

#18
"B" #21SR

CEDAR POINT

Results of the Baseline Vegetation and Wildlife Surveys
and
Management Recommendations

A Florida Communities Trust Grant Report



Prepared By

City of Jacksonville
Department of Regulatory and Environmental Services
Air and Water Quality Division
Technical Services Branch
Wetland and Wildlife Section
117 W. Duval Street, Suite 225
Jacksonville, Florida 32202

Phone 904-630-4900

Contact Person:
Cynthia Irvin
Ecologist

August 10, 1998

Table of Contents

Introduction	1
Methods and Materials.....	1
Avian Surveys.....	1
Mammal Surveys	2
Herpetofaunal Surveys	2
Other Animals	3
Vegetation Surveys	3
Results	4
Habitat Types.....	4
Vegetation and Wildlife Inventories.....	5
Table 1. Vegetation List.....	6
Table 2. Bird Species Observed By Month	9
Table 3. Bird Species Occurrence By Time of Year	11
Table 4. Animal Species Observed	13
Table 5. Listed Plant and Animal Species	16
Table 6. Florida Natural Areas Inventory (FNAI) Flora and Fauna Rankings and Status	16
Soils.....	17
Discussion	21
Recommendations.....	22
Figure 1. Property Location.....	24
Figure 2. Parcel Boundaries	25
Figure 3. Survey Detail Map	26
Figure 4. Herpetofaunal Array Design.....	27
Figure 5. Field Verified Land Cover.....	28
Figure 6. SJRWMD Land Cover/Land Use Map.....	29
Figure 7. Soils Survey (1978).....	30
Figure 8. Soils Survey (Interim)	31
Figure 9. Adjacent Lands	32
Figure 10. Current Access.....	33
Appendix A. Vegetation Survey Dominance Determination Methodology	34
Appendix B. Draft Memorandum of Agreement for Management of City Owned Cedar Point Property.....	36
Appendix C. Florida Natural Areas Inventory (FNAI) Flora and Fauna Rankings and Status Explanations.....	40

Introduction

This report details the baseline vegetation and wildlife surveys conducted on the City of Jacksonville's Cedar Point property. The purpose of conducting baseline surveys was to determine what habitat types and what animal species occur on the property. With this information, a specific management plan can be formulated to guide future use of the property while conserving the natural systems.

Cedar Point is located on Jacksonville's north side off Cedar Point Road (Figure 1). At the time of writing this report, the Cedar Point property consists of several parcels. The first parcel was acquired via a Florida Communities Trust (FCT) grant. At the time of that purchase, another parcel was donated to the City. Several years later, another parcel was added. Figure 2 shows these separate purchases. The baseline surveys were conducted only on the original FCT grant parcel to fulfill grant requirements.

Methods and Materials

Vegetation and wildlife surveys were conducted over a period of approximately one year from January 1995 to March 1996. The following is a description of the methods and materials used for vegetation and wildlife surveys performed at Cedar Point. Figure 3 shows the property boundary, existing vehicle trails, transect trails, and trap array locations.

Avian Surveys

Avian species richness was evaluated using several predetermined survey routes. Field methods were directed to: a) which species were present and b) when they were present. This was accomplished by direct observation of the animals, observation of signs such as tracks or scat, and/or identification of vocalizations.

Bird surveys were performed on several transect routes. The routes were chosen to provide spatial coverage of the study area, and to sample all of the study areas' major habitats. Routes mostly followed existing trails, when possible. Following open trails should have increased bird visibility, and continuity was maintained by following a regular route. The regular survey routes are described as follows:

- Avian route 1 (AR1) - This trail runs the length of the property from north to south. Most of the habitat is oak/hickory forest where the mature trees form a tall canopy much like the ceiling in a cathedral. This is ideal habitat for a wide variety of songbirds and woodpeckers. It also represents the most abundant habitat type on the property.
- AR2 - The next areas are the marshes. These areas can be accessed by following trail number 6 to the island trap array, trails number 1 and 2 at the southern end of

the property, and trail number 9B. This allowed direct observation of the marshes and also the transition from upland habitats to the marshes.

- AR3 - There are several ponds located throughout the property. These are located at the end of trail 10, trail 4 and trail 5. These areas are somewhat enclosed by forest or have less open space than the marshes. There are osprey nests located at the end of trails 4 and 5.

All areas of the property were surveyed although not with the regularity of the above described routes. The surveys were performed once each month for a period of three days. Surveys were performed over one full calendar year, as indicated above.

Mammal Surveys

Small mammal trapping was performed to obtain information on the species composition within Cedar Point. Mammal trap sites were selected to sample the variety of habitats found within the study area. Traps were placed adjacent to animal trails in order to take advantage of their known travel paths. Sherman Live Traps (4" x 4" x 12") were placed in the vicinity of the reptile arrays for ease of monitoring and were set and checked during the monthly surveys.

Small mammals were also trapped during the course of the reptile surveys, which were also documented for inclusion into these surveys. Evidence of larger mammalian species was documented during the course of all surveys, which included visual documentation, track identification, scat identification, or other signs leading to positive identification.

Herpetofaunal Surveys

Three arrays were erected and used as the primary survey method for snakes and other reptiles and amphibians within the study area. The array is a system of funnel traps and bucket traps attached to drift fences that was adapted from a design used by Dalrymple (Dade County, Florida) and Matthew Wingate (Jacksonville DEP). This is illustrated in detail in Figure 4.

The funnel traps were constructed of cylinders of one-fourth inch hardware cloth (or one-fourth inch plastic cloth) approximately one meter in length and one third meter in diameter. They were fitted on both ends with funnels made from the same material.

The bucket traps were five gallon plastic buckets buried up to the rim at ground level. Bucket traps were installed at the center and at each end of the arms of each array.

The arrays were installed with three arms, each arm five meters long, half meter high, and constructed of aluminum sheeting. Each array contained a total of ten traps (four bucket and six funnel traps).

Array locations are described as follows:

- HA1 (Array 1) - Located just after the first fork in the main trail. Habitat type is mainly young hardwood hammock - canopy contains mature oaks and understory consists of young sapling trees. Ground cover vegetation is fairly sparse.
- HA2 (Array 2) - Located at end of trail 6 on small island. Salt marsh surrounds the island with a major tidal creek located on the east side of the island. Vegetation is mainly southern red cedar trees and *Ilex* spp. Ground cover is sparse.
- HA3 (Array 3) - Located along trail 3. Area is mature oak/hickory hammock with transition to saw palmetto/pine/cedar habitat. Understory of oak/hickory hammock consists of a wide variety of species of moderate density.

Other Animals

Other animals, such as insects, arachnids, etc. were observed during the performance of the above mentioned surveys and the vegetation surveys. Some dip-netting was done in aquatic environments to sample some of the aquatic species. These species are included in the wildlife species list.

Another survey technique used was the scent station. This methodology was provided by James McRacken, Biologist with the Department of Environmental Protection. A scent station is a circular area of ground, approximately 4.0 feet in diameter, that has been cleared of all debris and smoothed out. On this area a layer of fine material such as lime is placed about one half to one inch thick. The lime is then made very smooth. In the center of the circle, a generous squirt of target species urine is placed. The theory is that an animal will come along, smell the urine, stop to investigate, and then leave its footprints in the lime for easy identification.

Vegetation Surveys

Vegetation surveys were conducted using methodology adapted from the Army Corps of Engineers Wetland Delineation Manual (Appendix A). This methodology was used because it produced the most objective results. With this, a land cover map was generated from actual ground observations and aerial photography. First, on an aerial photograph, lines were drawn depicting what appeared to be changes in vegetative cover. Then, each one of these different areas was visited, vegetation surveys were conducted, and then the differences or similarities noted. The different habitats were then mapped as seen in Figure 5. A list of plant species found on site can be found in Table 1.

For comparison purposes, the Land Cover/Land Use map generated by the SJRWMD is included as Figure 6.

Plant species found outside of the survey plots are included in the species list but were not used to determine dominance.

Results

This survey is by no means comprehensive and complete. Surveys were conducted during the daytime hours except for one night time survey. Aquatic species were not scientifically sampled due to lack of equipment and difficulty of access. Wildlife species observed are only those species that were trapped, easily seen, heard or were determined by other signs such as tracks and scat. Many animal species are very secretive in their habits and are not easily viewed even in the best of situations.

Habitat Types

The habitat types found at Cedar Point are coastal maritime hammock, mixed forested uplands, scrub, pine flatwoods, freshwater ponds, pine dominated-salt influenced forest, wetland mixed forest, and salt marshes.

Coastal Maritime Hammock. 102.2 acres This is the most prevalent habitat type on the property. It is dominated by live oak (*Quercus virginiana*) in the canopy and cabbage palm (*Sabal palmetto*) in the shrub layer. Other species include southern red cedar (*Juniperus silicicola*), pignut hickory (*Carya glabra*), water oak (*Quercus nigra*), sweetgum (*Liquidambar styraciflua*), wax myrtle (*Myrica cerifera*), swamp dogwood (*Cornus foemina*), sparkleberry (*Vaccinium arboreum*), highbush blueberry (*Vaccinium corymbosum*) black cherry (*Prunus serotina*), yaupon holly (*Ilex vomitoria*), cross vine (*Bignonia capriolata*), nut-rush (*Scleria triglomerata*), longleaf spangle grass (*Chasmanthum sessiliflorum*), pepper vine (*Ampelopsis arborea*), magnolia (*Magnolia grandiflora*), virginia creeper (*Parthenocissus quinquefolia*), spanish moss (*Tillandsia usneoides*), greenbrier (*Smilax* spp.), grape (*Vitis* spp.), and poison ivy (*Rhus radicans*).

Pine dominated - salt influenced forest. 57.5 acres This pine forest occurs mostly on the edges of the property where the salt marshes and coastal maritime hammock meet. It is dominated by loblolly and slash pine and cabbage palm and appears to be irregularly inundated by the tide. Other species present include southern red cedar, yaupon holly, and marsh elder (*Iva frutescens*).

Pine flatwoods. 42.53 acres The pine flatwoods are typical of Florida. Dominated by pond, loblolly and slash pines (*Pinus elliottii*) with an understory consisting of saw palmetto and gallberry.

Shrub/scrub. 4.2 acres This is a small area that is dominated by saw palmetto, gallberry, red bay (*Persea borbonia*) and rusty lyonia and is practically impenetrable. There are no trees forming a canopy although there are many tree species present. Among them are several species of oak of which none have reached tree stature yet. The tallest species (oaks and lyonia) reach a height of approximately 10 to 20 feet. This area is mainly located between the pine flatwoods and the coastal maritime hammock. If fire is kept out of this area, it could likely succeed to hardwood forest in time. However, if fire should occur here, it would most likely kill the hardwoods and the area would succeed toward a pine flatwoods type of community.

Freshwater Ponds. 2.52 acres There are several freshwater ponds on the property. They are shallow -- approximately one to two feet deep. Most are open with no emergent vegetation and in one pond, early preliminary surveys found widgeon-grass (*Ruppia maritima*) to be present. Widgeon-grass was not found during these surveys. One pond is associated with the wetland mixed forest and is dominated by swamp tupelo (*Nyssa sylvatica*). It has a dense cover of sawgrass (*Cladium jamaicense*) over approximately 50% of the pond.

Mixed Forested Uplands 2.23 acres This area is dominated by laurel oak (*Quercus laurifolia*). Other species present include longleaf pine (*Pinus palustris*), loblolly pine (*Pinus taeda*), water oak, saw palmetto (*Serenoa repens*), gallberry (*Ilex glabra*), blackjack oak (*Quercus marilandica*), highbush blueberry, rusty lyonia (*Lyonia ferruginea*), American holly (*Ilex opaca*), bracken fern (*Pteridium aquilinum*), wild olive (*Osmanthus americana*), muscadine grape (*Vitis rotundifolia*), cross vine, and greenbrier.

Wetland Mixed Forest 2.1 acres This area is dominated by pond pine (*Pinus serotina*), swamp tupelo, and slash pine. Other species include red bay, saw palmetto, yaupon holly, sweet bay (*Magnolia virginiana*), wax myrtle, highbush blueberry, cinnamon fern (*Osmunda cinnamomea*), chain fern (*Woodwardia virginica*), and red chokeberry (*Aronia arbutifolia*).

Salt marshes. The salt marshes are typical of the salt marshes in northeast Florida. Here they extend beyond the property boundaries on three sides. Depending on elevation and tidal inundation, among other factors, the marshes are primarily dominated by either needle rush (*Juncus roemerianus*) or smooth cordgrass (*Spartina alterniflora*). Other plants in the salt marsh include sea lavender (*Limonium carolinianum*), glasswort (*Salicornia virginica*), and saltgrass (*Distichlis spicata*).

Among these fairly distinct habitat types are areas of transition (ecotones) where delineations are less clear. These areas typically contain species of two or more habitat types. An example is the area between the salt marshes and upland forests. Species found in these areas include sea ox-eye daisy (*Borrchia frutescens*), marsh elder, matrimony vine (*Lycium carolinianum*), sea myrtle (*Baccharis halimifolia*), seaside gerardia (*Agalinus maritima*), and sea purslane (*Sesuvium portulacastrum*) in addition to upland species such as pines, oak, cabbage palm, etc.

Vegetation and Wildlife Inventories

Table 1 is the list of plant species found at Cedar Point.

Table 2 lists the bird species observed and in which month they were seen. The time frame begins in Jan 1995 and ends in Mar 1996. The months of February, March and December of 1995 and January of 1996 are missing. Surveys were not completed in these months for various reasons. The Yellow-crowned Night Heron was seen at a date outside of this time frame and therefore has no month listed.

Table 3 lists the bird species observed and their expected time of occurrence based on data provided by the Duval County Audubon Society.

Table 4 lists other animal species observed at Cedar Point.

