

Osprey Estates Property
Indian River County Environmental Bond
2024



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1.0 OSPREY ESTATES PROPERTY

The Osprey Estates Property, Environmental Bond Nomination Number 28, was nominated by an agent representing the landowner with the anticipated acquisition type of Fee Simple.

1.1 LOCATION

The property is in eastern Indian River County on Tax Parcels # 32392400000003000001.1, #32392400000003000001.2, and #32392400000003000001.0 (Figure 1). The east boundary of the property lies along approximately 300m of the west bank of the Indian River/Intercoastal Waterway across from Gifford Point. Gifford Dock Rd runs along the west and north boundaries and terminates at the 45th Street canoe launch at the northeast corner of the property. The parcel is part of a complex of mosquito impoundments dominated by mangroves and likely Brazilian pepper shrubs. Osprey Estates is also known as the Triangle Impoundment and Gifford Plots Impoundment borders it to the south.

1.2 SIZE

The property is an approximately 12.7-acre irregular shaped quadrilateral approximately 270 m from north to south and is approximately 240 m wide.

1.3 CURRENT AND FUTURE ZONING

The current and future land use zoning is Municipality Residential Single Family, City of Vero Beach.

1.4 PENDING ZONING CHANGES AND SPECIAL OVERLAY DISTRICTS

An inquiry to the City of Vero Beach is needed to verify the Future Land Use plans within the City of Vero Beach municipal boundaries.

2.0 VEGETATIVE COMMUNITIES

The Osprey Estates property is within the Indian River Lagoon and associated estuarine wetlands portion of the county. The onsite wetlands have been hydrologically isolated from the Indian River with the construction of mosquito impoundments in approximately the 1950s.

2.1 LAND USE AND LAND COVER

There were two natural community types, and one altered land use type identified on the property from the 2023 Florida Cooperative Landcover Map (CLC) (Figure 2). Approximately 58 percent of the site consists of mangrove swamp interspersed with openings where there is relic salt marsh totaling less than 35 percent of the site (Table 1). A small area of roadway on the impoundment berm makes up the remainder (<1 percent) of the property. Figure 3 and Table 1 present the acreage of each land use and natural community type on the property.

Table 1. The amount of each altered land use type or natural community type on the Osprey Estates property from the Florida Cooperative Landcover Map (2023).

Land Use/Natural Community	Acres	% Cover	Type	Up/Wet	State Rank
Mangrove Swamp	7.4	58.3%	Natural	Wetland	Secure
Salt Marsh	4.5	35.4%	Natural	Wetland	Secure
Transportation	0.8	6.3%	Altered	Upland	
Total Altered	0.8	6.3%			
Total Natural	11.9	93.7%			
Total Upland	0.8	6.3%			
Total Wetland	11.9	93.7%			

*The level of disturbance within each onsite natural community has not been assessed.

Characteristic species of mangrove swamps include red mangrove, black mangrove, white mangrove, and buttonwood. Brazilian pepper can be a common component especially within disturbed estuarine communities. The mangrove species within mosquito impoundments tend to transition from a forest dominated by black mangroves with red mangroves along deeper areas to a forest dominated by white mangroves. Salt marsh is an herbaceous community that occurs in the portion of the coastal zone affected by tides and seawater but protected from large waves. Dominant species often include saltmarsh cordgrass, saltwort, glasswort, salt grass, seaside ox-eye daisy, Carolina sea lavender, marsh fimbry, shoreline seapurslane, marsh elder, and saltgrass.

There were no regionally rare natural community types (e.g., scrub) identified on the property from the CLC map or from a review of current and historical aerial imagery.

Figure 4 shows the under-represented natural communities mapped by FNAI for the Florida Forever statewide environmental lands acquisition program that occur on and near the property. The entire property has a rank of Priority 3 for under-represented natural communities (scale is Priority 1 through 4 with 1 being the highest priority).

2.2 SOILS

The soil types found on the Osprey Estates Property are represented in Figure 5.

2.3 HISTORICAL IMAGERY REVIEW

Some of the aerial photographs reviewed for this assessment can be found in the Appendix.

1943 (UF Map Library)

Natural communities

- The site is predominantly saltmarsh dominated by herbaceous species
- there is a small clump of mangroves and possibly Brazilian pepper shrubs (approximately 1/10 of the area) near the center of parcel
- There appears to be two small tidal pools or mudflats near the south-central boundary

Anthropogenic factors

- There is a thin ditch that runs staggered through the parcel from north to south and the mangroves appear to be associated with berms from the ditching

- Raised (likely gravel) roads form the southern and northern boundaries and are likely on berms from the start of the construction of the mosquito impoundment
- There appears to be a small berm along a portion of the riverfront

1957 (UF Map Library)

- The north and south boundary roads have been widened and there appears to be a parallel ditch and berm
- A ditch and berm now run along the eastern boundary inland and parallel to the river shore, effectively closing the impoundment from tidal flushing
- Salt marsh is still the most dominant natural community though the mangroves and shrubs have increased slightly from the 1943 aerial
- Two or three docks have been installed at the terminus of the southern boundary road
- The narrow interior ditches are not as obvious
- There are three tidal pools or mudflats apparent within the impoundment berms

1970 (UF Map Library)

- Only a small amount ($<1/4$) of the salt marsh is evident, the remainder of the site appears flooded with a slight increase in shrubs

1994 (Google Earth Pro)

- Gifford Dock Rd now forms the west and boundaries of the property
- Salt marsh appears to have increased slightly from the 1970 photo and covers approximately 1/3 of the parcel concentrated on the west side
- The mangrove shrubs have increased slightly but look shorter than the 1943 aerial
- The berms are now covered in shrubs
- The ditches are flooded as are the three tidal pools, the pools are all connected by a series of ditches, and this may be a result of Open Marsh Water Management Mosquito control techniques
- There appears to be a new narrow ditch that extends into the salt marsh habitat
- The docks at the end of the southern road are no longer apparent and the road appears to have been closed and only a ditch and forested berm remain

2005 (Google Earth Pro)

- Only 1/10 of the site is covered in salt marsh
- The shrubs in the impoundment interior have a different signature than the shrubs along the berms (possibly mangroves versus Brazilian pepper)
- There are new sinuous ditches in the remaining salt marsh

2010 (Google Earth Pro)

- Approximately 1/10 of the site is still covered in salt marsh
- The ditches and three tidal pools are inundated
- The dock at the end of Gifford Dock Rd is apparent

2024 (Google Earth Pro)

- Very little to no salt marsh remains

- Site appears flooded and dominated by woody species with some deeper water areas
- The bright green signature running along the berms is likely Brazilian pepper

2.4 OFFSITE CONTINUITY OF NATURAL COMMUNITIES

The site is within a mosaic of former salt marsh that has been incorporated into mosquito control impoundments. Less than 200m to the north and west the estuarine wetlands are bounded by housing developments and a golf course. There is approximately 3km of contiguous estuarine wetland habitat extending south of the parcel.

3.0 RARE SPECIES

Table 2 includes a list of the animal species and Table 3 includes the plant species that have the potential to occur onsite that are considered endangered, threatened, or rare as listed by the U.S. Fish and Wildlife Service (FWS), Florida Fish and Wildlife Conservation Commission (FWC), Florida Natural Areas Inventory (FNAI) and the Florida Department of Agriculture. A search using the FNAI Biodiversity Matrix Map Server, and the FWS Information, Planning, and Consultation System (IPaC) Resource List was performed for listed species that may potentially occur within the Project Site. These lists were reviewed and only the species that were potentially likely to occur within the habitats available onsite were included. For example, given that the Osprey Estates property doesn't appear to contain scrub, species dependent on that habitat that were recorded within the FNAI or IPaC generated lists were excluded from Tables 2 and 3. Additionally, species that are tracked by FNAI or state listed that occur within Indian River that were not included in the Biodiversity Matrix search, but potential habitat occurs onsite, were included in Tables 2 and 3. The majority of the animals and plants listed for this property are often associated with salt marsh or mangrove wetland communities. A seagrass survey adjacent to the parcel extending out 400 ft perpendicular to the shore into the Indian River that was contracted by the Oculina Bank in 2008 found the state listed Endangered, federally listed Threatened, Johnson's seagrass (*Halophila johnsonii*) was present adjacent to the property.

