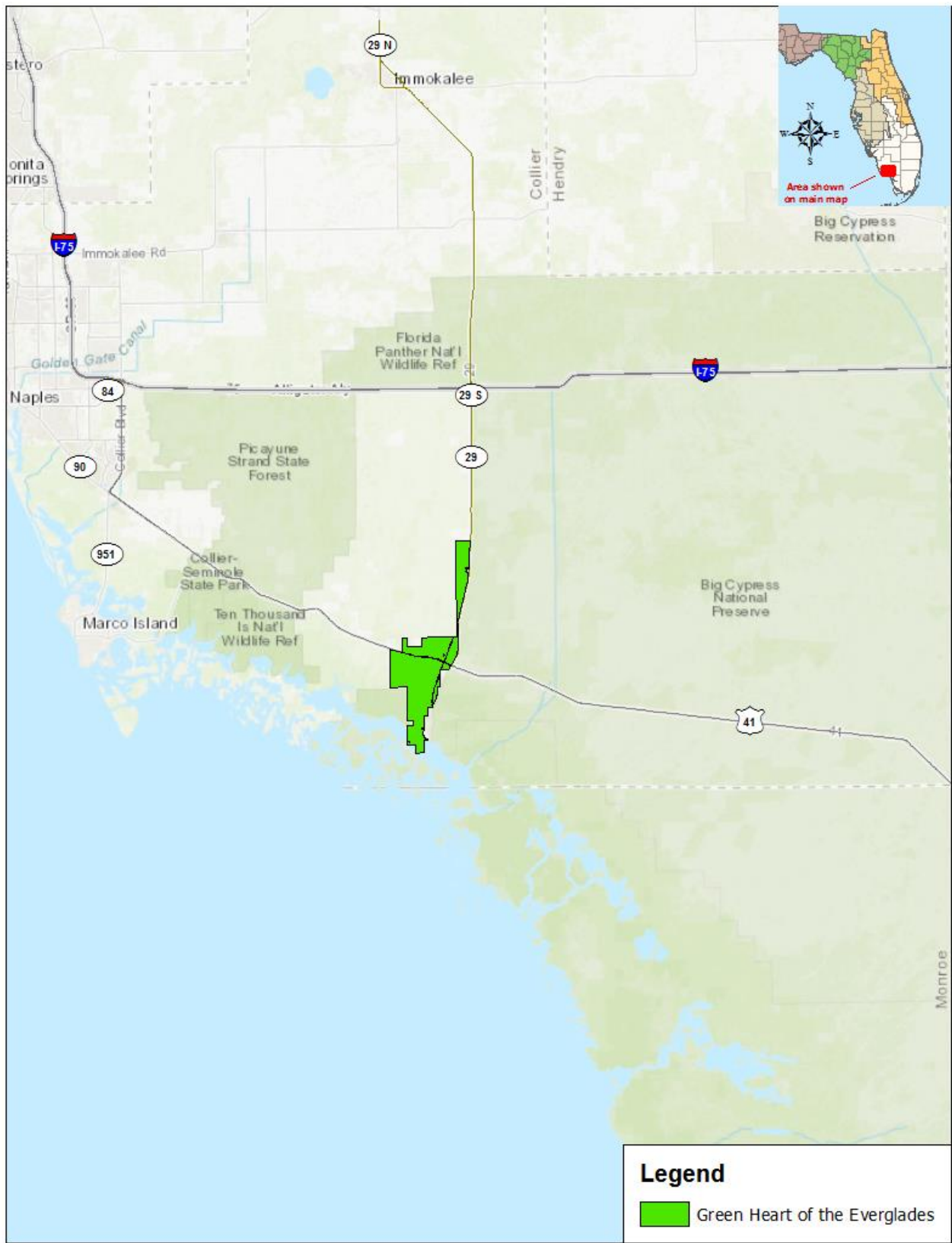
Pursuant to Section 373.1391, Florida Statutes, the District is charged with the responsibility of managing these lands. This Interim Land Management Plan guides the management of the GHOTE property through the 5-year period of 2024-2029 and was developed through stakeholder participation and approved by the District's Governing Board. Goals identified for the next 5 years include establishing the Management Area, developing a General Management Plan to replace the Interim Land Management Plan, identifying resource-based public use opportunities, and providing security and resource protection.

2. INTRODUCTION

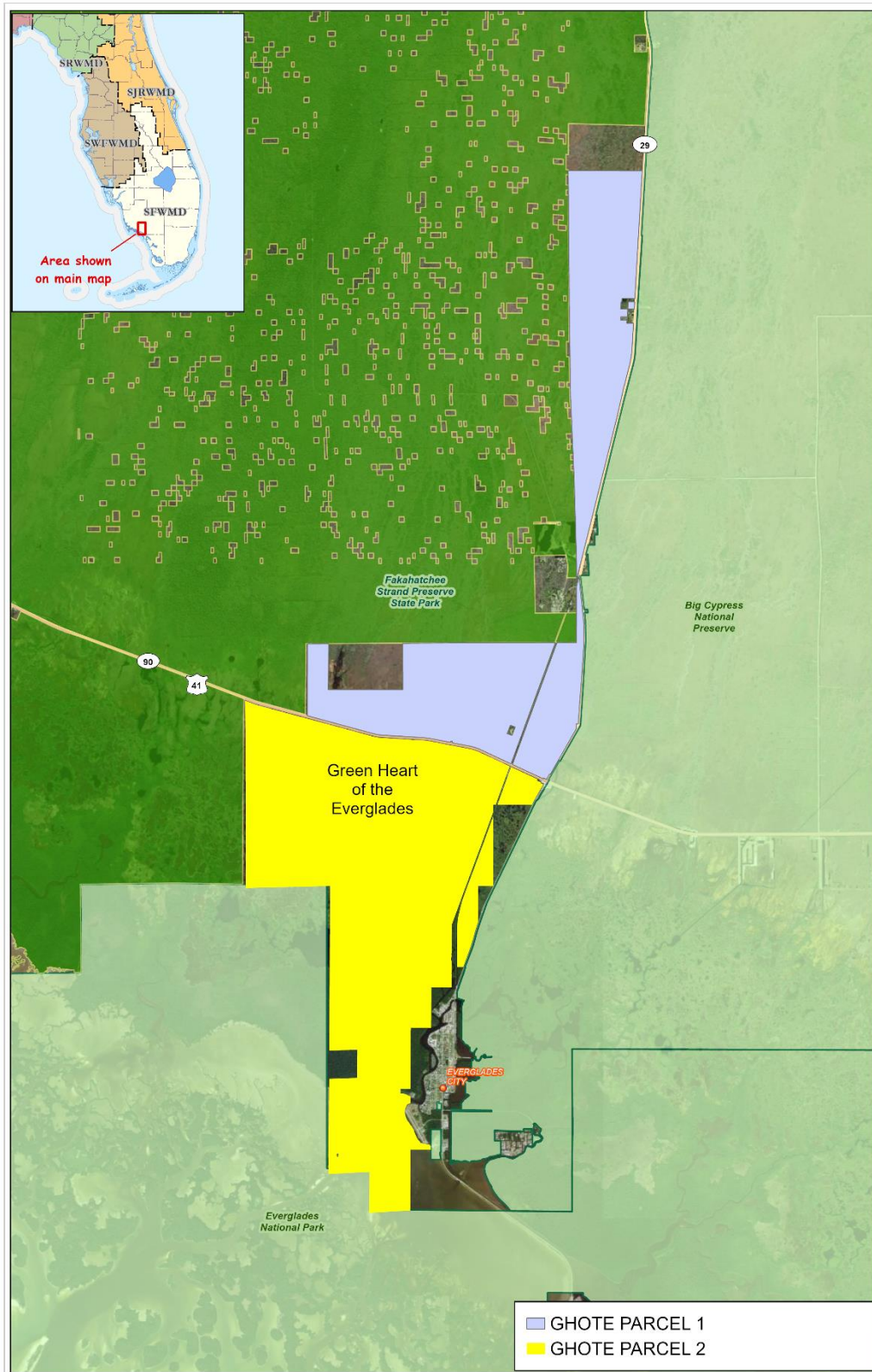
The GHOTE is located west of State Road 29 (S.R. 29) in Collier County, Florida. It is bisected by U.S. Highway 41 (**Map 1**). The property is surrounded by the Fakahatchee Strand Preserve State Park to the west, Big Cypress National Preserve to the east, Everglades National Park and Everglades City to the southeast, and Ten Thousand Islands to the south. The GHOTE is divided into (2) separate areas for management purposes: Parcels 1 and 2 (**Map 2**).

Parcel 1 encompasses 4,214 acres and is located at the northwestern intersection of U.S. 41 and S.R. 29. It is adjoined to the eastern boundary of the Fakahatchee Strand Preserve State Park and bisected from Big Cypress National Preserve by S.R. 29. This parcel historically housed the Carnestown industrial site and the Copeland Market, along with some historic house and packing house structures. An unregistered cattle dip vat site was also identified on the property.

Parcel 2 encompasses approximately 6,839 acres and is located at the southwestern intersection of U.S. 41 and S.R. 29. It is bordered by the Fakahatchee Strand Preserve State Park to the west, Big Cypress National Preserve to the east, Everglades City and Everglades National Park to the southeast, and Ten Thousand Islands to the south. This parcel contains an airboat tour facility, which leases approximately 850 square feet for a building, a dock, and an associated paved parking lot. The airboat facility also maintains and operates above-ground storage tanks to store fuel for the airboat operation.



Map 1. GHOTE location map.



Map 2. GHOTE Components.

2.1. Acquisition Purpose and Significance of the Area

The District purchased the GHOTE property to conserve and protect its unique habitat for the native or endangered and threatened species utilizing the region. The GHOTE property is the last remaining sizeable vacant land separating the Fakahatchee Strand Preserve State Park from the Big Cypress National Preserve and Everglades National Park. The acquisition of the GHOTE property supports the Florida Forever Act (§259.105(4), Florida Statutes), specifically the goals outlined in §259.105(4)(a)(3), 259.105(4)(c)(1), 259.105(4)(c)(4), 259.105(4)(c)(6), 259.105(4)(d)(2), 259.105(4)(e)(1), 259.105(4)(e)(2), and 259.105(4)(e)(3), Florida Statutes. WildLandscapes International, a Florida-based non-profit organization dedicated to working with diverse stakeholders and communities to conserve large, connected landscapes, entered into an agreement with the Collier companies to bring the GHOTE lands under public ownership to connect the surrounding state and federal conservation lands. This initiative by WildLandscapes to bring the landowners together under one agreement helped maximize transactional efficiency. It ensured a comprehensive closing, allowing the District to acquire and get these lands under public ownership. The purchase of the GHOTE also includes the mineral rights, which permanently precludes the property's oil, gas, and mineral exploration and extraction. Without conservation, this property would be subject to development.

The acquisition of the GHOTE property increases the acreage of conservation lands in the area, securing a critical corridor connecting adjacent conservation lands. Preserving the GHOTE in its current state supports a variety of rare and endangered species, including the Florida panther. The estuarine ecosystem of the Ten Thousand Islands area links the hydrology of the GHOTE and the Everglades. Presently, sheetflow in the watershed basin is diverted to the Barron River Canal, which channels most of the runoff that historically entered the GHOTE to Chokoloskee Bay. The Everglades and Ten Thousand Islands areas are prime examples of areas that experience nutrient-laden point source runoff and rapid drying out of the natural areas. Because of its capacity to redirect flows and disperse stormwater runoff, the GHOTE property provides a unique opportunity to improve hydrologic conditions for the natural areas to the south and east of the GHOTE property, including improving the beneficial flows to the estuarine ecosystem of the Ten Thousand Islands area to make the ecosystem more resilient. Diverting flows to the GHOTE property could enhance the water quality conditions downstream in the Ten Thousand Islands areas by reducing freshwater flows into Chokoloskee Bay. The potential for water quality improvements in the region also aligns with the goals of other Comprehensive Everglades Restoration Projects.

2.2. Legal Requirements of Management

Section 373.1391, Florida Statutes, requires the District to manage lands in such a way that maintains a balance between resource conservation and public recreational use. Any lease agreements shall be consistent with the purpose for which the lands were acquired in accordance with §373.093, Florida Statutes, and shall follow best management practices.

The Florida Aquatic Preserve Act was enacted by the Florida Legislature in 1975 and is codified in Chapter 258, Florida Statutes. The legislative intent for establishing aquatic preserves is to set aside state-owned submerged lands in areas with exceptional biological, aesthetic, and scientific value as aquatic preserves or sanctuaries for the benefit of future generations. The

Legislature provides a foundation for managing and preserving the natural conditions of areas designated as aquatic preserves.

The District has partnered with the Florida Fish and Wildlife Commission (FWC) to establish District properties as a Public Small Game Hunting Area (PSGHA) through their authority under Chapter 379, Florida Statutes. This partnership allows the FWC to promulgate rules under Chapter 68, Florida Administrative Code, in coordination with the District, to regulate public use on that portion of the property.

Public use on District lands is also governed by Chapter 40E-7, Florida Administrative Code, which allows the District to establish regulations governing public access and use. These regulations ensure that District lands are used for appropriate nature-based recreation and purposes that align with District objectives. As its steward, the Land Stewardship Section is responsible for protecting, enhancing, and restoring District lands for the benefit and enjoyment of existing and future generations.

The determination of compatible public uses on District lands is based on the following criteria:

- Consistency with the acquisition purposes, including protecting natural ecosystems.
- Restrictions by easements, leases, reservations, adjacent land ownership, or conditions of the purchase agreement.
- Existing infrastructure and facilities, including fences, gates, signage, access, trails, campsites, etc.
- Available funding.
- Limitations on use resulting from endangered species and sensitive natural or archeological resources.
- Public health, safety, and welfare.

3. MANAGEMENT AREA GOALS AND OBJECTIVES

The GHOTE primary functions and management priorities for 2024 - 2029 are outlined in the following goals and objectives:

Management of Wildlife and Habitats

Goal 1: Designate the land use and resource managers for the property.

Objectives:

- Designate the GHOTE property as a Management Area to allow compatible resource-based recreation and educational opportunities on the property in accordance with Chapter 40E-7, Florida Administrative Code.
- Authorize FWC to establish portions of the GHOTE MA as PSGHA.

- Coordinate with FWC on the development of area regulations, including the identification of hunting seasons, hunting and no-hunting zones, and access.

Goal 2: Maintain, improve, or restore floral and faunal resources.

Objectives:

- Assess the condition of the natural communities and develop a management strategy to enhance, manage, and restore the natural communities to their historic plant cover types.
- Implement a prescribed fire program and establish fire return intervals to maintain the marsh community within appropriate fire return intervals.
- Continue to collect opportunistic data on the occurrence of wildlife species.
- Identify habitat and wildlife monitoring needs and establish monitoring protocols for the GHOTE MA.

Nuisance and Invasive Species Management

Goal 3: Manage nuisance and invasive species to minimize their negative impacts on natural communities.

Objectives:

- Implement an integrated vegetation management program to control nuisance and invasive vegetation and systematically improve the natural communities on the property.
- Implement an Early Detection Rapid Response treatments of invasive plant species, as needed.
- Participate in local Cooperative Invasive Species Management Areas.
- Implement a wildlife damage management program to reduce impacts of invasive and nuisance species on the property.
- Identify land management and maintenance budgets annually to implement the vegetation management program.
- Identify operational and capital improvement budgets to maintain staff, equipment, and supply resources necessary to attain a level of responsible management as outlined in this Interim Land Management Plan.

Hydrological Management

Goal 4: Protect, enhance, and restore historic hydrological regime.

Objectives:

- Coordinate with regional partners on ongoing hydrologic improvement projects in the area.
- Investigate options to improve the water quality, quantity, and distribution of sheetflow discharging onto the GHOTE MA.

Public Access and Recreational Opportunities

Goal 5: Provide nature-based public use opportunities.

Objectives:

- Interim activities will include nature-based recreation consistent with the Management Area designation as described and allowed in accordance with Chapter 40E-7, Florida Administrative Code, such as hunting, frogging, crabbing, fishing, wildlife viewing, environmental education, and non-motorized and motorized watercraft use, including airboating.
- Provide resource-based ecotourism opportunities on the GHOTE MA, such as commercial airboating.
- Establish and post designated public access points to govern public access in accordance with Chapter 40E-7, Florida Administrative Code.
- Coordinate with FWC to establish hunting regulations and provide necessary law enforcement for managing the property as a PSGHA.
- Identify operational and capital improvement budgets for the infrastructure needed to provide additional public access opportunities to the property.
- Identify partners and funding sources to assist with developing recreational access and opportunities on the property.
- Identify on-site signage needs for resource protection, regulations, public information and education, and recreational opportunities.
- Provide public outreach and education through area brochures, websites, and presentations at the District's Recreational Forum meetings.
- Utilize volunteer and alternative workforce opportunities within the property.
- Periodically inspect recreation facilities and repair or replace posted signage as needed.
- Assess the effect of recreational uses on the natural communities.

Operation and Maintenance of Capital Facilities and Infrastructure

Goal 6: Maintain and improve facilities and infrastructure.

Objectives:

- Identify operational and capital improvement budgets to create public use facilities (e.g., signage and kiosks, boat ramps, parking areas, structures, etc.).
- Seek partnership and grant funding opportunities to maximize the capital improvement budget for creating public use facilities in the GHOTE MA.
- Maintain and manage the management area boundaries through posting and fencing.

- Complete an inventory of existing assets on the property to identify and quantify the infrastructure, including miles of roads and trails, number and type of boat ramps, culverts and water control structures (number, type, size, and location), facilities (number, type, and location of buildings, sheds, etc.), fences (length, type, and location), etc.
- Manage the asset inventory through the District's SAP System Database and develop a planning tool to track maintenance schedules, maintenance costs, and asset replacements/additions.

Cultural Resource Management

Goal 7: Protect existing cultural resources.

Objectives:

- Provide resource protection through partnerships with FWC and local law enforcement.
- Coordinate with the Florida Division of Historical Resources (FDHR) to determine the need for additional cultural resource surveys and ensure the findings are recorded in the FDHR Master Site file.
- Monitor, protect, and preserve all known/identified sites.
- Ensure at least 1 member of staff has attended the FDHR cultural resource training program.

4. AREA HISTORY

Since the late 1800s, the GHOTE area has consisted of agricultural, residential, industrial, and undeveloped natural land. Agriculture activities along the western banks of the Barron River included crops such as sugar cane, banana, avocado, date palms, cucumbers, eggplant, and tomatoes. Traces of the sugar cane and avocado farms are also noticeable on the southernmost end of the GHOTE.

In 1911, Barron Gift Collier, a wealthy streetcar advertising mogul and entrepreneur, visited Useppa Island in southwest Florida and purchased the property as a winter home. His interest in southwest Florida grew swiftly after his first acquisition. He began to acquire land in what was then southern Lee County, eventually acquiring about 1.3 million acres for his operations.

In 1921, Collier purchased the Deep Lake Grove and Railroad in Deep Lake, north of present-day Everglades City. He later purchased additional land south of Deep Lake and around Halfway Creek to expand his railroad for transporting agricultural freight. Collier acquired the Village of Everglade, including the GHOTE property, in 1922. At the time, the town consisted of a few houses on a narrow strip of land along the Allen River, currently the Barron River, the Rod and Gun Club on the original site of the Allen Home, a complex of warehouses, and a store. At that time, the surroundings comprised pine, cypress, marsh, and extensive swamp land. Towns such as Immokalee, Naples, Marco, Caxambas, Chokoloskee, Deep Lake, and Everglades were all small settlements separated by miles of inaccessible terrain. Collier successfully lobbied the 1923 Legislature to separate his inholdings from Lee County and establish a new county bearing his

name. In return, Collier promised to provide drainage, establish roads connecting the widely dispersed towns, and complete the final and most challenging stretch of the Tamiami Trail (a.k.a. U.S. 41) that would connect Tampa to Miami. Collier also planned to construct a road connecting Immokalee with the Village of Everglade and lobbied to get the Atlantic Coast Line to extend rail service from Immokalee south. Collier County was established in 1923. The Village of Everglade, later called the Town of Everglades, and presently known as Everglades City, became the county seat.

Collier assembled engineers and architects to begin planning the development of Everglades City. The development plan included the residential community and headquarters for the Collier companies within Everglades City and the industrial center north of the City within Port Dupont. Several houses, a school, and later the Bank of Everglades, Everglades Inn, and Juliet Carnes Collier Memorial Hospital were constructed in the residential center between 1922 and 1926. Collier also brought a trolley, electricity, a library, movie theatres, and a three-story department store to the City. The first sawmill facility was built in Port DuPont in 1922 before the designation of the town as the county seat. He later added a foundry and machine shops to support the industrial center.

During the construction of the Tamiami Trail, the industrial center was moved north from Port DuPont to Carnestown. The industrial site in Carnestown, which was located on GHOTE property, housed the largest warehouse on the southwest coast of Florida and served as the hub for ongoing construction activities. Collier dredged a canal and built a road from Port DuPont to Carnestown. He moved barges, machinery, and other equipment used in the construction of the Tamiami Trail from Port DuPont to Carnestown, where a new work camp with a warehouse, foundry, and machine shops was established. A series of canals along the north side of Tamiami Trail, visible in the 1940 aerial photograph, is thought to have been utilized for fill material to build roads. After the Tamiami Trail was completed in 1928, Carnestown was demolished, and associated machinery and housing were relocated to other areas of development.

Around the same time Tamiami Trail was completed, Collier pushed the construction of S.R. 29, connecting Everglades City to Immokalee. He also pushed for the extension of the Atlantic Coast Line Railroad. The dredge material from the Barron River Canal served as fill material for constructing the roadway and railway grade. In 1928, the Atlantic Coast Line Railroad began providing service to Everglades City, the southernmost point the Coast Line ever reached. The railroad was used to transport produce and lumber to Immokalee, and it ran through the GHOTE property. Railroad stations were located in Carnestown and Copeland, which is a town just north of Carnestown. The Atlantic Coast Line extended the railroad service from Immokalee to Deep Lake, where it connected to Collier's Deep Lake Railroad. During that time, an estimated 1,400 acres of the GHOTE were used for farming vegetable crops. The crops were then transported to packing houses in Copeland, where they were washed and shipped north on the Atlantic Coast Railway. The railroad was later removed in 1957. Agricultural production significantly decreased by the late 1960s, leading to the termination of farming operations on the GHOTE. Areas once cleared for cropland have since been overgrown with natural vegetation.

In 1953, the State legislature authorized a new town charter establishing the Town of Everglades as the City of Everglades. Afterward, the Collier companies began selling its properties

to the community. On May 19, 1959, Collier County held a referendum and voted to move the County seat to East Naples. In 1960, Hurricane Donna's strong winds and coastal flooding destroyed hundreds of homes in Collier County and hit Everglades City. In November of 1960, the Collier Corporation relocated its offices to Naples. Two years later, the Bank of Everglades moved to Immokalee. While the population of the City of Everglades declined, the community held on. In 1965, the area was renamed Everglades City, and fishing and tourism became the City's major economic factors.

Commercial fishing, independent of the Collier operations, had been ongoing throughout the area's history. Fisherman would sell their catch to local packing houses, which shipped to northern markets. In the 1950s, fishermen from North Carolina arrived in the area to work in the shrimping industry and later expanded into stone crabbing. As the fishing industry grew, the condition of the Everglades ecosystem and its adjoining bays were declining. The continued degradation of the Everglades ecosystem led to the eventual closure of the Everglades National Park to commercial fishermen. Although fishing remains a popular activity for tourists in Everglades City, the ban on commercial fishing, along with other influences, largely shifted the local economy to ecotourism. The locals began to run airboat tours, and air boating began developing into the popular Tamiami Trail tourist attraction that it is today. Several businesses along the Tamiami Trail now profit from taking tourists into the Everglades on airboats. Presently, several independently operated commercial airboat businesses utilize areas within the GHOTE.

A more in-depth discussion regarding historical land uses in the region before and during the 20th century is in **Appendix A**.

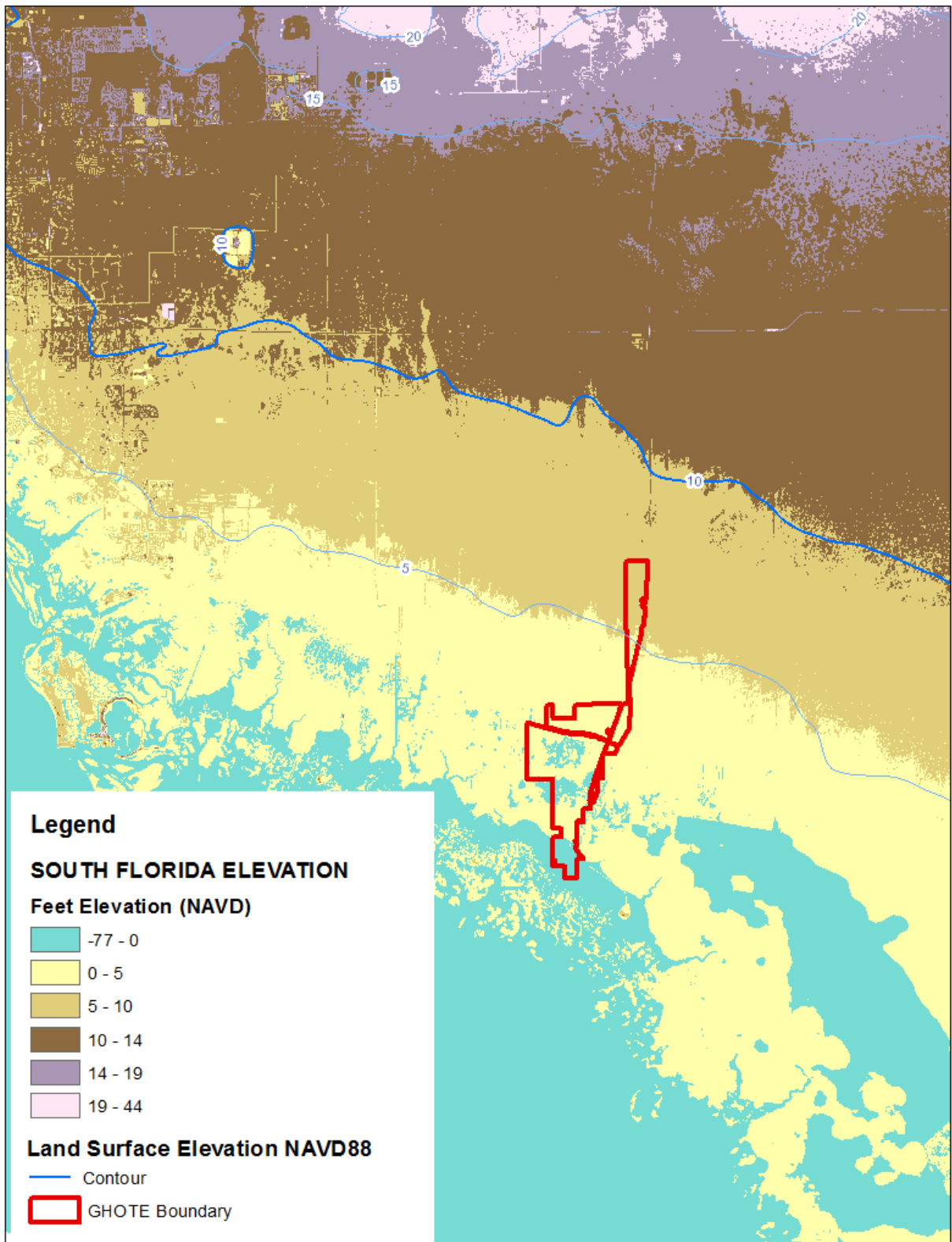
5. RESOURCE DESCRIPTION AND ASSESSMENT

Inventories of natural and historic resources are conducted to provide information for effective land management planning, natural community maintenance, and ecological restoration. Floral and faunal species are inventoried by Land Stewardship personnel, volunteers, or private contractors. The data helps District land managers with resource management planning.