Table 5 shows the plant and animal species that are listed by the Florida Game and Freshwater Fish Commission (FGFWFC), US Fish and Wildlife Service (USFWS), and/or the Florida Department of Agriculture and Consumer Services (FDA) as requiring or needing special protection. This information was taken from "Florida's Endangered Species, Threatened Species and Species of Special Concern - Official Lists and the Primary Laws and Regulations Accommodating Their Welfare", August 1997, Florida Game and Fresh Water Fish Commission.

Table 6 shows the status of plants and animals tracked by the Florida Natural Areas Inventory (FNAI). This information shows the species status on a global scale, a state scale and the number of locations recorded in the state where the species has been documented. Not all locations have been documented by FNAI.

Table 1. Vegetation List¹

Scientific Name	Common Name
<i>Agalinus maritima</i>	seaside gerardia
<i>Amorpha fruticosa</i>	indigo bush
<i>Ampelopsis arborea</i>	pepper vine
<i>Andropogon elliotii</i>	broom straw
<i>Aralia spinosa</i>	devil's walking stick
<i>Arisaema dracontium</i>	green dragon
<i>Aronia arbutifolia</i>	red chokeberry
<i>Baccharis halimifolia</i>	sea myrtle
<i>Bacopa monnieri</i>	coastal water hyssop
<i>Batis maritima</i>	salt wort
<i>Bignonia capriolata</i>	crossvine
<i>Borrichia frutescens</i>	sea ox-eye daisy
<i>Bumelia tenax</i>	buckthorn
<i>Callicarpa americana</i>	beauty berry
<i>Campsis radicans</i>	trumpet vine
<i>Carphephorus odoratissimus</i>	vanilla plant
<i>Carya glabra</i>	pignut hickory
<i>Chasmanthium sessiliflorum</i>	long leaf spangle grass
<i>Cladium jamaicense</i>	sawgrass
<i>Cnidoscolus stimulosus</i>	stinging nettle
<i>Cornus foemina</i>	swamp dogwood
<i>Cynanchum angustifolium</i>	milkweed vine
<i>Distichlis spicata</i>	saltgrass
<i>Elephantopus elatus</i>	elephant's foot
<i>Epidendrum conopseum</i>	green fly orchid
<i>Eriocaulon decangulare</i>	pipewort
<i>Erythrina herbacea</i>	coral bean

¹ An asterisk denotes a listed species. See Table 5 for listed species status.

Scientific Name	Common Name
<i>Fimbristylis</i> spp.	
<i>Forestiera segregata</i>	Florida privet
<i>Gelsemium sempervirens</i>	yellow jessamine
<i>Hamamelis virginiana</i>	witch hazel
<i>Ilex glabra</i>	gallberry
<i>Ilex opaca</i>	American holly
<i>Ilex vomitoria</i>	yaupon holly
<i>Iva frutescens</i>	marsh elder
<i>Juncus roemerianus</i>	black rush, needle rush
<i>Juniperus silicicola</i>	southern red cedar
<i>Leucothoe racemosa</i>	dog hobble
<i>Limonium carolinianum</i>	sea lavender
<i>Liquidambar styraciflua</i>	sweetgum
<i>Lorinseria areolata</i>	dimorphic chain fern
<i>Lycium carolinianum</i>	matrimony vine
<i>Lyonia ferruginea</i>	rusty lyonia
<i>Magnolia grandiflora</i>	magnolia
<i>Magnolia virginiana</i>	sweet bay
<i>Monotropa uniflora</i>	indian pipes
<i>Morus rubra</i>	red mulberry
<i>Myrica cerifera</i>	wax myrtle
<i>Nyssa sylvatica</i>	swamp tupelo
<i>Osmanthus americana</i>	wild olive
<i>Osmunda cinnamomea</i>	cinnamon fern
<i>Osmunda regalis</i>	royal fern
<i>Panicum commutatum</i>	
<i>Panicum</i> spp.	
<i>Parthenocissus quinquefolia</i>	Virginia creeper
<i>Persea borbonia</i>	red bay
<i>Phlebodium aureum</i>	golden polypody
<i>Phoradendron serotinum</i>	mistletoe
<i>Pinus elliotii</i>	slash pine
<i>Pinus palustris</i>	longleaf pine
<i>Pinus serotina</i>	pond pine
<i>Pinus taeda</i>	loblolly pine
<i>Polypodium polypodioides</i>	resurrection fern
<i>Prunus serotina</i>	black cherry
<i>Prunus umbellata</i>	hog plum
<i>Pteridium aquilinum</i>	bracken fern
<i>Quercus laurifolia</i>	laurel oak
<i>Quercus marilandica</i>	blackjack oak
<i>Quercus myrtifolia</i>	myrtle oak
<i>Quercus nigra</i>	water oak
<i>Quercus pumila</i>	running oak
<i>Quercus virginiana</i>	live oak
<i>Rhus radicans</i>	poison ivy
<i>Ruellia caroliniensis</i>	ruellia

Scientific Name	Common Name
<i>Ruppia maritima</i> .	widgeon-grass
<i>Sabal palmetto</i>	cabbage palm
<i>Salicornia virginica</i>	glasswort
<i>Salvia lyrata</i>	lyre-leaf sage
<i>Scleria triglomerata</i>	nut-rush
<i>Serenoa repens</i>	saw palmetto
<i>Sesuvium portulacastrum</i>	sea purslane
<i>Sida rhombifolia</i>	
<i>Smilax auriculata</i>	
<i>Smilax bona-nox</i>	greenbrier
<i>Smilax glauca</i>	saw briar
<i>Smilax laurifolia</i>	bamboo vine
<i>Smilax pumila</i>	sarsaparilla vine
<i>Smilax rotundifolia</i>	
<i>Spartina alterniflora</i>	cord grass
<i>Spartina bakeri</i>	sand cord grass
<i>Spartina patens</i>	marsh-hay cord grass
<i>Sporobolus spp.</i>	
<i>Spiranthes vernalis</i>	spring ladies' tresses
<i>Stenotaphrum secundatum</i>	St. Augustine grass
<i>Tillandsia recurvata</i>	ball moss
<i>Tillandsia usneoides</i>	spanish moss
<i>Tradescantia ohiensis</i>	spiderwort
<i>Tripsacum dactyloides</i>	eastern gamma grass
<i>Vaccinium arboreum</i>	sparkleberry
<i>Vaccinium corymbosum</i>	highbush blueberry
<i>Vaccinium myrsinites</i>	shiny blueberry
<i>Vaccinium stamineum</i>	dwarf blueberry
<i>Verbena brasiliensis</i>	verbena
<i>Vicia acutifolia</i>	vetch
<i>Vitis rotundifolia</i>	muscadine grape
<i>Woodwardia virginica</i>	Virginia chain fern
<i>Yucca aloifolia</i>	spanish bayonets
<i>Yucca filamentosa</i>	beargrass

Table 2. Bird Species Observed By Month²

Common Name	Scientific Name	Jan 95	Apr/ May	Jun 95	Jul 95	Aug 95	Sep 95	Oct 95	Nov 95	Feb 96	Mar 96
American Anhinga	<i>Anhinga anhinga</i>	x			x	x	x	x	x		x
American Crow	<i>Corvus brachyrhynchos</i>	x						x			
American Goldfinch	<i>Carduelis tristis</i>	x									
American Kestrel	<i>Falco sparverius</i>	x						x			
American Redstart	<i>Setophaga ruticilla</i>					x	x	x			
American Robin	<i>Turdus migratorius</i>	x								x	x
American Woodcock	<i>Philohela minor</i>	x									
Bald Eagle	<i>Haliaeetus leucocephalus</i>	x							x	x	x
Barred Owl	<i>Strix varia</i>				x						
Belted Kingfisher	<i>Megasceryle alcyon</i>	x				x	x	x	x	x	x
Black Skimmer	<i>Rynchops niger</i>			x							
Black Vulture	<i>Coragyps atratus</i>	x				x	x	x	x	x	x
Black-and-White Warbler	<i>Mniotilta varia</i>					x	x	x	x		x
Black-bellied Plover	<i>Pluvialis squatarola</i>	x									
Black-crowned Night Heron	<i>Nycticorax nycticorax</i>				x						
Black-throated Blue Warbler	<i>Dendroica caerulescens</i>						x	x			
Blue Jay	<i>Cyanocitta cristata</i>	x	x			x	x	x	x	x	x
Blue-gray Gnatcatcher	<i>Poliophtila caerulea</i>			x	x				x		x
Boat-tailed Grackle	<i>Quiscalus major</i>	x									
Brown Pelican	<i>Pelicanus occidentalis</i>	x							x	x	x
Carolina Wren	<i>Thryothorus ludovicianus</i>	x	x	x		x	x	x	x	x	x
Cedar Waxwing	<i>Bombycilla cedrorum</i>	x								x	
Chipping Sparrow	<i>Spizella passerina</i>	x									
Chuck-will's-widow	<i>Caprimulgus carolinensis</i>					x	x				
Clapper Rail	<i>Rallus longirostris</i>	x		x	x	x	x	x	x	x	x
Common Bobwhite	<i>Colinus virginianus</i>						x				
Common Loon	<i>Gavia immer</i>	x									
Common Nighthawk	<i>Chordeiles minor</i>										x
Common Screech Owl	<i>Otus asio</i>										
Common Yellowthroat	<i>Geothlypis trichas</i>	x						x	x	x	x
Double-crested Cormorant	<i>Phalacrocorax auritus</i>	x						x	x	x	x
Downy Woodpecker	<i>Picoides pubescens</i>	x			x	x	x	x	x	x	x
Eastern Phoebe	<i>Sayornis phoebe</i>	x							x		x
Fish Crow	<i>Corvus ossifragus</i>							x			
Forster's Tern	<i>Sterna forsteri</i>	x								x	x
Gray Catbird	<i>Dumetella carolinensis</i>	x						x	x	x	x
Great Blue Heron	<i>Ardea herodias</i>	x		x	x	x	x	x	x	x	x
Great Crested Flycatcher	<i>Myiarchus crinitus</i>		x	x	x						
Great Egret	<i>Casmerodius albus</i>	x		x	x	x	x	x	x	x	x

² An asterisk denotes a listed species. See Table 5 for listed species status.

Common Name	Scientific Name	Jan 95	Apr/ May	Jun 95	Jul 95	Aug 95	Sep 95	Oct 95	Nov 95	Feb 96	Mar 96
Great Horned Owl	<i>Bubo virginianus</i>	x									x
Green Heron	<i>Butorides striatus</i>			x		x	x	x	x		
Hermit Thrush	<i>Catharus guttatus</i>	x							x	x	x
Herring Gull	<i>Larus argentatus</i>	x									
Hooded Merganser	<i>Lophodytes cucullatus</i>	x							x		x
Killdeer	<i>Charadrius vociferus</i>	x								x	
Lesser Yellowlegs	<i>Tringa flavipes</i>									x	
Little Blue Heron	<i>Florida caerulea</i>	x		x	x	x	x	x		x	x
Loggerhead Shrike	<i>Lanius ludovicianus</i>	x						x			
Louisiana Waterthrush	<i>Celurus motacilla</i>					x	x				
Marsh Wren	<i>Cistothorus palustris</i>										x
Martin	<i>Falco columbarius</i>							x			
Mourning Dove	<i>Zenaida macroura</i>	x				x	x	x		x	x
Northern Cardinal	<i>Cardinalis cardinalis</i>	x	x	x	x	x	x	x	x	x	x
Northern Harrier	<i>Circus cyaneus</i>									x	x
Northern Mockingbird	<i>Mimus polyglottos</i>	x				x	x	x	x	x	x
Northern Parula Warbler	<i>Parula americana</i>		x	x	x	x	x				x
Northern Waterthrush	<i>Seiurus noveboracensis</i>					x	x				
Osprey	<i>Pandion haliaetus</i>	x		x	x	x	x	x	x	x	x
Ovenbird	<i>Seiurus aurocapillus</i>						x				
Painted Bunting	<i>Passerina ciris</i>		x	x	x						
Palm Warbler	<i>Dendroica palmarum</i>									x	x
Peregrin Falcon	<i>Falco peregrinus</i>							x			
Pied-billed Grebe	<i>Podilymbus podiceps</i>	x							x		x
Pileated Woodpecker	<i>Melanerpes erythrocephalus</i>	x				x	x	x	x	x	x
Pine Warbler	<i>Dendroica pinus</i>							x		x	x
Purple Martin	<i>Progne subis</i>			x							
Red-bellied Woodpecker	<i>Melanerpes carolinus</i>	x	x	x	x	x	x	x	x	x	x
Red-breasted Merganser	<i>Mergus cerraator</i>	x									x
Red-eyed Vireo	<i>Vireo olivaceus</i>		x	x	x						
Red-headed Woodpecker	<i>Melanerpes erythrocephalus</i>								x		
Red-shouldered Hawk	<i>Buteo lineatus</i>				x	x	x	x	x	x	x
Red-tailed Hawk	<i>Buteo jamaicensis</i>	x	x		x	x	x	x		x	x
Red-winged Blackbird	<i>Agelaius phoeniceus</i>	x							x	x	x
Ring-billed Gull	<i>Larus delawarensis</i>	x								x	x
Ruby-crowned Kinglet	<i>Regulus calendula</i>	x						x	x	x	x
Rufous-sided Towhee	<i>Pipilo erythrophthalmus</i>	x		x				x	x	x	x
Sedge Wren	<i>Cistothorus platensis</i>								x		
Sharp-shinned Hawk	<i>Accipiter striatus</i>								x		x
Snowy Egret	<i>Egretta thula</i>	x		x	x	x	x	x	x	x	x
Solitary Vireo	<i>Vireo solitarius</i>	x								x	x
Spotted Sandpiper	<i>Actitis macularia</i>								x		
Summer Tanager	<i>Piranga rubra</i>			x							
Tree Swallow	<i>Iridoprocne bicolor</i>	x		x				x			x