Figure 6 shows The Florida Fish and Wildlife Conservation Commission's Fish and Wildlife Research Institute Terrestrial Resources Geographic Information System web mapping results for species observations near the assessment property. Note these observations are a collection of species documented in the vicinity by various means and are a very incomplete representation of what may occur in the area or that may utilize this property. The resources selected for documented occurrences in the area included Black Bear Calls, Black Bear Telemetry, Eagle Nesting, Panther Mortality, Panther Telemetry, Scrub Jay, Wading Bird Rookeries, and opportunistic Wildlife Observations. There are no documented wildlife sightings on the Osprey Estates property (Figure 6).

Figure 7 shows the Critical Lands and Waters Identification Project (CLIP version 4.0) Biodiversity Resource Priorities model, which combines several conservation priorities models including the Strategic Habitat Conservation Areas for Florida Forever, Vertebrate Richness, Potential Rare Species Habitat, and Priority Natural Communities Core Data layers. The property is mapped as Priority 3 (Priority 1 has the highest conservation priority on a scale from 1 to 5) (Figure 7).

Table 2. The animal species listed endangered, threatened, or tracked by FNAI that have the potential to occur on the Osprey Estate property.

Species Name	Common Name	Global Rank	State Rank	Federal Status	State Listing
<u>Bird</u>					
<i>Egretta caerulea</i>	little blue heron (nests)	G5	S4	N	ST
<i>Egretta rufescens</i>	reddish egret (nests)	G4	S2	N	ST
<i>Egretta thula</i>	snowy egret (nests)	G5	S3	N	N
<i>Egretta tricolor</i>	tricolored heron (nests)	G5	S4	N	ST
<i>Eudocimus albus</i>	white ibis (nests)	G5	S4	N	N
<i>Haematopus palliatus</i>	American oystercatcher	G5	S2	N	ST
<i>Haliaeetus leucocephalus</i>	bald eagle	G5	S3	N	Y
<i>Mycteria americana</i>	wood stork	G4	S2	T, PDL	FT
<i>Nyctanassa violacea</i>	yellow-crowned night-heron (nests)	G5	S3	N	N
<i>Nycticorax nycticorax</i>	black-crowned night-heron (nests)	G5	S3	N	N
<i>Platalea ajaja</i>	roseate spoonbill (nests)	G5	S2	N	T
<i>Rynchops niger</i>	black skimmer	G5	S3	N	ST
<i>Setophaga discolor paludicola</i>	Florida prairie warbler	G5T3	S3	N	N
<i>Setophaga kirtlandii</i>	Kirtland's Warbler	G3	S1		N
<i>Sternula antillarum</i>	least tern	G4	S3	N	ST
<i>Thalasseus maximus</i>	royal tern	G5	S3	N	N
<i>Thalasseus sandvicensis</i>	sandwich tern	G5	S2	N	N
<u>Fish</u>					
<i>Acipenser oxyrinchus oxyrinchus</i>	Atlantic Sturgeon	G3T3	S1	E	FE
<i>Ctenogobius stigmaturos</i>	Spottail Goby	G2	S2	N	N
<i>Microphis brachyurus</i>	Opossum Pipefish	G4G5	S2	SC	N
<i>Rivulus marmoratus</i>	Mangrove Rivulus	G4G5	S3	SC	N
<u>Reptile</u>					
<i>Drymarchon couperi</i>	eastern indigo snake	G3	S2?	T	FT

Table 3. The plant species listed endangered, threatened, or tracked by FNAI that have the potential to occur on the Osprey Estate property.

Species Name	Common Name	Global Rank	State Rank	Federal Status	State Listing
<i>Glandularia maritima</i>	coastal vervain	G3	S3	N	E
<i>Halophila johnsonii</i>	Johnson's seagrass	GNR	S2	N	E
<i>Harrisia simpsonii</i>	Simpson's prickly apple	G2	S2	N	N
<i>Lantana depressa var. floridana</i>	Atlantic Coast Florida lantana	G2T1T2	S1S2	N	E
<i>Opuntia stricta</i>	erect prickly pear	G4?	S3S4	N	T

4.0 WETLANDS

Approximately 94 percent of the site is covered in wetlands according to the CLC map. The parcel is within the Indian River Lagoon watershed.

4.1 AERIAL EXTENT AND CONNECTIVITY

From the CLC map there were two wetland natural community types identified on the property mangrove swamp and salt marsh (Table 1).

Figure 8 shows the wetlands, waterbodies, and flood zones located on the property from the National Wetlands Inventory (NWI) and Federal Emergency Management Agency (FEMA) maps. The NWI map identified 12.7 acres of wetlands, a total of 100 percent of the site was typed as Estuarine and Marine wetlands.

The onsite wetlands appear to be hydrologically isolated from the Indian River. It is not clear if there is a Rotational Impoundment Management Plan or Modified Rotational Impoundment Management currently being administered to the Triangle Impoundment. The onsite wetlands may not be hydrologically connected to the Indian River or adjacent wetlands; however, the site is contiguous with the surrounding areas that are undeveloped and have wetland natural communities.

4.2 ALTERATIONS

The parcel was historically a portion of a large expanse of salt marsh that was subsequently impounded with a series of berms and ditches and became part of the Triangle Impoundment. It appears that additional alterations to the salt marsh community have occurred within the impoundment. There has been some ditching within the impounded salt marsh and at least three pools may have been created (excavated) as a likely result of Open Marsh Water Management (OMWM) method which uses biological control techniques to reduce salt marsh mosquitoes, by digging ditches and creating ponds in salt marsh. This technique attempts to eliminate shallow standing water and gives predators like fish access to mosquito larvae.

Invasive exotic plant infestations, particularly Brazilian pepper, could be high especially in the disturbed areas, along the berms and spoil mounds.

5.0 WATER RESOURCES

5.1 AQUIFER RECHARGE

Figure 9 shows the priority ranking for aquifer recharge on the project site. This is a broad measure focusing on the recharge of springs, sinks, aquifers, natural systems, and water supply. Areas of potential recharge to the Floridan and surficial aquifers were determined from soil hydraulic conductivity, proximity to karst features, depth to water, and overburden (Florida Forever Conservation Needs Assessment, Tech Report 2023). Essentially the entire site has a Priority 6 rank (out of 6 ranks with Priority 1 being the highest priority) for aquifer recharge (Figure 9).

5.2 WATER QUALITY

The wetlands onsite have the potential to aid in maintaining water quality and in situ water purification of stormwater entering the system from the uplands. Onsite water quality could potentially be improved by assuring that the impounded wetland is allowed to regularly flush with the tides allowing for the biological and chemical processes within waters influenced by natural tidal exchange.

5.3 WATER ATTENUATION

The wetland communities can help to store water and reduce the speed of water as it flows over the landscape.

6.0 CORRIDORS AND GREENWAYS

The proposed Osprey Estates Property is contiguous with the CGW Mitigation Bank to the south, which is contiguous with other privately owned conserved properties (Hidden Marsh, Narrows Marsh, Bridgeview) totaling more than 228 acres (Figure 10). East across the Indian River from the parcel is more than 508 acres within the Lost Acres Conservation Area.

Figure 11 shows the CLIP landscape priority ranking for the property. This model combines priorities from the Ecological Greenways and Landscape Integrity Core Data layers. No portion of this property was ranked a priority.

7.0 RESTORATION, LAND MANAGEMENT, HAZARDOUS MATERIALS, AND RECREATION

7.1 RESTORATION POTENTIAL

Possible restoration of the onsite natural communities could include hydrologic enhancement, salt marsh restoration, and invasive exotic plant species control. The alterations to the onsite hydrology would need to be more thoroughly assessed to determine the type and amount of restoration that may be beneficial and feasible.