5.1 Physiograph

Topography

Collier County's topography is very flat, with an average slope of one foot per mile. Collier County ranges from 3.3 feet relative to sea level in Everglades City to about 45 feet near Immokalee's high point. Tide levels in Collier County vary only 2-3 feet but can significantly influence the surface water flow by causing the freshwater/saltwater interface to extend miles inland.



Map 3. Regional topography.

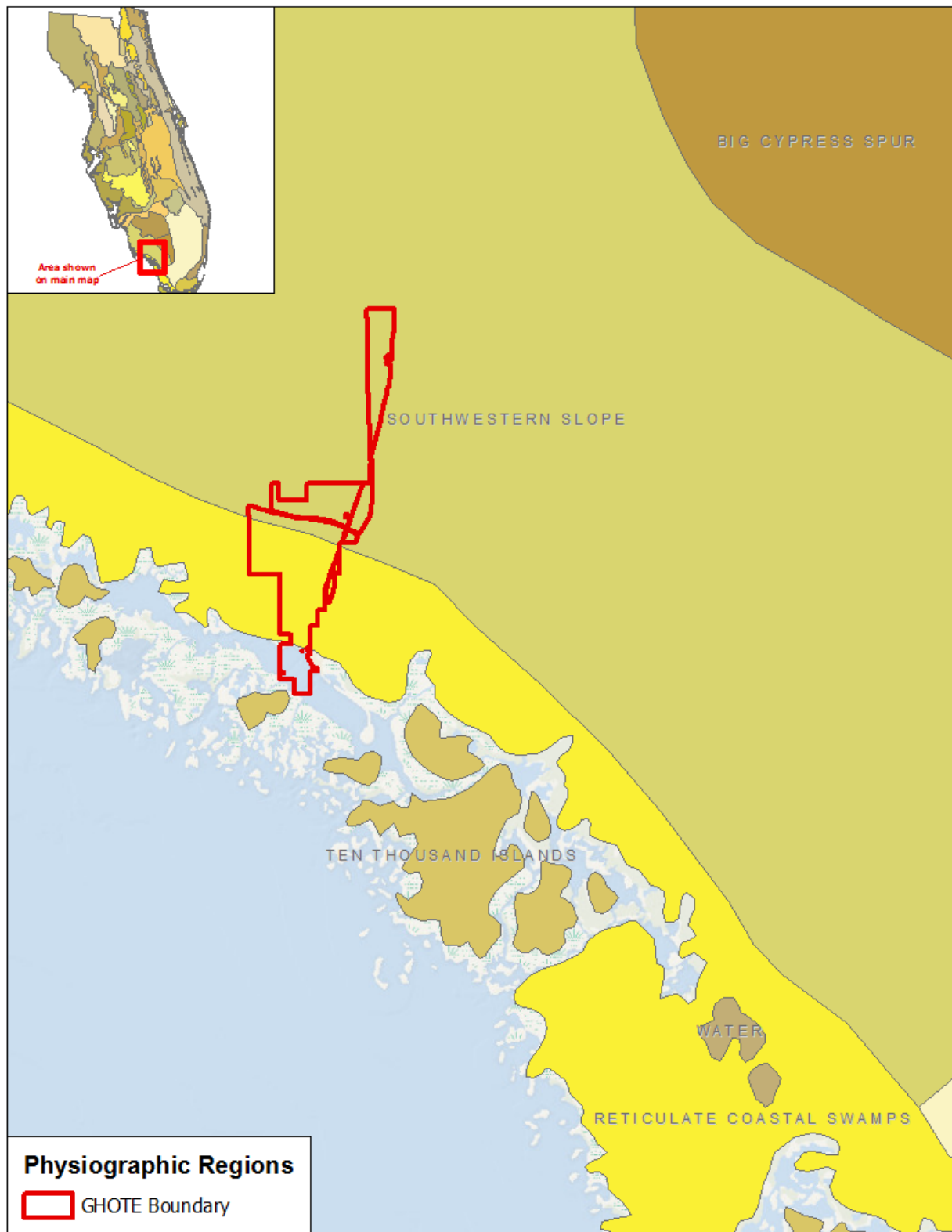
Geology

The GHOTE is located within the Coastal Lowlands of the Coastal Plain physiographic province of the eastern United States. This physiography includes several geomorphic features including the Atlantic Coastal Ridge, Big Cypress Spur, Big Cypress Swamp, Cape Sabal, Caloosahatchee Valley, De Soto Plain, Eastern Valley, Everglades, Gulf Coastal Lowlands, Immokalee Rise, Mangrove and Coastal Glades, Osceola Plain, Sandy Flatlands, Southern Slope Southwestern Slope, and the Reticulate Coastal Swamps. The GHOTE lies with the geomorphic features of the Southwestern Slope and Reticulate Coast Swamp (**Map 4**).

The Southwestern Slope is bordered on the east by the Big Cypress Spur, on the northeast by the Immokalee Rise, and on the west and southwest by the Reticulate Coastal Swamps. Elevations in this area range from two feet above mean sea level (MSL) at the southern boundary, with the coastal swamps up to 25 feet above MSL where the Slope joins the Immokalee Rise. The Reticulate Coastal Swamps are intricately channeled coastal marshes and mangrove swamps that form the southwest coastline of Collier County. These lowlands are less than five feet above mean sea level and subject to tidal action. Most of the Southwestern Slope geomorphic feature is a thinly coated sand overlying an eroded Tamiami Formation limestone surface. The Reticulate Coastal Swamps consist of thin organic and marly soils overlying the Tamiami limestone.

Mineral soils covering the rock and marl formations primarily comprise marine sands deposited during the Pleistocene period. During this period, the sand on the Talbot and Pamlico terraces was deposited by high sea levels of the Sangamon and Peorian interglacial ages. Other sand, marl, and peat were deposited on top of some of the Pamlico sand at the end of the Wisconsin glacial stage of the Pleistocene series.

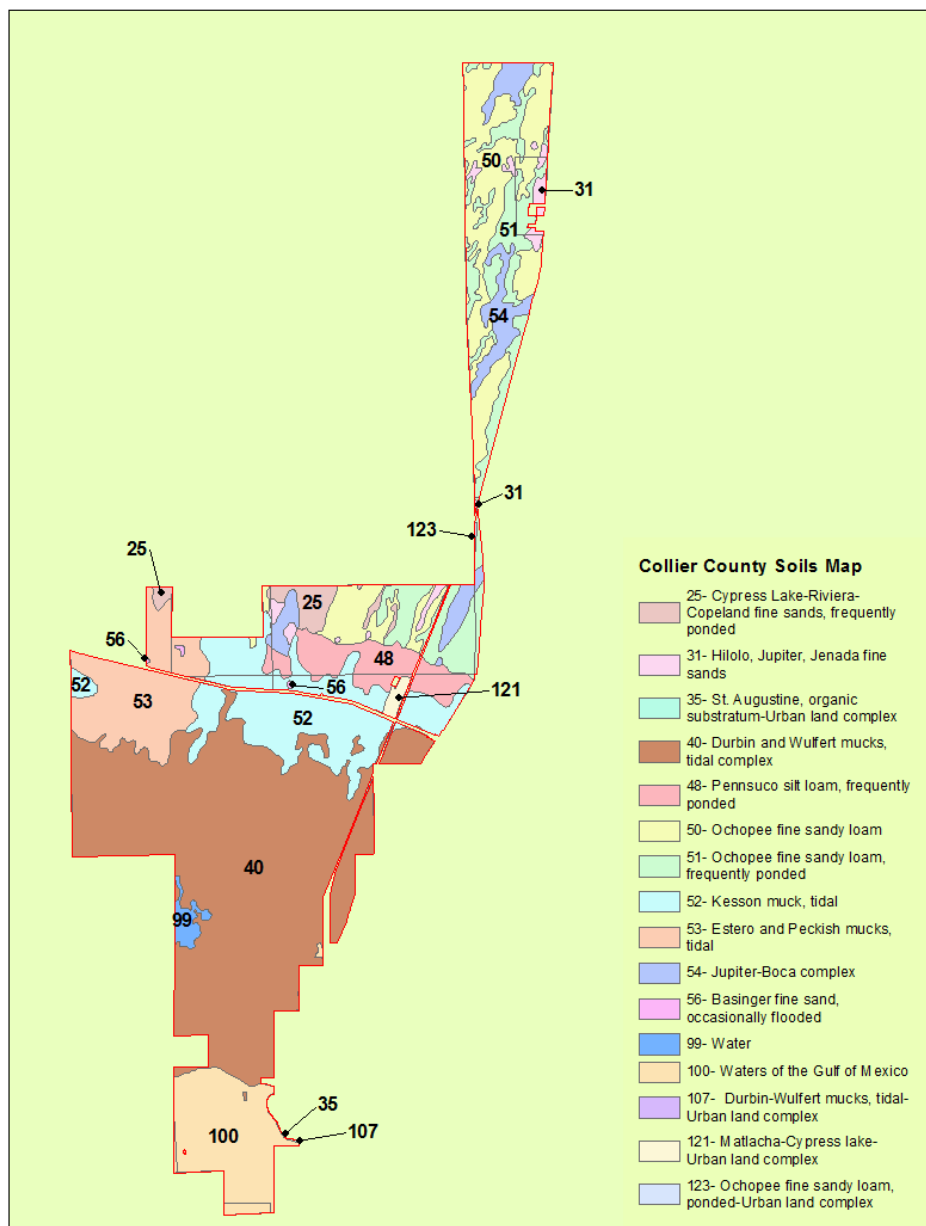
An extensive shallow aquifer underlies the Big Cypress Swamp and adjacent areas of southwest Florida. This aquifer is replenished primarily by infiltration from local rainfall and seepage from weir-operated drainage canals. The thickness of the aquifer is about 130 feet in western Collier County, where it consists of the Pamlico Sand and the Anastasia Formation of Pleistocene age and limestone of the Tamiami Formation of Miocene age. These formations are highly permeable in certain areas. Underlying the GHOTE is about 50 feet of the permeable shelly limestone of the unconfined aquifer. The shallow aquifer is a prime source of freshwater supplies in Collier County and adjoining parts of Lee and Hendry counties. However, it is not the direct source of municipal water supply due to its water quality and inadequate flows during the dry season. The shallow aquifer thins eastward and wedges near the Dade and Broward county boundary.



Map 4. GHOTE major geomorphic features.

Soils

A soil map encompassing the GHOTE (**Map 5**) was compiled using Collier County soil survey data from the U.S. Department of Agriculture and Natural Resources Conservation Service (NRCS). The upland soils comprised of St. Augustine organic substratum-urban land complex and Matlacha-Cypress lake-urban land complex, make up less than 1% of the underlying soils. The wetland soils, which encompass most of the soil profile, are dominated by Basinger fine sand, Cypress Lake-Riviera-Copeland fine sands, Durbin and Wulfert mucks tidal and urban complex, Estero and Peckish muck tidal, Jupiter-Boca complex, Hilolo Jupiter Jenada fine sands, Kesson muck, Ochopee fine sandy loam, and Pennsuco silt loam. NRCS updates its soil information periodically and is available through the NRCS Web Soil Survey.



Map 5. GHOTE NRCS soil classifications.

Hydrology

The GHOTE is in the West Collier Drainage Area within the Big Cypress Basin watershed. The property boundaries fall within three interconnected sub-basins (**Map 6**): Fakahatchee, Barron River, and the Coastal Basins sub-basins. The Fakahatchee and Barron River sub-basins are generally unaffected by tidal fluctuations except during extreme storm tides such as those associated with hurricanes. The Coastal Basins sub-basin is tidally influenced.

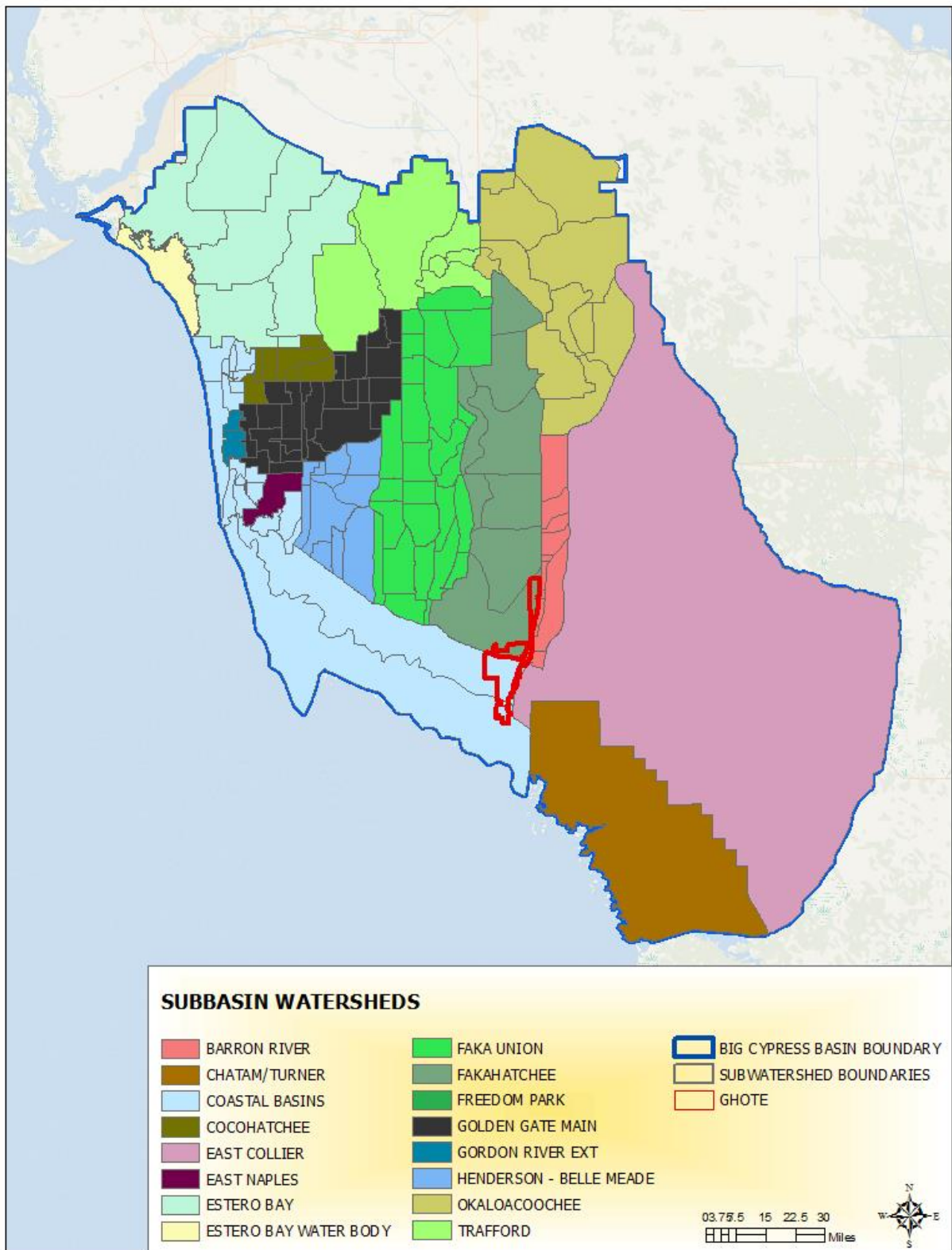
Drainage in Collier County is determined by topographic configuration and canals. The general pattern is south and southwesterly toward the coast. Historically, freshwater meandered south as sheetflow through natural sloughs, wetlands, and rivers, ultimately reaching the Ten Thousand Islands estuary. The completion of the Tamiami Trail created a block to the historical drainage. The Tamiami Canal intercepted the flow, and the intermittent bridges and culverts conveying sheetflow under the road were not all placed consistently to mimic historic flow patterns. As a result, the hydrology of the downstream wetlands and estuaries became affected by the uneven water distribution and changes to the natural flow pattern. The construction of the Barron River Canal along S.R. 29 also plays a significant role in reducing historic sheetflow across the landscape. The Barron River Canal artificially increased the amount of water discharging to the Barron River, resulting in a sizeable single-point discharge of freshwater to Ten Thousand Islands' Chokoloskee Bay.

The Tamiami Trail Culverts Project, completed in 2006, was one of the critical projects authorized by Congress in 1996 under the Water Resources Development Acts (WRDA). The project envisioned constructing 77 culverts in 30 locations along the western portion of Tamiami Trail. The initial culvert installation occurred between County Road 92 and S.R. 29 to restore sheetflow to the Picayune Strand. The U.S. Geological Survey (USGS) conducted a 4-year study (March 2006 through September 2010) to quantify the volume of freshwater flowing under the road in this area. The study area was divided into seven segments (sub-basins) demarcated by existing plugs in the Tamiami Canal on the north side of the road. The GHOTE boundaries extend within the easternmost two sub-basins of this study area. The study found that the Barron River Canal (Bridge 75), where flows bypass the GHOTE, accounted for 77–82% of the annual flow exiting via Barron River into the Ten Thousand Islands' Chokoloskee Bay during the study period. The remaining bridges and culverts with the potential for reaching the GHOTE in the Barron River section accounted only for 9–13% and 8–11% of the flow, respectively (Booth et al., 2014). One bridge (Bridge 73) contributed about 20% of the flow in the adjacent segment. In contrast, the remaining bridges and culverts contributed 3–8% and 1–3% of the total flow from the sub-basin, respectively (Booth et al., 2014).

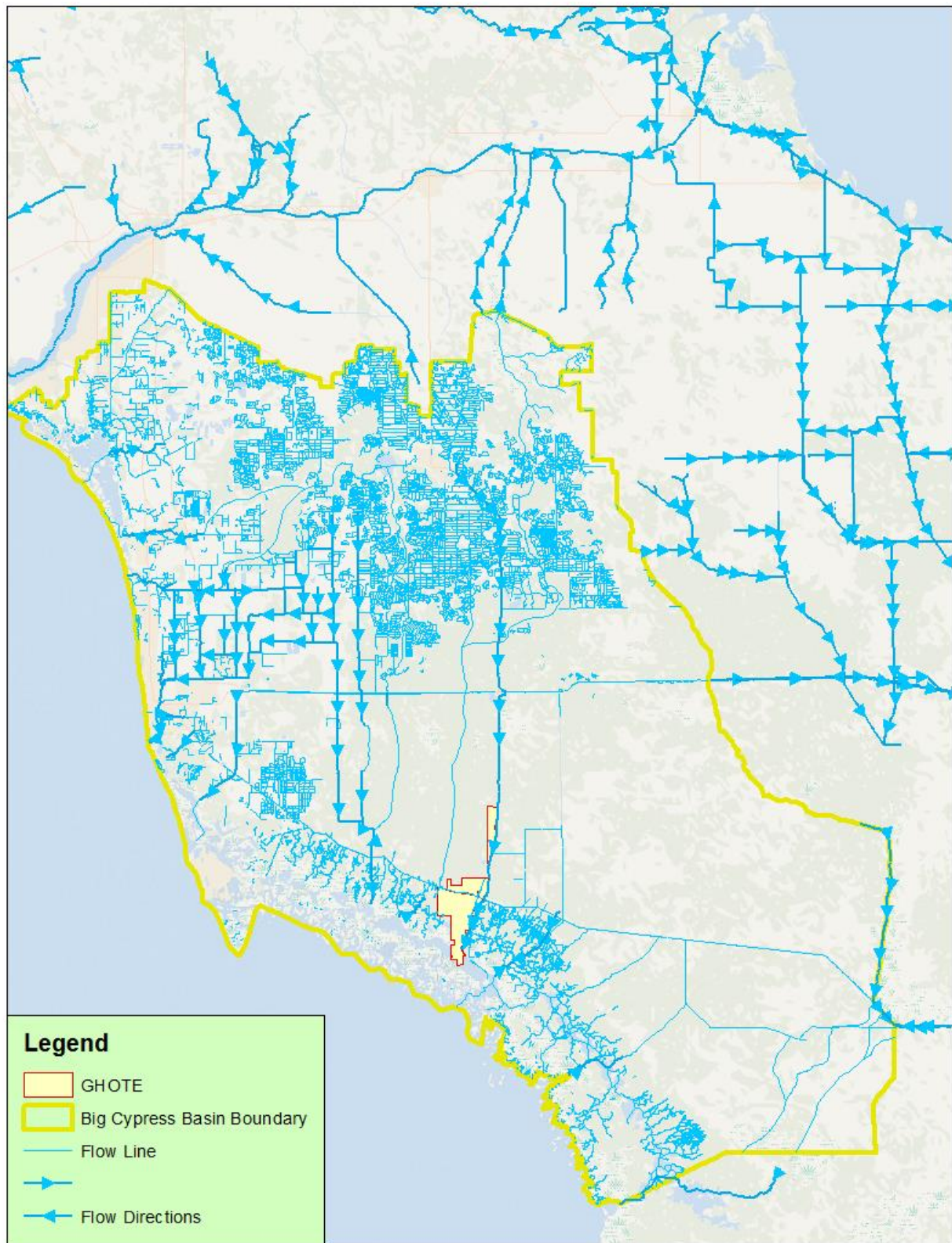
Although the volume of freshwater entering the GHOTE has not been directly quantified, water quality deterioration due to salinity changes in the GHOTE is evident in the notable shifts in the vegetative communities from salt marsh to mangroves. Saltwater intrusion is a long-term threat to coastal wetland vegetation and coastal morphology worldwide. In 2006, USGS initiated an ongoing study to assess salinity patterns in the Ten Thousand Islands estuary. A report published in 2010 characterized the seasonal and spatial distribution of freshwater flow and salinity in the Ten Thousand Islands area during 2007–2009. The study identified the entrapment of high-salinity water within the shallow inner bays and noted hypersaline conditions throughout the study area. Monitoring data collected during the peak of the 2007 and 2008 dry seasons suggested that the

lack of rainfall and high evaporation rates within the shallow estuaries prompted hypersaline conditions in the bays and canals. For example, salinity maps produced during the peak of the dry season for each year (2007-2009) indicated that hypersaline conditions were occurring throughout the entire estuary, including Faka Union Bay and Barron River (Booth et al., 2014). The monitoring data suggested that except during the peak of the dry season, freshwater discharge from the Barron River Canal reduced salinities in Barron River and Chokoloskee Bay, showing a correlation between freshwater input and salinity gradient. A more recent report focused on a study area extending from Blackwater River to East Rivers analyzed monitoring data collected up to 2019 (Booth et al., 2021). The data from the Barron River station was not analyzed in the report; however, a similar condition is expected based on the persisting salinity trend noted in the report. This report inferred that the negative trend in salinity in the Faka Union and East Rivers stations likely correlated with the increasing trends in freshwater observed from Faka Union and East Rivers. This overall trend in salinity patterns supports the need to restore historic hydroperiods and sheetflow patterns to distribute freshwater discharge more evenly and prolong it in the inner bays of the Ten Thousand Islands estuary.