Common Name	Scientific Name	Jan 95	Apr/ May	Jun 95	Jul 95	Aug 95	Sep 95	Oct 95	Nov 95	Feb 96	Mar 96
Tri-colored Heron	<i>Hydranassa tricolor</i>	x		x	x	x	x	x			x
Tufted Titmouse	<i>Parus bicolor</i>	x	x	x	x	x	x	x	x	x	x
Turkey Vulture	<i>Cathartes aura</i>	x		x		x	x	x	x	x	x
White Ibis	<i>Eudocimus albus</i>	x			x	x	x	x	x		x
White Pelican	<i>Pelicanus erythrorhynchos</i>	x							x		
White-eyed Vireo	<i>Vireo griseus</i>	x		x	x	x	x		x	x	x
Willet	<i>Catoptrophorus semipalmatus</i>	x								x	x
Wood Stork	<i>Mycteria americana</i>	x	x	x	x	x	x	x	x	x	x
Wood Thrush	<i>Hylocichla mustelina</i>						x				
Worm-eating Warbler	<i>Helmitheros vermivorus</i>		x			x	x				
Yellow-bellied Sapsucker	<i>Sphyrapicus varius</i>								x	x	x
Yellow-billed Cuckoo	<i>Coccyzus americanus</i>				x	x	x				
Yellow-crowned Night Heron	<i>Nyctanassa violacea</i>										
Yellow-rumped Warbler	<i>Dendroica coronata</i>	x							x	x	x
Yellow-shafted Flicker	<i>Colaptes auratus</i>								x	x	
Yellow-throated Warbler	<i>Dendroica dominica</i>		x			x	x				x

Table 3. Bird Species Occurrence By Time of Year³

Common Name	Scientific Name	Yr	Sum	Win	Mig	Tran
American Anhinga	<i>Anhinga anhinga</i>	x				
American Crow	<i>Corvus brachyrhynchos</i>	x				
American Goldfinch	<i>Carduelis tristis</i>			x		
American Kestrel	<i>Falco sparverius</i>			x		
American Redstart	<i>Setophaga ruticilla</i>				x	
American Robin	<i>Turdus migratorius</i>			x		
American Woodcock	<i>Philohela minor</i>			x		
Bald Eagle	<i>Haliaeetus leucocephalus</i>			x		
Barred Owl	<i>Strix varia</i>	x				
Belted Kingfisher	<i>Megaceryle alcyon</i>				x	
Black Skimmer	<i>Rynchops niger</i>	x				
Black Vulture	<i>Coragyps atratus</i>	x				
Black-and-White Warbler	<i>Mniotilta varia</i>			x		
Black-bellied Plover	<i>Pluvialis squatarola</i>			x		
Black-crowned Night Heron	<i>Nycticorax nycticorax</i>	x				
Black-throated Blue Warbler	<i>Dendroica caerulescens</i>				x	
Blue Jay	<i>Cyanocitta cristata</i>	x				
Blue-gray Gnatcatcher	<i>Polioptila caerulea</i>	x				
Boat-tailed Grackle	<i>Quiscalus major</i>	x				
Brown Pelican	<i>Pelicanus occidentalis</i>	x				

³ Yr = year-round resident; Sum = summer resident; Win = winter resident; Mig = migrant; Tran = transient

Common Name	Scientific Name	Yr	Sum	Win	Mig	Tran
Carolina Wren	<i>Thryothorus ludovicianus</i>	x				
Cedar Waxwing	<i>Bombycilla cedrorum</i>			x		
Chipping Sparrow	<i>Spizella passerina</i>			x		
Chuck-will's-widow	<i>Caprimulgus carolinensis</i>		x			
Clapper Rail	<i>Rallus longirostris</i>	x				
Common Bobwhite	<i>Colinus virginianus</i>	x				
Common Flicker	<i>Colaptes auratus</i>	x				
Common Loon	<i>Gavia immer</i>			x		
Common Nighthawk	<i>Chordeiles minor</i>		x			
Common Screech Owl	<i>Otus asio</i>	x				
Common Yellowthroat	<i>Geothlypis trichas</i>	x				
Double-crested Cormorant	<i>Phalacrocorax auritus</i>	x				
Downy Woodpecker	<i>Picoides pubescens</i>	x				
Eastern Phoebe	<i>Sayornis phoebe</i>			x		
Fish Crow	<i>Corvus ossifragus</i>	x				
Forster's Tern	<i>Sterna forsteri</i>			x		
Gray Catbird	<i>Dumetella carolinensis</i>	x				
Great Blue Heron	<i>Ardea herodias</i>	x				
Great Crested Flycatcher	<i>Myiarchus crinitus</i>		x			
Great Egret	<i>Casmerodius albus</i>	x				
Great Horned Owl	<i>Bubo virginianus</i>	x				
Green Heron	<i>Butorides striatus</i>	x				
Hermit Thrush	<i>Catharus guttatus</i>			x		
Herring Gull	<i>Larus argentatus</i>			x		
Hooded Merganser	<i>Lophodytes cucullatus</i>			x		
Killdeer	<i>Charadrius vociferus</i>	x				
Lesser Yellowlegs	<i>Tringa flavipes</i>			x		
Little Blue Heron	<i>Florida caerulea</i>	x				
Loggerhead Shrike	<i>Lanius ludovicianus</i>	x				
Louisiana Waterthrush	<i>Ceirus motacilla</i>				x	
Marsh Wren	<i>Cistothorus palustris</i>	x				
Merlin	<i>Falco columbarius</i>					x
Mourning Dove	<i>Zenaida macroura</i>	x				
Northern Cardinal	<i>Cardinalis cardinalis</i>	x				
Northern Harrier	<i>Circus cyaneus</i>			x		
Northern Mockingbird	<i>Mimus polyglottos</i>	x				
Northern Parula Warbler	<i>Parula americana</i>		x			
Northern Waterthrush	<i>Seiurus noveboracensis</i>				x	
Osprey	<i>Pandion haliaetus</i>	x				
Ovenbird	<i>Seiurus aurocapillus</i>				x	
Painted Bunting	<i>Passerina ciris</i>		x			
Palm Warbler	<i>Dendroica palmarum</i>			x		
Peregrin Falcon	<i>Falco peregrinus</i>					x
Pied-billed Grebe	<i>Podilymbus podiceps</i>	x				
Pileated Woodpecker	<i>Melanerpes erythrocephalus</i>	x				
Pine Warbler	<i>Dendroica pinus</i>	x				
Purple Martin	<i>Progne subis</i>	x				

Common Name	Scientific Name	Yr	Sum	Win	Mig	Tran
Red-bellied Woodpecker	<i>Melanerpes carolinus</i>	x				
Red-breasted Merganser	<i>Mergus cerrator</i>			x		
Red-eyed Vireo	<i>Vireo olivaceus</i>		x			
Red-headed Woodpecker	<i>Melanerpes erythrocephalus</i>	x				
Red-shouldered Hawk	<i>Buteo lineatus</i>	x				
Red-tailed Hawk	<i>Buteo jamaicensis</i>	x				
Red-winged Blackbird	<i>Agelaius phoeniceus</i>	x				
Ring-billed Gull	<i>Larus delawarensis</i>	x				
Ruby-crowned Kinglet	<i>Regulus calendula</i>			x		
Rufous-sided Towhee	<i>Pipilo erythrophthalmus</i>	x				
Sedge Wren	<i>Cistothorus platensis</i>		x			
Sharp-shinned Hawk	<i>Accipiter striatus</i>			x		
Snowy Egret	<i>Egretta thula</i>	x				
Solitary Vireo	<i>Vireo solitarius</i>			x		
Spotted Sandpiper	<i>Actitis macularia</i>			x		
Summer Tanager	<i>Piranga rubra</i>		x			
Tree Swallow	<i>Iridoprocne bicolor</i>			x		
Tri-colored Heron	<i>Hydranassa tricolor</i>	x				
Tufted Titmouse	<i>Parus bicolor</i>	x				
Turkey Vulture	<i>Cathartes aura</i>	x				
White Ibis	<i>Eudocimus albus</i>	x				
White Pelican	<i>Pelicanus erythrorhynchos</i>					x
White-eyed Vireo	<i>Vireo griseus</i>	x				
Willet	<i>Catoptrophorus semipalmatus</i>	x				
Wood Stork	<i>Mycteria americana</i>	x				
Wood Thrush	<i>Hylocichla mustelina</i>				x	
Worm-eating Warbler	<i>Helmitheros vermivorus</i>				x	
Yellow-bellied Sapsucker	<i>Sphyrapicus varius</i>			x		
Yellow-billed Cuckoo	<i>Coccyzus americanus</i>		x			
Yellow-crowned Night Heron	<i>Nyctanassa violacea</i>	x				
Yellow-rumped Warbler	<i>Dendroica coronata</i>			x		
Yellow-throated Warbler	<i>Dendroica dominica</i>	x				

Table 4. Animal Species Observed

Common Name	Scientific Name	Classification
Amphibians		
Eastern Spadefoot Toad	<i>Scaphiopus holbrookii</i>	
Florida Cricket Frog	<i>Acris gryllus dorsalis</i>	
Gray Treefrog	<i>Hyla chrysoscelis</i>	
Green Treefrog	<i>Hyla cinerea</i>	
Little Grass Frog	<i>Limnaeodius ocularis</i>	
Southern Leopard Frog	<i>Rana sphenoccephala</i>	

Common Name	Scientific Name	Classification
Southern Toad	<i>Bufo terrestris</i>	
Squirrel Treefrog	<i>Hyla squirella</i>	
Arachnids		
Arrow-shaped Micrathena	<i>Micrathena sagittata</i>	
Black and Yellow Argiope	<i>Argiope aurantia</i>	
Carolina Wolf Spider	<i>Lycosa carolinensis</i>	
Crablike Spiny Orb Weaver	<i>Gasteracantha cancriformis</i>	
Daddy Long Legs	<i>Leibonum spp.</i>	
Green Lynx Spider	<i>Peucetia viridans</i>	
Orchard Spider	<i>Lecauege venusta</i>	
Tick	<i>Dermacentor spp.</i>	
Diplopoda		
Millipedes	<i>Narceus spp.</i>	Chordeumida
Insects		
Patent Leather Beetle	<i>Odontoaenius disjunctus</i>	Coleoptera
Tortoise Beetle	<i>Hemishpaerota cyanea</i>	Coleoptera
Deerflies	<i>Chrysops spp.</i>	Diptera
Lovebug	<i>Plecia nearctica</i>	Diptera
Mosquito		Diptera
No-see-um	<i>Culicoides spp.</i>	Diptera
Robber Fly		Diptera
Earwig		Dermaptera
Florida Woods Cockroach	<i>Eurycotis floridana</i>	Dictyoptera
Smoky-brown Cockroach	<i>Periplaneta fuliginosa</i>	Dictyoptera
Southern Green Stink Bug	<i>Nezara viridula</i>	Hemiptera
Wheel Bug	<i>Arilus cristatus</i>	Hemiptera
Cicada		Homoptera
Spittlebug		Homoptera
American Bumble Bee	<i>Bombus pennsylvanicus</i>	Hymenoptera
Honey Bee	<i>Apis mellifera</i>	Hymenoptera
Florida Carpenter Ant	<i>Campototus abdominalis</i>	Hymenoptera
Paper Wasp	<i>Polistes spp.</i>	Hymenoptera
Southern Fire Ant	<i>Solenopsis xyloni</i>	Hymenoptera
Velvet Ant	<i>Dasymutilla occidentalis</i>	Hymenoptera
Bagworm	<i>Thridopteryx ephemeraeform</i>	Lepidoptera
Black Swallowtail	<i>Papilio polyxenes</i>	Lepidoptera
Eastern Tent Caterpillar	<i>Malacosoma americanum</i>	Lepidoptera
Great Southern White	<i>Ascia monuste</i>	Lepidoptera
Long-tailed Skipper	<i>Urbanus proteus</i>	Lepidoptera
Palamedes Swallowtail	<i>Papilio palamedes</i>	Lepidoptera

Common Name	Scientific Name	Classification
Red Admiral	<i>Vanessa atalanta</i>	Lepidoptera
Spicebush Swallowtail	<i>Papilio troilus</i>	Lepidoptera
Tiger Swallowtail	<i>Papilio glaucus</i>	Lepidoptera
Viola's Wood Satyr	<i>Megisto viola</i>	Lepidoptera
Zebra Swallowtail	<i>Eurytides marcellus</i>	Lepidoptera
American Bird Grasshopper	<i>Schistocerca maerica</i>	Orthoptera
Angular-winged Katydid	<i>Microcentrum retinerve</i>	Orthoptera
Southeastern Lubber Grasshopper	<i>Romalea microptera</i>	Orthoptera
Field Cricket	<i>Gryllus spp.</i>	Orthoptera
Mole Cricket	<i>Scapteriscus spp.</i>	Orthoptera
Praying Mantis	<i>Stagmomantis carolina</i>	Orthoptera
Palmetto Stick Insect	<i>Anisomorpha buprestoides</i>	Phasmida
Chilopoda		
Centipedes	<i>Scolopendra spp.</i>	Scutigermorpha
Fish		
Atlantic mummichog	<i>Fundulus heteroclitus</i>	
Red Drum	<i>Sciaenops ocellata</i>	
Mammals		
Armadillo	<i>Dasypus novemcinctus</i>	
Bobcat	<i>Lynx rufus</i>	
Cotton Mouse	<i>Peromyscus gossypinus</i>	
Eastern Gray Squirrel	<i>Sciurus carolinensis</i>	
Eastern Mole	<i>Scalopus aquaticus</i>	
Eastern Woodrat	<i>Neotoma floridana</i>	
Feral Hog	<i>Sus scrofa</i>	
Opossum	<i>Didelphis marsupialis</i>	
Raccoon	<i>Procyon lotor</i>	
River Otter	<i>Lutra canadensis</i>	
White Tail Deer	<i>Odocoileus virginianus</i>	
Reptiles		
Broad-headed Skink	<i>Eumeces laticeps</i>	
Five-lined Skink	<i>Eumeces fasciatus</i>	
Florida Box Turtle	<i>Terrapene carolina bauri</i>	
Florida Cottonmouth	<i>Agkistrodon piscivorus conanti</i>	
Florida Snapping Turtle	<i>Chelydra serpentina osceola</i>	
Green Anole	<i>Anolis carolinensis</i>	
Common Ground Skink	<i>Scincella lateralis</i>	
Red Rat Snake	<i>Elaphe guttata guttata</i>	
Rough Green Snake	<i>Opheodrys aestivus</i>	
Southern Black Racer	<i>Coluber constrictor priapus</i>	
Striped Mud Turtle	<i>Kinosternon bauri</i>	