7.2 LAND MANAGEMENT POTENTIAL

There are several estuarine impoundment management strategies. Allowing or continuing to allow the tides to flush through the property helps to maintain black mangroves, supply habitat for the fish community including some of the rare listed species, provide a nursery for juvenile fish, and allow for natural biological and chemical processes inherent to estuarine systems. Any management of the waters within the impoundment would likely have to be in coordination with the Indian River Mosquito Control District. It is not clear if the Triangle Impoundment is currently in a Rotational Impoundment Management schedule.

The prevalence of invasive exotic plant species is currently unknown. An onsite reconnaissance would be necessary to determine occurrences and infestation levels.

7.3 HAZARDOUS MATERIALS

There are no hazardous waste sites reported on the property from two online sources provided by the Florida Department Environmental Protection Division of Waste Management.

Map Direct: <https://ca.dep.state.fl.us/mapdirect/>

Contamination Locator Map <https://ca.dep.state.fl.us/mapdirect/?web-map=bdfa237157c7426a8f552e40a741685e>

DEP cleanup sites <https://www.arcgis.com/apps/mapviewer/index.html?web-map=316f774db3f7420faf54008608faff64>

7.4 RECREATION AND EDUCATION OPPORTUNITIES

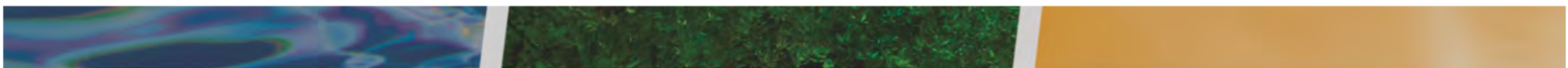
The process of establishing recreational opportunities will require inventorying the area to determine appropriate locations for activities, collaborating with stakeholders, determining the desired objectives that recreation could provide, and identifying the financial costs and benefits of providing the different types of opportunities. Some examples of potential recreation at this site include canoeing, bank fishing, wildlife viewing, and hiking. There is an existing county owned canoe launch and fishing dock (45th Street dock) adjacent to the northeast corner of the parcel that allows for easy access to explore the shoreline of the Osprey Estates property. There is the potential for a walking trail that circumnavigates the property along the impoundment berm. Educational kiosks describing the estuarine wetlands and how they relate to water quality within the Indian River Lagoon could be installed among many other educational opportunities.

8.0 OTHER CONSIDERATIONS

In a 2010 environmental site assessment report by G.K. Environmental, Inc. (GKE), there was a proposed project to permit and construct three single-family homes on stilts, each with a boat dock with two slips, trim 65 percent of the shoreline mangroves, and filling a portion of the onsite wetlands was proposed.

9.0 SUMMARY

The Osprey Estates Property is a 12.7-acre parcel nominated by an agent representing the landowner, is contiguous with existing private conservation properties, and is within the Indian River Lagoon and Associated Wetlands portion of the county. It contains a mix of mangrove swamp and salt marsh estuarine wetlands. The parcel lies within a high priority surface water resource area.



FIGURES

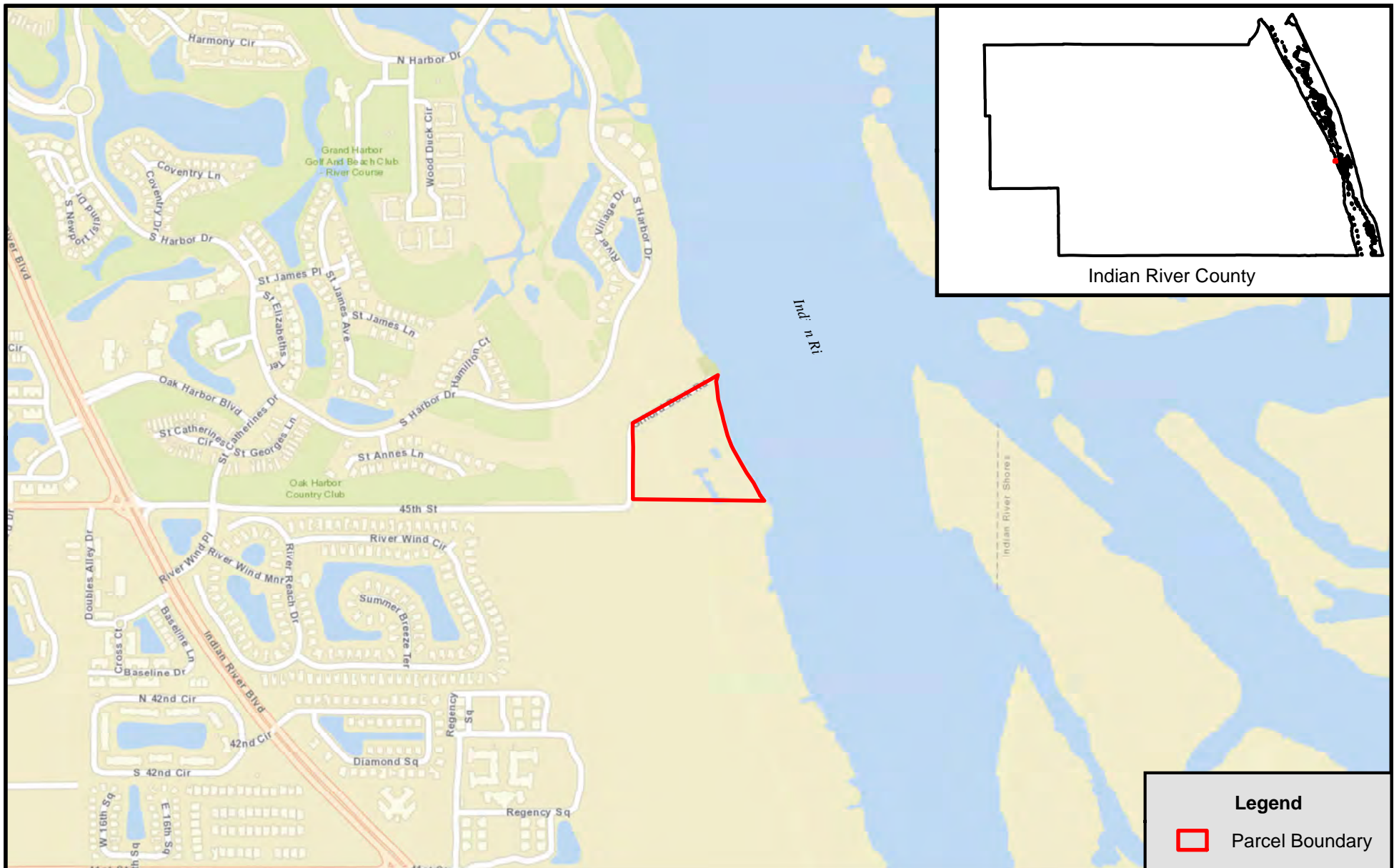
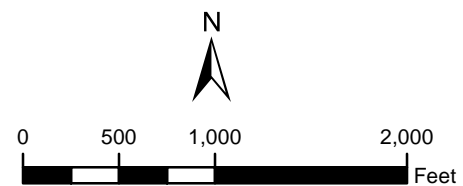


Figure 1.
The Location of the Osprey Estates Property
within Indian River County, Florida

Source: ESRI, DigitalGlobe Imagery; Water & Air Research, Inc., 2024.