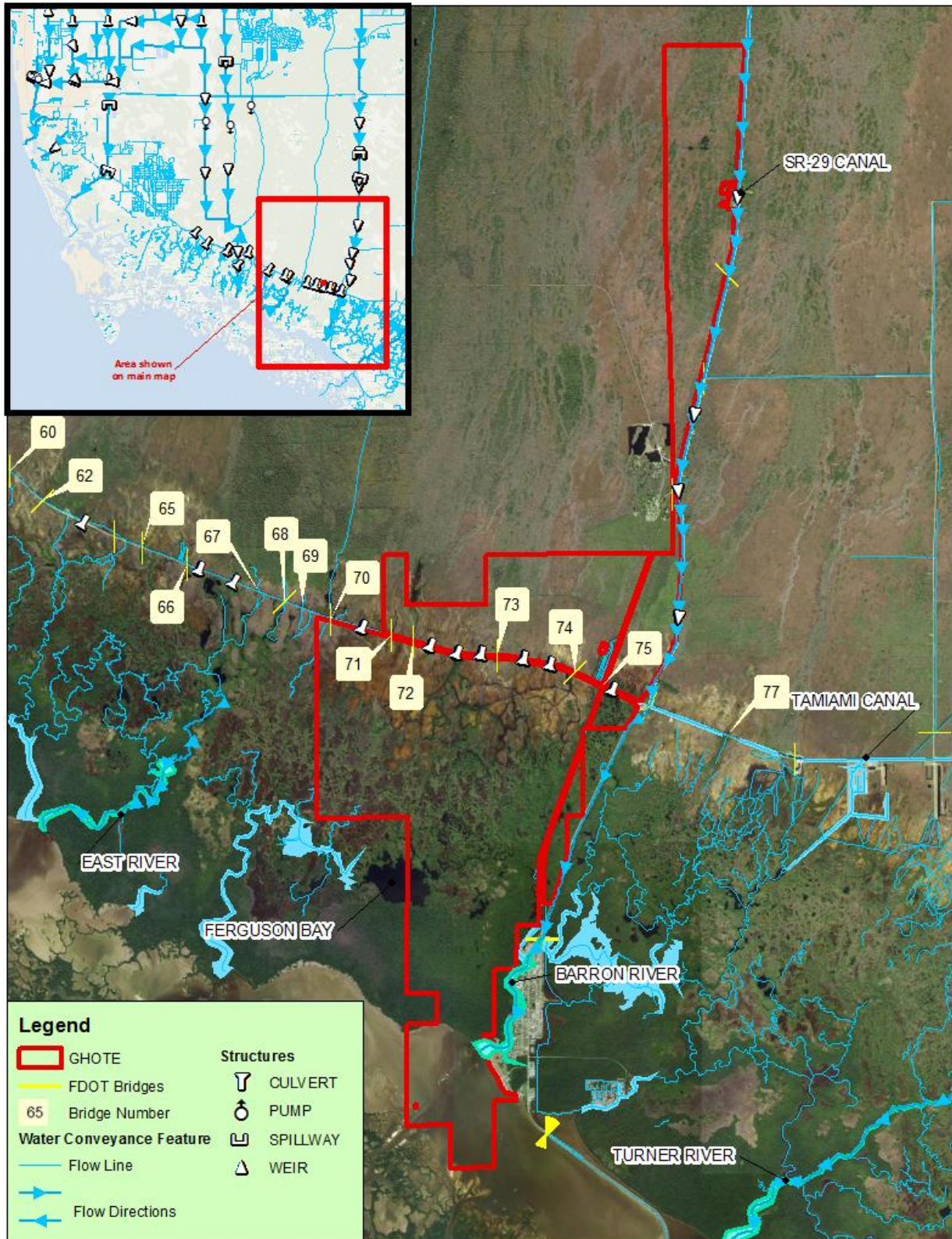
Tidal fluctuations influence the salt marsh system in the GHOTE MA, thus having higher soil salinity than the freshwater marsh community on the property. Alterations to the freshwater influx into the system are increasingly promoting the encroachment of more salt-tolerant species. As a result, mangroves are steadfastly migrating upstream into the traditional salt marsh system, particularly the northern portion of the GHOTE MA. Similar conditions reported in the Big Cypress National Preserve Hydrologic Restoration Management Plan Environmental Assessment (NPS, 2021) suggest a systematic problem within the Coastal Sub-Basin. Although sea level rise and high tide events associated with hurricanes play a role in the changes in mangrove coverage, the diversion of runoff into adjacent canals has exacerbated the encroachment problem, leaving the system unable to sustain its gradient of fresh, brackish, and salt-tolerant species assemblages. As mangroves continue to move upstream, they will displace the salt marsh communities. Without intervention, the mangrove system will eventually replace the remaining salt marsh community in the GHOTE. Although mangroves support a variety of wildlife, many species of waterbirds rely specifically on marshes as foraging habitat. Additional studies would be necessary to investigate further the spatial distribution of freshwater flow in this segment of the Tamiami Trail and identify available pathways for sheetflow restoration to restore the historic hydroperiods and sheetflow patterns in the GHOTE MA to the extent possible.



Map 6. Regional basin watersheds and subbasins.



Map 7. Regional hydrography.



Map 8. Location of water inflows to the GHOTE

5.2 Vegetation

Nine distinct natural community types exist within the GHOTE. The District groups natural community types based on the descriptions contained in the Florida Natural Areas Inventory Classification System (FNAI 2010) and the Florida Land Cover Classification System (Kawula & Redner 2018). The GHOTE is dominated by a mixture of salt and freshwater wetlands. Salt-tolerant communities are predominantly found on the south side of GHOTE due to the U.S. 41 bisection. A detailed description of the natural communities is provided in Appendix B.

Natural plant Communities and Percent coverage in the GHOTE

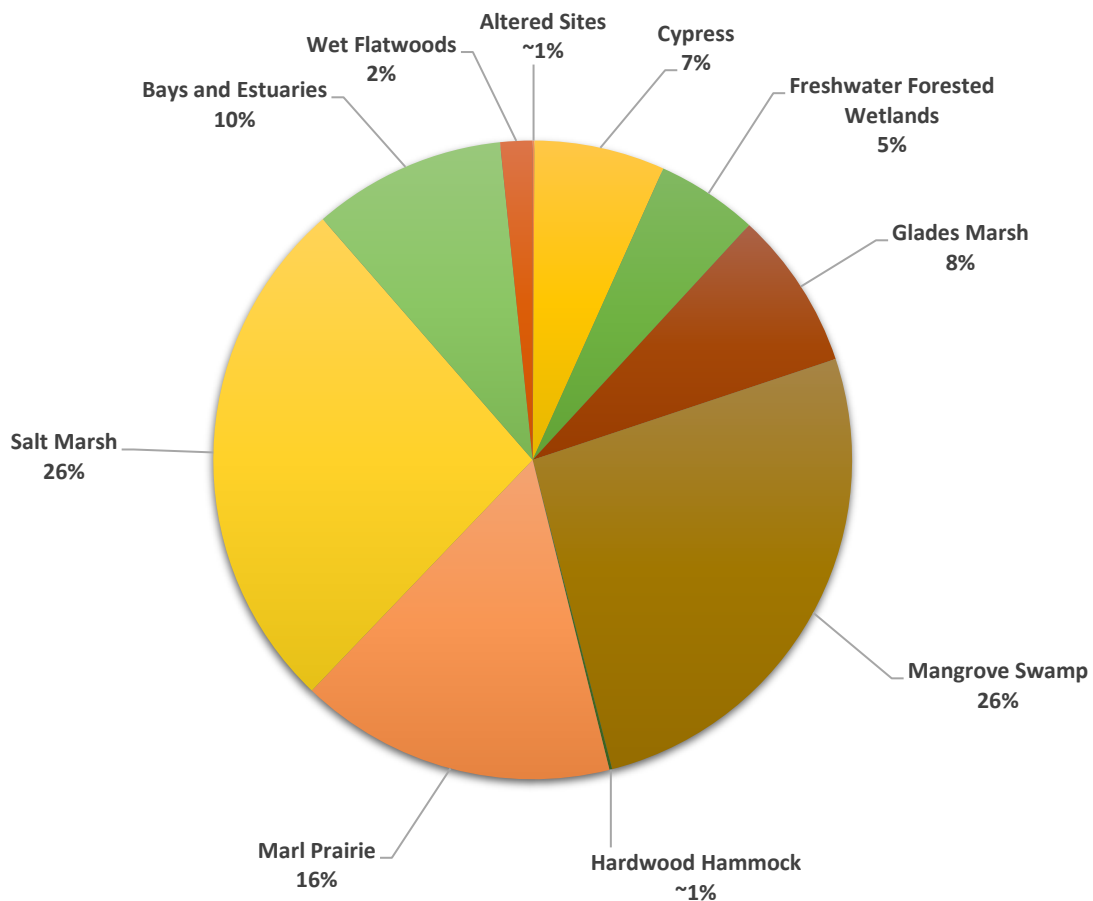
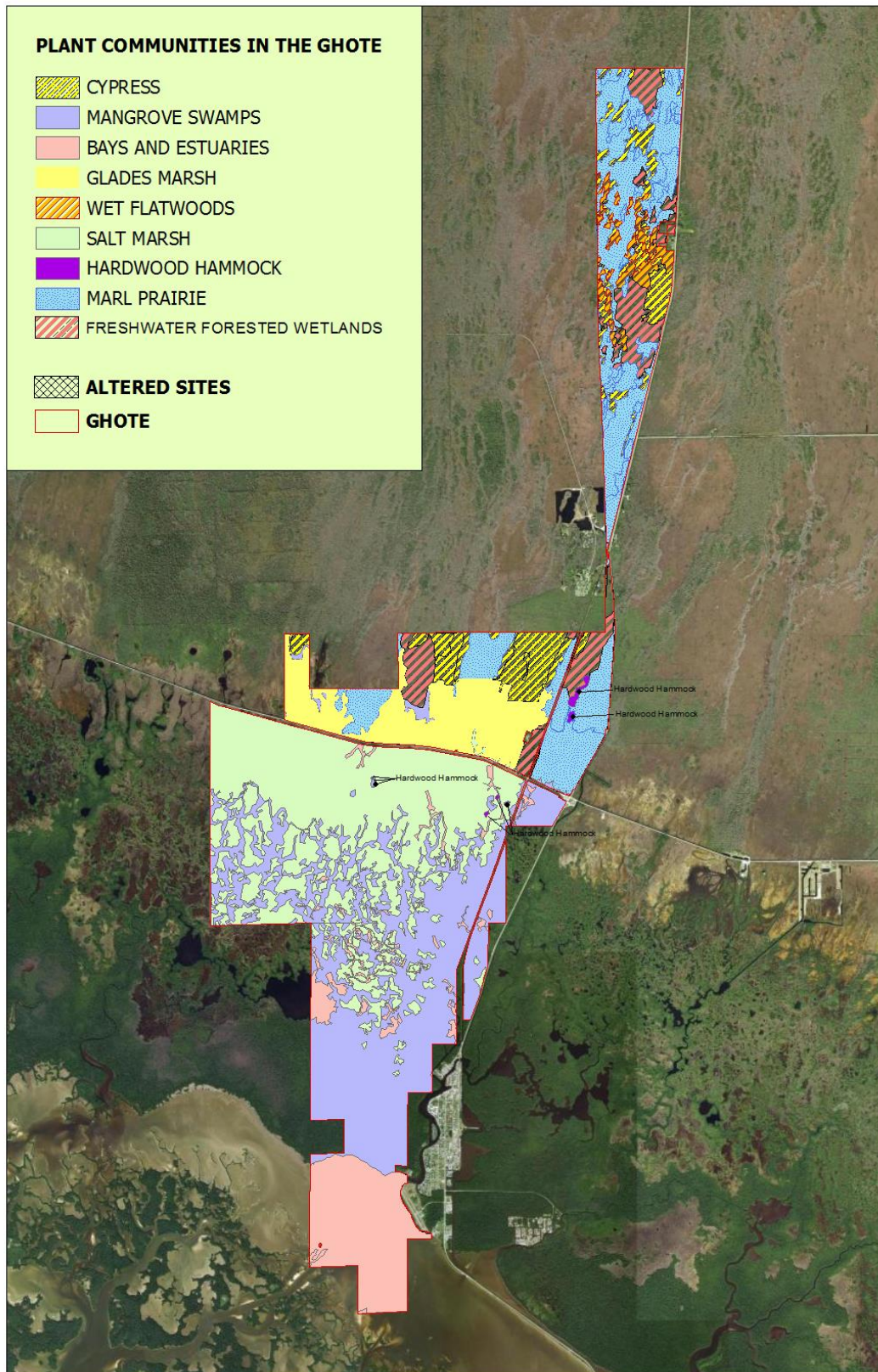


Figure 1. Natural plant community types and percent coverage in the GHOTE.



Map 9. Plant communities in the GHOTE.

Listed Species

Listed species include those plants and animals identified as rare, threatened, or endangered by the U.S. Fish and Wildlife Service (FWS), FWC, and the Florida Department of Agriculture and Consumer Services. Over 115 listed plant and animal species are recorded in the surroundings of the GHOTE. **Table 1** identifies those listed plant species known to occur within the GHOTE.

Table 1. Listed plant species on the GHOTE and status. ^{a,*}

Common Name	Scientific Name	Status
Balbis' Airplant	<i>Tillandsia balbisiana</i>	ST
Big-Mouth Star Orchid	<i>Epidendrum amphistomum</i>	SE
Cardinal Airplant	<i>Tillandsia fasciculata</i>	SE
Cypress peperomia	<i>Peperomia glabella</i> *	SE
Florida clamshell orchid	<i>Prosthechea cochleate</i> *	SE
Ghost Orchid	<i>Dendrophylax lindenii</i> *	SE
Giant Airplant	<i>Tillandsia utriculata</i>	SE
Leatherleaf Airplant	<i>Tillandsia variabilis</i>	ST
Mullein Nightshade	<i>Solanum donianum</i>	ST
Paurotis Palm	<i>Acoelorrhaphe wrightii</i>	ST
Royal Palm	<i>Roystonea regia</i>	SE
Simpson's Stopper	<i>Myrcianthes fragrans</i>	ST
Small's flax	<i>Linum carteri</i> var. <i>smallii</i> *	SE
Stiff Flower Star Orchid	<i>Epidendrum rigidum</i>	SE
Leafy vanilla	<i>Vanilla phaenantha</i> *	SE
Yellow Helmet Orchid	<i>Polystachya concreta</i>	SE

a. Key to abbreviations: Species listed by the State of Florida as State-designated Threatened (ST), State-designated Endangered (SE).

*Species likely to be present on or near the property based on habitat and species range models, but not observed.

Nuisance and Invasive Plant Species

The subtropical climate of South Florida offers an ideal environment for nuisance and invasive plants to spread rapidly and alter natural ecosystems. Among all the states, Florida is second only to Hawaii in the severity of threats posed by nuisance and invasive species to native habitats and species. The South Florida Water Management District is committed to reducing the proliferation of nuisance and invasive species to protect the ecological values of its management areas (SFWMD, 2020). However, changes in the surrounding environment and past land use have disrupted the balance of the natural ecosystem within the GHOTE, which has led to the colonization of invasive plants. If proper land management is not implemented, the expansion of nuisance and invasive plant species will continue to displace native plants and reduce wildlife utilization.

5.3 Wildlife

The natural communities within GHOTE provide habitat for numerous birds, reptiles, and mammal species. These diverse species are supported by the large interconnecting natural

communities within the region. **Appendix C** includes a detailed list of reptiles, amphibians, mammals, birds, fish, and invertebrates documented in the region that utilize the GHOTE communities and adjoining communities.

Game species

Some District lands provide quality habitat for game species. The District allows the public to use District lands for game, small game, and spring turkey season hunts as appropriate. The GHOTE area contains abundant wild turkey, waterfowl, and small game populations. The District will authorize FWC to begin the rulemaking process to establish the Management Area as a PSGHA and oversee the game management, and hunting and recreation activities on the GHOTE MA in accordance with State and Federal regulations.

Rare, Threatened and Endangered Listed Species

Several federally or state-listed species that have been documented in the vicinity utilize the GHOTE, including the Big Cypress Fox squirrel and Florida panther. Table 2 provides a list of these protected species that may be found on the GHOTE property.

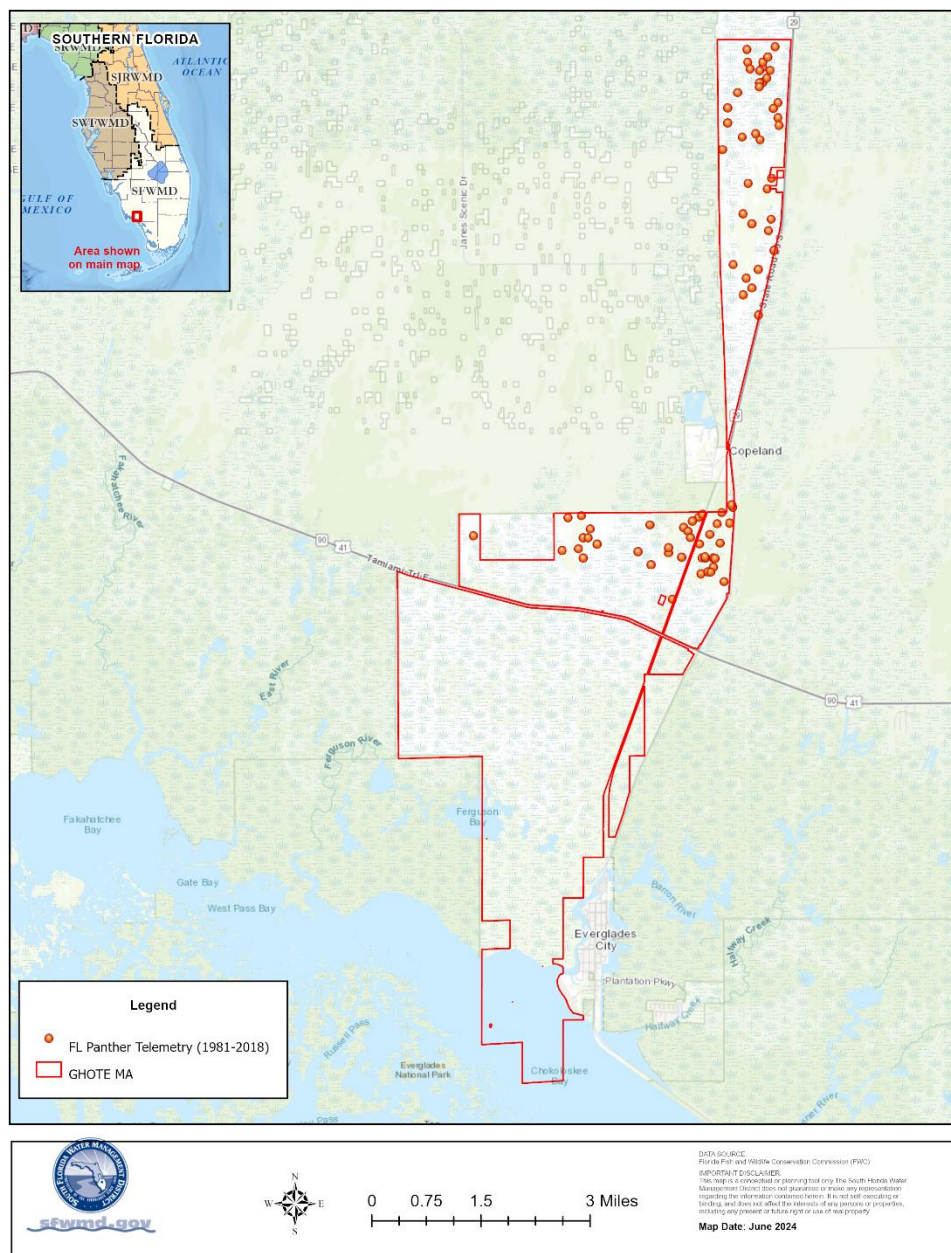
Table 2. Listed wildlife species utilizing the GHOTE area and status. ^{a,**}

Common Name	Scientific Name	Status
Herps		
American Alligator	<i>Alligator mississippiensis</i>	FT Due to Similar Appearance to A. Crocodiles
American Crocodile	<i>Crocodylus acutus</i> *	FT
Eastern Indigo Snake	<i>Drymarchon couperi</i> **	FT
Hawksbill Sea Turtle	<i>Eretmochelys imbricata</i> **	FE
Smalltooth Sawfish	<i>Pristis pectinata</i>	FE
Mammals		
Big Cypress Fox Squirrel	<i>Sciurus niger avicennia</i>	ST
Everglades Mink	<i>Neovison vison evergladensis</i>	ST
Florida Bonneted Bat	<i>Eumops floridanus</i> *	FE
Florida Panther	<i>Puma concolor</i>	FE
Sherman's Short-Tailed Shrew	<i>Blarina shermani</i>	ST
West Indian Manatee	<i>Trichechus manatus</i>	FT
Birds		
American Oystercatcher	<i>Haematopus palliatus</i>	ST
Black Rail	<i>Laterallus jamaicensis</i>	FT
Black Skimmer	<i>Rynchops niger</i>	ST
Crested Caracara	<i>Caracara cheriway</i>	FT
Florida Sandhill Crane	<i>Grus canadensis pratensis</i>	ST
Least Tern	<i>Sternula antillarum</i>	ST
Little Blue Heron	<i>Egretta caerulea</i>	ST
Red-Cockaded Woodpecker	<i>Picoides borealis</i> **	FE
Reddish Egret	<i>Egretta rufescens</i>	ST

Table 2 (Continued). Listed wildlife species utilizing the GHOTE area. a,**

Common Name	Scientific Name	Status
Roseate Spoonbill	<i>Platalea ajaja</i>	ST
Snail Kite	<i>Rostrhamus sociabilis plumbeus</i>	FE
Tricolored Heron	<i>Egretta tricolor</i>	ST
White-Crowned Pigeon	<i>Columba leucocephala</i> *	ST
Wood Stork	<i>Mycteria americana</i>	FT

a. Key to abbreviations: Species listed by the State of Florida as Federally-designated Endangered (FE), Federally-designated Threatened (FT).
**Species potentially present based on their known or predicted range, but not observed.



Map 10. Florida Panther radiotelemetry collected within the GHOTE from 1981-2018.

5.4 Cultural Resources

Archaeological and historic resources are protected by site identification and inter-agency coordination with the Florida Division of Historical Resources (FDHR). The Florida Master Site File, maintained by the FDHR, was searched for archaeological and historical sites known to exist on the property. Three prehistoric sites found on the property have been recorded in the FDHR Master Site File. The potential for additional cultural sites and other archeological targets to be located within or in the vicinity of the property is likely but has not been thoroughly investigated. The District will coordinate with FDHR to determine the need for additional cultural resources assessment surveys and discuss additional findings in the General Management Plan.

The District is committed to protecting the integrity of the cultural resource sites within the GHOTE MA. The management goal for cultural resources within the GHOTE MA is to preserve sites and objects representing Florida's cultural periods. Land managers focus primarily on prohibiting ground-disturbing activities in and around these archaeological sites. Vegetation management and prescribed burning activities are carefully conducted to reduce impacts on these resources.

6. PUBLIC USE

Section 373.1391(1)(a), Florida Statutes, states that the District shall manage and maintain, to the extent practicable, lands acquired to ensure a balance between public access, general public recreation, and restoration and protection. The District encourages public use of management areas for appropriate natural resource-based activities. District lands are generally available for public use, except in instances where the public use would be incompatible with the purposes for which these lands were acquired, there is no legal public access, or where construction activities prohibit public entry. Public input into the management of the area is solicited at the District's quarterly Recreational Forum Meetings. In coordination with partnering agencies, adjustments to public use opportunities are made on an ongoing basis through the Recreational Forum Meetings and rulemaking, if necessary. This plan describes the scope of public use opportunities available or planned as of the date of the interim plan. This interim plan is not intended to set public use policies through the plan period. Compatible recreation on District lands typically includes hiking, biking, hunting, fishing, frogging, horseback riding, canoeing, geocaching, boating, primitive camping, environmental education, wildlife viewing, nature photography, natural history study, and flora and fauna identification.

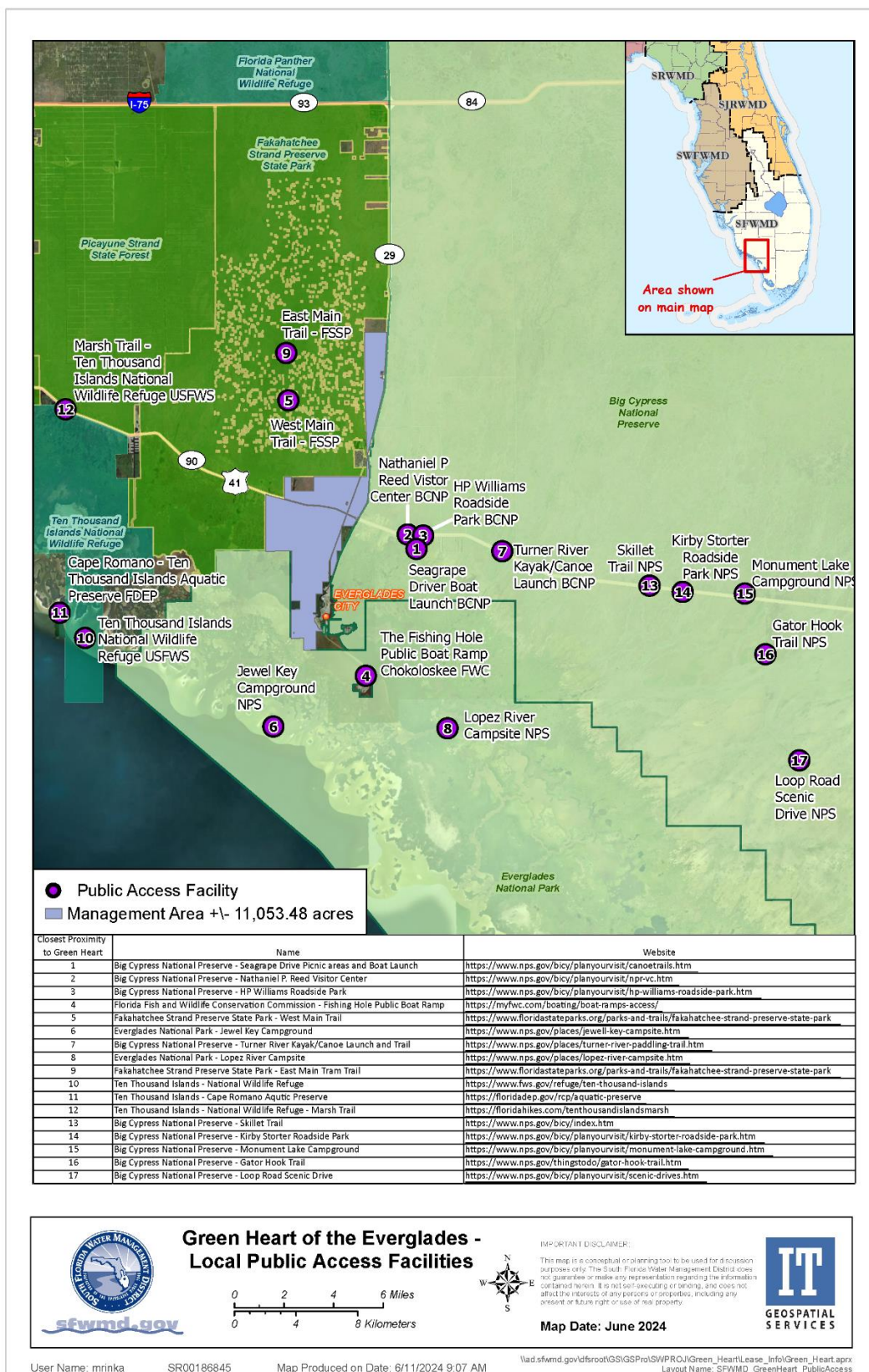
The District identified existing recreational opportunities available in the surrounding area (**Map 11**) from other agencies and recreation providers to determine the resources that can be best provided on the GHOTE MA. Community participation has been integral to recreational use planning for the GHOTE MA. To address public issues and concerns, the District solicited public input from stakeholders through public notices/news releases, established a dedicated email address to receive comments specifically for this project, conducted a public scoping meeting, and presented updates at the District's public Recreational Forum meetings. To date, public input mainly focused on the availability of recreational opportunities within GHOTE, including commercial and public airboat use, access to canoes, kayaks, and other vessels, and PSGHA for

waterfowl, frogging, and fishing. The District also received additional comments regarding protecting natural resources, noise reduction, and tribal rights.