Table 5. Listed Plant and Animal Species

Common Name	Scientific Name	Status ⁴		
		FGFWFC	USFWS	FDA
Bald Eagle	<i>Haliaeetus leucocephalus</i>	T	T	
Black Skimmer	<i>Rynchops niger</i>	SSC		
Brown Pelican	<i>Pelicanus occidentalis</i>	SSC		
Little Blue Heron	<i>Egretta caerulea</i>	SSC		
Snowy Egret	<i>Egretta thula</i>	SSC		
Tri-colored Heron	<i>Egretta tricolor</i>	SSC		
White Ibis	<i>Eudocimus albus</i>	SSC		
Wood Stork	<i>Mycteria americana</i>	E	E	
Green Fly Orchid	<i>Epidendrum conopseum</i>			C
Cinnamon Fern	<i>Osmunda cinnamomea</i>			C
Royal Fern	<i>Osmunda regalis</i>			C

Table 6. Florida Natural Areas Inventory (FNAI) Flora and Fauna Rankings and Status⁵

Common Name	Scientific Name	FNAI Global Rank	FNAI State Rank	Federal Status	State Status	Number of FNAI recorded locations
American Redstart	<i>Setophaga ruticilla</i>	G5	S3	N	N	2
Bald Eagle	<i>Haliaeetus leucocephalus</i>	G4	S3	LT	LT	947
Black Skimmer	<i>Rynchops niger</i>	G4	S3	N	LS	74
Black-crowned Night Heron	<i>Nycticorax nycticorax</i>	G5	S3?	N	N	96
Brown Pelican	<i>Pelicanus occidentalis</i>	G4	S3	N	LS	130
Florida Panther	<i>Felis concolor coryi</i>	G5T1	S1	LE	LE	12
Great Egret	<i>Ardea alba</i>	G5	S4	N	N	238
Little Blue Heron	<i>Egretta caerulea</i>	G5	S4	N	LS	190
Louisiana Waterthrush	<i>Seiurus motacilla</i>	G5	S3	N	N	2
Merlin	<i>Falco columbarius</i>	G5	SU	N	N	17
Peregrin Falcon	<i>Falco peregrinus</i>	G4	S2	LE+	LE	24
Snowy Egret	<i>Egretta thula</i>	G5	S4	N	LS	25
Southeastern American Kestrel	<i>Falco sparverius paulus</i>	G5T3T4	S3?	N	LT	87
Tri-colored Heron	<i>Egretta tricolor</i>	G5	S4	N	LS	246
White Ibis	<i>Eudocimus albus</i>	G5	S4	N	LS	201

⁴ FGFWFC = Florida Game and Fresh Water Fish Commission; USFWS = US Fish and Wildlife Service; FDA = Florida Department of Agriculture and Consumer Services; E = Endangered; T = Threatened; SSC = Species of Special Concern; C = Commercially Exploited

⁵ See Appendix C for explanation of rankings and status.

Common Name	Scientific Name	FNAI Global Rank	FNAI State Rank	Federal Status	State Status	Number of FNAI recorded locations
Wood Stork	<i>Mycteria americana</i>	G4	S2	LE	LE	149
Worm-eating Warbler	<i>Helmitheros vermivorus</i>	G5	S1	N	N	1
Yellow-crowned Night Heron	<i>Nyctanassa violacea</i>	G5	S3?	N	N	54

Soils⁶

Soils maps are given in Figures 7 and 8. Two of the seven soils are hydric soils -- Leon fine sand, tidal and Tisonia mucky peat.

Evergreen-Wesconnett complex, depressional, 0 to 2% slopes. These are nearly level, very poorly drained soils in shallow depressions and large drainageways. They are ponded for 9 to 12 months in most years. Individual areas range in size from 4 to 1,200 acres. Slopes range from 0 to 2 percent and are smooth to concave.

Typically, the surface layer of the Evergreen soil extends to a depth of about 17 inches. It is black muck in the upper part, black loamy fine sand in the next part, and very dark gray fine sand in the lower part. The subsurface layer, to a depth of about 26 inches, is light brownish gray fine sand. The subsoil, to a depth of about 80 inches, is dark reddish brown loamy fine sand in the upper part and dark reddish brown fine sand in the lower part. Some soils occurring in areas of this map unit are similar to the Evergreen soil but generally have more than 16 inches of organic material where they are in the center of the delineations.

Typically, the surface layer of Wesconnett soil is black fine sand about 2 inches thick. The upper part of the subsoil, between depths of 2 and 32 inches, is weakly cemented fine sand. The upper 8 inches is black, the next 16 inches is dark reddish brown, and the lower 6 inches is dark brown. Below this is a layer of pale brown fine sand about 12 inches thick. The lower part of the subsoil, between depths of 44 and 80 inches, is fine sand. It is weakly cemented, and the sand grains are well coated with organic matter. The upper 28 inches is reddish black, and the lower 8 inches is very dusky red.

Permeability of Evergreen soil is rapid in the organic layer and in the surface and subsurface layers and moderate in the subsoil. The available water capacity is very high in the organic layers and very low or low in the mineral layers. The seasonal high water table is at or above the surface during most of the year. These soils are high in natural fertility.

Under natural conditions, Wesconnett soil has a water table at a depth of 0 to 10 inches, or the soil is covered by water for 6 to 12 months during most years. Permeability is rapid in the surface layer and between depths of 32 and 44 inches and moderate to moderately rapid between depths of 2 and 32 inches and below a depth of 44 inches. Natural fertility is moderate, and organic matter content is high. Available water capacity is moderate.

Natural vegetation in Wesconnett soil consists of baldcypress, sweetbay, magnolia, sweetgum, cabbage palm, holly, and water oak with an understory of waxmyrtle and sparse amounts of creeping

⁶ Soils information is taken directly from the US Department of Agriculture Natural Resources Conservation Service Soil Surveys of Duval and Nassau Counties (Florida).

bluestem, hairy bluestem, and toothache grass. Natural vegetation in Evergreen soils consists of baldcypress and pond pine. The understory includes large gallberry, ferns, water grasses, huckleberry, greenbrier, and southern bayberry.

Hurricane-Ridgewood soils, 0 to 5% slopes. These nearly level and gently sloping, somewhat poorly drained and poorly drained soils are on narrow to broad ridges and on isolated knolls interspersed with flatwoods. The mapped areas range from about 3 to 150 acres. Slopes are smooth or concave or convex.

The Hurricane soil is nearly level and gently sloping and is somewhat poorly drained. Typically, the surface layer is grayish brown fine sand about 5 inches thick. The subsurface layer is fine sand. It extends to a depth of about 68 inches. It is yellowish brown in the upper part, light yellowish brown in the next part, and light gray in the lower part. The subsoil, to a depth of 80 inches or more, is fine sand. It is dark brown in the upper part and dark reddish brown in the lower part. Some soils occurring in areas of this map unit are similar to the Hurricane soil but have a black and very dark gray surface layer about 10 to 30 inches thick.

Typically, the surface layer of the Ridgewood soil is gray fine sand about 7 inches thick. The subsoil, to a depth of about 24 inches, is light yellowish brown fine sand. The substratum, to a depth of 80 inches or more, is fine sand. It is light yellowish brown in the upper part, pale brown in the next part, and light gray in the lower part. Soils occurring in areas of this map unit that are similar to the Ridgewood soil are the Albany and Hurricane soils. These soils have a water table that is slightly higher than that of the Ridgewood soil where they are on the lower parts of the landscape.

The Hurricane soil has a seasonal high water table at a depth of 24 to 42 inches for 2 to 6 months of the year. Permeability is rapid in the upper part of the soil and moderately rapid in the lower part. The available water capacity is very low or low in the surface and subsurface layers and moderate in the subsoil. The content of organic matter and natural fertility are low.

Permeability of the Ridgewood soil is rapid. The available water capacity is very low or low. The seasonal high water table is at a depth of 18 to 42 inches for 2 to 4 months of the year. It rises to a depth of 15 to 24 inches for brief periods of less than 3 weeks. The soil is very low in natural fertility.

The natural vegetation of Hurricane soils consists of longleaf pine, slash pine, turkey oak, and live oak. The understory includes gallberry, pineland threeawn, bluestem, hairy panicum, lovegrass, and broom sedge. The natural vegetation of Ridgewood soils consists of longleaf pine, slash pine, turkey oak, bluejack oak, and live oak. The understory includes American holly, gallberry, and saw palmetto. The most common grasses are pineland threeawn, broomsedge bluestem, and panicum.

Leon fine sand, 0 to 2% slopes. This is a nearly level, poorly drained soil in broad flatwood areas. Individual areas range from 5 to 2,000 acres in size. Slopes range from 0 to 2 percent and are smooth to convex.

Typically, the surface layer is fine sand about 8 inches thick. In the upper 5 inches it is very dark gray, and in the lower 3 inches it is dark gray. The subsurface layer is gray fine sand about 10 inches thick. This subsoil is fine sand that extends to a depth of more than 80 inches. The upper 8 inches of subsoil is black and weakly cemented, the next 11 inches is very dark gray and weakly cemented, the next 8 inches is dark brown, and the lower 35 inches is dark reddish brown and weakly cemented.

Included with this soil in mapping are small areas of Mascotte, Ortega, Pottsburg, Ridgeland, and Wesconnett soils. Also included are small areas of similar soils which the subsoil is at a depth of more than 30 inches. Included soils make up about 10 percent of any mapped area.

Under natural conditions, this soil has a water table at a depth of less than 10 inches for 2 to 4 months and at a depth of 10 to 30 inches for 2 to 8 months during most years. Permeability is moderate to moderately rapid in the weakly cemented layers and rapid in all other layers. Natural fertility is low, and organic matter content is medium. Available water capacity is moderate.

Natural vegetation includes second growth slash pine and longleaf pine, sawpalmetto, inkberry, waxmyrtle, and fetterbush. Native grasses include lopsided indiagrass, pineland threeawn, panicum, and bluestems.

Leon fine sand, 0 to 2% slopes, very frequently flooded (tidal). This nearly level, very poorly drained soil is in narrow tidal marshes bordering flatwoods. It is subject to flooding by normal high tides. The mapped areas range from about 3 to 50 acres. Slopes are smooth and are 0 to 2 percent.

In 96 percent of the areas mapped as Leon fine sand, tidal, Leon soils make up 88 to 100 percent of the map unit. Dissimilar soils make up about 0 to 12 percent. They generally are in areas less than 3 acres in size.

Typically, the surface layer is fine sand about 26 inches thick. It is dark gray in the upper part of the subsoil, to a depth of about 40 inches, is dark grayish brown and dark brown fine sand. Separating the upper and lower parts of the subsoil, to a depth of about 43 inches, is a buried subsurface layer of light gray fine sand. The lower part of the subsoil, to a depth of about 58 inches, is dark brown fine sand. The substratum, to a depth of 80 inches or more, is dark olive gray fine sand.

Included in this map unit are small areas of dissimilar soils. These are Tisonia soils and Arents. Arents are higher on the landscape than the Leon soils, and Tisonia soils are lower.

Permeability of this Leon soil is moderately rapid in the surface layer and moderate or moderately rapid in the subsoil and the substratum. The available water capacity is low to high. The seasonal high water table is at or near the surface during most of the year. The soil is low in natural fertility.

The natural vegetation consists of saltwort, bushy seaoxeye, marshhay cordgrass, seashore cordgrass, batis, and smooth cordgrass.

Salt marshes provide good habitat for a variety of wildlife. The habitat generally is maintained by natural forces and influences, such as by tidal action and periodic hurricanes.

Storms generally create "open" water in salt and brackish marshes and also change salinity levels. The resulting effect is that plant succession is set back and a more favorable habitat can be created for waterfowl, furbearers, and other forms of wildlife, such as wading birds. Artificially created dikes that control salinity are used in managing marsh plants for wildlife. Prescribed burning is also used in marsh management.

Lynn Haven fine sand. This is a nearly level, poorly drained soil in broad flatwood areas. Individual areas range from 5 to 400 acres in size. Slopes range from 0 to 2 percent and are smooth to convex.

Typically, the surface layer is fine sand about 13 inches thick. The upper 7 inches is black, and the lower 6 inches is very dark gray. The subsurface layer is light gray and gray fine sand extending to a depth of 21 inches. The subsoil is weakly cemented fine sand that extends to a depth

of 80 inches or more. The upper 14 inches is black the next 27 inches is dark reddish brown, and the lower 18 inches is dark brown.

Included with this soil in mapping are small areas of Leon, Pottsburg, Ridgeland, and Wesconnett soils. Included areas make up about 10 percent of any mapped area.

Under natural conditions, this soil has a water table at a depth of less than 10 inches for 2 to 4 months and at a depth of 10 to 30 inches for 2 to 8 months during most years. Permeability is moderate to moderately rapid in the weakly cemented layers and rapid in all other layers. Natural fertility is low and organic matter content is high. Available water capacity is moderate.