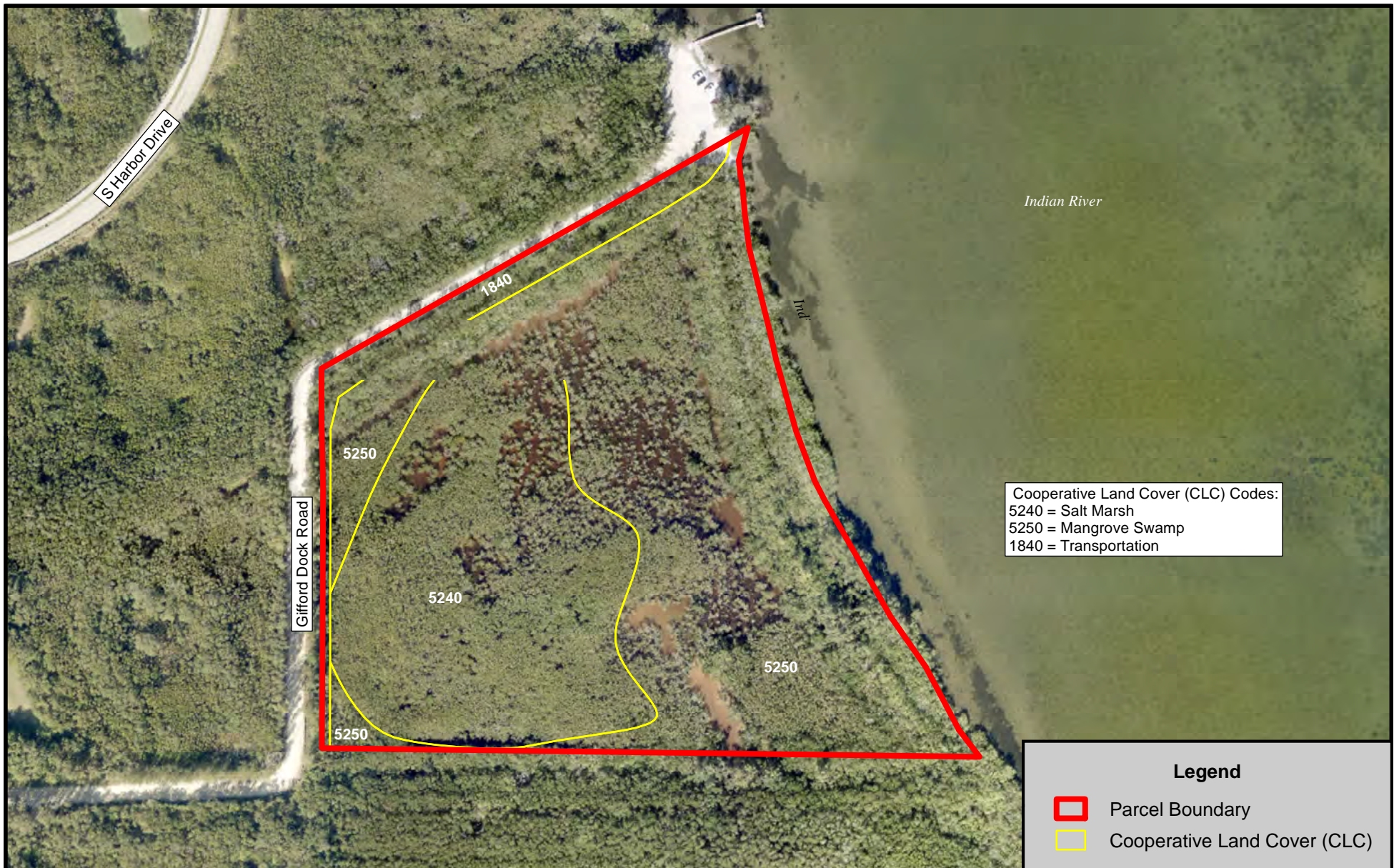
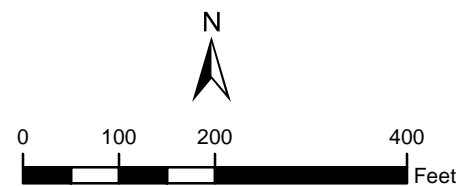


Figure 2.
The Florida Cooperative Land Cover Map
on the Osprey Estates Property
Indian River County, Florida

Source: ESRI, DigitalGlobe Imagery, 2023; Water & Air Research, Inc., 2024.



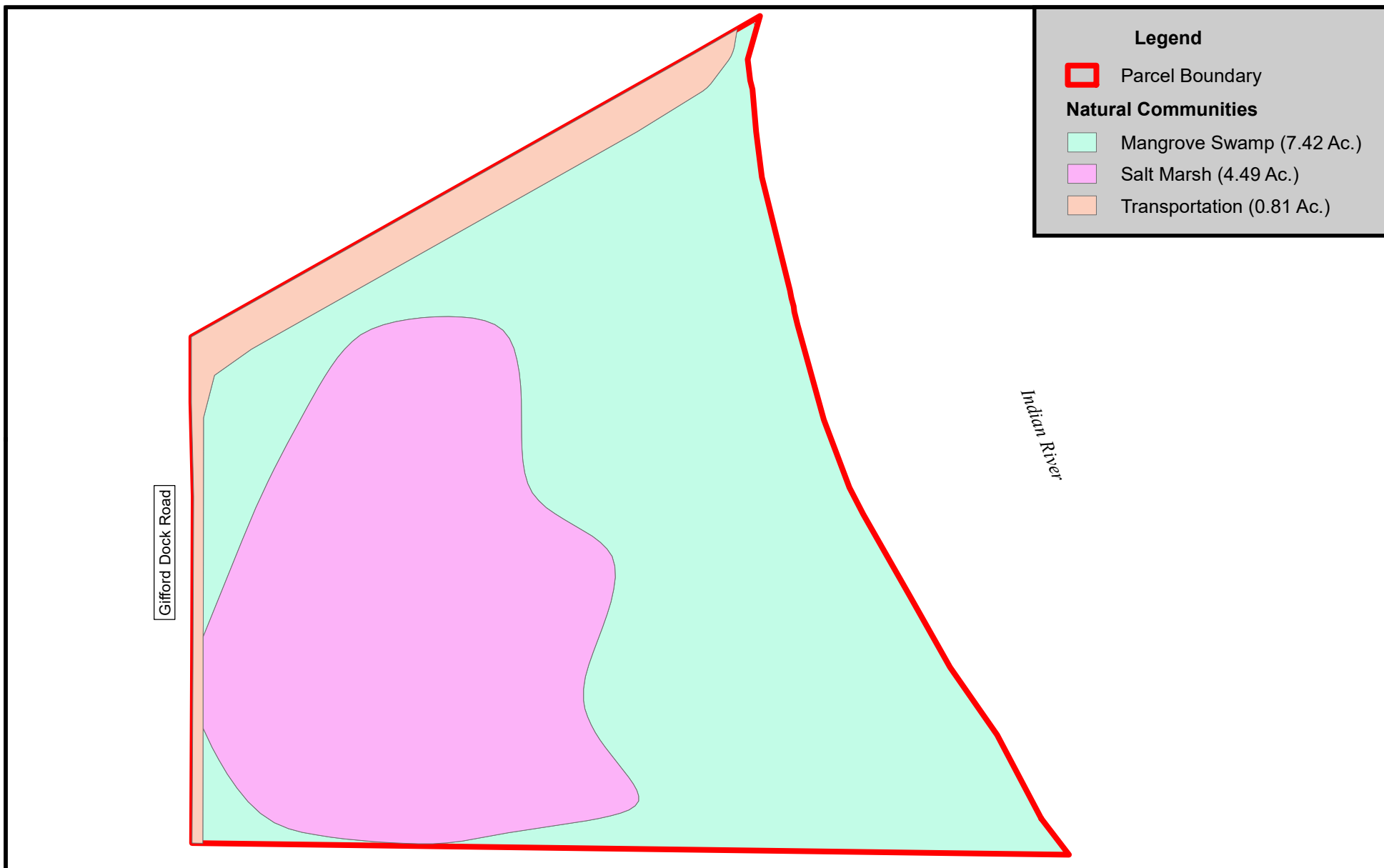
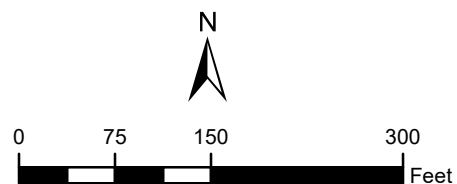
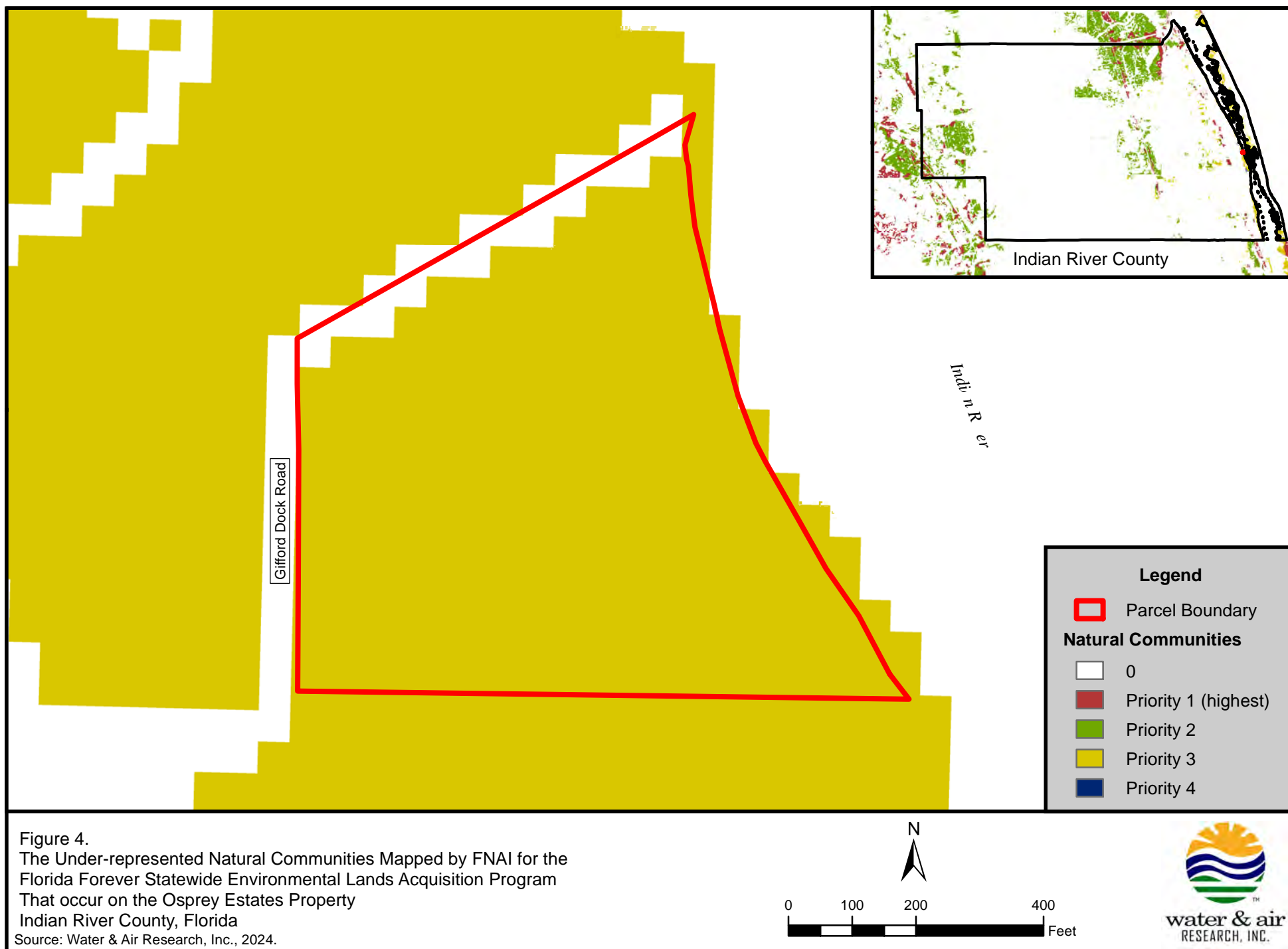