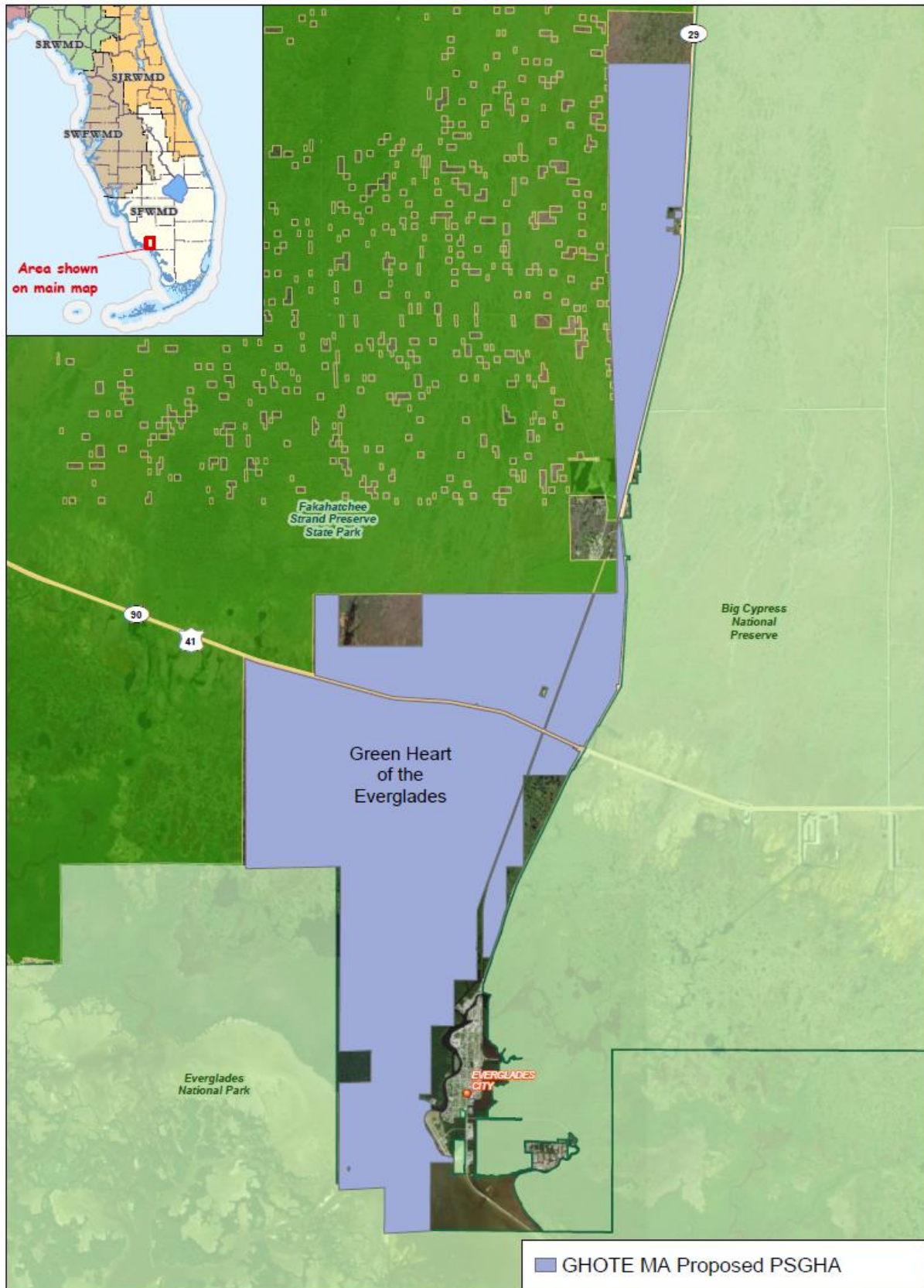
The District finds hunting, frogging, crabbing, fishing, wildlife viewing, environmental education, and non-motorized and motorized watercraft use, including airboating, compatible with the GHOTE MA. However, since the necessary funding, infrastructure, staff, and resources to manage public use facilities on this property are not currently available, new facilities will not be constructed until these resources become available.

The GHOTE MA will be designated as a PSGHA in partnership with FWC and made available for recreational hunting when funding, staff, resources, or other opportunities become available to support public access. Although the GHOTE MA can support small game hunting, waterfowl hunting, frogging, crabbing, fishing, wildlife viewing, environmental education, and motorized and non-motorized watercraft use, public use is limited due to inadequate facilities and limited public access points needed to fully support public use. Existing navigable waters within the GHOTE MA will remain accessible to public use in accordance with state and federal law.

Green Heart of the Everglades Interim Land Management Plan
South Florida Water Management District, Land Stewardship Section



Map 11. Location of nearby public access.



Map 12. Areas being considered for PSGHA.

Resource Protection

The District contracts with FWC to provide law enforcement services through the “enhanced patrol” program. The program provides funding for additional law enforcement patrols throughout the year to perform targeted operations to address specific law enforcement needs. Law enforcement surveillance protects natural and cultural resources. It deters vandalism, dumping, poaching, and other illegal activities while safeguarding the public. The presence and continual maintenance of posted boundary signs also enhance resource protection.

The U.S. Coast Guard is the nation’s lead maritime service, executing various marine safety and security missions inland, along the coasts, and in international waters. The U.S. Coast Guard has the authority to ensure vessel safety and protect the environment, the waterways, and surrounding infrastructure. The U.S. Coast Guard can control vessel traffic independently or holistically by creating vessel traffic systems, restricted navigation areas, safety zones, security zones, and anchorage areas. The U.S. Coast Guard’s authority to regulate navigation expands from the nation’s inland waters to the coastal waters and high seas, concurrently with State and local regulations where applicable and not otherwise preempted. The Submerged Lands Act confirmed the State of Florida’s ownership of tidal lands, islands, sand bars, shallow banks, and lands waterward of the ordinary or mean high water line beneath navigable freshwater or tidally influenced waters (Thomas et al., 2015). Florida’s authority to regulate activities on navigable waters has a proprietary and regulatory foundation. The State also delegates this power to local governments, allowing them concurrent regulatory control over waters within their jurisdiction.

Lease Administration

The District authorizes reservations, leases, or similar agreements on District lands or interest in land when such use is compatible with the purpose of the acquisition and the long-term use of the land. Historic property uses, such as agriculture, are allowed to continue on certain properties on an interim basis until the land is needed for construction or restoration. In the interim, the District will establish lease agreements to authorize compatible commercial airboat use of the property consistent with the management objectives.

7. NATURAL RESOURCE MANAGEMENT

To keep native plant communities healthy and productive, District land managers take appropriate actions to compensate for the loss of natural processes. Several land management practices are utilized to preserve the ecological health and function of the management areas. These practices include prescribed burning of fire-dependent plant communities with fire return intervals that mimic natural fire regimes; controlling nuisance and invasive vegetation through the selective use of herbicides and biological control agents; restoring the physical structure of plant communities and biological diversity through mechanical vegetation management including mowing, chopping, and shredding; and implementing hydrologic restoration activities where the natural hydrology has been altered through ditches, canals, and other surface water drainage features.

7.1. Fire

Fire has shaped the distribution of plants in Florida's ecosystems. Historically, wildfires reduced fuel loads in natural communities. Due to habitat fragmentation and human suppression efforts, these fires no longer naturally occur with historical frequency or extent, thus resulting in alteration to the natural community structure and function in fire-dependent communities. Most plant communities in Florida are adapted to periodic fires and rely on them to maintain their vegetative characteristics and biodiversity. Land Managers use prescribed burning to reduce hazardous buildup of vegetative fuel load, maintain plant species diversity, enhance wildlife habitat, and encourage restoration of native plant communities. Land Stewardship recognizes the importance of fire as a management tool and has integrated prescribed fire into its land management strategy.

Prescribed Fire Planning

The fire management program includes wildfire prevention, detection and suppression, and prescribed burning. Prescribed burn standards and procedures are outlined in the Land Stewardship's Wildlands Fire Manual, which also serves as a centralized resource for information on fire management on District lands. The manual outlines the procedures that must be followed to ensure compliance with statutory requirements in §590, Florida Statutes, and Rules 5I-2 & 62.256, Florida Administrative Code.

There is little history regarding the occurrence of fires within GHOTE MA prior to the District's acquisition. However, the incidence of past fires on and around the management area likely ranged from lightning to artificial fires for farming, hunting, and lumbering.

Prescribed fire is applied with different management objectives based on plant community needs, wildlife utilization, and specific species requirements. A prescribed burn program will be implemented for the GHOTE MA, and a fire-return frequency will be established to accomplish the herbaceous plant community's land and resource condition objectives. Prescriptions for these burns will identify the environmental conditions, return frequency, and ignition techniques to provide for mosaic burns that do not remove all vegetation while re-defining the boundaries of embedded plant communities that are not fire-dependent.

The marsh, wet flatwoods, and prairie communities within the GHOTE MA require periodic fire to maintain their vegetative characteristics and biodiversity. Land Stewardship will utilize prescribed fire to maintain the grassland structure and reduce the encroachment of mangroves and other woody species. Grasses and sedges constitute the principal ground cover in these communities, providing fine fuel that burns quickly when ignited. However, because the property consists mainly of wetlands, prescribed fire application is limited to the drier months when surface water recedes. Although burning in late summer and early fall is preferable to replicate historical fire patterns, late fall and spring burns are the most conducive for fire application within the GHOTE MA due to its high-water table and tidal influence. Prescribed fire will be applied in the marsh while the soil is saturated to achieve a patchy, low-intensity fire (cool burn) and prevent organic soil subsidence where present.

Challenges for the GHOTE MA's fire program include increased smoke management requirements near roads and population centers, shifting winds with afternoon sea breezes, and water levels that restrict most vehicles from accessing the burn unit. Smoke mitigation is particularly challenging due to the proximity of major roads and highways within the vicinity of the GHOTE MA and proximity to populated areas, such as the City of Everglades, Lee Cypress, Jerome, and Copeland.

Meeting the prescribed fire goals and objectives for fire-maintained communities largely depends on weather conditions, personnel, and statewide emergencies such as wildfires, hurricanes, and other natural disasters. Ideally, burn crews would consist of 6-8 or more individuals. However, with only 3 District Land Stewardship employees assigned to the West Coast Region, conducting prescribed burns requires outside assistance from other agencies (including FWC, local fire departments, and local counties), other District staff, and trained volunteers to ensure it is conducted safely and effectively.

Wildfire Suppression

Wildfires ignited by lightning are a common occurrence throughout Florida. The Florida Forest Service (FFS) is responsible for preventing, detecting, and suppressing wildfires in Florida (§590.01, Florida Statutes). Maintaining fire-dependent habitats with frequent prescribed burns is the main way the District limits the negative impacts of wildfires and increases the ability of the FFS to respond successfully to wildfire events. When a wildfire is detected, the land manager immediately notifies FFS while the Land Stewardship staff responds and, if appropriate, begins fire suppression efforts. Upon arrival, FFS takes command of the fire while the District continues to provide logistical and situational support as needed.

7.2. Control of nuisance and invasive plant species

The District's vegetation management program utilizes an Integrated Pest Management strategy to maintain nuisance and invasive populations at the lowest feasible level. Integrated Pest Management is an ecosystem-based strategy that focuses on the long-term prevention of pests and their damage through the combination of management techniques, including prescribed fire, herbicide application, mechanical treatment, biological control, and physical removal. The selection of control measures depends on species type, environmental factors, and the impacted natural communities.

Invasive plant control funding represents the largest item in the Land Stewardship Program's annual budget. Land managers have developed specific management area treatment strategies that optimize invasive plant control efforts. Although Category I and II species in the Florida Invasive Species Council (FISC) lists are invasive and threaten the function and ecological stability of the natural communities, achieving maintenance on all species identified on these lists is currently not feasible with existing budgetary resources. The primary goal of the Land Stewardship's invasive plant management program is to control the spread of 30 identified invasive species (**Table 3**), in addition to area-specific priority species based on early detection/rapid response and locally significant impacts or potential for impacts. The main species being targeted for treatment in the GHOTE MA are Brazilian pepper, Melaleuca, Australian pine, torpedo grass, and cattail.

Nuisance species treatment is primarily conducted by herbicide applicators contracted through the District's Vegetation Management Section. Supplemental efforts by District staff are also conducted on small or sporadically distributed infestations. Treatment areas are scheduled based on the severity of nuisance and invasive plant infestation, time since the last treatment, property access, groundwater conditions, avian nesting seasons, and public use. All treatments follow the District's best management practices for herbicide and use the best available science. Treatment dates, locations, and species treated are recorded in a GIS database. Herbicide use is recorded in the District's invasive plant control database.

Table 3. Land Stewardship Section invasive species control priority species.

Scientific Name	Common Name	FISC Category
<i>Abrus precatorius</i>	Rosary Pea	I
<i>Acacia auriculiformis</i>	Earleaf Acacia	I
<i>Albizia julibrissin</i>	Mimosa, Silk Tree	I
<i>Albizia lebeck</i>	Woman's Tongue	I
<i>Ardisia crenata</i>	Coral Ardisia, Scratchthroat	I
<i>Ardisia elliptica</i>	Shoebutton Ardisia	I
<i>Bischofia javanica</i>	Bishopwood	I
<i>Casuarina cunninghamiana</i>	River Sheoak, Australian-Pine	I
<i>Casuarina equisetifolia</i>	Australian-Pine, Beach Sheoak	I
<i>Casuarina glauca</i>	Suckering Australian-Pine, Gray Sheoak	I
<i>Colocasia esculenta</i>	Wild Taro	I
<i>Cupaniopsis anacardioides</i>	Carrotwood	I
<i>Dioscorea alata</i>	Winged Yam	I
<i>Imperata cylindrica</i>	Cogon Grass	I
<i>Leucaena leucocephala</i>	Lead Tree	II
<i>Lygodium japonicum</i>	Japanese Climbing Fern	I
<i>Lygodium microphyllum</i>	Old World Climbing Fern	I
<i>Melaleuca quinquenervia</i>	Melaleuca, Paper Bark	I
<i>Mikania micrantha</i>	Mile-A-Minute Vine	II
<i>Mimosa pigra</i>	Catclaw Mimosa	I
<i>Rhodomyrtus tomentosa</i>	Downy Rose-Myrtle	I
<i>Schefflera actinophylla</i>	Schefflera, Australian Umbrella Tree; Octopus Tree	I
<i>Schinus terebinthifolia</i>	Brazilian Pepper	I
<i>Senna pendula</i> var. <i>glabrata</i>	Christmas Senna, Climbing Cassia, Christmas Cassia	I
<i>Solanum diphyllum</i>	Twoleaf Nightshade	II
<i>Solanum tampicense</i>	Wetland Nightshade, Aquatic Soda Apple	I
<i>Solanum viarum</i>	Tropical Soda Apple	I
<i>Syzygium cumini</i>	Jambolan-Plum, Java Plum	I
<i>Triadica sebifera</i>	Popcorn Tree, Chinese Tallow Tree	I

7.3. Wildlife Management

The District's wildlife management relies on active habitat management that addresses the needs of all species present. The Land Stewardship Program accomplishes this by:

- Performing land management activities that maintain and/or improve native wildlife habitat, including prescribed fire and nuisance and invasive plant control.
- Conducting specific management activities that benefit protected species when necessary.
- Following management guidelines for listed species protection as determined by the South Florida Multi-Species Recovery Plan, Volume 1 (U.S. Fish and Wildlife Service (USFWS) 1999).
- Maintaining species lists of confirmed and potential wildlife species.
- Working cooperatively with FWC to manage public hunts and address wildlife management issues.

Game Management

The District partners with FWC to manage game species and public hunting opportunities on District lands established as Wildlife Management Areas (WMAs), Wildlife Environmental Areas (WEAs), PSGHAs, and Public Use Areas. These designations allow FWC to utilize biological and law enforcement staff to assist in managing wildlife on District lands and enforce wildlife and public use rules for resource protection purposes. These designations also allow FWC to establish hunting seasons and promulgate rules regulating public activities in these areas. The District will coordinate with FWC to establish a PSGHA on the GHOTE MA.

7.4. Mechanical Vegetation Control

Prescribed fire is the most cost-effective and ecologically beneficial method of vegetation control for fire-maintained habitats in South Florida. However, in locations where prescribed fire cannot be used as a land management tool, such as urban interface zones, or when other constraints prohibit the use of prescribed fire, mechanical vegetation control is an alternative method for reducing vegetation coverage and fuel loads. Mechanical vegetation control can reduce woody plant growth and increase species diversity through mowing, chopping, and shredding. Mechanical treatment can improve the natural characteristics of disturbed habitats overgrown with nuisance and invasive vegetation.

7.5. Hydrologic and Habitat Restoration

Incorporating fire, invasive plant control, and mechanical vegetation management is integral to any restoration project on managed lands where appropriate. The initial restoration efforts on the GHOTE MA will focus on enhancing the plant communities to eliminate nuisance and invasive species on the property and implementing management strategies for the long-term management of the natural communities. The need for hydrologic improvement on the property will be evaluated as land managers continue to assess the property. As site investigations identify needs

for hydrological modification, a restoration project plan will be designed and implemented based on funding availability.

8. ADMINISTRATION

Administration of District lands is directed through the Land Stewardship Section within the Land Resources Bureau. Policy decisions, planning and budgeting, procurement of personnel and equipment, contract administration, and program development issues are administrative tasks coordinated through the Land Stewardship. Input is provided by regional land managers located over the 16-county area. Regional land managers handle regular administrative duties from their field locations to ensure quick response to local concerns and management issues. Administrative activities for GHOTE MA will be handled through the District's field office at the CREW MA and the District's headquarters in West Palm Beach.

8.1. Planning and Budgeting

Planning is a major component of the Land Stewardship Section and is critical to maintaining proper program focus, direction, and coordination with other agencies. This document forms the framework for prioritizing and creating targeted plans for the activities to be conducted within the appropriated budget during the next five years.

The District is assessing principal funding sources for land management operations on the GHOTE MA, which may include lease and ad valorem tax revenues. Overall funding availability determines management activities. Budget distribution among the District's five land management regions is based on a programmatic prioritization of management activities. Operational funds are distributed to accomplish each management area's objectives most effectively. The operation and maintenance of the GHOTE MA include costs to cover staffing, operational and land management expenses, and capital refurbishment of the infrastructure. Capital infrastructure needs are determined based on current conditions and anticipated serviceability. Priorities for capital refurbishment are made on a Districtwide basis.

Strategies are updated annually to prioritize prescribed fire planning, nuisance and invasive control, and public use, equipment, and infrastructure needs, including fencing, public use facilities, administrative structures, and hydrologic components. These strategies and budgets are developed in concert with District-wide operational priorities and budgetary cycles and are prioritized across all areas managed by the Land Stewardship Program. A land management strategy will be developed for the GHOTE.

Table 4. GHOTE MA estimated expenditures for fiscal year 2025-2030.

MANAGEMENT ACTIVITIES	FY2024- 25	FY2025- 26	FY2026- 27	FY2027- 28	FY2028- 29	FY2029- 30
Resource protection						
FWC Law Enforcement Support	\$60,000	\$60,000	\$60,000	\$60,000	\$60,000	\$60,000
Resource Management						
Mechanical Vegetation Mgmt.		\$400,000	\$400,000	\$200,000	\$50,000	\$50,000
Chemical Vegetation Mgmt.		\$250,000	\$250,000	\$250,000	\$250,000	\$120,000
Wildlife and Environmental Monitoring	\$150,000	\$150,000	\$150,000	\$150,000	\$150,000	\$150,000
Wildlife Damage Mgmt.		\$5,000	\$5,000	\$5,000	\$5,000	\$5,000
Prescribed Burning/Site Prep	\$5,000	\$5,000	\$5,000	\$5,000	\$5,000	\$5,000
Boundary Survey	\$175,000					
Signage	\$25,000	\$25,000				
Solid Waste/Debris Removal	\$5,000	\$5,000	\$5,000	\$5,000	\$5,000	\$5,000
Fencing		\$50,000	\$50,000			
Capital Improvements						
Rec. Facilities Engineering & Design		\$1,000,000				
Rec. Facilities Construction				\$10,000,000		
Rec. Facilities Maint.					\$24,000	\$24,000
Support & Administration						
Infrastructure Maint.	\$5,000	\$5,000	\$5,000	\$5,000	\$5,000	\$5,000
Prescribed Burn PPE	\$2,000			\$2,000		
Land Mgmt. Spec SR	\$64,625	\$64,625	\$64,625	\$64,625	\$64,625	\$64,625
Land Mgmt. Tech 2	\$43,742	\$43,742	\$43,742	\$43,742	\$43,742	\$43,742
Vehicles	\$120,000					
Vehicle Fuel & Maint.	\$12,000	\$12,000	\$12,000	\$12,000	\$12,000	\$12,000

Table 4 (Continued). GHOTE MA estimated expenditures for fiscal year 2025-2030.

MANAGEMENT ACTIVITIES	FY2024-25	FY2025-26	FY2026-27	FY2027-28	FY2028-29	FY2029-30
Airboat		\$80,000				
Airboat Fuel & Maint.		\$3,000	\$3,000	\$3,000	\$3,000	\$3,000
Swamp Buggy		\$80,000				
Swamp Buggy Fuel & Maint.		\$3,000	\$3,000	\$3,000	\$3,000	\$3,000
Small Tools & Equipment	\$5,000	\$2,000	\$2,000	\$2,000	\$2,000	\$2,000
Total *	\$672,367	\$2,243,367	\$1,058,367	\$10,810,367	\$682,367	\$552,367

* Land management funding is dependent upon annual legislative appropriations and governing board authorization.

8.2. Personnel and Equipment

The Land Stewardship Program is separated into five geographic regions. Each region is assigned a Region Supervisor (Land Manager), one to three Land Management Technicians, and based on the need in some areas, a Land Management Assistant, Scientist III, and/or Scientist IV. A Section Leader provides direct oversight and supervision for the land managers. The Land Stewardship Section Administrator, Land Stewardship Senior Scientist, Wildlife and Public Use Section, Vegetation Management Section, and other support personnel from the District's headquarters in West Palm Beach and the Big Cypress Basin Field Station will provide additional leadership and assistance if needed. Management of the GHOTE MA property is the primary responsibility of the West Coast region's Supervisor, one Senior Land Management Assistant, and one Land Management Technician.

Staff have access to tools, supplies, four-wheel drive vehicles, fire suppression trucks, all-terrain vehicles, swamp buggies, and other heavy equipment. This equipment is maintained through the Clewiston Field Station. Equipment from other regions and leased equipment are also available if needed.

8.3. Volunteers

Section 373.1391, Florida Statutes, encourages the District to use volunteers for land stewardship and other services. The District recognizes the merits of volunteerism and welcomes participation in activities appropriate for public involvement. The Land Stewardship Section provides a range of volunteer opportunities for both individuals and groups. These opportunities include creating and maintaining public use trails, maintaining public use facilities and amenities, leading field interpretations and guided tours, organizing clean-ups of trails and waterways, conducting invasive plant sweeps, and helping with District-sponsored public events like Earth Day and Public Lands Day.

In Fiscal Year 2023, District Lands benefited from 14,493 volunteer hours or \$426,239 worth of volunteer services (using a \$29.41/hour Florida average for the value of volunteer service). Volunteer services include time performing functions such as waterway clean-ups, facility

maintenance and development, campground host activities, and providing environmental education programs. The District will assess opportunities within the GHOTE MA.

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Appendix A.

The GHOTE Area History

PREHISTORIC OVERVIEW

Within the interior wetlands of south Florida are small, palm tree-studded elevations resembling islands in a sea of grass that provided dry ground for Precolumbian settlements. Numerous archaeological sites left by the native inhabitants of Florida are still very much evident. Specific pottery designs and manufacturing techniques are most often used to identify cultural affiliation. Before 500 B.C., two major cultural traditions, Paleoindian and Archaic, are found throughout the state. Beginning around 500 B.C., specific cultural traits are recognized as belonging to distinctive cultural periods or traditions and are often correlated with environmental conditions or geographical regions.

Paleoindian (ca. 12,000 B.C. - 7,500 B.C.)

The earliest evidence of human occupation in Florida dates to around 12,000 years ago and is termed the Paleoindian Period. It is characterized by a fisher-hunter-gatherer population. Evidence from several sites indicates that Paleoindians hunted now-extinct Pleistocene megafauna (e.g., mammoth, bison) as well as species common today. They also fished and gathered wild plants and shellfish. The environmental conditions during Paleoindian times were different from the present day, as many of today's lakes, rivers, and estuaries had not yet developed, and freshwater sources were often limited to springs and sinkholes. Many Paleoindian sites are found around these water sources in areas of karstic, tertiary limestone formations. Our knowledge of the period is primarily limited to stone tools and the byproducts of stone tool production. While most Paleoindian sites are recorded in northern Florida, two important sites are found in Sarasota County. The Little Salt Spring and Warm Mineral Springs sites have provided a good deal of information about Paleoindians in southern Florida.