Natural vegetation consists of second growth slash pine and longleaf pine, sawpalmetto, inkberry, waxmyrtle, and fetterbush. Native grasses include lopsided indiagrass, pineland threeawn, panicum and bluestems.

Pottsburg fine sand, high, 0 to 3% slopes. This is a nearly level, somewhat poorly drained soil on the flatwoods at slightly higher elevations than the surrounding soils. Individual areas range from 5 to 800 acres in size. Slopes range from 0 to 2 percent and are smooth to convex.

Typically, the surface layer is gray fine sand about 3 inches thick. The subsurface layer extends to a depth of 57 inches. It is brown fine sand 7 inches thick, grayish brown fine sand 24 inches thick, and light gray fine sand 23 inches thick. The subsoil, between depths of 57 and 80 inches, is dark reddish brown fine sand that is weakly cemented and well coated with organic matter.

Included with this soil in mapping are small areas of Kershaw, Leon, Mandarin, Ortega, Ridgeland, and Wesconnett soils. Included areas make up about 15 percent of any mapped area.

Under natural conditions, this soil has a water table at a depth of 6 to 12 inches for 2 to 4 months and at a depth of 12 to 40 inches for 6 to 9 months or longer during most years. Permeability is rapid to a depth of 57 inches and moderate below that depth. Natural fertility and organic matter content are low. Available water capacity is low.

Natural vegetation consists of second growth slash pine and longleaf pine, sawpalmetto, blackjack oak, and inkberry. Native grasses include pineland threeawn, broomsedge, bluestem, lopsided indiagrass, chalky bluestem, wild grape, and other perennial grasses.

Tisonia mucky peat. This is a level to nearly level, very poorly drained soil on broad tidal marshes. Individual areas range in size from 4 to 4,000 acres. Slopes range to 0 to 1 percent.

Typically, the surface layer is dark grayish brown mucky peat about 18 inches thick. It is underlain by dark olive gray clay that extends to a depth of 65 inches or more.

Included with this soil in mapping are small areas of Leon, Maurepas, Pamlico, and Ridgeland soils. Also included are small areas of similar soils that have a surface layer less than 16 inches in thickness. Included soils make up about 10 percent of any mapped area.

Under natural conditions, this soil has a water table at a depth of less than 10 inches, or the soil is covered by water for 6 to 12 months during most years. Tidal action inundates this soil twice daily. Permeability is rapid in the surface layer and very slow in the clayey material. Natural fertility is low, and organic matter content is very high. Available water capacity is high.

Natural vegetation is dominantly needlegrass rush, seashore saltgrass, marshhay cordgrass, and smooth cordgrass.

Discussion

Conversations with local area residents and 1940's vintage aerial photography confirm that the majority of the FCT grant acquired parcel has been in a wooded condition for more than 50 years. The middle parcel (the last acquired) once contained many very large pine and oak trees. These were harvested and then a large portion was replanted with slash pine. It appears that these slash pines were harvested probably in the early 1990's and replanted once again. Other parts of the middle parcel were left as open fields and a home was placed on the property about 50 or more years ago. The whole property was used to run cattle and hogs for many years. Eventually the cattle were removed and the home has long since been gone. Many hogs still remain as local residents have kept the area stocked for hunting purposes. Local residents also use the property for hiking, nature study, illegal hunting, target practice, dumping of raccoons, and horseback riding. Pumpkin Hill Creek, which runs along the east edge of the property, is frequently used by fishermen and others with small boats.

The FCT grant parcel has been managed by Mother Nature for many years. The habitat types have been allowed to develop through the various stages of succession without human intervention. The habitats that have developed have adapted to the local environment and are best suited to those conditions. There has been very little disturbance on the parcel which has adversely affected the habitats on the study parcel and therefore restoration activities are not necessary.

The goals of the City in owning this property are:

- Preservation of natural resources;
- Archaeological and historical preservation;
- Education;
- Passive recreation.

To achieve those goals, the City has partnered with the The National Park Service (NPS) to assist in the management of this property. They have prepared a management plan that addresses each of these goals.

Cedar Point is located adjacent to the Timucuan Ecological and Historic Preserve (TEHP). The relationship of Cedar Point to the TEHP and other surrounding public properties is shown in Figure 9. NPS purchased an addition to the TEHP which is the property immediately to the east (formerly known as Buddy's Fish Camp) of the City's Cedar Point. NPS is going through the process of including Cedar Point within its boundary and expects to have that task completed sometime in the year 2000. This action will allow the NPS to manage the City's Cedar Point property along with the old Buddy's Fish Camp Property. The property will be managed as a whole for preservation of natural, archaeological and historical resources, education, and passive recreation. Cedar Point is currently accessed via Cedar Point Road and through other public lands and private lands (see Figure 10). The public lands are owned by the St. Johns River Water Management District (SJRWMD). Because of the problem of crossing private land to access Cedar Point, there will be a bridge built across Pumpkin Hill Creek to connect the NPS and City properties. In order to avoid duplication of

services and minimize environmental impacts, access to the City property will be via the NPS property once the bridge is installed. The current plan is to have the entrance to the area at the NPS side and have the parking, concessions, camping, etc. located there. Once the City's property is incorporated into the Timucuan boundary, then the NPS will take over management of it. The draft management agreement is given in Appendix B.

Recommendations.

Implement NPS management plan. The NPS has an existing management plan that includes the City's Cedar Point property. This plan covers the day-to-day management activities as well as site improvements, trail systems, etc.

Listed Species. The three listed plants species -- Green Fly Orchid, Cinnamon Fern, and Royal Fern - are listed as commercially exploited. These species mainly need to be protected from harvesting by people. Signs posted at the entrances to trails notifying the public that all plants and animals are protected on park property are recommended. The animal species listed -- Bald Eagle, Black Skimmer, Brown Pelican, Little Blue Heron, Snowy Egret, Tri-colored Heron, White Ibis and Wood Stork -- were mainly seen foraging or roosting on the property. It is possible that some species may nest on the property in the future. All these animal species utilize the ponds and/or marshes for foraging. They prefer to utilize trees along the edges of the property for roosting. No special management techniques should be required to maintain these components. Surveys should be conducted regularly to monitor usage by these species so that adjustments can be made as necessary.

Surveys. Surveys should continue on the property as many species of both plants and animals were not found that are very likely to occur on the property. These surveys can be limited to certain times when the target species are most likely to occur such as during reproductive times or migrations. Also, comprehensive surveys should be conducted regularly with a goal of censusing population densities in order to monitor species stability. Surveys should also be conducted before and after any prescribed burning to assess the condition of the habitat.

Exotic species removal. The only exotic species found during these surveys has been the wild hogs. These animals can be quite destructive as they compete with native wildlife for food and shelter. They also disturb the ground while foraging for food and can have an adverse impact on sensitive plant species. It is recommended that the wild hog population level be monitored and kept to a minimum. It is probably impossible to completely eradicate the animals because they travel off of the property and on to private lands where local residents like to keep the animals for hunting purposes. The property should also be monitored for other exotic species, particularly plants. There are known occurrences of exotic invasive plant species on adjacent properties and it is therefore likely that these species can invade the City property.

Other observations. It has been frequently reported that a panther has been seen in the area. Whether this animal is the endangered Florida panther is unknown. Scent stations were placed at some of the locations of these sightings and at other areas where the animal might travel. No footprints were found. However, DEP biologists on the adjacent Pumpkin Hill Creek Buffer Preserve actually saw a

panther. The area certainly has enough wildlife to sustain such an animal. As the park is developed and the public begins to use the property for hiking, biking, etc., it is not expected to have an adverse impact on the panther. Prior to the purchase of the property by the NPS, the site was a fish camp and trailer park. There were several families living there and the site was a popular boat launch area. The area has been used extensively by local area residents for their own brand of resource based recreation. With on site management and controlled recreational activities, impacts to the panther would likely remain the same as before public purchase or decrease. Fewer visitors would be expected on the City owned property due to the distance from the proposed entrance. It would probably be comparable to the amount of use the property received before the City's purchase. Therefore, it would most likely be perceived as "business as usual" from the panther's point of view.

Cedar Point is very popular with ospreys for nesting. There were six active nests found on the property. In order to provide a more accurate count of the nests, an aerial survey was conducted in a small helicopter. It was noted that the birds were not at all bothered by the presence of the aircraft. During the ground surveys, it was also noted that the birds did not seem to be bothered by the presence of humans near their nest trees. It is therefore believed that the presence of recreationists on the property will have no adverse effect on these animals.

Future storm damage. It is recommended that future storm damage, such as fallen and dead standing trees, be left in place. Storms that damage trees are a part of the the natural process and serve many purposes. A fallen tree will create an opening in the canopy which will allow more light to reach the forest floor. Species that require those conditions then have an opportunity to thrive where they otherwise might not. A fallen tree also provides habitat, such as shelter, for a variety of animals. As it decays, it provides needed nutrients and organic material to the soil. A dead or dying standing tree will provide nesting, roosting and/or foraging habitat for a variety of animals.

Prescribed burn plan. The pine flatwoods habitat is one that is adapted to relatively frequent natural fires. This area should have a prescribed burn program developed to mimic the pattern of natural lightning fires. It is suggested that this program include the division of the habitat into smaller units that will be burned at different times to maintain uneven aged stands of vegetation. This will maintain species diversity and provide area fauna with a variety of food, cover and nesting sources. The recommended frequency for burns should be between three and twelve years.

The shrub/scrub area should be left to follow a natural successional pattern without prescribed burning. All of the other habitat types do not require burning for maintenance.

Figure 1

PROPERTY LOCATION

USGS QUAD (1993)