Figure 3.
The Land Use and Natural Communities on the
Osprey Estates Property
Indian River County, Florida

Source: Water & Air Research, Inc., 2024.





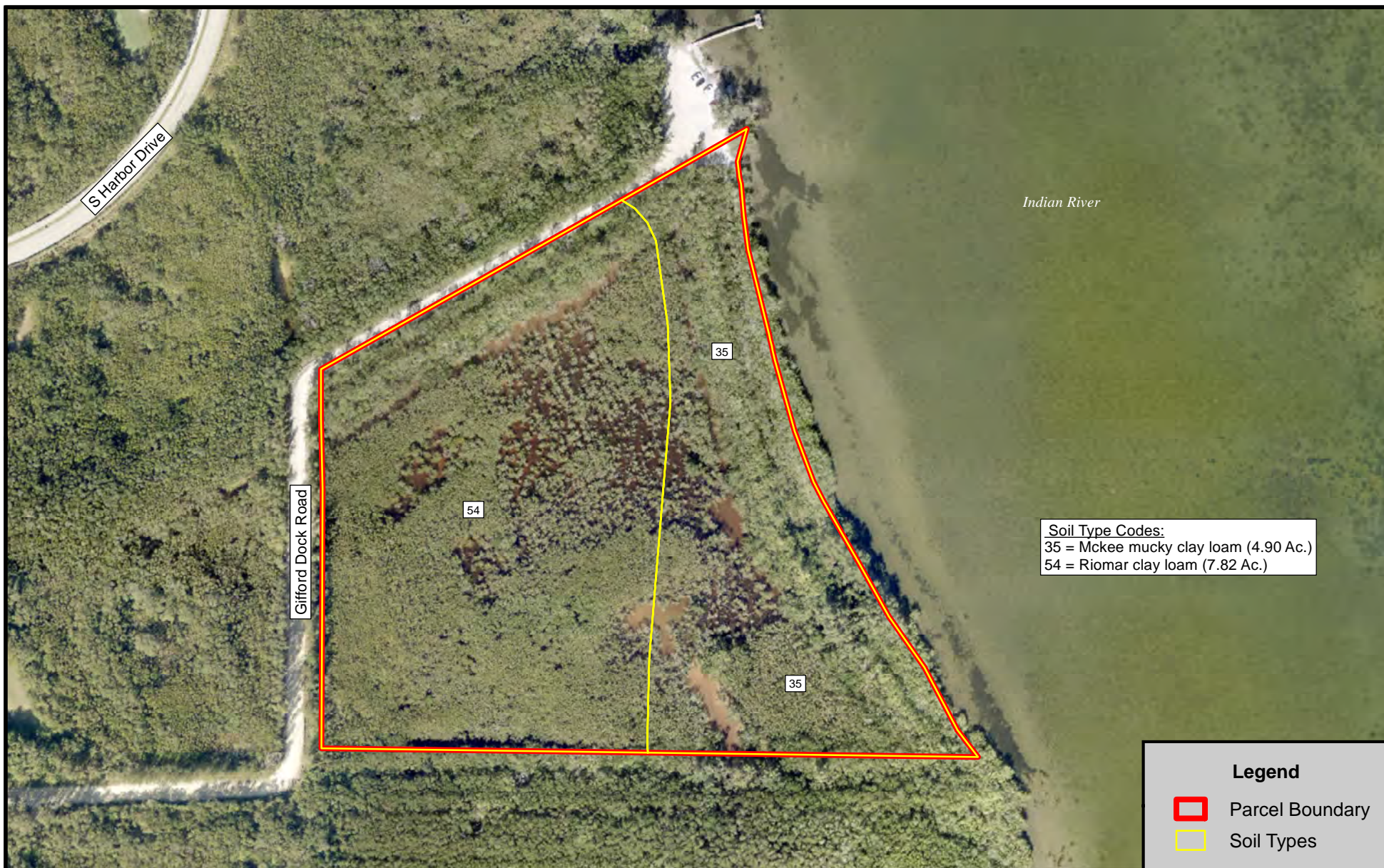
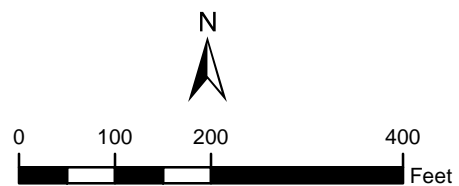


Figure 5.
 The Soil Types Found on the
 Osprey Estates Property
 Indian River County, Florida

Source: ESRI, DigitalGlobe Imagery, 2023; Water & Air Research, Inc., 2024.