Archaic (ca. 7,500 B.C. - 500 B.C.)

The climatic and environmental changes that took place at the close of the Pleistocene epoch brought with them changes in the types and distribution of game animals available to prehistoric hunters. During the late Archaic Period, the Everglades and associated aquatic systems of southern Florida developed. Adapting to their new environment, the Archaic peoples became increasingly adapted to a much broader range of plant and animal sources for survival. Archaic peoples began to exploit a wider range of food sources, including smaller game, fish, mollusks and nuts, and became increasingly more sedentary than their predecessors. The tool kit used by these people became more varied and complex over time.

The Archaic epoch is traditionally divided into three periods – Early, Middle and Late – based upon stylistic changes in tools and the eventual presence of fiber-tempered pottery. Early Archaic period artifact assemblage suggests the early Archaic peoples initially shared similar lifestyles as the Paleoindians but adjusted to new environmental conditions since they were less constrained by water availability than in the Paleoindian period. Adapting to new conditions meant the Early Archaic peoples could hunt and collect from old Paleoindians and new site locations. It is surmised that the changes in their social organization and settlement patterns resulted in more efficient exploration of food resources and gave rise to more specialized tools. As Early Archaic cultures adjusted to new environmental conditions, they began to transition from the lanceolate projectile points from the Paleoindian period to a variety of stemmed tools. The Early Archaic cultures can be viewed as a population changing from nomadic Paleoindian subsistence pattern to the more settled coastal and riverine-associated regimes of the middle Archaic period.

During the Middle Archaic period, the vegetation community gradually changed, with oaks in some regions giving way to pines and mixed forests. The environmental conditions in certain locations were becoming increasingly drier and hotter, reducing the viability of upland habitats that supported the people's dependency on mast, deer, turkey, and other resources. Meanwhile, riverine habitat appeared to have improved as increased runoff from desiccated uplands enhanced the food potential along major rivers. The Middle Archaic artifact assemblage is characterized by several varieties of stemmed, broad-blade projectile points. It is surmised that if the Middle Archaic peoples were performing similar activities as Early Archaic peoples, they had to use a greater variety of tools. The implication is that the increase in seasonal sedentism led to them acquiring more specialized tools. Some tools were not easily transported in large numbers.

Early and Middle Archaic period sites in southwest Florida are relatively rare. The Bay West Site (8CR200) in Collier County provides one of the richest sources of Middle Archaic period traditions in this area of Florida. It is a mortuary site located in a cypress pond. The pond's peat preserved human remains, wooden tools and posts, botanical remains, antlers, lithics, and shells (Beriault et al., 1981).

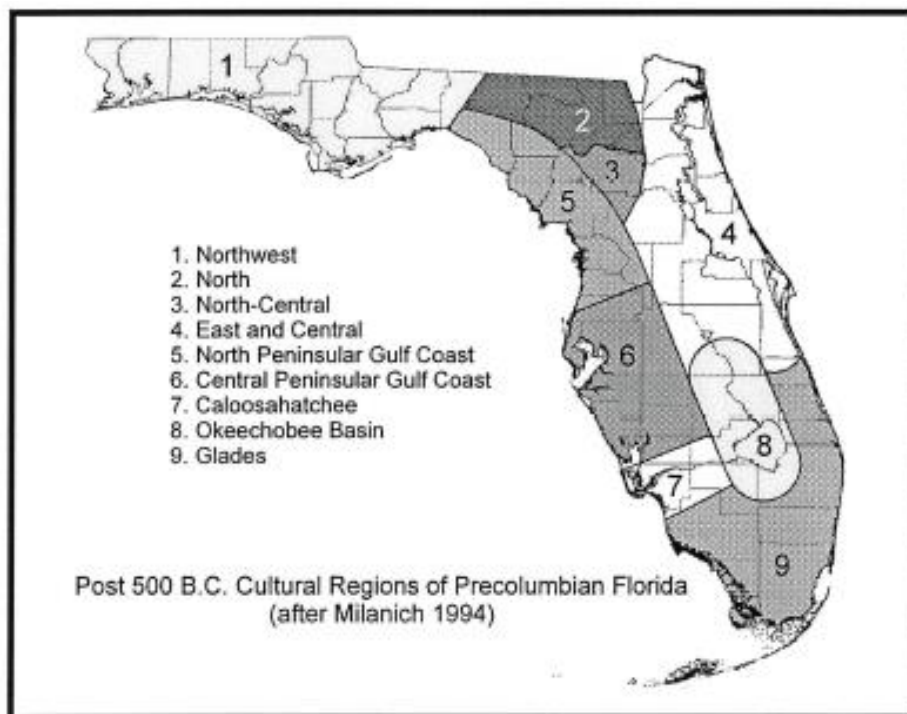
The earliest pottery, known as Orange, is a marker for the Late Archaic. Its diagnostic feature is a fibrous material used in the temper. The fiber was burned away during the firing process, leaving distinctive hollow areas visible on the vessel surface. The pottery appears at sites in Florida around 4,000 years ago. Late Archaic sites in southwest Florida that contain fiber tempered pottery include Marco Island, Horr's Island, and Cape Haze. These sites also possessed aceramic cultural material below Orange phase deposits, suggesting their occupation may have extended as far back as the Middle Archaic period (Dickel and Carr, 1991).

Post-500 B.C. Regional Cultures

By about 500 B.C., the introduction of ceramics and increased sedentism among aboriginal peoples made distinct regional cultures possible to develop. These cultures were highly adapted to distinctive ecological niches and could be distinguished archaeologically by differences in site location, subsistence strategies, belief systems, and ceramic types, among other differences.

Glades Region

Archaeologically, the GHOTE property is included within what has been termed the Glades culture region (**Map 1**). The Glades region is the largest of the South Florida regions in geographical extent, comprising all South Florida southeast of the Okeechobee and Caloosahatchee regions. This region includes the Everglades, Collier County, and the extensive saltwater marshes and mangrove forests once found along both coasts.



Map 1. Culture Areas of Florida (after Milanich 1994).

The Glades region is marked by sand-tempered pottery vessels, which are typically bowls with incurving walls and rim shaped using the coiling method. The Glades decorative motifs include linear and curvilinear incisions and rim ticking. The type Glades Tooled appears late in the Precolumbian period and exhibits elaborated lip treatments, either pinched to a piecrust-like edge, folded, or dowel impressed. The bodies of the carinated bowls are typically undecorated, and they are often extremely shallow. As typical in southern Florida, shell and bone were used as raw materials for tools. Shell picks, hammers, adzes, celts, gouges, chisels, awls, knives, scrapers, cups, and dippers were made from *Busycon*, *Pleuroploca*, and *Strombus* shells. Changes in pottery styles through time have enabled archeologists to divide the temporal range of the Glades tradition into several periods. This ceramic chronology, largely based on ceramic decorative motifs now recognized as applying to the Glades region, is summarized in Table 1.

Table 1. Glades Region Ceramic Chronology.

Period	Dates	Distinguishing ceramics
Glades IIIb	A.D. 1400 -1513	Almost no decorated ceramics; Glades Tooled rims. ^a
Glades IIIa	A.D. 1200 -1400	Appearance of Surfside Incised (parallel incised lines below lip); some lip-grooving; St. Johns Check Stamped and Safety Harbor sherds found in this and subsequent periods.
Glades IIc	A.D. 1100 -1200	Almost no decorated ceramics; some grooved lips; Plantation Pinched (lines of finger-pinched indentations below lip on rim).
Glades IIb	A.D. 900 -1100	Key Largo Incised still majority decorated type; some incision on rims and some lip grooving; Matecumbe Incised appears (cross-hatched incisions below lip on rim); more incurving bowls.
Glades IIa	A.D. 750 - 900	Appearance of Key Largo Incised (loops or arches incised below lip); Opa Locka Incised (half-circles or arches incised below lip in vertical rows with open sides down); Miami Incised (diagonal parallel incised rims below lip on rim).
Glades I late	A.D. 500 -750	Appearance of decorated pottery (less than 10 percent of ceramics at sites); Sanibel Incised (ticking to form running lines of inverted Vs below lip); Cane Patch Incised (incised looping line with stab-and-drag punctuations, below lip); Fort Drum Incised (vertical or diagonal ticking on lip or rim); Fort Drum Punctated (punctuations around vessel below lip).
Glades I early	500 B.C.- A.D. 500	First appearance of sand-tempered pottery (Glades Plain or undecorated Glades Gritty Ware - both types subsumed under plain, sand-tempered, not separated as to type; no decoration.

a. Glades Tooled may appear slightly earlier in time, in period IIIA or the A.D. 1400 date for the beginning of period IIIB maybe earlier. (Archaeology of Precolumbian Florida)

A variety of wooden implements, like the types found in the Key Marco site on the Southeast Florida coast, have also been recovered in the Glades region, often as a result of construction activities, such as digging boat slips or dredging canals. The shell, bone, and wooden tool and weapon assemblages of the Glades culture are as varied as the artifact assemblages of northern Florida.

The variety of archaeological sites in the Glades region rivals that found in any region in northern Florida. Such sites include the Turner River site in Collier County, the Granada site on the Miami River, and Horr's Island in Collier County and Key Marco. Marine shells and earth

middens predominate along the coasts, especially in the estuaries. Earth middens, characterized by a dark color resulting from high organic content, are more commonly found than shell middens in some areas. Overall, the archaeological site distribution in the Glades region is densest along the coast and largest where rivers drain interior wetlands. The dependence of Glades people on wetland resources is reflected in the faunal and floral data collected from sites like Granada, site 8Cr201, Key Marco, and the freshwater wetland sites in the Big Cypress area. Various combinations of shellfish, marine or freshwater fish, and reptiles provided the bulk of the meat biomass for the Glades people. Many of these middens were probably used over many generations and may represent villages. Other middens represent likely campsites that were seasonally occupied for hunting and gathering resources. In some coastal and inland Glades sites, burials have been found in villages or camp middens.

HISTORICAL OVERVIEW

Three European nations (Spain, France, and Britain) settled and controlled all or parts of Florida during the Colonial Period (1513 - 1821).

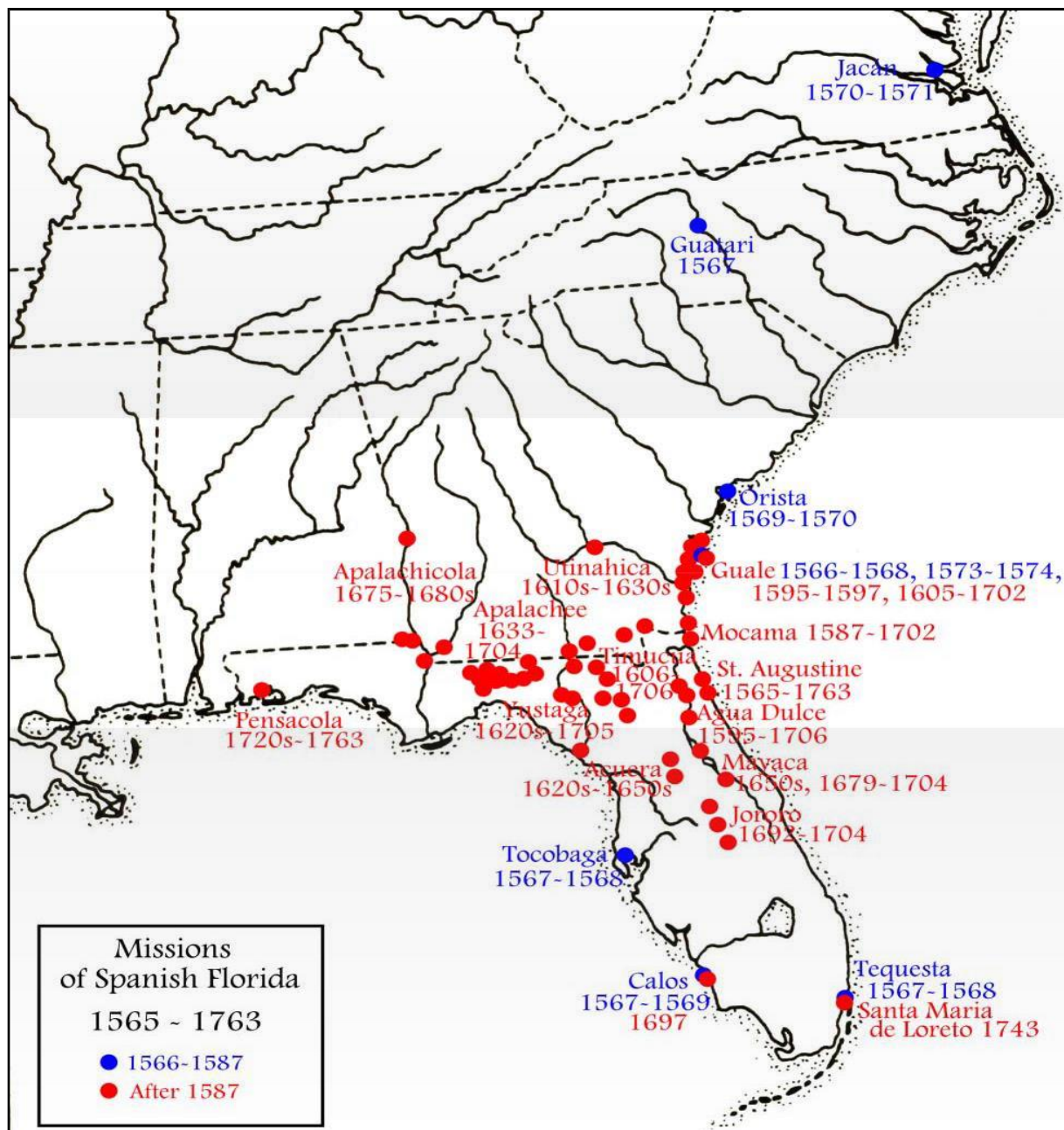
Table 2. Historical Chronology of Florida.

Period	Date Range
<i>Colonial</i>	
First Spanish	1513 - 1763
British	1763 - 1783
Second Spanish	1783 - 1821
<i>American</i>	
Territorial	1821 - 1845
Antebellum	1845 - 1860
Civil War	1860 - 1865
Late 19 th /Early 20 th Century	1865 - 1917
20 th /21 st Century	1917 -present

Colonial Period

After the initial European discovery of Florida by Ponce de Leon in 1513, several Spanish explorers traversed Florida, including Panfilo de Narvaez in 1528 and Hernando De Soto in 1539. Historical or archaeological evidence doesn't suggest that the early Spanish explorers visited the Collier County area, but their presence was undoubtedly known in South Florida (Hudson et al., 1989). Spanish chroniclers noted that encounters between the Spanish and native populations were often violent, as witnessed by apparent sword wounds on bones found in the Tatham Mound in Citrus County (Mitchem, 1989). Diseases introduced by the Spanish proved more destructive, however, decimating Indian populations throughout Florida.

The Spanish established the first permanent European settlement in Florida at St. Augustine in 1565 (Lyon, 1976). Shortly after the establishment of St. Augustine, Spanish missionaries began a mission system in Florida that would last until the siege of St. Augustine by the British and their Creek allies in 1702 (**Map 2**). All the missions were virtually destroyed by 1704 (McEwan, 1993).



Map 2. Spanish Missions in Florida [long-term Spanish missions were not established in southern Florida (UWF-Archaeology Dept.)]

It has been estimated that between 4,000 and 7,000 people lived in southwest Florida at the time of European contact. Estimates of 1,000 people living at Calos, what is believed to be the Calusa capital at Mound Key, and as many as 50 villages being subject to the rulers of the region are not unusual (Widmer, 1988). According to Widmer (1988), many of the cultural pattern characteristic of the Calusa sociopolitical system can be found as early as A.D. 800 in southwestern Florida. The presence of non-mortuary ceremonial mounds, evidence of a dense population, and indications of burial hierarchy all point to the existence of a chiefdom-level society.

By the 1600s, the native population had greatly reduced. Little trace of the original inhabitants could be found until the middle of the eighteenth century. At that time, the coastal area was inhabited by seasonal fishermen from Cuba and other areas. Fishing ranchos along the coast were established in areas such as Boca Grande, Useppa Island, Punta Rassa, and San Carlos Bay (Hammond, 1973).

The Calusa



Figure 1. A representation of the Calusa royal court in Mound Key, the exhibit is in the Florida Museum of Natural History in Gainesville.

At the time the Spanish arrived in SW Florida in 1513, they were met by the powerful and populous Calusa nation. The Calusa were forewarned of the Spanish plans of conquest by many refugees from present-day Cuba who had fled to SW Florida. The Calusa were spread over as much as 10,000 square miles in over 50 pueblos. These villages were concentrated heavily along the coast and were home to between 700 and 1000 people each. The interior settlements were much smaller, typically with less than 100 residents.

The Calusa were aggressively isolationist during the first 175 years of Spanish rule in Florida. For their part, the Spanish regarded South Florida as not being worth the trouble of subjugating either from a military or resource standpoint, so they did not press the issue. Spanish missions in South Florida typically did not last more than a year. The Calusa's isolation broke in 1688 when the Calusa chief converted to Christianity and allowed a group of his people to live near Havana for a year to evaluate the living conditions and to see how they would be treated. Visitation to Cuba by the Calusa increased through the 1690s. The timing proved fortuitous because Carolinian-allied, Yamasee Indians, began conducting slaving raids deep into Calusa territory in the early 1700s (**Map 3**). By 1711, most of the Calusa had evacuated to the Keys, including the Calusa Chief and most of his surviving vassals. Hundreds of the surviving Calusa evacuated to Cuba over the next few years and settled in the vicinity of La Cabaña, a small area northeast of downtown Havana, immediately across the harbor entrance.

Some Calusa may have been able to return to their homes in the interlude between the collapse of the Indian slave trade (1715) and the start of the Seven Years' War in 1756 (AKA the French and Indian War), when British-allied Creeks invaded and took over the interior of Florida, leading to the complete occupation of the peninsula. The remaining Calusa refugees in Key West evacuated to Cuba. After the British siege of Havana in 1762, most of the Calusa in Havana moved to Guanabacoa, Southeast of downtown Havana, to make room for the construction of the Castillo de La Cabaña that was constructed to defend the harbor entrance.



The commander's notes: H. Place where they swam over a Deep River [Caloosahatchee]. I. The same River is here Brackish. K. Place where they took 29 slaves. L. Here they took 6 slaves. M. Here they took and killed 33 Men at 1 o'clock the same day, numerous body of Indians came against them. They being but 33 men, yet put them presently to flight; they having no arms but Harpoons made of Iron and Fish bones; they were all painted.

Map 3. A map of a 1708 British-led Yamasee slave raid waged against Florida Indians and describing contact with the Calusa.

British Period 1763-1783

During the British period, beginning in 1763, the region saw a large in-migration of Creek. Many of the surviving members of the coastal tribes evacuated to Cuba with the Spanish when the British took over. In 1765, the Treaty of Picolata (today Palatka) recognized all the interior of Florida as belonging to the Lower Creeks. This territory would have followed a line from the west bank of the St. John's River to its source in St. Lucie County, then south to Cape Sabal on the southern tip of the Florida Peninsula. The coastal areas, defined by the landward extent of brackish water, were ceded by the Creeks to the British, with British law recognizing the interior of Florida being the legal possession of the Creeks. British law also held that the ultimate fee title to the property lay with the Crown. The Creeks were entitled to own, occupy, and enjoy the entirety of their possessions; however, they could not dispose of their property without having it cleared by the delegated authority of the Crown. Similarly, the British could not legally dispossess the Creeks of their property without their consent.

Throughout the second half of the 18th century, the Creeks who lived along the length of the Florida Peninsula (the Seminoles) grew culturally and politically distinct from the Alabama Creeks. The Seminoles incorporated large numbers of black refugees from the southern U.S. into their population. By the end of the British period, in 1783, the Creek Confederacy and Seminoles no longer had a cognizable political affiliation and were, by all accounts, distinct and independent tribes.

Second Spanish Period (retrocession) 1783-1821

Throughout the Second Spanish Period, following the post-revolution departure of the British, the Spanish Monarchy felt their hold on the territory was tenuous at best. They faced increasing unregulated migration from northern settlers and constant violations of their sovereignty by armed parties seeking the return of slaves, many of whom had found a home among the Seminoles or had been given legal asylum by the Spanish in their coastal cities after swearing an oath of loyalty to the Spanish Crown. The recognition by the British that the interior land belonged to the Seminoles was preserved by the Spanish through the Treaty of Pensacola in 1784 and the Treaty of Walnut Hills in 1793. Spanish law, at that time, recognized a tribal right to property on par with that of a young don who inherited an estate before coming of age. The Seminoles were the legal owner of the land but required Spanish permission to sell their land.

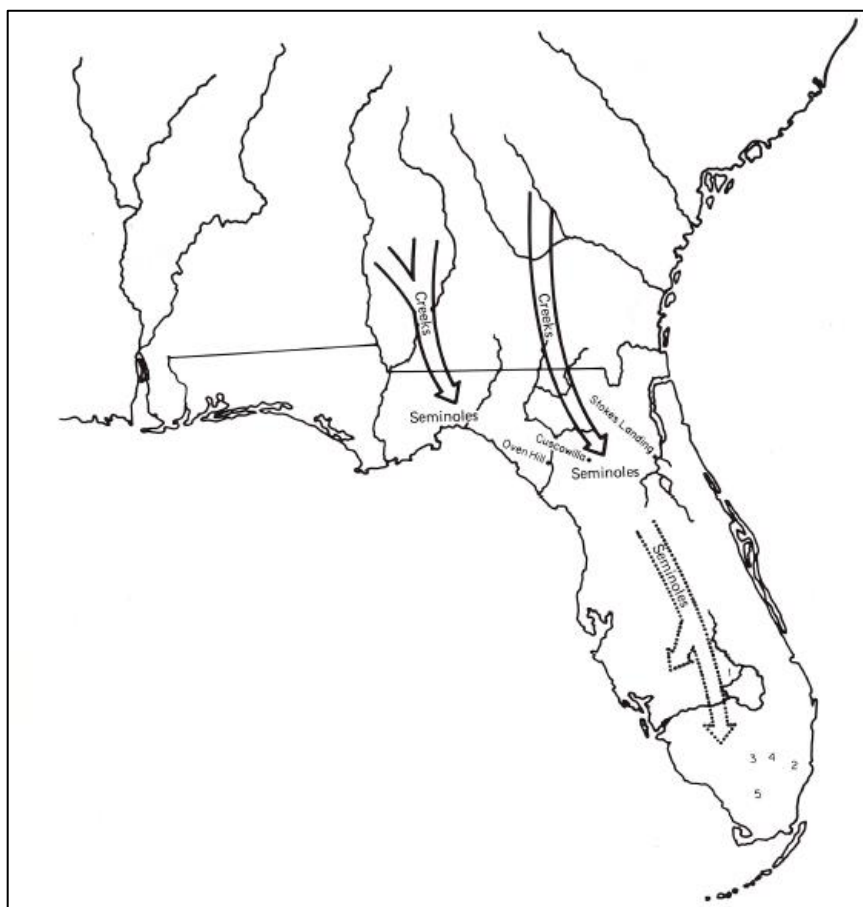
The post-revolution relationship between the U.S. and the Creeks quickly splintered and deteriorated. The U.S. signed a treaty with a faction of the Creeks in 1790, to which the Seminoles were not a party, that included a provision for the return of any former slaves or their children. Private Georgia militias used this treaty as a justification for raiding Seminole towns throughout northern Florida and abducting black Seminoles. The raids drove many bands of Seminoles south, where they settled in large numbers in the uplands. Their numbers swelled following the U.S. – Creek War in Alabama and Tennessee (1813-1814), which sent many Creek refugees to Florida.

Territorial/Early American Period

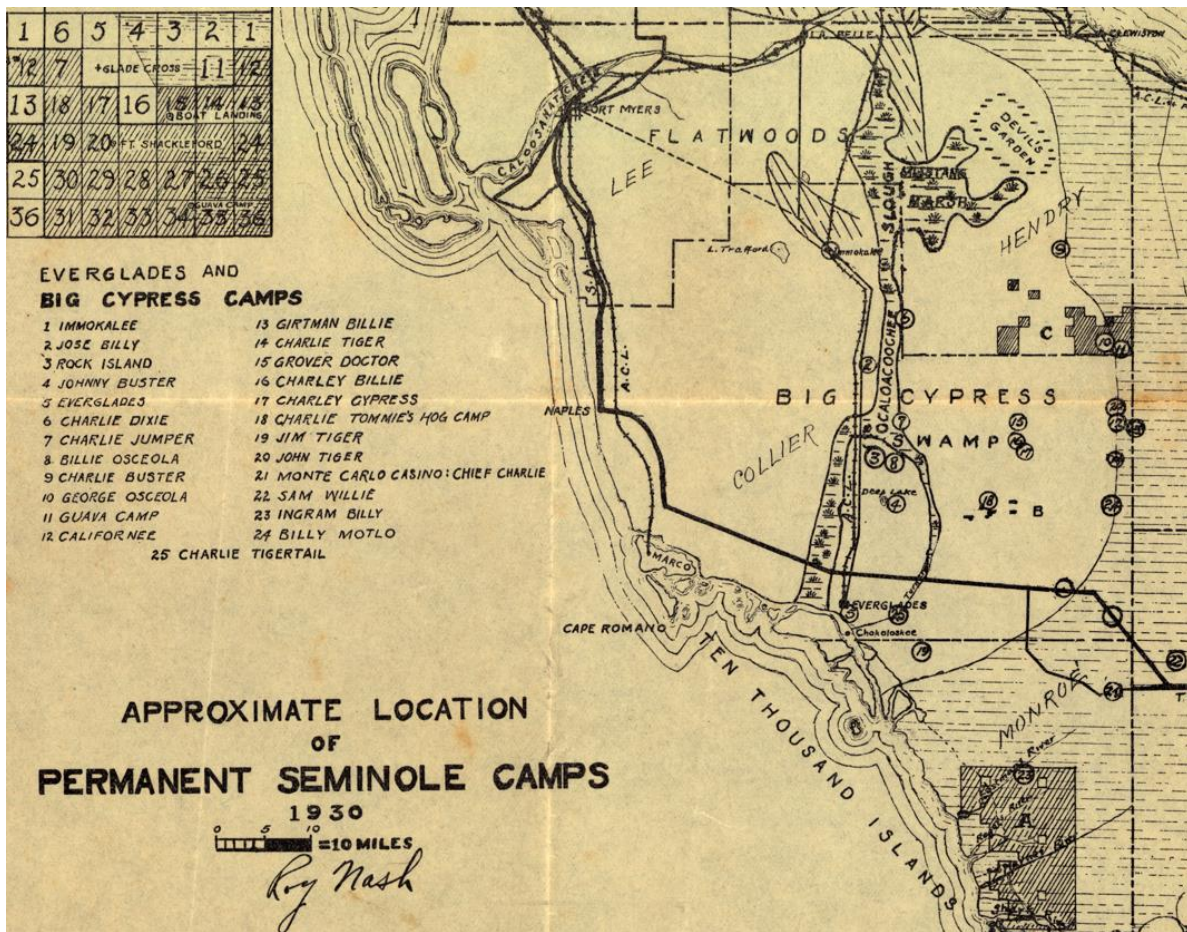
The Seminole Wars

Disputes between the Seminole Indians and white settlers led to three successive wars. The first took place predominately in the northern part of Florida between 1817 and 1818. Not long afterward in 1823, the Seminoles were encouraged to sign the Treaty of Moultrie Creek, which provided for the removal of the Seminoles to lands in the west. Some Seminoles did not agree with the terms of this treaty, however, and by 1835 the Florida territory again erupted with hostilities.