- Project Boundary
- FCT Grant Purchase
- Donation
- Addition

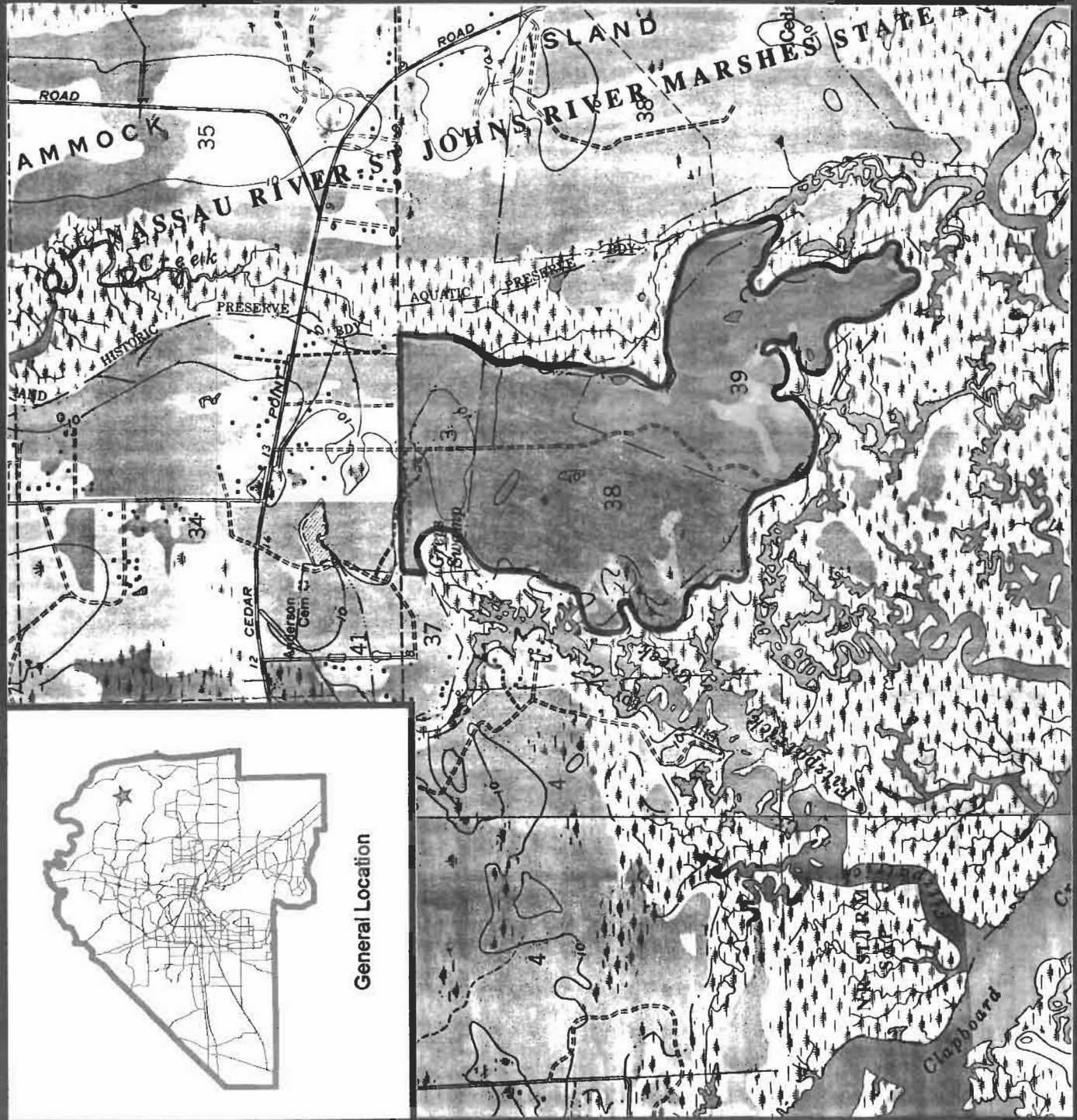


Figure 2

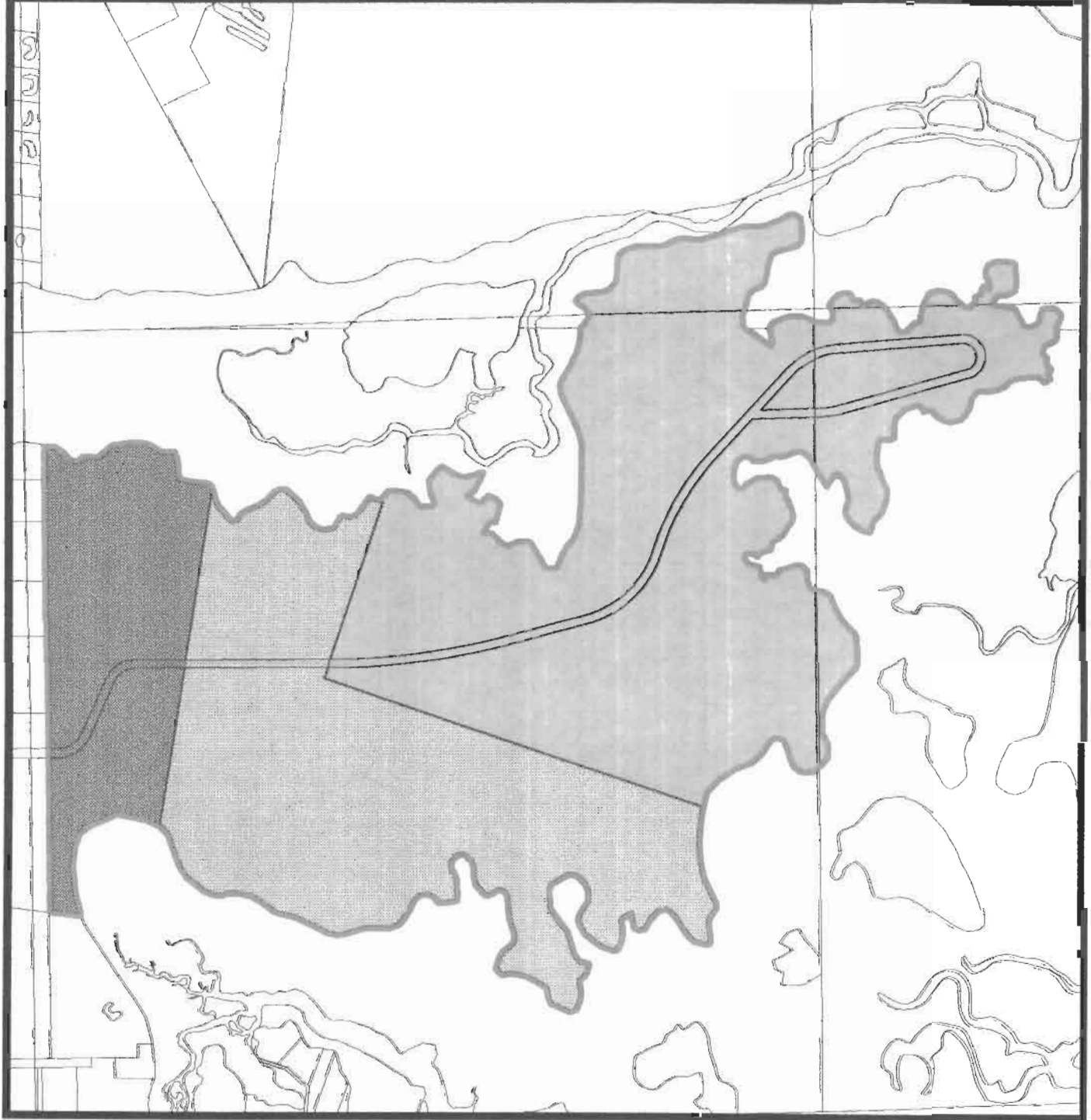
PARCEL BOUNDARIES

FCT Grant Purchase
Donation
Addition



1000 0 1000 Feet

7/10/98
NAMES CHANGE



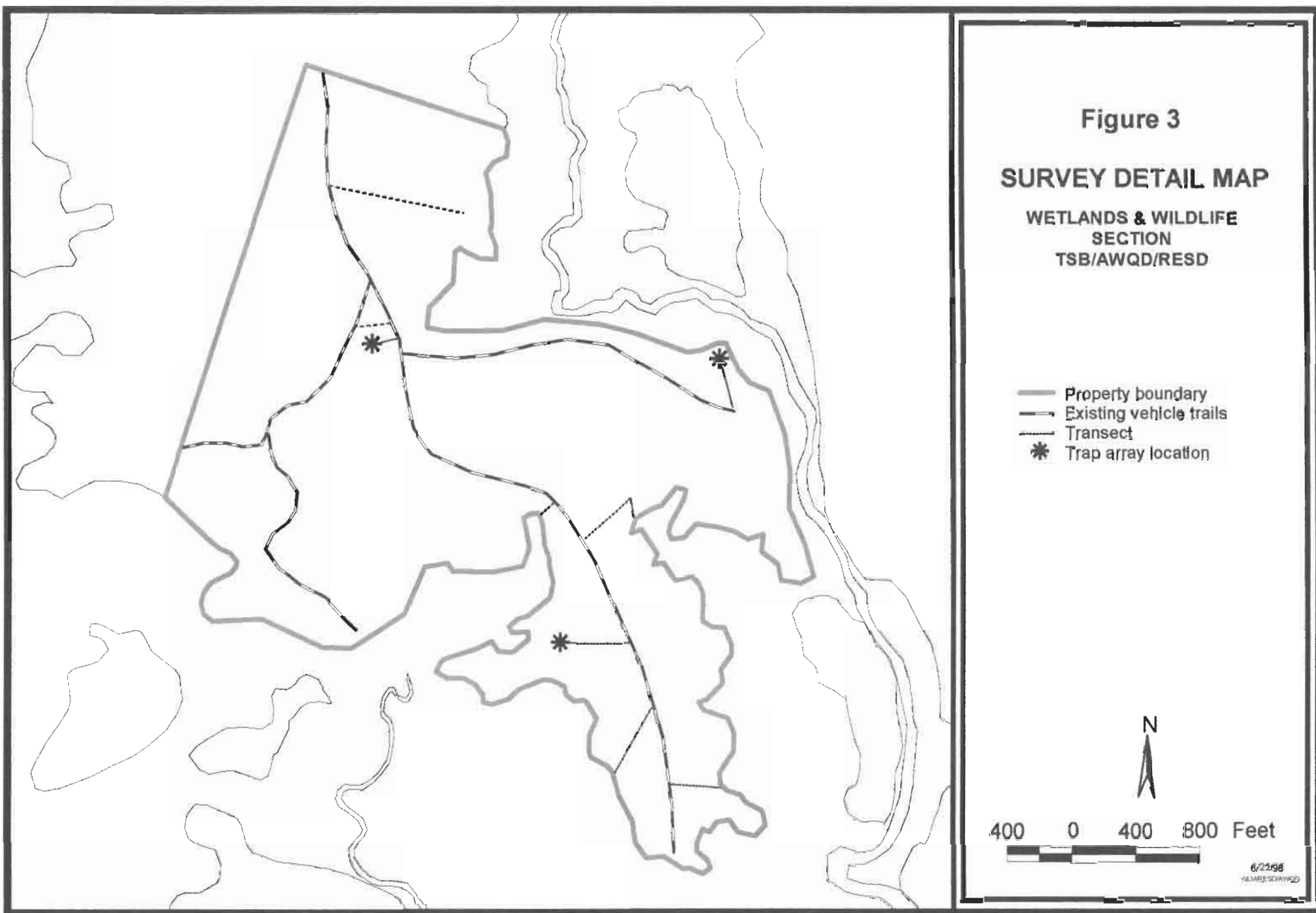
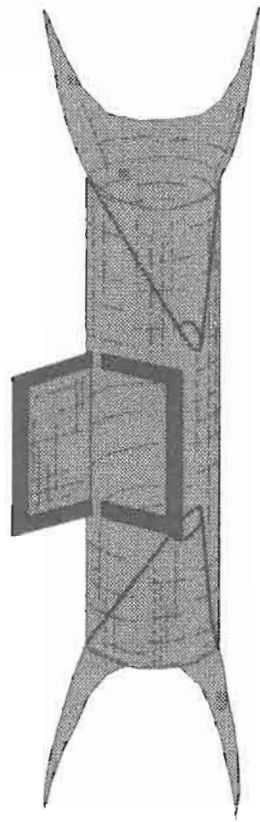


Figure 4
HERPETOFAUNAL
ARRAY DESIGN

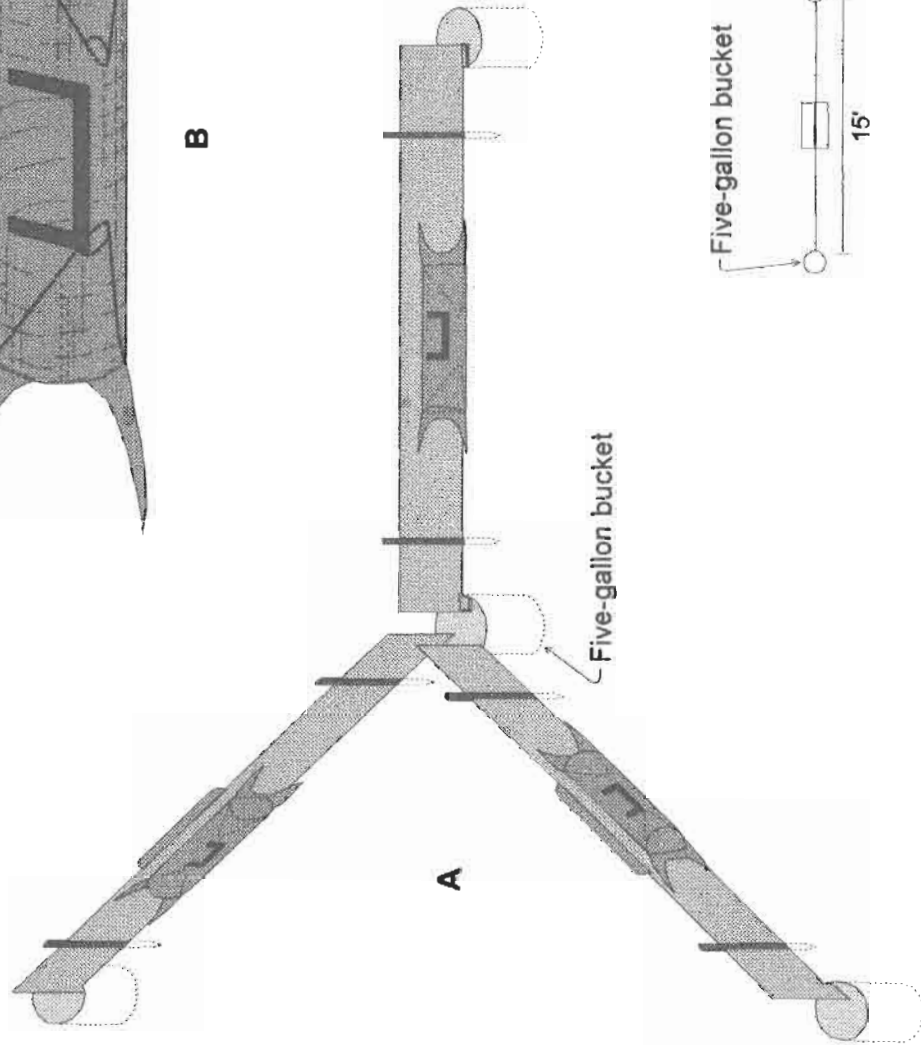
A - One Herpetofaunal
Array

B - Funnel Trap

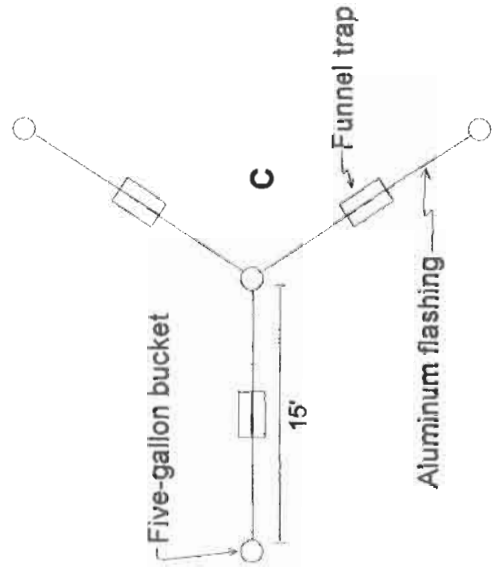
C - Plan view of
Array Layout



B



A



15'