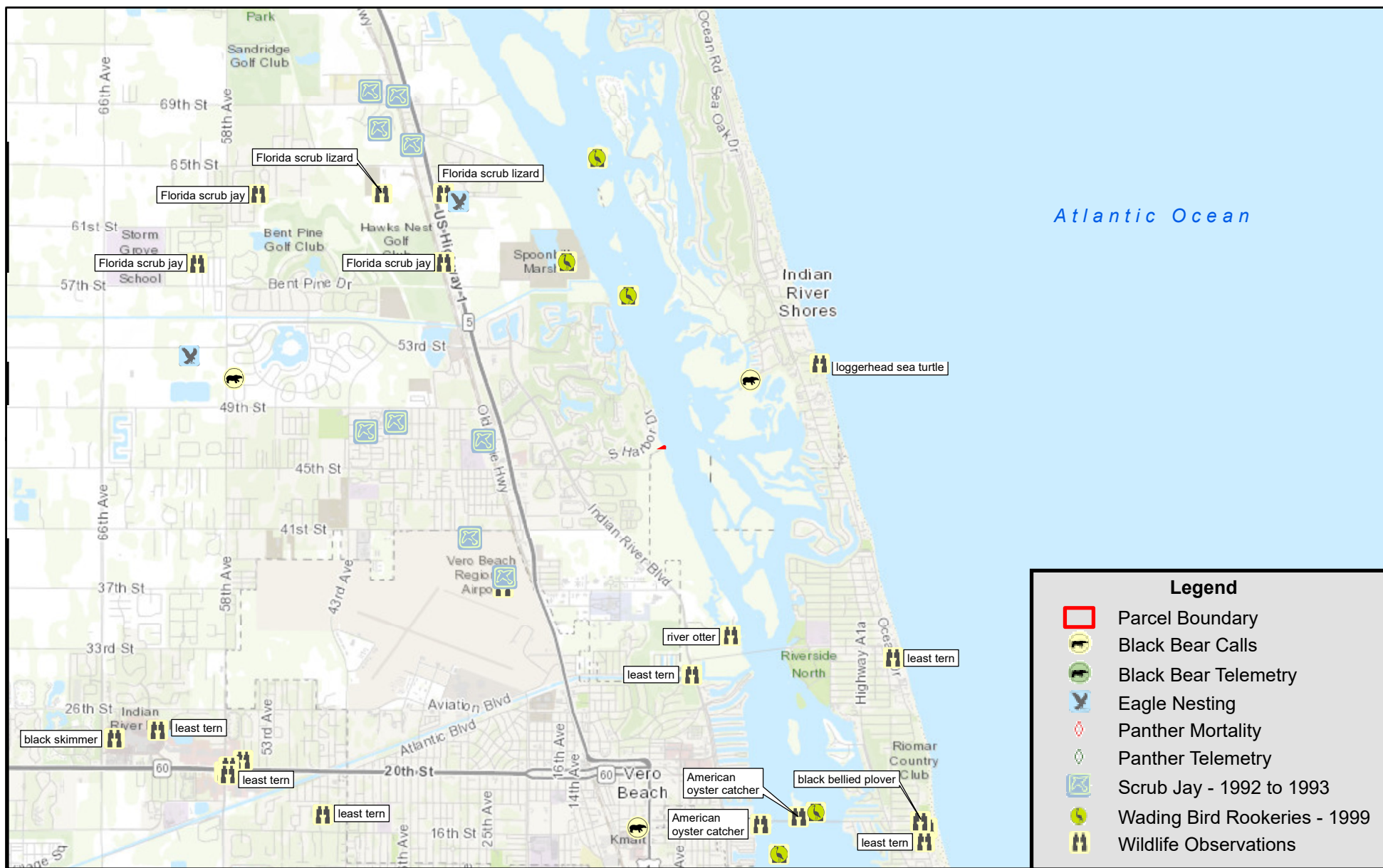
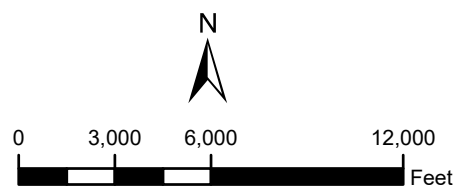


Figure 6.
 The Florida Fish and Wildlife Conservation Commission's Fish and Wildlife Research Institute Terrestrial Resources Geographic Information System Web Mapping Results for Species Observations near the Assessment Property
 Source: FNAI, 2023; Water & Air Research, Inc., 2024.



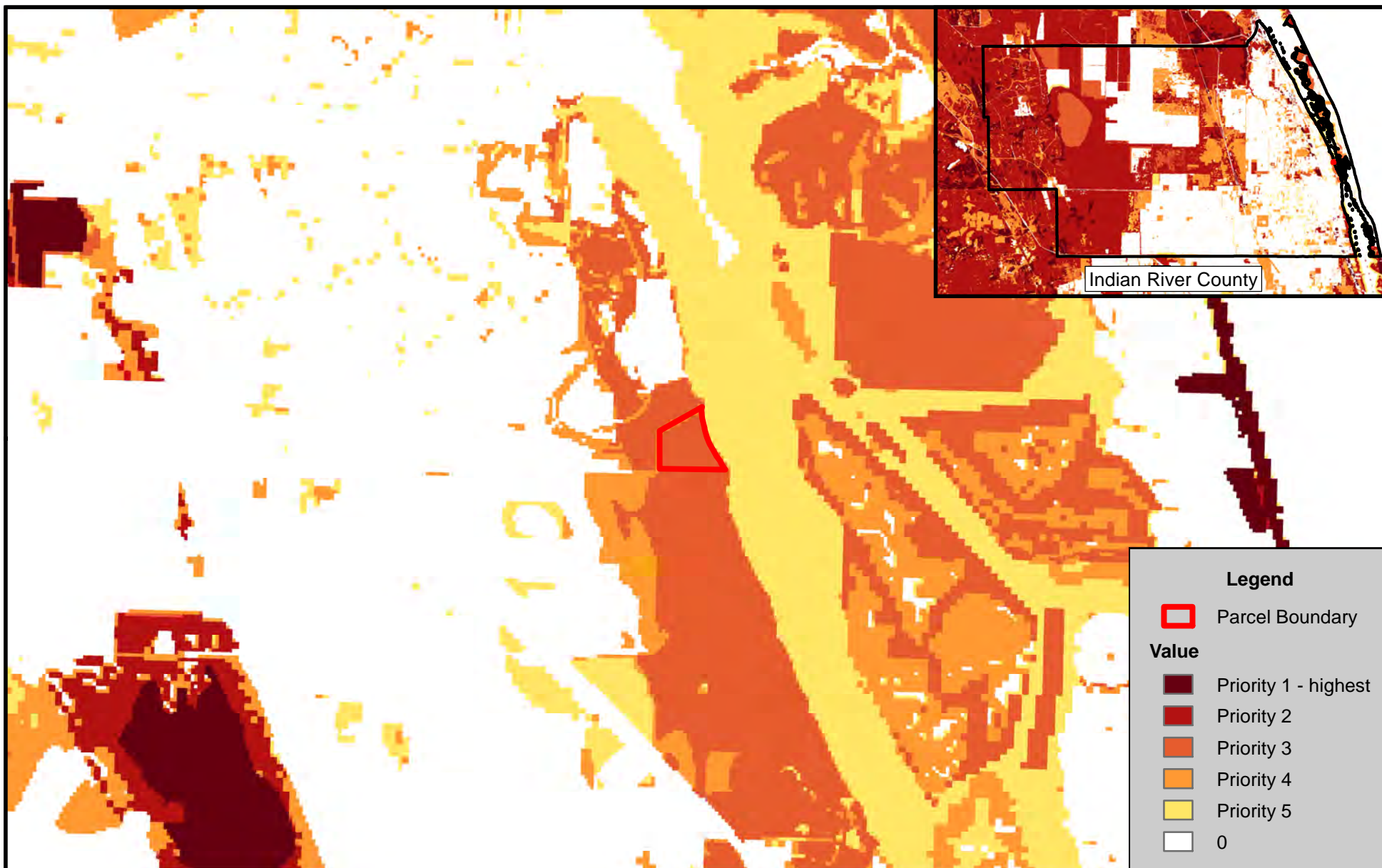
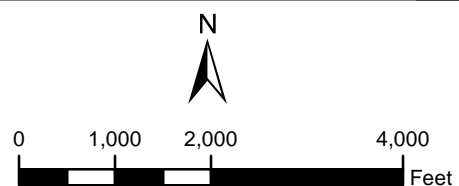