The Second Seminole War (1835-1842) took place primarily in southern Florida. In the years leading up to the Second Seminole War, there was a significant in-migration of Seminole Indians into the area. These were both Seminoles who had been living in Florida for many years as well as new arrivals following the Creek War of 1813-1814. After the First Seminole War, the Indians had been gradually pushed south of the Caloosahatchee River from north-central Florida (**Map 4**). Several forts, satellite camps, and temporary supply depots were established in present-day Lee and Collier counties at the onset of the second wave of hostilities.



Map 4. Movement of Creeks into Florida in the eighteenth century and of Seminoles into the southern part of the state in the nineteenth century. Numbers show modern settlements; (1) Brighton; (2) Dania; (3-4) Big Cypress federal and state reserves; (5) Tamiami Trail.



Map 5. Approximate location of permanent Seminole camps within Big Cypress (1930)

During the progression of the second Seminole war, the military established a series of frontier outposts, intended to be approximately 20 miles apart, as an attempt to effectively contain the Seminoles to areas south of Lake Okeechobee and away from the coasts. The military campaign against the Seminoles in Collier County intensified between November 1841 and February 1842 when Captain George Wright organized a series of river and land expeditions into the interior of the county. Starting from coastal points such as Goodland Point and Big Marco Pass, expeditions were initiated in search of any remaining Seminole Indians. Although the attempts to locate Seminole forces were unsuccessful, it allowed the U.S. government to explore the county's interior and coastal fringe for the first time (Tebeau, 1966). Following the unilateral cessation of the campaign by the U.S. Military, a few hundred Seminoles lived in the vicinity of Big Cypress, including Billy Bowlegs II's large band who were the focus of the short-lived Third Seminole war, and who relocated to Oklahoma following the end of that conflict in 1858.

Late 19th/Early 20th - Century Settlement

1850s – 1900

The latter half of the 19th century saw the region develop as an eclectic mix of outcasts, outlaws, deserters, Seminole Indians, and entrepreneur settlers. Homesteading settlers began trickling into the area during the 1860s and lived mainly off the land with their small vegetable plots. The government would grant 160-acre tracts to single men or heads of households through successive acts of Congress, such as the Armed Occupation Act of 1842. This act granted 160 acres to anyone who submitted a permit to the regional land office to build and live in a house on the parcel and cultivate at least 5 acres of it for at least 5 years. Many settlers were veterans of the Second Seminole War who had familiarized themselves with choice parcels during their routine patrols. However, these early settlers were few and far between, the U.S. Government had only authorized 1,250 homesteads for the entire peninsula south of Palatka. During the Civil War, the southern part of the Florida peninsula became home to many deserting Confederate soldiers. During this time, several Seminole families moved back into the area around Lake Trafford. In 1893, the Women's National Indian Association set up an outreach service in present-day Immokalee, where the Seminole Tribe of Florida still holds a small reservation.



The Widow McLean, emblematic of the eclectic mix of late 19th century settlement of the countryside around southwest FL. Standing over six feet tall, she was 200 pounds of pure orneriness. When asked if she had ever been scared living alone in the swamps and wilds she replied, "Never have been and I reckon it's too late to begin now."

Figure 2. The Widow McLean, a Late 19th century south Florida settler

Feather Trade

Near the end of the 19th century tens of millions of wild birds were killed to meet the demand for feather adornments on high-end clothing. Herons and egrets, with their long, delicate bridal veil breeding plumage were among the most prized for the fashion industry. The plumage hunters targeted the largest rookeries where they could take the greatest number of birds in their breeding plumage.

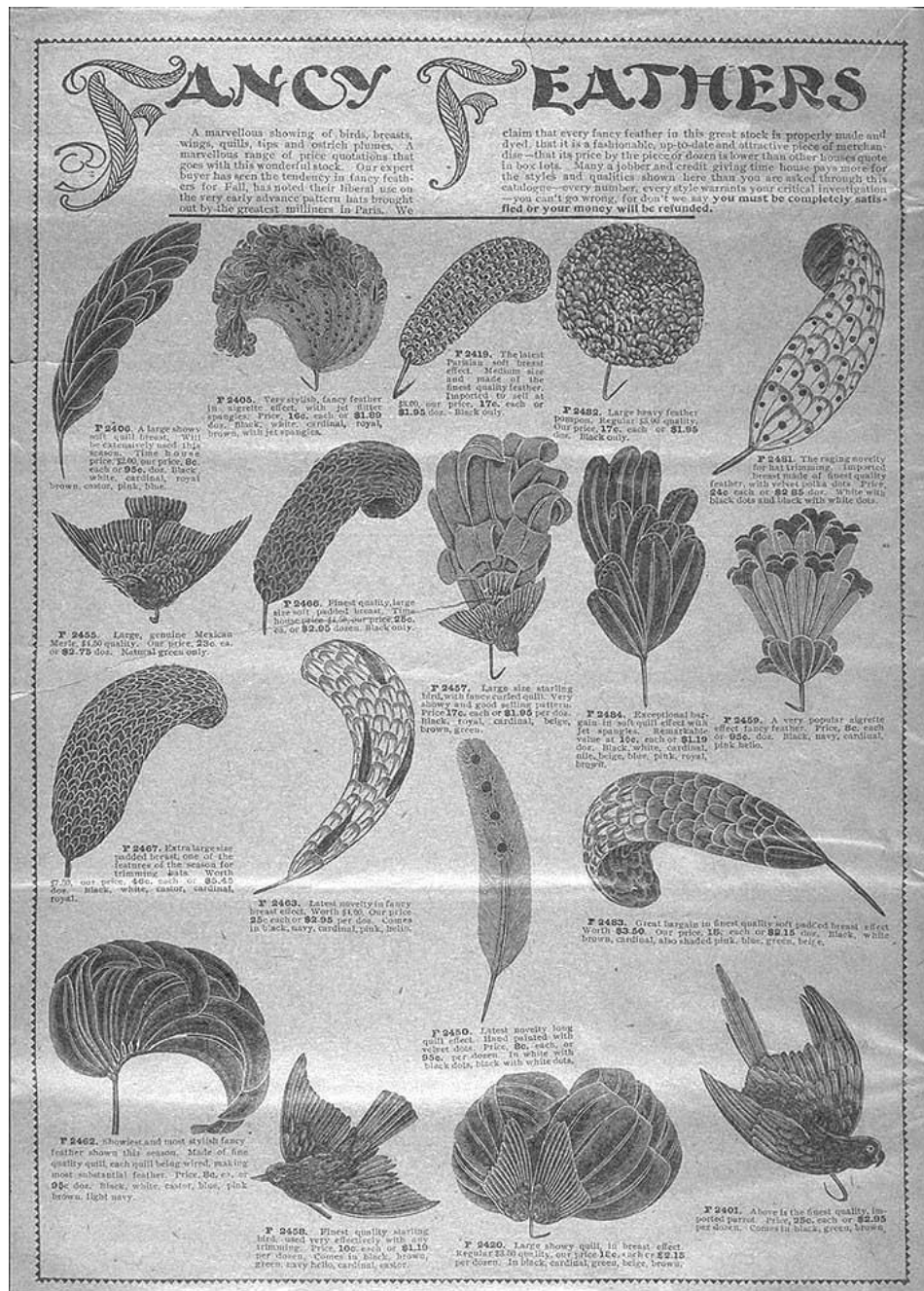


Figure 3. An advertisement from a 19th century feather accessory catalog.

20th Century

Audubon Wardens

By the turn of the century, the population of these plumage birds had collapsed, leading to the passage of the Weeks–McLean Migratory Bird Act in 1913 (which was held unconstitutional and later replaced by the Migratory Bird Treaty Act of 1918). Following the passage of the Weeks–McLean Act, the Audubon Society hired seasonal wardens to guard prominent rookeries, including the well-known bird rookery in Corkscrew.



Photo showing the warden camp at the Corkscrew Swamp rookery within a pine flatwood (foreground), marsh (intermediate), and the corkscrew cypress strand (background), illustrating the condition of the land before the large-scale land conversion of the 20th century. The knee-high palmettos, scorch marks on the pines, and lack of shrubs in the marsh are clear indicators of a landscape that burned frequently. Photographed by T. Gilbert Pearson in 1913.

Figure 4. Camp of Rhett Green, Warden of Corkscrew Rookery, Florida.

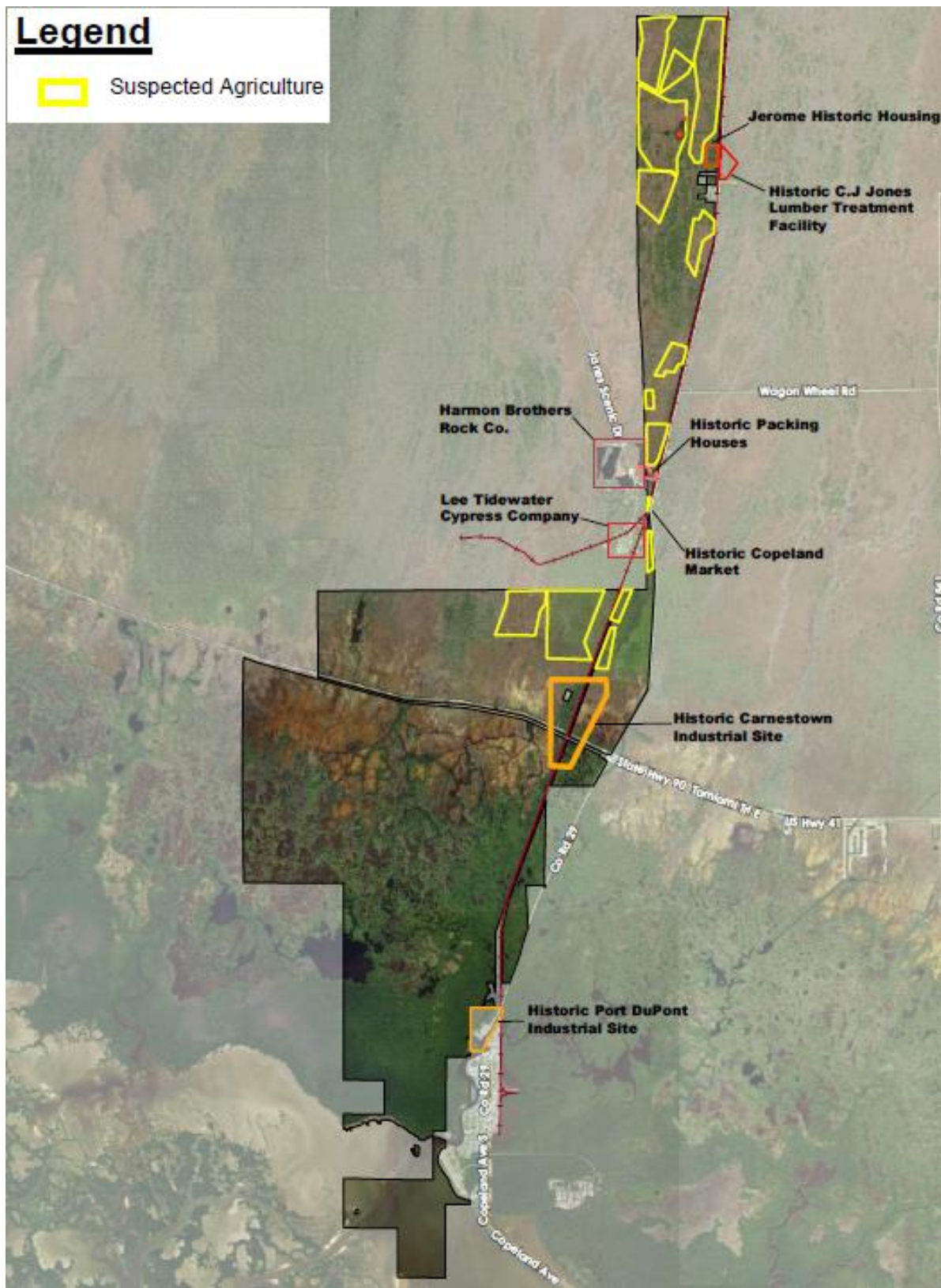
The 20th century brought additional alterations to the natural communities, including logging, cattle grazing, fire suppression, and urban and rural development in the surrounding landscape. The first commercial citrus groves were planted in the first years of the 20th century and were bearing fruit by 1915. Barron Collier acquired 1.3 million acres of land between 1911 and 1925, and the arrival of the Atlantic Coast Line railway in 1928 enabled the wholesale harvesting of hardwoods and virgin cypress. Much of the lumber from the historic Big Cypress Swamp was harvested under government and international contracts to help rebuild post-war Europe. In the latter half of the 20th century, commercial activities such as timber, oil exploration, and recreational hunting became

important in the region. Several cattle operations were in operation, including the Flint family cattle ranch in Flint Pen Strand. Other landowners, such as Alico and Collier, leased land for grazing and hunting. Florida's first commercial oil was produced from the Sunniland Oil Field in 1943, the first of 11 commercial oil fields. The West Felda oil field (1966) and Lake Trafford oil field (1969) are located north of the GHOTE.

Everglades City, Copeland, Jerome, and Lee-Cypress

Touted as Florida's Last Frontier, Everglades City is located forty-five minutes south of Naples. As in the olden days, this former county seat has remained relatively laid-back and unpretentious. While fishing and tourism are presently the major economic factors of this small town, the early years are marked by the agriculture and industrial centers that once flourished in this region. Numerous historical sites are located within walking distance of one another, with several situated around the town circle in Everglades City.

Barron Collier began acquiring properties in the area in 1922 and lobbied for Collier County to be established. Collier County was then created from his inholdings in 1923. The Village of Everglade became the county seat and was later incorporated as Everglades City. Collier made Everglades City his headquarters for the construction of the Tamiami Trail. Port DuPont, in Everglades City, served as the industrial center of the town and included a sawmill, foundry, and machine shop. A canal was dredged during the construction of the Tamiami Trail in the 1920s, and a road was constructed from Port DuPont to Carnestown. A series of dredged canals north of the Tamiami Trail can be identified in the 1940 aerial photograph and is posited to have been utilized for fill material during road construction. Barges, machinery, and equipment used to construct the Tamiami Trail were brought from Port DuPont to Carnestown. A work camp, warehouse, foundry, and machine shop were established for the work camp. For a period, Carnestown was home to the largest warehouse on the southwest coast of Florida and was the center of construction activities. After the Tamiami Trail was completed, Carnestown was demolished, and all associated machinery and housing were relocated to other areas of development. Around the same time the trail was completed, S.R. 29 was constructed and connected Everglades City to Immokalee. The Barron River Canal, located east of S.R. 29, served as a borrow canal to provide fill for the roadway and railway grade construction. As a result, the sheet flow from the Big Cypress Basin is diverted to the Barron River Canal and currently runoff to Chokoloskee Bay.



Map 6. Overview map showing significant industrial operations associated with the GHOTE.

In 1928, the Atlantic Coast Railway was completed to provide service to Everglades City from Immokalee and cities further north. A railroad station was constructed in Carnestown and another just in Copeland, just north of Carestown, to ship produce and lumber north to Immokalee. Copeland was originally a farming community established by Alfred D. Webb and the Janes brothers. Webb and J.B. Janes purchased 10 acres of undeveloped land in Copeland for tomato farming in 1932, and by the early 1940s, agricultural land had expanded to several thousand acres. The area became known as a tomato farming center. Other vegetable crops included peppers, cucumbers, and melons. Approximately 1,400 acres of the GHOTE tracts are estimated to have been farmed for vegetable crops. The produce grown on the site would be sent to packing houses in Copeland, where they were washed and shipped north on the Atlantic Coast Railway. Agricultural productivity was significantly diminished by the late 1960s, and the areas that were once cleared for cropland have since been overgrown with natural vegetation.

Small-scale lumbering in the Big Cypress began around 1900 with small sawmills at Everglades, Naples, and Immokalee. By 1930, eight small mills were operating within 20 miles of Immokalee (Tebeau, 1966). In the mid to late 1930s, lumber operations expanded. The peak lumbering period was from the 1940s through the mid-1950s. By the end of this time, most of the large south Florida slash pines and cypress had been removed. Early pine logging was completed by teams with oxen that would haul felled trees to small mill towns. In 1940, C.J. Jones built a sawmill and lumber treatment facility in Jerome, just north of Copeland, to process the slash pines that were being harvested from present-day Big Cypress National Preserve. The Jerome camp at the Jerome site was small but, included at least a dozen small buildings that were used to house the workers of the sawmill. Reports indicate the facility and housing structures accidentally caught on fire in 1955 and burned to the ground.

Copeland became a center of the local logging industry in the 1940s. During World War II, cypress was in heavy demand for manufacturing barrels and packing crates and coffins. Collier County had one of the country's largest remaining stands of virgin cypress and pine trees. These virgin stands in Collier County had reached heights upward of 130 feet or more. Lee Tidewater Cypress Company began logging operations in Collier County in 1944 and retired in April 1957. It was the only logging operation devoted exclusively to logging cypress. Tramways were constructed for the logging operation in the present-day Fakahatchee Preserve State Park and Bird Rookery Swamp. The main tramway leading from Lee-Cypress to the northwest later became a road and main entrance to the Fakahatchee Preserve State Park, known today as Janes Scenic Drive. Cypress lumber was transported from Lee-Cypress north on the Atlantic Coast Railway to Perry, Florida. By 1945, most of the narrow-gauge tram roads through the hardwood hammocks and cypress, which can still be explored from the Bird Rookery Swamp trailhead, had been constructed to make industrial scale logging possible. Lee Tidewater Cypress Company operated four steam engines through the swamps until the logging ceased, and many of the workers relocated because the economically harvestable stands had been depleted. The last steam locomotive used to carry timber is displayed at the Collier County Museum in Naples. The Lee Tidewater Cypress Company camp employed 1000 workers. The Company managed a self-contained community (Village of Lee-Cypress), creating its power plant, general store with a restaurant, repair shop and housing, and a Baptist church for the workers and their families at the height of the logging industry. Almost all functions in the camp were overseen by the Lee-Cypress

Company. As the industries closed, the town's population declined to just a few dozen homes.

Resource Preservation

In 1974, Big Cypress National Preserve was established as the nation's first national preserve to prevent the development of the world's largest Jetport in the heart of the Greater Everglades of south Florida. The concept of a national preserve was born from an exercise in compromise by the local conservations, sportsmen, environmentalists, Seminoles, Miccosukees, and many others who wanted to protect the Everglades but felt that national parks were managed in a restrictive manner and limited access to the swamp and feared Gladesmen's way of life would be lost. The first purchase of land creating Fakahatchee Strand Preserve State Park was made in 1974 with funds from the Environmentally Endangered Lands (EEL) program. It was the beginning of a continuous acquisition effort that is ongoing to this day through the Conservation and Recreation Lands (CARL) Program. In 1981, the Florida Legislature established the Save Our Rivers (SOR) program authorizing the five water management districts to acquire environmentally sensitive land. The legislation (373.59, Florida Statutes) produced the Water Management Lands Trust Fund and empowered the water management districts to acquire lands needed to manage, protect, and conserve the state's water resources. Once acquired, the lands are managed in an environmentally acceptable manner and support appropriate public use. SOR funds were used in the acquisition of the Picayune Strand State Forest to the west and the GHOTE MA. In 1989 The U.S. Fish and Wildlife Service acquired 26,270 acres for the Florida Panther National Wildlife Refuge through the Land and Water Conservation Fund (LWCF). The GHOTE was the last remaining large, contiguous tract of land not slated for development.

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Appendix B.

Green Heart of the Everglades Natural Communities

The Green Heart of the Everglades (GHOTE) property comprises nine distinct natural communities and two altered landcover types based on a combination of vegetation, landscape position, and hydrology (FNAI 2010). These communities will be managed through achieving and maintaining optimal fire return intervals for fire-dependent communities; control of non-native plant and animal species; maintenance of natural hydrological functions; maintenance of proper vegetative structure that represents the natural diversity of the community; maintenance of healthy populations of plant and wildlife species (including those that are imperiled or endemic); and maintenance of intact ecotones between natural communities across the landscape.

The following modifications to the FNAI classifications were made:

- Cypress – Originally classified as Cypress/Tupelo by FNAI. Better classified as Cypress due to lacking Tupelo (FNAI Natural Community Guide 2010 and Kawula and Redner 2018)).
- Bays and Estuaries – Originally classified as Marine and Estuarine Mineral Based by FNAI. Better classified as Bays and Estuaries Unconsolidated Substrate.
- Marl Prairie – Originally classified as Prairies and Bogs by FNAI. It is better classified as Marl Prairie. (FNAI Natural Community Guide 2010).

The habitats within the GHOTE are classified as follows:

- Hardwood Hammock
- Wet Flatwoods
- Freshwater Forested Wetlands
- Cypress
- Gades Marsh
- Marl Prairie
- Bays and Estuaries
- Salt Marsh
- Mangrove Swamps
- Altered Landcover

Hardwood Hammock (0.14%)

This community encompasses approximately 15 acres, subclassified as rockland and maritime hammocks.

In the GHOTE, the hardwood hammock community is represented by a couple of small rockland hammock islands intermixed with the cypress strands on the north side of the property and a few maritime hammocks that are surrounded by the mangroves and salt marshes on the south side of the property. Several islands of rockland hammock can also be found within the matrix of cypress and freshwater forested wetlands, but these smaller islands have not been quantified. Typical plants include cabbage palm (*Sabal palmetto*), royal palm (*Roystonea regia*), swamp laurel oak (*Quercus laurifolia*), live oak (*Quercus virginiana*), and gumbo limbo (*Bursera simaruba*). Hardwood hammocks have a sparse understory due to over-story shading. The typical understory vegetation includes wax myrtle (*Myrica cerifera*), marlberry (*Ardisia escallonioides*), white stopper (*Eugenia axillaris*), wild coffee (*Psychotria nervosa*), beautyberry (*Callicarpa americana*), Simpson's stopper (*Myrcianthes fragrans*), Jamaican capertree (*Capparis cynophallophora*), Wingleaf Soapberry (*Sapindus saponaria*), gallberry (*Ilex glabra*), hog plum (*Ximenia americana*), common persimmon (*Diospyros virginiana*), Florida Bully (*Sideroxylon reclinatum*), myrsine (*Rapanea punctata*), and saw palmetto (*Serenoa repens*). Epiphytes, including orchids, ferns, and bromeliads can be found on larger trees. Nuisance and invasive species presence are minimal in this community.

Rockland hammocks are ranked second most endangered both statewide and globally (G2/S2), and maritime hammocks are ranked as globally vulnerable (G3/S2) (FNAI, 2010). Rockland hammocks have a very restricted range and are at high risk of extinction due to this. Maritime hammocks have a moderate range globally but are vulnerable due to a widespread decline.

Wet Flatwoods (2%)

This community encompasses approximately 180 acres and is found in the northern portion of the GHOTE intermixed with marl prairie and freshwater forested wetland communities.

In the GHOTE, the wet flatwoods are characterized by a moderate canopy of slash pine with an understory of low to dense shrub coverage and dense groundcover vegetation. Cabbage palm is also common in the canopy. Typical understory vegetation includes dahoon holly (*Ilex cassine*), cabbage palm, and wax myrtle, myrsine, and Carolina willow (*Salix caroliniana*). Small inclusions of saw palmetto are scattered in slightly elevated spots. Other plants associated with this habitat type include sawgrass (*Cladium mariscus jamaicense*), iris (*iris sp.*), swamp fern (*Blechnum serrulatum*), and gulfdune paspalum (*Paspalum monostachyum*). The increase in shrub density in the wet flatwoods is linked to the exclusion of fire. Management of wet flatwoods in the GHOTE will include the appropriate prescribed fire rotation. The community is in fair condition with varying coverage of nuisance and invasive species.

Wet flatwoods provide valuable habitats for various wildlife, including Florida panthers, black bears, fox squirrels, white-tailed deer, tree-cavity-dependent species, and tree-nesting species. FNAI ranks wet flatwoods as apparently secure in its range globally and statewide (G4/S4).

Freshwater Forested Wetlands (5%)

The freshwater forested wetland community in the GHOTE is subclassified as mixed wetland hardwood, freshwater tidal swamp, and mixed hardwood-coniferous.