Five-gallon bucket

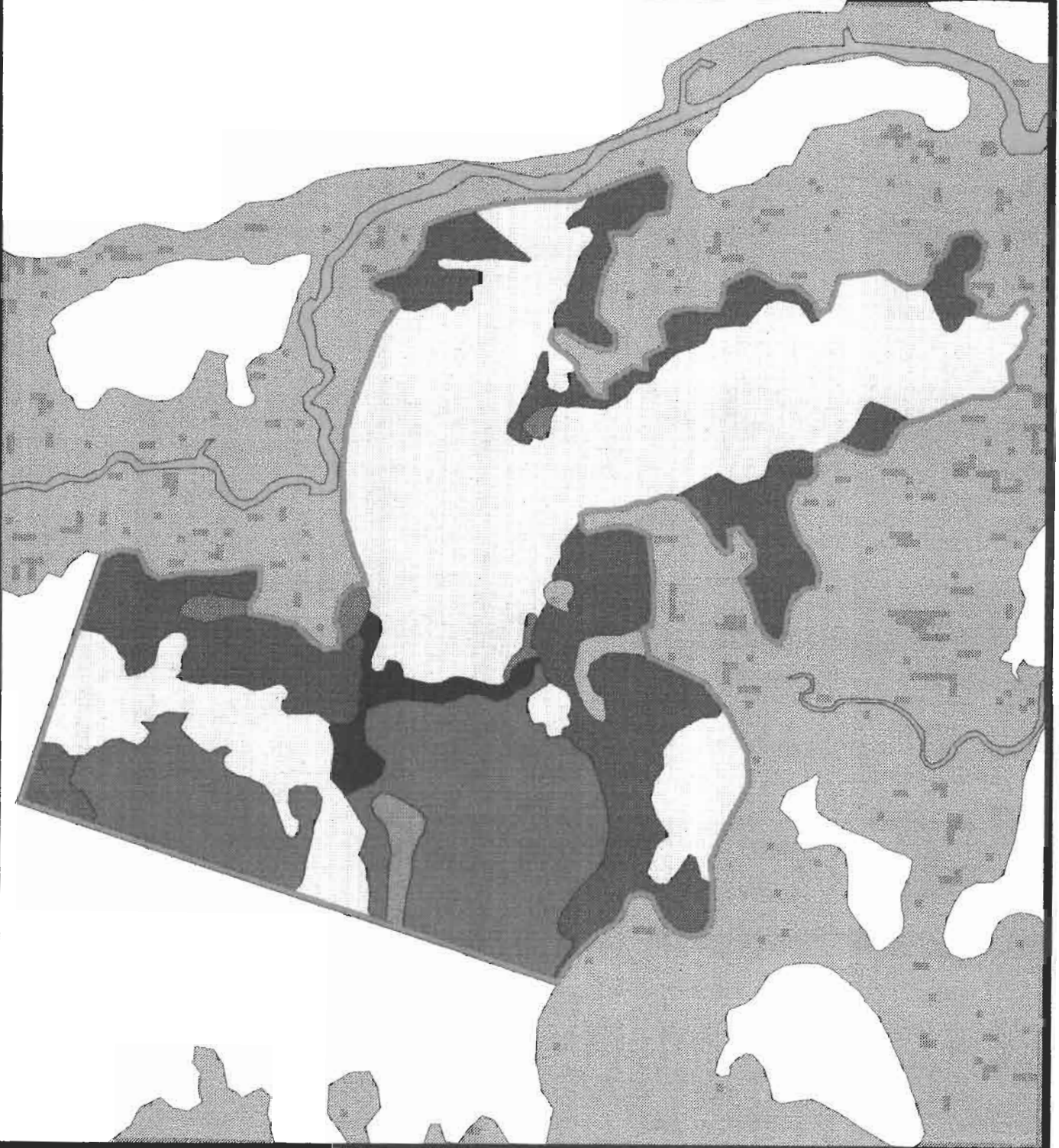
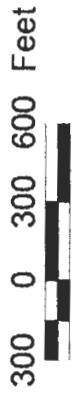
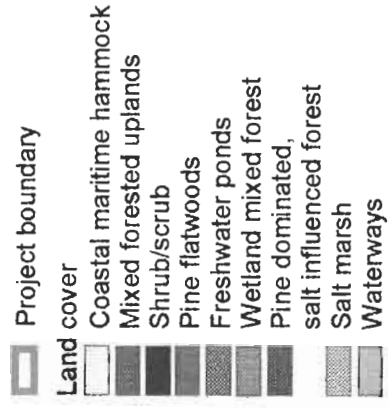
Funnel trap

Aluminum flashing

Figure 5

**FIELD VERIFIED
LAND COVER**

WETLANDS & WILDLIFE
SECTION
TSB/AWQD/RES D



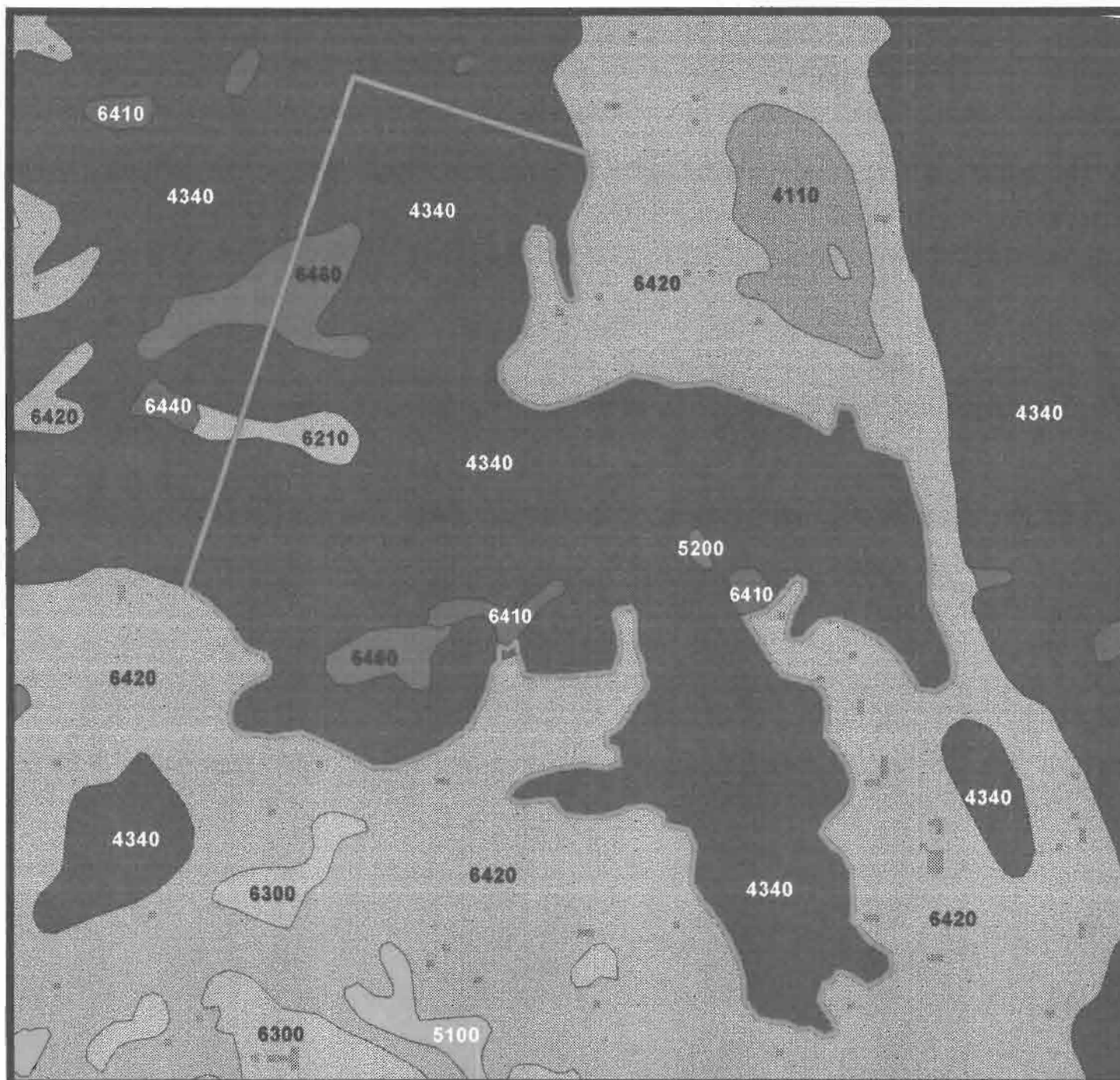


Figure 6

**LAND COVER/
LAND USE (1990)**

**ST. JOHNS RIVER WATER
MANAGEMENT DISTRICT**

 Property boundary

Land cover

-  4110 Pine flatwoods
-  4340 Upland hardwood forest
-  5100 Waterways
-  5200 Lakes
-  6210 Wetland coniferous forest - Cypress
-  6300 Wetland mixed forest
-  6410 Freshwater marsh
-  6420 Salt marsh
-  6440 Emergent aquatic vegetation
-  6460 Mixed scrub-shrub wetland



600 0 600 Feet



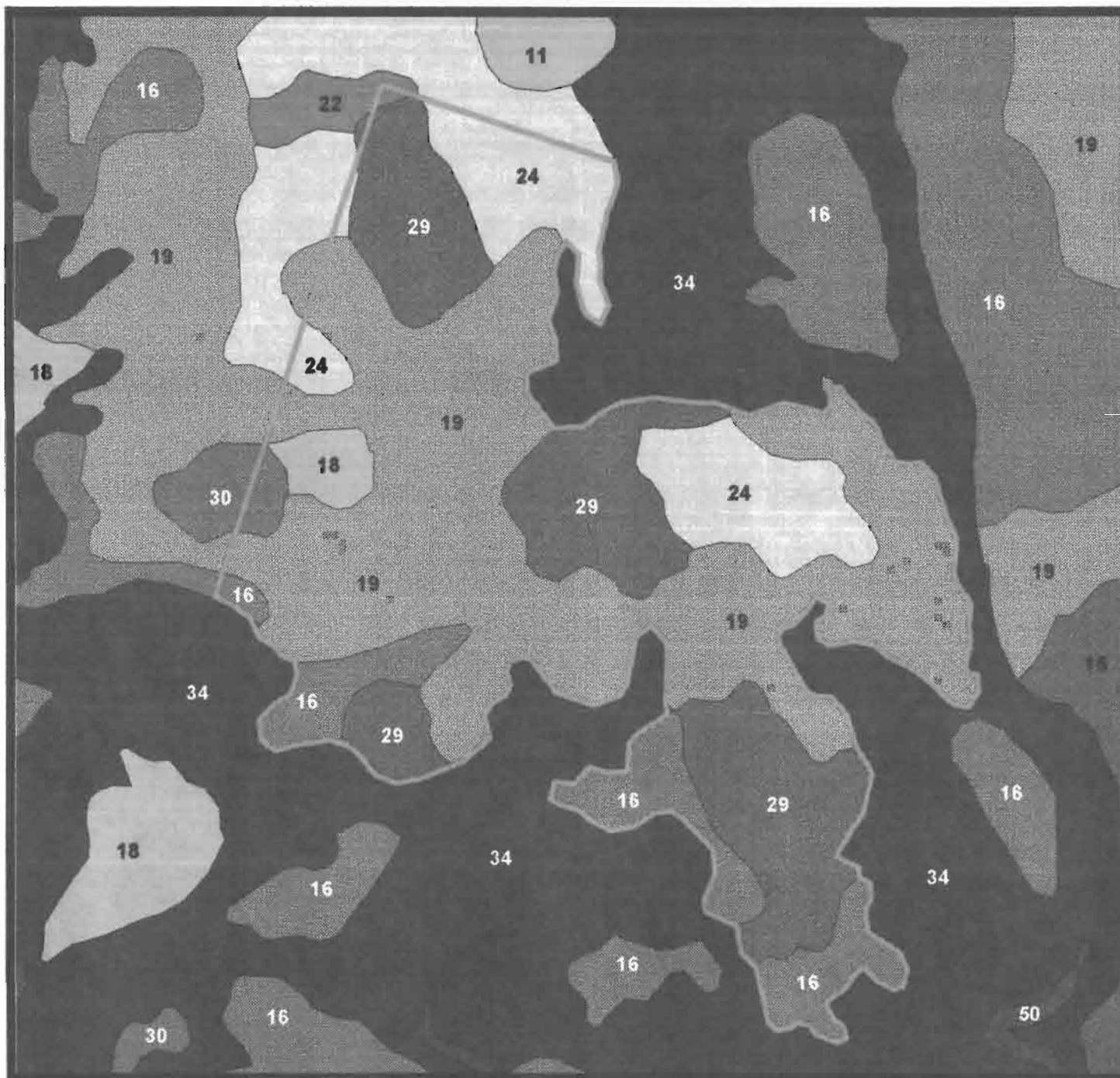


Figure 7

SOILS SURVEY (1978)

UNITED STATES DEPARTMENT
OF AGRICULTURE

 Property boundary

Soils

-  11 Kershaw fine sand
-  16 Leon fine sand
-  18 Lynn Haven fine sand
-  19 Mandarin fine sand
-  22 Maurepas muck
-  24 Ortega fine sand
-  29 Pottsburg fine sand
-  30 Ridgeland fine sand
-  34 Tisonia mucky peat
-  50 Water



500 0 500 Feet



Figure 8

SOILS SURVEY INTERIM (1997)

UNITED STATES DEPARTMENT
OF AGRICULTURE

- Project boundary
- FCT Grant purchase
- Donation
- Addition

Soils

- 22 Evergreen - Wesconnett complex
- 24 Hurricane and Ridgewood
- 32 Leon fine sand
- 33 Leon fine sand - frequently flooded
- 35 Lynn Haven fine sand
- 58 Pottsborg fine sand
- 68 Tisonia mucky peat
- W Waterways



Figure 9

ADJACENT LANDS

-  Cedar Point
-  Nassau River - St. Johns River
-  Marshes Aquatic Preserve
-  Timucuan Ecological and Historic Preserve
-  Within both Preserves
-  Pumpkin Hill Buffer Preserve (owned by SJRWMD)
-  National Park Service Property
-  Audubon Sanctuary