Figure 7.
The Biodiversity Resource Priorities Model (CLIP 4.0)
on the Osprey Estates Property
Indian River County, Florida

Source: FNAI, 2023; Water & Air Research, Inc., 2024.



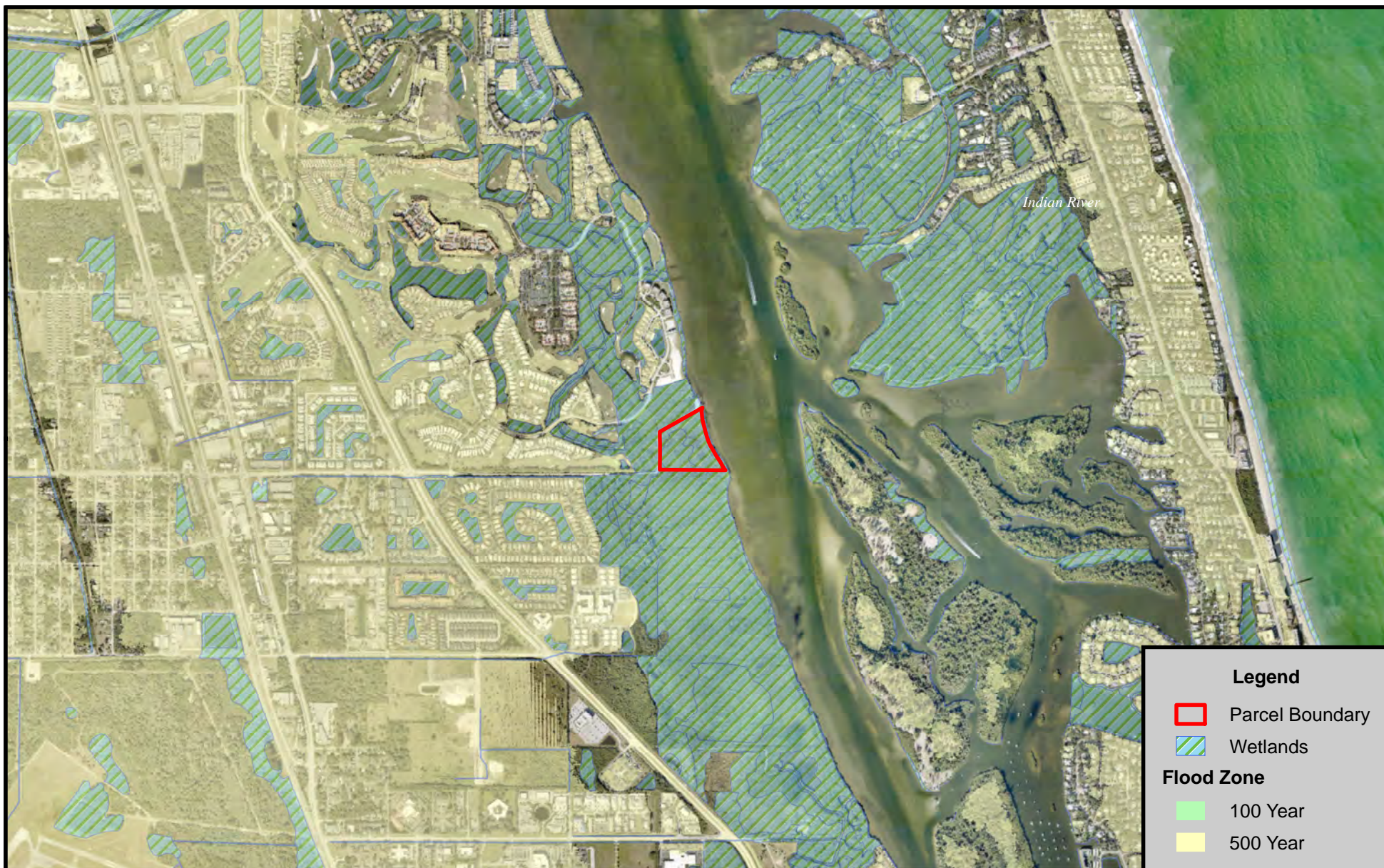
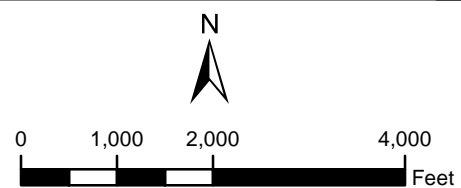


Figure 8.
The NWI Wetlands and FEMA Flood Zones
on the Osprey Estates Property
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Source: ESRI, DigitalGlobe Imagery, 2023; Water & Air Research, Inc., 2024.