Mixed wetland hardwood encompasses approximately 97 acres and occurs as patches between the marl prairie and wet flatwoods communities in the northern portion of GHOTE. The canopy is dominated by cabbage palm, red maple (*Acer rubrum*), swamp bay (*Persea palustris*), and laurel oak. Cypress is also present but represents a relatively inconspicuous part of the flora. Typical understory vegetation includes wax myrtle, myrsine, Carolina willow, wild coffee, swamp fern, sawgrass (*Cladium jamaicense*), inundated beaksedge (*Rhynchospora inundata*), rush fuirena (*Fuirena scirpoidea*), saltmarsh umbrella-sedge (*Fuirena breviseta*), musky mint (*Hyptis alata*), arrowhead (*Sagittaria lancifolia*), and sand cordgrass (*Spartina bakeri*).

The freshwater tidal swamp community in the GHOTE is approximately 47 acres and is characterized by a mixture of freshwater and saltwater tolerant species. This area once represented a healthy mixed hardwood-coniferous swamp strand that extended from the Big Cypress National Preserve. The remnant community has been severed from the original mixed hardwood-coniferous swamp system by a canal and a series of ditches and berms (furrows). This area has since been recruited by the native vegetation and developed into a freshwater tidal swamp due to the influx of freshwater discharge from the adjacent canal and pulses of saltwater in response to tides. The canopy and sub-canopy contain red mangrove (*Rhizophora mangle*), black mangrove (*Avicennia germinans*), buttonwood (*Conocarpus erectus*), and pond apple (*Annona glabra*). Groundcover vegetation includes swamp-lily (*Crinum americanum*), beaksedge (*Rhynchospora sp.*), needlegrass rush (*Juncus roemerianus*), and leather fern (*Acrostichum sp.*). Because of the disturbance from the remnant furrows and ditches from the previous industrial activities, nuisance and invasive species, including Australian pine, Brazilian pepper, and cattail, are prominent in the vegetation structure but are expected to be eradicated, and the natural floodplain swamp flora is expected to be restored with the implementation of the vegetation management program.

The mixed hardwood-coniferous swamp community encompasses approximately 424 acres and occurs between the marl prairies and cypress strands. Cabbage palm is prominent in the canopy, likely due to hydrologic alterations. Various canopy species, including cypress, pond apple, Carolina willow, swamp bay, dahoon holly, swamp laurel oak, and pop ash are found in this community. Typical understory vegetation includes buttonbush (*Cephalanthus occidentalis*), wax myrtle, swamp fern, sawgrass (*Cladium jamaicense*), beaksedge (*Rhynchospora sp.*), cattail (*Typha sp.*), sawgrass, pickerelweed (*Pontederia cordata*), alligator flag (*Thalia geniculata*), big floating heart (*Nymphoides aquatica*), duckweed (*Lemna sp.*), bladderwort (*Utricularia sp.*), and arrowhead.

The coverage of nuisance and invasive species in the freshwater forested wetlands within the GHOTE varies. FNAI ranks hydric hammocks and freshwater tidal swamps as apparently secure in their range globally and statewide (G4/S4). Mixed hardwood-coniferous swamps or canopied swamps are ranked as vulnerable globally and statewide (G3/S3) due to a restricted range, relatively few populations (often 80 or fewer), recent and widespread declines, or other factors.

Cypress 7%)

This community is subclassified as dome and strand swamps and encompasses approximately 732 acres.

Dome swamps in the GHOTE are scattered over the marl prairies and dominated by cypress, red maple, dahoon holly, pop ash (*Fraxinus caroliniana*), and pond apple (*Annona glabra*), with sawgrass, alligator flag, maidencane (*Hymenachne hemitomom*), arrowhead, and pickerelweed in the center. Other common plants include swamp bay, sweetbay, chain fern (*Woodwardia* sp.), floating heart, wild pine (*Tillandsia* sp.), royal fern (*Osmunda regalis*), Carolina willow, wax myrtle, orchids (*Encyclia* sp. and *Epidendrum* sp.), St. John's-wort, Mexican primrose willow (*Ludwigia octovalvis*), Virginia willow (*Itea virginica*), and swamp dogwood (*Cornus foemina*), and buttonbush.

The strand swamp is part of the elongated depressional strand that extends from Fakahatchee State Park. This community is represented by a closed canopy cypress-dominated wetland. Some remnant tram roads extending into the strand have become overground with hardwoods, forming artificial linear hammocks. Cabbage palms are also increasingly spreading in the strand due to the alterations in the hydrology. Maple is prominent in the understory, particularly in the transitional areas. Other variable woody understory include pond apple, swamp laurel oak, cabbage palm, strangler fig, swamp bay, sweet bay, Carolina willow, and buttonbush. The groundcover vegetation includes string-lily, giant leather fern, swamp fern (*Telmatoblechnum serrulatum*), royal fern, primrose willow (*Ludwigia* sp.), smartweed (*Polygonum* sp.), and sawgrass.

The cypress community is in fair condition with varying coverage of nuisance and invasive species. Dome Swamps are ranked statewide and globally as apparently secure (G4/S4), though it may be quite rare in parts of its range, especially at the periphery. Strand swamps are ranked the second most endangered level statewide and globally (G2/S2).

Glades Marsh (8%)

In the GHOTE, the glades marsh community is approximately 887 acres. It grades into the marl prairie, cypress strand, and saltmarsh communities. An old tram bed that severs the marl prairie habitat and the glades marsh restricts the hydrological connection between the marl prairie habitat and the glades marsh communities.

The glades marsh community is dominated by groundcover vegetation, including sawgrass, sand cordgrass, arrowhead, cattail, needlegrass rush, maidencane, musky mint, fireflag, pickerelweed, and iris sp.

Glades marshes are ranked as vulnerable statewide and globally (G3/S3).

Bays and Estuaries (10%)

The Bays and Estuaries community in the GHOTE encompasses 1,081 acres and is characterized by unconsolidated substrates and open water bays.

The unconsolidated substrate consists of unvegetated, open areas of mineral-based substrate surrounded by mangroves. This open-water habitat is underlain primarily by marl or very fine sand and silt/clay. This bottom provides habitat for various benthic invertebrates. When exposed during low water levels, these areas are used extensively by shore and wading birds as feeding and loafing areas. Included among the unconsolidated substrates are a few swamp lakes of varying depths. These are likely manmade features associated with the construction of adjacent roads. Although small, these areas provide refuge for American alligator (*Alligator mississippiensis*), river otter (*Lontra canadensis*), bottom-feeding fish, and various turtle and frog species. They also provide nesting and feeding habitats for black-crowned night herons (*Nycticorax nycticorax*), wood storks (*Mycteria americana*), purple gallinules (*Porphyrio martinica*), egrets, herons, and ibis.

The open water bay consists of an expansive marine bottom. These areas consist of widely unvegetated substrates with occasional pockets of submerged vegetation. Seagrass and algae in the open water bay provide shelter to numerous marine organisms, supporting a wide variety of commercially and recreationally important fish, crustaceans, and mollusks. Live bottom reefs of oysters may be scattered throughout. The GHOTE bay community is also very important to the federally threatened smalltooth sawfish (*Pristis pectinata*) and the endangered manatee.

Bays and Estuaries are ranked statewide and globally as secure (G5/S5).

Marl Prairie (16%)

In the GHOTE, this community encompasses approximately 1,771 acres.

The marl prairie community is dominated by groundcover vegetation intermixed with hammocks, cypress, and freshwater forested communities. The canopy is open with occasional occurrences of cabbage palm, cypress, dahoon holly, swamp bay, pop ash, laurel oak, and red maple. The understory is characterized by low to dense shrub coverage indicative of hydrologic alteration and fire exclusion. The sub-canopy vegetation is a mix of scattered to dense cabbage palm, cypress, wax myrtle, buckthorn, willow, red maple, saffron plum (*Sideroxylon celastrinum*), swamp dogwood (*Cornus foemina*), false-willow (*Baccharis angustifolia*), wild coffee, myrsine, and buttonbush. Dense pockets of nuisance and invasive shrub species dominate in more disturbed areas. The ground cover consists of gulfdune paspalum, sawgrass, inundated beaksedge, saltmarsh umbrella-sedge, rush fuirena, arrowhead, swamp fern, and sawgrass.

The marl prairie community is in poor condition due to the presence of dense shrubs and a high concentration of nuisance and invasive species. Signatures from the 1940s aerial photographs suggest that the marl prairie community within the GHOTE was used for agriculture. Nuisance and invasive species in this community range from scattered in less disturbed areas to monocultures in highly disturbed areas. The density of shrub species is expected to decrease, and the natural prairie flora restored with the implementation of the prescribed fire program. Manual

manipulation, such as mechanical and herbicide treatment, might be required in dense areas to restore the natural plant coverage in this community.

Prairies provide valuable habitat for white-tailed deer and numerous bird species. Management of the prairie system includes the appropriate application of prescribed fire, treatment of non-native invasive plant species, and mechanical treatments as needed.

Marl prairies are ranked as vulnerable statewide and globally (G3/S3).

Estuarine Mangrove Swamp (26%)

The mangrove community in the GHOTE encompasses approximately 2,886 acres of its southern boundary. Red and black mangroves dominate this community. Buttonwood is occasionally present. Within the mangrove are a few shell mounds high enough to support the maritime hammock. Once limited to the property's southern edge, the mangrove community has noticeably been migrating northward since the drainage canals and the construction of US 41 have reduced the freshwater pressure, allowing the tides to transport and distribute mangrove propagules farther north. Mangrove tree heights vary noticeably throughout the property, likely due to reoccurring loss of biomass associated with frequent storm events and hurricanes. The understory is generally open where tree heights have reached canopy stature. Saltmarsh species are occasionally found in the groundcover, particularly along the northern edge of the mangroves where the natural saltmarsh community is being displaced.

The mangrove swamps are of significant value to the estuarine system. The mangroves serve as protected habitats for nursery-stage fish, crustaceans, and shellfish and provide important habitats for nesting and roosting colonial water birds. The mangrove community in the GHOTE is also home to rare and endangered orchids.

Nuisance and invasive species coverage in the mangrove swamp is minimal. The mangrove swamp community is ranked as secure globally and apparently secure statewide (G5/S4).

Estuarine Salt Marsh (26%)

The salt marsh community is approximately 2,922 acres and represents the dominant vegetation community in the GHOTE. It is a brackish system and is periodically inundated at the higher tides and during storm events. The salt marsh grades into the mangrove swamp, forming overlapping zones where red mangrove and buttonwood become increasingly frequent. The canopy and sub-canopy are open, which is typical of an herbaceous community. Red mangroves are occasionally present within the salt marsh because of the landward progression of the mangrove infringement. The vegetation in the salt marsh is dominated by needlegrass rush (*Juncus roemerianus*), cattail, salt marsh cordgrass (*Spartina alterniflora*), and salt grass (*Distichlis spicata*).

These salt marshes are important feeding areas for many resident and migratory wading birds, waterfowl, raptors, and mammals. Limiting disturbance to vegetation in the salt marsh by limiting airboats and other vessels to designated trails and improving the hydrology is significant to maintaining this natural community type.

The salt marsh community is in good condition, with varying coverage of nuisance and invasive species. It is ranked globally and apparently secure statewide (G5/S4).

Altered Landcover Types (3%)

The altered landcover makes up approximately 10 acres of the GHOTE. These areas consist primarily of ditches, roads, and previously cleared areas bordering adjacent roads and dwellings. These areas will not be restored to their historic natural community but will be maintained for nuisance and invasive species in their altered states.

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Appendix C. Species List

Table 1. List of plants on the GHOTE and status. ^{a,*}

Scientific Name	Common Name	Listing Status
<i>Acer rubrum</i>	Red Maple	
<i>Acmella repens</i>	Oppositeleaf Spotflower	
<i>Acoelorrhaphe wrightii</i>	Paurotis Palm	ST
<i>Acrostichum danaeifolium</i>	Giant Leather Fern	
<i>Albizia lebeck</i>	Lebeck	non-native
<i>Aletris lutea</i>	Yellow Colicroot	
<i>Alysicarpus vaginalis</i>	White Moneywort	non-native
<i>Amaranthus australis</i>	Southern Amaranth	
<i>Ambrosia artemisiifolia</i>	Common Ragweed	
<i>Ammannia latifolia</i>	Pink Redstem	
<i>Anemia adiantifolia</i>	Pineland Fern	
<i>Annona glabra</i>	Pond Apple	
<i>Ardisia escallonioides</i>	Marlberry	
<i>Asclepias incarnata</i>	Swamp Milkweed	
<i>Asclepias lanceolata</i>	Fewflower Milkweed	
<i>Asclepias longifolia</i>	Longleaf Milkweed	
<i>Asemeia grandiflora</i>	Showy Milkwort	
<i>Asparagus aethiopicus</i>	Sprenger's Asparagus	non-native
<i>Baccharis glomeruliflora</i>	Silverling	
<i>Baccharis halimifolia</i>	Groundsel Tree	
<i>Bacopa caroliniana</i>	Carolina Water-Hyssop	
<i>Bacopa monnieri</i>	Herb-Of-Grace	
<i>Berchemia scandens</i>	Supplejack	
<i>Bidens alba</i>	White Beggarticks	
<i>Boehmeria cylindrica</i>	False Nettle	
<i>Boltonia diffusa</i>	Smallhead Doll's Daisy	
<i>Buchnera floridana</i>	Florida Bluehearts	
<i>Bursera simaruba</i>	Gumbo Limbo	
<i>Campyloneurum phyllitidis</i>	Long Strapfern	
<i>Carex gigantea</i>	Giant Sedge	
<i>Cassytha filiformis</i>	Love Vine	
<i>Casuarina equisetifolia</i>	Australian Pine	non-native
<i>Casuarina glauca</i>	Swamp Sheoak	non-native
<i>Centella asiatica</i>	Spadeleaf	
<i>Centella erecta</i>	American Coinwort	
<i>Cephalanthus occidentalis</i>	Buttonbush	
<i>Cheiroglossa palmata</i>	Hand Fern	

Table 1 (Continued). List of plants on the GHOTE and status. ^{a,*}

Scientific Name	Common Name	Listing Status
<i>Chrysobalanus icaco</i>	Cocoplum	
<i>Cirsium horridulum</i>	Bristle Thistle	
<i>Citrus sp.</i>	Citrus	
<i>Cladium mariscus jamaicense</i>	Jamaica Swamp Sawgrass	
<i>Coelorachis rugosa</i>	Wrinkled Jointtail Grass	
<i>Conoclinium coelestinum</i>	Blue Mistflower	
<i>Coreopsis leavenworthii</i>	Leavenworth's Tickseed	
<i>Cornus foemina</i>	Swamp Dogwood	
<i>Crinum americanum</i>	Southern Swamp Lily	
<i>Cyperaceae sp.</i>	Sedges	
<i>Cyperus ligularis</i>	Swamp Flatsedge	
<i>Cyperus surinamensis</i>	Tropical Flatsedge	
<i>Dalbergia ecastaphyllum</i>	Coinvine	
<i>Dendrophylax lindenii</i> *	Ghost Orchid	SE
<i>Dendrophylax porrectus</i>	Needleroot Airplant Orchid	
<i>Desmodium incanum</i>	Creeping Beggarweed	non-native
<i>Dichanthelium caeruleum</i>	Blue Witchgrass	
<i>Dichanthelium strigosum</i> var. <i>glabrescens</i>	Hairless Witchgrass	
<i>Diodia virginiana</i>	Virginia Buttonweed	
<i>Diospyros virginiana</i>	Common Persimmon	
<i>Distichlis spicata</i>	Saltgrass	
<i>Dyschoriste angusta</i>	Pineland Twinflower	
<i>Echinochloa paludigena</i>	Florida Cockspur Grass	Native endemic
<i>Echinochloa sp.</i>	Barnyard Grass	
<i>Eleocharis cellulosa</i>	Gulf Coast Spikerush	
<i>Eleocharis interstincta</i>	Knotted Spikerush	
<i>Encyclia tampensis</i>	Florida Butterfly Orchid	
<i>Epidendrum amphistomum</i>	Big-Mouth Star Orchid	SE
<i>Epidendrum rigidum</i>	Stiff Flower Star Orchid	SE
<i>Erigeron quercifolius</i>	Daisy Fleabane, Oakleaf Fleabane	
<i>Eryngium yuccifolium</i>	Rattlesnake Master	
<i>Erythrina herbacea</i>	Coral Bean	
<i>Eugenia axillaris</i>	White Stopper	
<i>Eupatorium capillifolium</i>	Dogfennel	
<i>Eupatorium leptophyllum</i>	False Fennel	

Table 1 (Continued). List of plants on the GHOTE and status. ^{a,*}

Scientific Name	Common Name	Listing Status
<i>Eupatorium mikanioides</i>	Semaphore Thoroughwort	Native endemic
<i>Eupatorium serotinum</i>	Late Boneset, Lateflowering Thoroughwort	
<i>Euploca polyphylla</i>	Pineland Heliotrope	
<i>Eustachys petraea</i>	Pinewoods Fingergrass	
<i>Evolvulus sericeus</i>	Silky Evolvulus	
<i>Ficus aurea</i>	Florida Strangler Fig	
<i>Fimbristylis cymosa</i>	Hurricanegrass	
<i>Fimbristylis sp.</i>	Fringe Rush	
<i>Flaveria linearis</i>	Narrowleaf Yellowtops	
<i>Fraxinus caroliniana</i>	Carolina Ash	
<i>Funastrum clausum</i>	White Twinevine	
<i>Helenium pinnatifidum</i>	Southeastern Sneezeweed	
<i>Hippocratea volubilis</i>	Medicine Vine	
<i>Hymenachne hemitomom</i>	Maidencane	
<i>Hypericum limosum</i>	Coastalplain St. John's Wort	
<i>Hypericum sp.</i>	St. John'd Wort	
<i>Hyptis alata</i>	Musky Mint	
<i>Ilex cassine</i>	Dahoon Holly	
<i>Ipomoea hederacea</i>	Ivy-Leaved Morning-Glory	non-native
<i>Ipomoea sagittata</i>	Saltmarsh Morning-Glory	
<i>Iva microcephala</i>	Piedmont Marsh Elder	
<i>Juncus biflorus</i>	Large Grass-Leaved Rush	
<i>Juncus megacephalus</i>	Bighead Rush	
<i>Juncus scirpoides</i>	Needlepod Rush	
<i>Justicia angusta</i>	Everglades Water-Willow	
<i>Kosteletzkya pentacarpos</i>	Saltmarsh Mallow	
<i>Laguncularia racemosa</i>	White Mangrove	
<i>Lantana camara</i>	Common Lantana	non-native
<i>Leucaena leucocephala</i>	White Leadtree	non-native
<i>Leucobryum albidum</i>	White Moss	
<i>Linum carteri var. smallii</i> *	Small's flax	SE
<i>Lobelia glandulosa</i>	Glade Lobelia	
<i>Ludwigia microcarpa</i>	Smallfruit Primrose-Willow	
<i>Ludwigia octovalvis</i>	Mexican Primrose-Willow	
<i>Ludwigia peruviana</i>	Peruvian Primrose-Willow	non-native
<i>Ludwigia repens</i>	Creeping Primrose-Willow	
<i>Lycium carolinianum</i>	Christmas Berry	
<i>Magnolia virginiana</i>	Sweetbay Magnolia	
<i>Mangifera indica</i>	Indian Mango	non-native
<i>Melaleuca quinquenervia</i>	Broad-Leaved Paperbark	non-native
<i>Melanthera angustifolia</i>	Everglades Squarestem	

Table 1 (Continued). List of plants on the GHOTE and status. ^{a,*}

Scientific Name	Common Name	Listing Status
<i>Melanthera nivea</i>	Snow Squarestem	
<i>Melothria pendula</i>	Creeping Cucumber	
<i>Mikania scandens</i>	Climbing Hempvine	
<i>Mitreola petiolata</i>	Lax Hornpod	
<i>Mitreola sessilifolia</i>	Swamp Hornpod	
<i>Morella cerifera</i>	Wax Myrtle	
<i>Muhlenbergia sericea</i>	Gulf Muhly	
<i>Myrcianthes fragrans</i>	Simpson's Stopper	ST
<i>Myrsine cubana</i>	Colicwood, Myrsine	
<i>Nekemias arborea</i>	Peppervine	
<i>Nephrolepis brownii</i>	Brown's Sword Fern	non-native
<i>Nephrolepis cordifolia</i>	Fishbone Fern, Tuberous Sword Fern	non-native
<i>Nephrolepis exaltata</i>	Southern Sword Fern	
<i>Oenothera simulans</i>	Southern Beeblossom	
<i>Osmunda spectabilis</i>	American Royal Fern	
<i>Packera glabella</i>	Butterweed	
<i>Panicum repens</i>	Torpedo Grass	non-native
<i>Panicum virgatum</i>	Switchgrass	
<i>Parthenocissus quinquefolia</i>	Virginia Creeper	
<i>Passiflora pallida</i>	Corksystem Passionvine	
<i>Peperomia glabella*</i>	Cypress peperomia	SE
<i>Persea palustris</i>	Swamp Bay	
<i>Persicaria hydropiperoides</i>	Swamp Smartweed	
<i>Persicaria punctata</i>	Dotted Knotweed	
<i>Phlebodium aureum</i>	Golden Polypody	
<i>Phragmites australis</i>	Common Reed	non-native
<i>Phyla nodiflora</i>	Turkey Tangle Frogfruit	
<i>Phytolacca americana</i>	American Pokeweed	
<i>Pinus elliotii densa</i>	South Florida Slash Pine	
<i>Piriqueta cistoides</i>	Pitted Stripeseed	
<i>Pithecellobium unguis-cati</i>	Catclaw Blackbead	
<i>Pleopeltis michauxiana</i>	Resurrection Fern	
<i>Pluchea baccharis</i>	Rosy Camphorweed	
<i>Polygala baldwinii</i>	Baldwin's Milkwort	
<i>Polygonum sp.</i>	Knotweeds	
<i>Polystachya concreta</i>	Yellow Helmet Orchid	SE
<i>Pontederia cordata</i>	Pickerelweed	
<i>Proserpinaca palustris</i>	Marsh Mermaidweed	
<i>Prosthechea cochleate*</i>	Florida clamshell orchid	SE
<i>Psilotum nudum</i>	Whisk Fern	
<i>Psychotria nervosa</i>	Shiny-Leaved Wild Coffee	

Table 1 (Continued). List of plants on the GHOTE and status. ^{a,*}

Scientific Name	Common Name	Listing Status
<i>Psychotria nervosa</i>	Wild Coffee	
<i>Psychotria tenuifolia</i>	Velvet-Leafed Wild Coffee	
<i>Pteridium aquilinum</i> var. <i>pseudocaudatum</i>	Tailed Bracken Fern	
<i>Pteridium caudatum</i>	Southern Brackenfern	
<i>Quercus laurifolia</i>	Swamp Laurel Oak	
<i>Quercus minima</i>	Dwarf Live Oak	
<i>Quercus virginiana</i>	Southern Live Oak	
<i>Randia aculeata</i>	White Indigoberry	
<i>Rhizophora mangle</i>	Red Mangrove	
<i>Rhynchospora colorata</i>	Whitetop Sedge	
<i>Rhynchospora inundata</i>	Narrowfruit Horned Beaksedge	
<i>Rhynchospora microcarpa</i>	Southern Beaksedge	
<i>Rhynchospora miliacea</i>	Millet Beaksedge	
<i>Rhynchospora odorata</i>	Fragrant Beaksedge	
<i>Rhynchospora</i> sp.	Beaksedges	
<i>Richardia grandiflora</i>	Largeflower Mexican Clover	non-native
<i>Roystonea regia</i>	Royal Palm	SE
<i>Rubus trivialis</i>	Southern Dewberry	
<i>Ruellia blechum</i>	Browne's Blechum	non-native
<i>Ruellia caroliniensis</i>	Carolina Ruellia	
<i>Sabal palmetto</i>	Cabbage Palmetto	
<i>Sabatia calycina</i>	Coastal Rose Gentian	
<i>Sabatia stellaris</i>	Marsh Pink	
<i>Saccharum giganteum</i>	Sugarcane Plumegrass	
<i>Sagittaria lancifolia</i>	Lanceleaf Arrowhead	
<i>Salix caroliniana</i>	Carolina Willow	
<i>Samolus ebracteatus</i>	Limewater Brookweed	
<i>Sansevieria hyacinthoides</i>	Mother-In-Law's Tongue	non-native
<i>Sapindus saponaria</i>	Wingleaf Soapberry	
<i>Schinus terebinthifolia</i>	Brazilian Pepper	non-native
<i>Serenoa repens</i>	Saw Palmetto	
<i>Sesuvium portulacastrum</i>	Sea Purslane	
<i>Setaria magna</i>	Giant Bristlegrass	
<i>Setaria parviflora</i>	Knotroot Bristlegrass	
<i>Sideroxylon reclinatum</i>	Florida Bully	
<i>Sisyrinchium angustifolium</i>	Narrow-Leaved Blue-Eyed Grass	
<i>Sisyrinchium</i> sp.	Blue-Eyed Grass	
<i>Smilax bona-nox</i>	Saw Greenbrier	
<i>Smilax laurifolia</i>	Laurel-Leaf Greenbrier	
<i>Solanum donianum</i>	Mullein Nightshade	ST
<i>Solidago mexicana</i>	Southern Seaside Goldenrod	

Table 1 (Continued). List of plants on the GHOTE and status. ^{a,*}

Scientific Name	Common Name	Listing Status
<i>Spermacoce neoterminalis</i>	Everglades Key False Buttonweed	Native endemic
<i>Spermacoce verticillata</i>	Shrubby False Buttonweed	non-native
<i>Sporobolus bakeri</i>	Sand Cordgrass	
<i>Stenandrium dulce</i>	Sweet Shaggytuft	
<i>Stenotaphrum secundatum</i>	Saint Augustine Grass	
<i>Stillingia sylvatica</i>	Queen's Delight	
<i>Symphotrichum carolinianum</i>	Climbing Aster	
<i>Symphotrichum dumosum</i>	Bushy Aster	
<i>Syngonium</i>	Arrow-Head Vines	non-native
<i>Syngonium podophyllum</i>	Goosefoot-Plant	non-native
<i>Syzygium cumini</i>	Java Plum	non-native
<i>Taxodium ascendens</i>	Pondcypress	
<i>Taxodium distichum</i>	Baldcypress	
<i>Telmatoblechnum serrulatum</i>	Toothed Midsorus Fern	
<i>Teucrium canadense</i>	American Germander	
<i>Thalia geniculata</i>	Alligator Flag	
<i>Thelypteris interrupta</i>	Swamp Shield-Fern	
<i>Thelypteris palustris</i>	Marsh Fern	
<i>Thespesia populnea</i>	Portia Tree	non-native
<i>Tiedemannia filiformis</i>	Water Cowbane	
<i>Tillandsia balbisiana</i>	Balbis' Airplant	ST
<i>Tillandsia fasciculata</i>	Cardinal Airplant	SE
<i>Tillandsia paucifolia</i>	Potbelly Airplant	
<i>Tillandsia setacea</i>	Southern Needleleaf Airplant	
<i>Tillandsia usneoides</i>	Spanish Moss	
<i>Tillandsia utriculata</i>	Giant Airplant	SE
<i>Tillandsia variabilis</i>	Leatherleaf Airplant	ST
<i>Toxicodendron radicans</i>	Eastern Poison Ivy	
<i>Typha</i>	Cattails	
<i>Urena lobata</i>	Caesar Weed	non-native
<i>Vanilla phaenantha</i> *	Leafy vanilla	SE
<i>Vicia acutifolia</i>	Fourleaf Vetch	
<i>Vigna luteola</i>	Hairy-pod Cowpea	
<i>Vitis cinerea</i>	Graybark Grape, Florida Grape	
<i>Vitis rotundifolia</i>	Muscadine Grapevine	
<i>Vittaria lineata</i>	Shoestring Fern	
<i>Waltheria indica</i>	Sleepy Morning	
<i>Woodwardia virginica</i>	Virginia Chainfern	
<i>Ximenia americana</i>	Hog Plum	
<i>Zizaniopsis miliacea</i>	Giant Cutgrass	

a. Key to abbreviations: Species listed by the State of Florida as State-designated Threatened (ST), State-designated Endangered (SE).
* Species likely to be present on or near the property based on habitat and species range models, but not observed.

Table 2. List of bird species utilizing the GHOTE area and status.^{a,**}

Scientific Name	Common Name	Status
<i>Accipiter cooperii</i>	Cooper's Hawk	
<i>Accipiter striatus</i>	Sharp-shinned Hawk	
<i>Actitis macularius</i>	Spotted Sandpiper	
<i>Aglaius phoeniceus</i>	Red-winged Blackbird	
<i>Aix sponsa</i>	Wood duck	
<i>Anas clypeata</i>	Northern shoveler	
<i>Anas crecca</i>	Green-winged Teal	
<i>Anas fulvigula</i>	Mottled duck	
<i>Anas platyrhynchos</i>	Mallard	
<i>Anhinga anhinga</i>	Anhinga	
<i>Anthus rubescens</i>	American Pipit	
<i>Aramus guarauna</i>	Limpkin	
<i>Archilochus colubris</i>	Ruby-throated Hummingbird	
<i>Ardea alba</i>	Great Egret	
<i>Ardea herodias</i>	Great Blue Heron	
<i>Ardea herodias occidentalis</i>	Great White Heron	
<i>Arenaria interpres</i>	Ruddy Turnstone	
<i>Aythya affinis</i>	Lesser Scaup	
<i>Baeolophus bicolor</i>	Tufted Titmouse	
<i>Bombycilla cedrorum</i>	Cedar Waxwing	
<i>Botaurus lentiginosus</i>	American Bittern	
<i>Bubo virginianus</i>	Great Horned Owl	
<i>Bubulcus ibis</i>	Cattle Egret	
<i>Buteo brachyurus</i>	Short-tailed Hawk	
<i>Buteo jamaicensis</i>	Red-tailed Hawk	
<i>Buteo lineatus</i>	Red-shouldered Hawk	
<i>Buteo platypterus</i>	Broad-winged Hawk	
<i>Butorides virescens</i>	Green Heron	
<i>Calidris alba</i>	Sanderling	
<i>Calidris alpina</i>	Dunlin	
<i>Calidris melanotos</i>	Pectoral Sandpiper	
<i>Calidris minutilla</i>	Least Sandpiper	
<i>Calidris pusilla</i>	Semipalmated Sandpiper	
<i>Caprimulgus carolinensis</i>	Chuck-will's-widow	
<i>Caprimulgus vociferus</i>	Whip-poor-will	
<i>Caracara cheriway</i>	Crested Caracara	FT
<i>Cardinalis cardinalis</i>	Northern Cardinal	
<i>Cathartes aura</i>	Turkey Vulture	
<i>Catharus fuscescens</i>	Veery	
<i>Catharus guttatus</i>	Hermit Thrush	
<i>Catharus minimus</i>	Gray-cheeked Thrush	
<i>Catharus ustulatus</i>	Swainson's Thrush	

Table 2 (Continued). List of bird species utilizing the GHOTE area and status.^{a,**}

Scientific Name	Common Name	Listing Status
<i>Charadrius semipalmatus</i>	Semipalmated Plover	
<i>Charadrius vociferus</i>	Killdeer	
<i>Chen caerulescens</i>	Snow Goose	
<i>Chlidonias niger</i>	Black Tern	
<i>Chordeiles minor</i>	Common Nighthawk	
<i>Circus cyaneus</i>	Northern Harrier	
<i>Cistothorus palustris</i>	Marsh Wren	
<i>Cistothorus platensis</i>	Sedge Wren	
<i>Coccyzus americanus</i>	Yellow-billed Cuckoo	
<i>Coccyzus minor</i>	Mangrove Cuckoo	
<i>Colaptes auratus</i>	Northern Flicker	
<i>Colinus virginianus</i>	Northern Bobwhite	
<i>Columba leucocephala</i>	White-crowned Pigeon	ST
<i>Columbina passerina</i>	Common Ground Dove	
<i>Coragys atratus</i>	Black Vulture	
<i>Corvus brachyrhynchos</i>	American Crow	
<i>Corvus ossifragus</i>	Fish Crow	
<i>Cyanocitta cristata</i>	Blue Jay	
<i>Dolichonyx oryzivorus</i>	Bobolink	
<i>Dryobates pubescens</i>	Downy Woodpecker	
<i>Dryocopus pileatus</i>	Pileated Woodpecker	
<i>Dumetella carolinensis</i>	Gray Catbird	
<i>Egretta caerulea</i>	Little Blue Heron	ST
<i>Egretta rufescens</i>	Reddish Egret	ST
<i>Egretta thula</i>	Snowy Egret	
<i>Egretta tricolor</i>	Tricolored Heron	ST
<i>Elanoides forficatus</i>	Swallow-tailed Kite	
<i>Eudocimus albus</i>	White Ibis	
<i>Falco columbarius</i>	Merlin	
<i>Falco peregrinus</i>	Peregrine Falcon	
<i>Falco sparverius</i>	American Kestrel	
<i>Fregata magnificens</i>	Magnificent Frigatebird	
<i>Fulca americana</i>	American Coot	
<i>Gallinago delicata</i>	Wilson's Snipe	
<i>Gallinula galeata</i>	Common Gallinule	
<i>Gavia immer</i>	Common Loon	
<i>Geothlypis trichas</i>	Common Yellowthroat	
<i>Grus canadensis pratensis</i>	Florida Sandhill Crane	ST
<i>Haematopus palliatus</i>	American Oystercatcher	ST
<i>Haliaeetus leucocephalus</i>	Bald Eagle	Eagle Act Protected

Table 2 (Continued). List of bird species utilizing the GHOTE area and status.^{a,**}

Scientific Name	Common Name	Listing Status
<i>Helmitheros vermivorum</i>	Worm-eating Warbler	
<i>Himantopus mexicanus</i>	Black-necked Stilt	
<i>Hirundo rustica</i>	Barn Swallow	
<i>Icterus spurius</i>	Orchard Oriole	
<i>Ixobrychus exilis</i>	Least Bittern	
<i>Lanius ludovicianus</i>	Loggerhead Shrike	
<i>Larus argentatus</i>	Herring Gull	
<i>Larus delawarensis</i>	Ring-billed Gull	
<i>Laterallus jamaicensis</i>	Black Rail	FT
<i>Leucophaeus atricilla</i>	Laughing Gull	
<i>Limnodromus sp.</i>	Dowitcher	
<i>Lophodytes cucullatus</i>	Hooded Merganser	
<i>Megaceryle alcyon</i>	Belted Kingfisher	
<i>Megascops asio</i>	Eastern Screech-owl	
<i>Melanerpes carolinus</i>	Red-bellied Woodpecker	
<i>Meleagris gallopavo</i>	Wild Turkey	
<i>Melospiza georgiana</i>	Swamp Sparrow	
<i>Melospiza melodia</i>	Song Sparrow	
<i>Mergus serrator</i>	Red-breasted Merganser	
<i>Mimus polyglottos</i>	Northern Mockingbird	
<i>Mniotilta varia</i>	Black-and-white Warbler	
<i>Molothrus ater</i>	Brown-headed Cowbird	
<i>Molothrus bonariensis</i>	Shiny Cowbird	
<i>Mycteria americana</i>	Wood Stork	FT
<i>Myiarchus crinitus</i>	Great Crested Flycatcher	
<i>Nannopterum auritum</i>	Double-crested Cormorant	
<i>Nyctanassa violacea</i>	Yellow-crowned Night Heron	
<i>Nycticorax nycticorax</i>	Black-crowned Night Heron	
<i>Pandion haliaetus</i>	Osprey	
<i>Parkesia motacilla</i>	Louisiana Waterthrush	
<i>Parkesia noveboracensis</i>	Northern Waterthrush	
<i>Passerculus sandwichensis</i>	Savannah Sparrow	
<i>Passerina ciris</i>	Painted Bunting	
<i>Passerina cyanea</i>	Indigo Bunting	
<i>Pavo cristatus</i>	Indian Peafowl	Non-native
<i>Pelecanus erythrorhynchos</i>	American White Pelican	
<i>Pelecanus occidentalis</i>	Brown Pelican	
<i>Peucaea aestivalis</i>	Bachman's Sparrow	
<i>Picoides borealis</i>	Red-cockaded Woodpecker	FE
<i>Picoides villosus</i>	Hairy Woodpecker	
<i>Pipilo erythrophthalmus</i>	Eastern Towhee	

Table 2 (Continued). List of bird species utilizing the GHOTE area and status.^{a,**}

Scientific Name	Common Name	Listing Status
<i>Piranga olivacea</i>	Scarlet Tanager	
<i>Platalea ajaja</i>	Roseate Spoonbill	ST
<i>Plegadis falcinellus</i>	Glossy Ibis	
<i>Pluvialis squatarola</i>	Black-bellied Plover	
<i>Podilymbus podiceps</i>	Pied-billed Grebe	
<i>Poliophtila caerulea</i>	Blue-gray Gnatcatcher	
<i>Porphyrio martinica</i>	Purple Gallinule	
<i>Porzana carolina</i>	Sora	
<i>Progne subis</i>	Purple Martin	
<i>Protonotaria citrea</i>	Prothonotary Warbler	
<i>Quiscalus major</i>	Boat-tailed Grackle	
<i>Quiscalus quiscula</i>	Common Grackle	
<i>Rallus elegans</i>	King Rail	
<i>Rallus longirostris</i>	Clapper Rail	
<i>Recurvirostra americana</i>	American Avocet	
<i>Regulus calendula</i>	Ruby-crowned Kinglet	
<i>Riparia riparia</i>	Bank Swallow	
<i>Rostrhamus sociabilis plumbeus</i>	Snail Kite	FE
<i>Rynchops niger</i>	Black Skimmer	ST
<i>Sayornis phoebe</i>	Eastern Phoebe	
<i>Scolopax minor</i>	American Woodcock	
<i>Seiurus aurocapillus</i>	Ovenbird	
<i>Setophaga americana</i>	Northern Parula	
<i>Setophaga caerulescens</i>	Black-throated Blue Warbler	
<i>Setophaga coronata</i>	Yellow-rumped Warbler	
<i>Setophaga discolor</i>	Prairie Warbler	
<i>Setophaga dominica</i>	Yellow-throated Warbler	
<i>Setophaga palmarum</i>	Palm Warbler	
<i>Setophaga petechia</i>	Yellow Warbler	
<i>Setophaga pinus</i>	Pine Warbler	
<i>Setophaga ruticilla</i>	American Redstart	
<i>Setophaga striata</i>	Blackpoll Warbler	
<i>Sialia sialis</i>	Eastern Bluebird	
<i>Sitta pusilla</i>	Brown-headed Nuthatch	
<i>Spatula discors</i>	Blue-winged Teal	
<i>Sphyrapicus varius</i>	Yellow-bellied Sapsucker	
<i>Spinus tristis</i>	American Goldfinch	
<i>Stelgidopteryx serripennis</i>	Northern Rough-winged Swallow	
<i>Sterna forsteri</i>	Forster's Tern	
<i>Sterna hirundo</i>	Common Tern	
<i>Sternula antillarum</i>	Least Tern	ST
<i>Streptopelia decaocto</i>	Eurasian Collared Dove	Non-native

Table 2 (Continued). List of bird species utilizing the GHOTE area and status.^{a,**}

Scientific Name	Common Name	Listing Status
<i>Strix varia</i>	Barred Owl	
<i>Sturnella magna</i>	Eastern Meadowlark	
<i>Sturnus vulgaris</i>	European Starling	Non-native
<i>Tachycineta bicolor</i>	Tree Swallow	
<i>Thalasseus maximus</i>	Royal Tern	
<i>Thalasseus sandvicensis</i>	Sandwich Tern	
<i>Thryothorus ludovicianus</i>	Carolina Wren	
<i>Toxostoma rufum</i>	Brown Thrasher	
<i>Tringa flavipes</i>	Lesser Yellowlegs	
<i>Tringa melanoleuca</i>	Greater Yellowlegs	
<i>Tringa semipalmata</i>	Willet	
<i>Tringa solitaria</i>	Solitary Sandpiper	
<i>Troglodytes aedon</i>	House Wren	
<i>Troglodytes hiemalis</i>	Winter Wren	
<i>Turdus migratorius</i>	American Robin	
<i>Tyrannus dominicensis</i>	Gray Kingbird	
<i>Tyrannus tyrannus</i>	Eastern Kingbird	
<i>Tyrannus verticalis</i>	Western Kingbird	
<i>Tyto alba</i>	Barn Owl	
<i>Vermivora celata</i>	Orange-crowned Warbler	
<i>Vermivora cyonoptera</i>	Blue-winged Warbler	
<i>Vireo altiloquus</i>	Black-whiskered Vireo	
<i>Vireo griseus</i>	White-eyed Vireo	
<i>Vireo olivaceus</i>	Red-eyed Vireo	
<i>Vireo solitarius</i>	Blue-headed Vireo	
<i>Zenaida macroura</i>	Mourning Dove	

a. Key to abbreviations: Species listed by the State of Florida as Federally-designated Endangered (FE), Federally-designated Threatened (FT).

** Species potentially present based on their known or predicted range, but not observed.

Table 3. List of mammals utilizing the GHOTE area and status.

Scientific Name	Common Name	Status
<i>Blarina shermani</i>	Sherman's Short-tailed Shrew	ST
<i>Canis latrans</i>	Coyote	Non-native
<i>Cryptotis parva</i>	Least Shrew	
<i>Dasypus novemcinctus</i>	Nine-banded Armadillo	Non-native
<i>Didelphis virginiana</i>	Virginia Opossum	
<i>Eumops floridanus</i>	Florida Bonneted Bat*	FE
<i>Glaucomys volans</i>	Southern Flying Squirrel	
<i>Lontra canadensis</i>	River Otter	
<i>Lynx rufus</i>	Bobcat	
<i>Mephitis mephitis</i>	Striped Skunk	
<i>Mustela frenata olivacea</i>	Southeastern Weasel	
<i>Neovison vison evergladensis</i>	Everglades Mink	ST
<i>Odocoileus virginianus</i>	White-tailed Deer	
<i>Oryzomys palustris</i>	Marsh Rice Rat	
<i>Perimyotis subflavu</i>	Tricolored Bat	
<i>Peromyscus gossypinus</i>	Cotton Mouse	
<i>Procyon lotor</i>	Raccoon	
<i>Puma concolor</i>	Florida Panther	FE
<i>Sciurus carolinensis</i>	Eastern Gray Squirrel	
<i>Sciurus niger avicennia</i>	Big Cypress Fox Squirrel	ST
<i>Sigmodon hispidus</i>	Hispid Cotton Rat	
<i>Spilogale putorius</i>	Eastern Spotted Skunk	
<i>Sus scrofa</i>	Wild Pig	Non-native
<i>Sylvilagus floridanus</i>	Eastern Cottontail Rabbit	
<i>Sylvilagus palustris</i>	Marsh Rabbit	
<i>Trichechus manatus</i>	West Indian Manatee	FT
<i>Tursiops truncatus</i>	Atlantic Bottle-nosed Dolphin	Marine Mammal Protection Act
<i>Urocyon cinereoargenteus</i>	Gray Fox	
<i>Ursus americanus</i>	American Black Bear	Bear Conservation Rule
<i>Vulpes vulpes</i>	Red Fox	Non-native

Table 4. List of reptiles utilizing the GHOTE area and status. ^a

Scientific Name	Common Name	Status
<i>Agama picticauda</i>	Peter's Rock Agama	Non-native
<i>Agkistrodon piscivorus</i>	Florida Cottonmouth	
<i>Alligator mississippiensis</i>	American Alligator	FT(S/A)
<i>Anolis carolinensis</i>	Green Anole	
<i>Anolis equestris</i>	Knight Anole	Non-native
<i>Anolis sagrei</i>	Brown Anole	Non-native
<i>Apalone ferox</i>	Florida Softshell	
<i>Cemophora coccinea</i>	Florida Scarlet Snake	
<i>Chelydra serpentina osceola</i>	Florida Snapping Turtle	
<i>Coluber constrictor priapus</i>	Southern Black Racer	
<i>Crocodylus acutus</i>	American Crocodile	FT
<i>Crotalus adamanteus</i>	Eastern Diamondback Rattlesnake	
<i>Deirochelys reticularia chrysea</i>	Florida Chicken Turtle	
<i>Diadophis punctatus</i>	Southern Ringneck Snake	
<i>Drymarchon couperi</i>	Eastern Indigo Snake**	FT
<i>Farancia abacura</i>	Eastern Mud Snake	
<i>Hemidactylus garnotii</i>	Indo-Pacific Gecko	Non-native
<i>Heterodon platirhinos</i>	Eastern Hognose Snake	
<i>Iguana iguana</i>	Green Iguana	Non-native
<i>Kinosternon baurii</i>	Striped Mud Turtle	
<i>Lampropeltis elapsoides</i>	Scarlet Kingsnake	
<i>Lampropeltis getulus floridana</i>	Florida Kingsnake	
<i>Leiocephalus carinatus</i>	Northern Curly-tailed Lizard	Non-native
<i>Malaclemys terrapin macrospilota</i>	Ornate Diamondback Terrapin	Protected by FWC from being collected in the field without a permit
<i>Micrurus fulvius</i>	Eastern Coral Snake	
<i>Nerodia clarkia compressicauda</i>	Mangrove Watersnake	
<i>Nerodia fasciata pictiventris</i>	Florida Watersnake	
<i>Nerodia floridana</i>	Florida Green Watersnake	
<i>Nerodia taxispilota</i>	Brown Watersnake	

Table 4 (Continued). List of reptiles utilizing the GHOTE area and status. ^a

Scientific Name	Common Name	Listing Status
<i>Opheodrys aestivus</i>	Rough Green Snake	
<i>Ophisaurus ventralis</i>	Eastern Glass Lizard	
<i>Pantherophis alleghaniensis</i>	Eastern Ratsnake	
<i>Pantherophis guttatus</i>	Corn Snake	
<i>Plestiodon inexpectatus</i>	Southeastern Five-lined Skink	
<i>Pseudemys nelsoni</i>	Florida Redbelly Turtle	
<i>Python bivittatus</i>	Burmese Python	Non-native
<i>Regina alleni</i>	Striped Crayfish Snake	
<i>Salvator merianae</i>	Argentine Black-and-white Tegu	Non-native
<i>Seminatrix pygaea cyclas</i>	Southern Florida swamp snake	
<i>Sistrurus miliarius barbouri</i>	Dusky Pigmy Rattlesnake	
<i>Storeria victa</i>	Florida Brown Snake	
<i>Terrapene carolina baurii</i>	Florida Box Turtle	
<i>Thamnophis saurita</i>	Ribbon Snake	
<i>Thamnophis sirtalis</i>	Eastern Garter Snake	

a. Key to abbreviations: Species listed by the State of Florida as Federally-designated Threatened because of similarity of appearance (FT(S/A)).

Table 5. List of amphibians utilizing the GHOTE area and status.

Scientific Name	Common Name	Status
<i>Acris gryllus dorsalis</i>	Florida Cricket Frog	
<i>Amphiuma means</i>	Two-toed Amphiuma	
<i>Anaxyrus quercicus</i>	Oak Toad	
<i>Anaxyrus terristris</i>	Southern Toad	
<i>Eleutherodactylus planirostris</i>	Greenhouse Frog	Non-Native
<i>Gastrophryne carolinensis</i>	Eastern Narrowmouth Toad	
<i>Hyla cinerea</i>	Green Treefrog	
<i>Hyla gratiosa</i>	Barking Treefrog	
<i>Hyla squirrellla</i>	Squirrel Treefrog	
<i>Lithobates grylio</i>	Pig Frog	
<i>Lithobates sphenoccephala</i>	Southern leopard frog	
<i>Notophthalmus viridescens piaropicola</i>	Peninsula Newt	
<i>Osteopilus septentrionalis</i>	Cuban Treefrog	Non-Native
<i>Pseudacris nigrita</i>	Southern Chorus Frog	
<i>Pseudacris ocularis</i>	Little Grass Frog	
<i>Siren lacertina</i>	Greater Siren	

Table 6. List of fish utilizing the GHOTE area and status.

Scientific Name	Common Name	Status
<i>Belonesox belizanus</i>	Pike Topminnon	Non-native
<i>Centropomus undecimalis</i>	Common Snook	
<i>Cyprindon variegatus</i>	Sheepshead Minnow	
<i>Eucinostomus harengulus</i>	Tidewater Morjarra	
<i>Eugerres plumieri</i>	Striped Mojarra	
<i>Lepisosteus platyrhincus</i>	Florida Gar	
<i>Mayaheros urophthalmus</i>	Mayan Cichlid	Non-native
<i>Menidia berylina</i>	Inland Silverside	
<i>Mugil sp.</i>	Common Mullet	
<i>Oreochromis sp.</i>	Tilapias	Non-native
<i>Poecilia latipinna</i>	Sailfin Molly	
<i>Pristis pectinata</i>	Smalltooth Sawfish	FE
<i>Rubricatichromis letourneuxi</i>	Letourneux's Jewel Cichlid	Non-native

Table 7. List of invertebrates utilizing the GHOTE area and status.

Scientific Name	Common Name	Status
<i>Aculops rhois</i>	Poison Ivy Leaf Mite	
<i>Anartia jatrophae</i>	White Peacock Butterfly	
<i>Anaxipha sp.</i>	Florida Carpenter Ant	
<i>Beatis sp.</i>	Halloween Pennant	
<i>Camponotus floridanus</i>	Double-lined Doryodes	
<i>Celithemis eponina</i>	Seaside Dragonlet	
<i>Culicidea sp.</i>	Mosquito	
<i>Doryodes bistrilis</i>	Water Scavenger Beetle	
<i>Erythrodiplax berenice</i>	True Oyster	
<i>Gymnandrosoma punctidiscum</i>	Brown Trigs	
<i>Hentzia sp.</i>	Blue-winged Olives	
<i>Herpetogramma bipunctalis</i>	Small Ground Cricket	
<i>Hydrophilidae sp.</i>	Pearl Moth	
<i>Leptoglossus phyllopus</i>	Crane Fly	
<i>Leucania incognita</i>	Long-jawed Jumping Spiders	
<i>Leucauge argyra</i>	Spotted Orbweavers	
<i>Leucauge argyroabapta</i>	Dotted Gymnandrosoma Moth	
<i>Libellula needhami</i>	Southern Beet Webworm Moth	
<i>Mangora placida</i>	Eastern Leat-footed Bug	

Table 7 (Continued). List of invertebrates utilizing the GHOTE area and status.

Scientific Name	Common Name	Status
<i>Marisa cornuarietis</i>	Wainscot	
<i>Mecaphesa celer</i>	Orchard Orb Weaver	
<i>Melogenia corona</i>	Mabel Orchard Orbweaver	
<i>Melolonthinae sp.</i>	June Beetle	
<i>Metamasius callizona</i>	Needham's Skimmer	
<i>Neonemobius sp.</i>	Tuft-legged Orbweaver	
<i>Neoscona sp.</i>	Giant Ramshorn Snail	Non-native
<i>Ostreidae sp.</i>	Swift Crab Spider	
<i>Paroxya clavuligera</i>	American Crowned Conch	
<i>Penestola bufalis</i>	Mexican Bromeliad Weevil	Non-native
<i>Penestola sp.</i>	Olive-green Swamp Grasshopper	
<i>Planorbella trivolvis</i>	Black Penestola Moth	
<i>Polygyra cereolus</i>	Marsh Ramshorn Snail	
<i>Pomacea maculata</i>	Southern Flatcoil	
<i>Pomacea paludosa</i>	Island Apple Snail	Non-native
<i>Romalea microtera</i>	Florida Apple Snail	
<i>Samea castellalis</i>	Florida Lubber	
<i>Samea multiplicalis</i>	Stained-glass Moth	
<i>Selenops submaculosus</i>	Wall Crab Spider	
<i>Stagmomantis floridensis</i>	Larger Florida Mantis	
<i>Tetragnatha laboriosa</i>	Silver Long-jawed Orbweaver	
<i>Tortricinae sp.</i>	Tortricine Leafroller Moth	