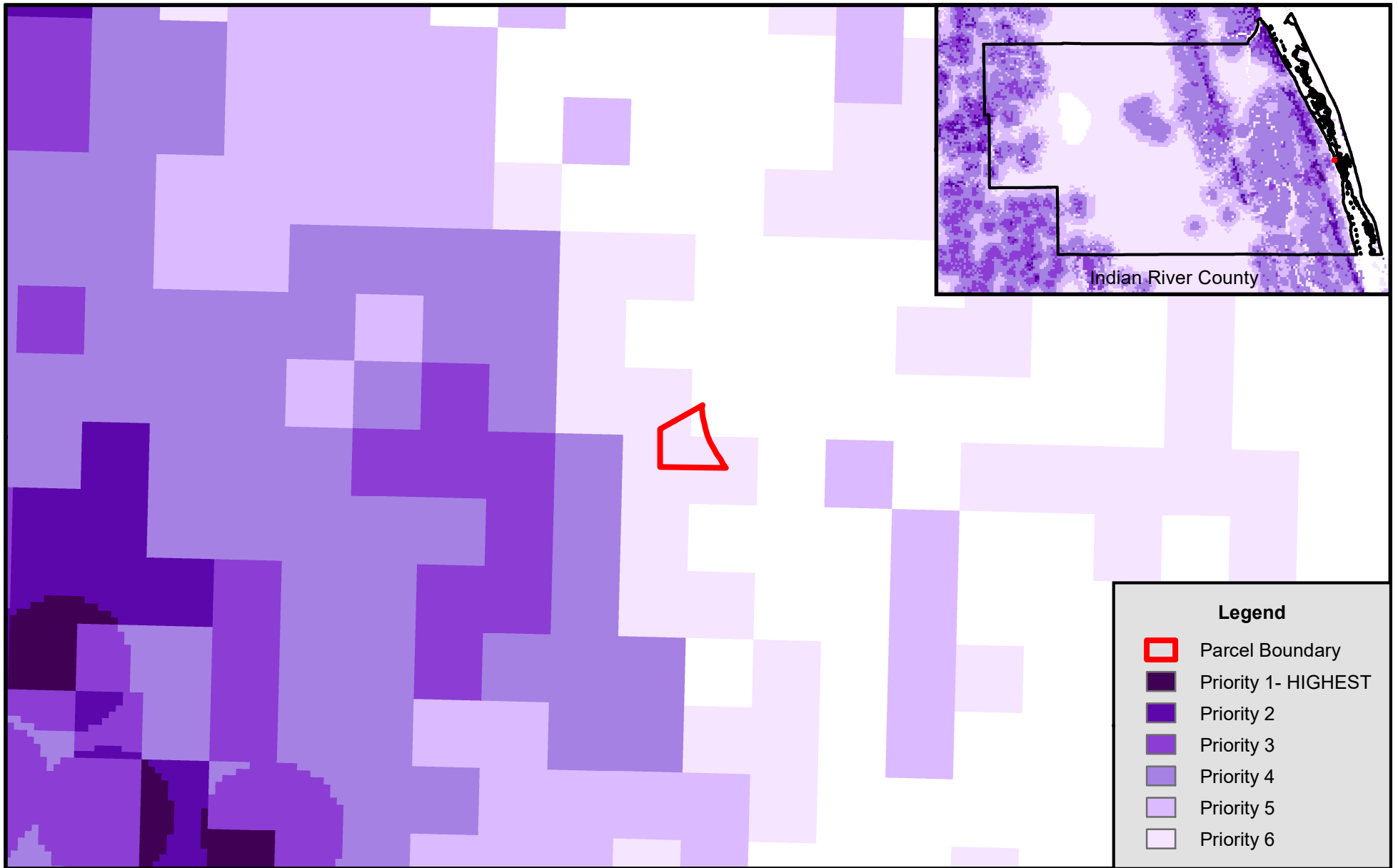


Figure 9.
Groundwater Recharge Areas Critical to Springs, Sinks, Aquifers,
Natural Systems, or Water Supply on the Osprey Estates Property
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Source: FNAI, 2023; Water & Air Research, Inc., 2024.

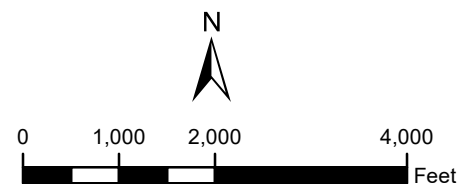




Figure 10.
The Osprey Estates Property
and the Conserved Lands in the Vicinity
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Source: ESRI, DigitalGlobe Imagery, 2023; Water & Air Research, Inc., 2024.

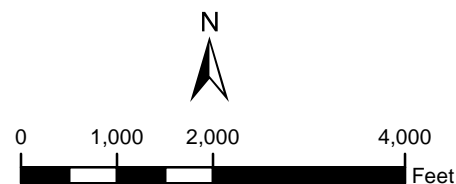
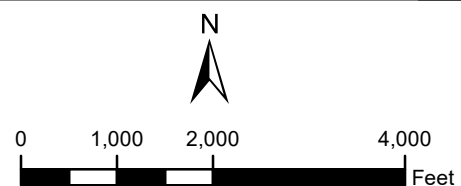
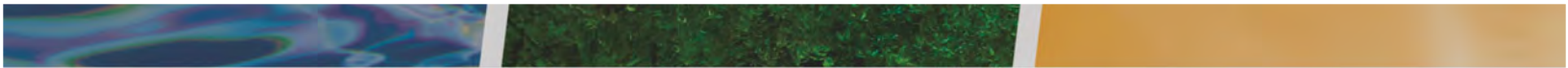




Figure 11.
The Landscape Resource Priorities Model (CLIP 4.0)
on the Osprey Estates Property
Indian River County, Florida

Source: FNAI, 2023; Water & Air Research, Inc., 2024.





APPENDIX

OSPREY ESTATES HISTORICAL AERIALS REVIEWED



1943 Aerial Photograph



1957 Aerial Photograph



1970 Aerial Photograph



1994 Aerial Photograph



2003 Aerial Photograph



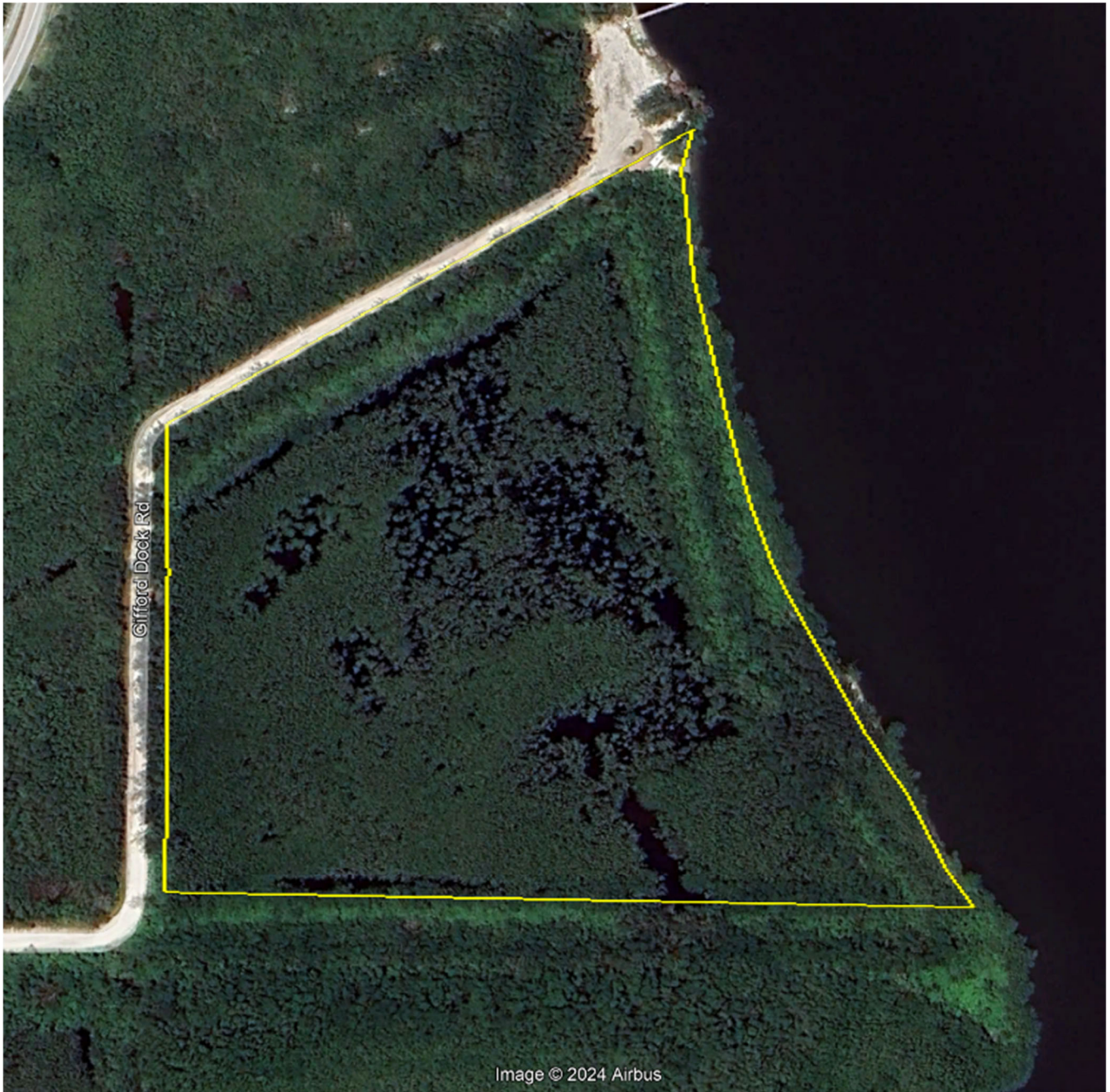
2005 Aerial Photograph



2010 Aerial Photograph



2016 Aerial Photograph



2024 Aerial Photograph



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***Environmental Engineers,
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