NASSAU RIVER - ST. JOHNS RIVER
MARSHES AQUATIC PRESERVE BOUNDARY
INCORRECT



7000 0 7000 14000 Feet

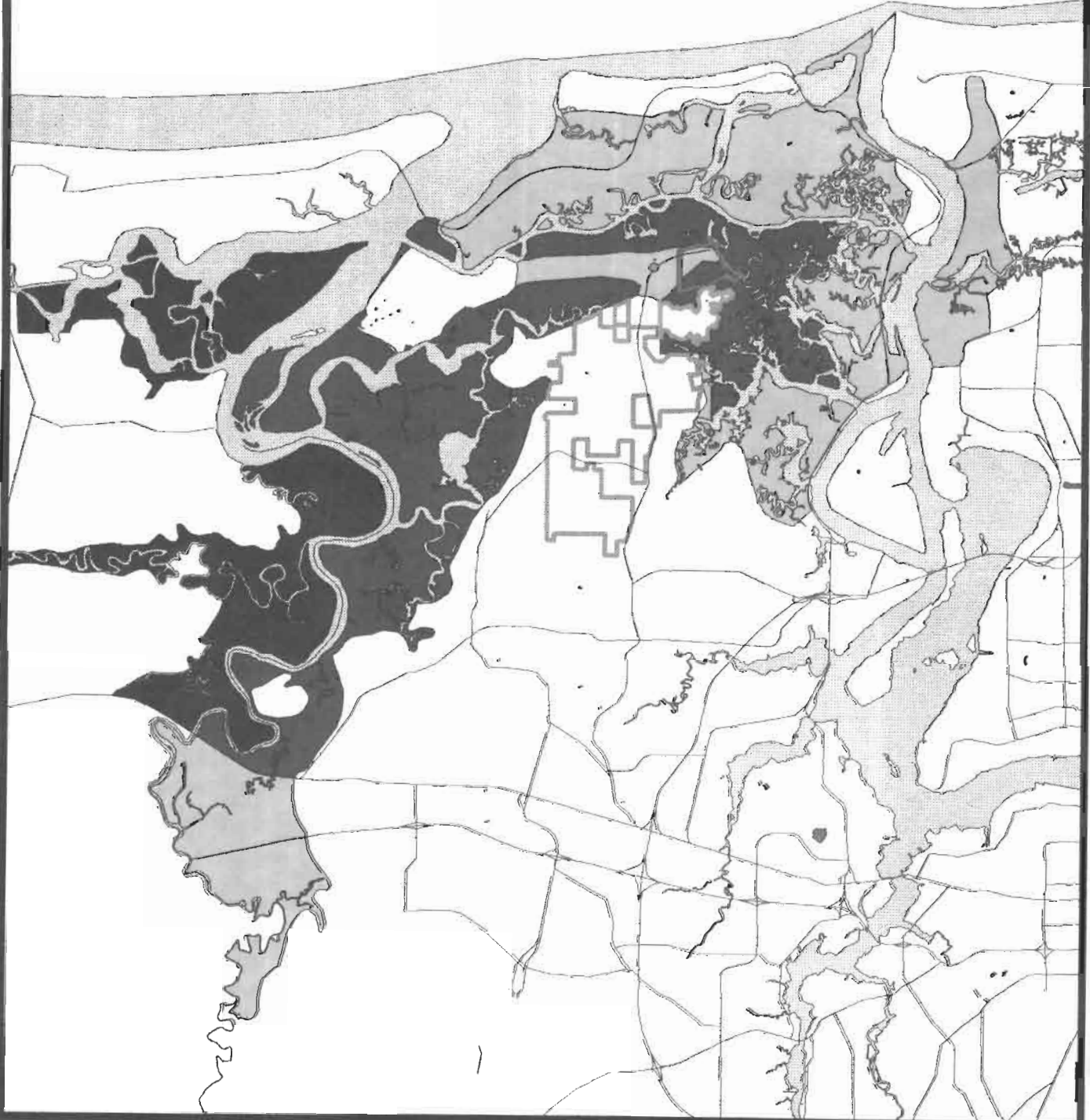




Figure 10
CURRENT ACCESS

-  Private Property
-  SJRWMD Property
-  Cedar Point
-  FCT Grant Purchase
-  Donation
-  Addition
-  Existing Access



500 0 500 1000 Feet



Appendix A. Vegetation Survey Dominance Determination Methodology

The purpose of this methodology is to provide an objective method for the determination of vegetative dominance in a sample plot. This methodology was adapted from the Army Corps of Engineers Wetland Delineation Manual.

Definitions:

Canopy -- Woody plants three inches dbh (diameter at breast height) and greater, regardless of height.

Shrub/sapling layer -- Woody plants less than three inches dbh and greater than or equal to 3.2 feet in height.

Herb/seedling layer -- All nonwoody plants and woody plants less than 3.2 feet tall.

A representative sample of a vegetative community is taken by randomly choosing an area that best represents the community as a whole. A thirty foot radius circle is marked and vegetation within the circle is surveyed as follows:

Canopy

Woody plants three inches dbh (diameter at breast height) and greater, regardless of height are measured and species noted. Using the formula $(r_1^2 + r_2^2 + r_3^2 + r_4^2 + r_n^2)$ where r = radius for each individual species, the total basal area (tba) for each species is determined. The tba's for each species are then related to one another and expressed as a percentage using the following steps:

$$tba_{1 \text{ to } n} = \text{absolute measure (am)}$$

$$tba_n \div am = \text{relative percent (\%)} \text{ for species } n$$

Arrange species in descending order based on percentage. If species₁ is greater than or equal to 50%, then species₁ is dominant. Any other species that is greater than or equal to 20% is also dominant. If species₁ is less than 50%, then add to it species₂. If the total is greater than or equal to 50%, then species₁ and species₂ are dominant. If the total of species₁ and species₂ is less than 50%, then add species₃. Continue in this manner until a total of 50% is reached. Then add any other species greater than or equal to 20%. These will then be the dominant species.

Shrub/sapling layer

One of two methods can be used for determining the dominance of shrub/sapling species -- percent cover or stem counts. Percent cover is determined by visually estimating the coverage of each species and expressing it as a percent. This is usually difficult to determine. The preferred method is stem counts (sc). Woody plants less than three inches dbh and greater than or equal to 3.2 feet in height are counted. The number of stems are counted at approximately three feet high and species noted. The following steps are then used to determine dominance:

$sc_1 \text{ to } n = \text{absolute measure (am)}$

$sc_n \div am = \text{relative percent (\%)} \text{ for species } n$

Arrange species in descending order based on percentage. If species₁ is greater than or equal to 50%, then species₁ is dominant. Any other species that is greater than or equal to 20% is also dominant. If species₁ is less than 50%, then add to it species₂. If the total is greater than or equal to 50%, then species₁ and species₂ are dominant. If the total of species₁ and species₂ is less than 50%, then add species₃. Continue in this manner until a total of 50% is reached. Then add any other species greater than or equal to 20%. These will then be the dominant species.

Herb/seedling layer

The herb/seedling layer is expressed as a percentage. A visual determination is made as to the percent cover of each species. Bare ground is included as a percent cover. Arrange species in descending order based on percentage. If species₁ is greater than or equal to 50%, then species₁ is dominant. Any other species that is greater than or equal to 20% is also dominant. If species₁ is less than 50%, then add to it species₂. If the total is greater than or equal to 50%, then species₁ and species₂ are dominant. If the total of species₁ and species₂ is less than 50%, then add species₃. Continue in this manner until a total of 50% is reached. Then add any other species greater than or equal to 20%. These will then be the dominant species.

Appendix B. Draft Memorandum of Agreement for Management of City Owned Cedar Point Property.

Agreement No. 5308MA5000096001

Memorandum of Agreement

Between the

National Park Service

and the

City of Jacksonville

Article I: Background and Objectives

The purpose of this Memorandum of Agreement is to provide for cooperative management of park lands acquired by the City of Jacksonville, an incorporated municipality in the State of Florida, hereinafter referred to as the City; and the Timucuan Ecological and Historic Preserve, a unit of the National Park Service, U. S. Department of the Interior, hereinafter referred to as the Preserve; in the area known as Cedar Point, located at or near the South end of Black Hammock Island.

- The Preserve has acquired 400.05 acres on the South end of Black Hammock Island, known as Cedar Point.
- The City has acquired lands immediately to the west of Cedar Point consisting of 444.66 acres.
- City owned lands are immediately adjacent to Preserve lands and are included within the proposed boundary expansion for the Timucuan Ecological and Historic Preserve.
- The approved grant application to the Florida Communities Trust requesting funds to purchase lands by the City and the Management Plan for these City lands specify that access to both parcels will be through lands acquired by the Preserve at Cedar Point and that management of this City property shall be coordinated with the Preserve.
- Joint management of both parcels supports the management alternative outlined in the approved General Management Plan for the Timucuan Preserve, March 28, 1996, which presents a cooperative, partnership approach for resource management and protection.
- Mutual benefits and interests to be gained and enhanced through management of these lands by the Preserve include:

- More cost effective management by eliminating the need for duplication of facilities. Parking, restrooms, and visitor services facilities will be concentrated in one location.
- Reduced environmental impact by concentrating support development facilities in one location.
- Services for visitors to both parcels will be concentrated in one area.
- The Preserve has been granted the authority to enter into Memoranda of Agreement through 16 U.S.C. § 6.

Article II: Statement of Work

The City Agrees to:

- Provide the Preserve with \$30,000.00 per year, payable on or before September 1 of each year, to furnish temporary personnel and other services to assist the Preserve in managing City owned property.

The Preserve Superintendent Agrees to:

- Provide the City with the following services on City owned lands covered by the memorandum of agreement:
 - Planning, conceptual design and compliance services for development proposed for both City and Preserve property to include planning and conceptual design of facilities and assistance with activities that may have an impact on cultural or natural resources including public input, public involvement and compliance.
 - Management (Supervision and Administrative oversight) services to include supervision and direction of all personnel conducting work on both parcels and procurement of needed supplies and materials to support routine operations.
 - Resource management services including direction or assistance in natural resource surveys and inventories, fire management and cultural resource identification, survey and management
 - Visitor services to include providing interpretive information, educational services, providing for visitor safety, emergency response and law enforcement.
 - Maintenance services to include providing regular and recurring maintenance to facilities on both parcels, directing rehabilitation and repair of trails and other visitor use facilities.
- These funds will not be used to fund the costs of supplies, material and/or labor associated with the construction of facilities or the purchase of any items specific to City lands such as signs, trash

receptacles, exhibits or other similar materials. Funding for these type of activities would be addressed separately from this agreement.

Article III: Term of Agreement

- The term of this agreement shall be for a period of three years from the date of the final signature to this agreement. At that time, the agreement will be reviewed, revised and updated if needed.
- This agreement may be renewed for additional time periods with the mutual consent of both parties.

Article IV: Key Officials

Barbara Goodman, Superintendent
Timucuan Ecological and Historic Preserve
13165 Mount Pleasant Road
Jacksonville, Florida 32225

Mr./Ms. _____
Department/Office of _____
City of Jacksonville

Jacksonville, Florida 32202

Article V: Property Utilization

Property furnished by the Government or acquired by the City shall be used and disposed of as set forth in NPS Property Management Regulations.

Article VI: Prior Approval

Not Applicable.

Article VII: Reports and/or Deliverables

Not Applicable (note: discussed possibility of quarterly report at meeting to review this draft.)

Article VIII: Termination

- Either party may terminate this agreement by providing 60 days advance written notice to the other party.

Article IX: Standard Clauses

- **Civil Rights:** During the performance of this agreement, the participants agree to abide by the terms of USDI-Civil Rights Assurance Certification, non-discrimination and will not discriminate against any person because of race, color, religion, sex or national origin. The participants will take affirmative action to ensure that applicants are employed without regard to their race, color, religion, sex or national origin.
- **Officials Not to Benefit:** No member or delegate to Congress, or resident Commissioner, shall be admitted to any share or part of this agreement, or to any benefit that may arise therefrom, but this provision shall not be construed to extend to this agreement if made with a corporation for its general benefit.
- **Promotions:** The City shall not publicize, or otherwise circulate, promotional material (such as advertisements, sales brochures, press releases, speeches, still and motion pictures, articles, manuscripts or other publications) which states or implies Governmental, Departmental, bureau or Government employee endorsement of a product, service, or position which the City represents. No release of information relating to this agreement may state or imply that the Government approves of the City's work product, or considers the City's work product to be superior to other products or services.
- **Public Information Release:** The City must obtain prior Government approval from the Preserve Superintendent for any public information releases which refer to the Department of the Interior, any bureau, park unit or employee (by name or title), or this agreement. The specific text, layout, photographs, etc., of the proposed release must be submitted with the request for approval.

Article X: Authorizing Signatures

IN WITNESS HEREOF, the parties hereto have signed their names and executed the Memorandum of Agreement.

City of Jacksonville

Mr./Ms. _____
Office/Department

Date

National Park Service

Barbara Goodman, Superintendent
Timucuan Ecological and Historic Preserve

Date

Appendix C. Florida Natural Areas Inventory (FNAI) Flora and Fauna Rankings and Status Explanations

FNAI GLOBAL RANK DEFINITIONS

- G1 = Critically imperiled globally because of extreme rarity (5 or fewer occurrences or less than 1000 individuals) or because of extreme vulnerability to extinction due to some natural or man-made factor.
- G2 = Imperiled globally because of rarity (6 to 20 occurrences or less than 3000 individuals) or because of vulnerability to extinction due to some natural or man-made factor.
- G3 = Either very rare and local throughout its range (21 - 100 occurrences for less than 10,000 individuals) or found locally in a restricted range or vulnerable to extinction from other factors.
- G4 = apparently secure globally (may be rare in parts of range)
- G5 = demonstrably secure globally
- GH = of historical occurrence throughout its range, may be rediscovered (e.g., ivory-billed woodpecker)
- GX = believed to be extinct throughout range
- GXC = Extirpated from the wild but still known from captivity or cultivation
- G#? = tentative rank (e.g., G2?)
- G#G# = range of rank; insufficient data to assign specific global rank (e.g., G2G3)
- G#T# = rank of a taxonomic subgroup such as a subspecies or variety; the G portion of the rank refers to the entire species and the T portion refers to the specific subgroup; numbers have same definition as above (e.g., G3T1)
- G#Q = rank of questionable species - ranked as species but questionable whether it is species or subspecies; numbers have same definition as above (e.g., G2Q)
- GU = due to lack of information, no rank or range can be assigned (e.g., GUT2).
- G? = not yet ranked (temporary)

FNAI STATE RANK DEFINITIONS

- S1 = Critically imperiled in Florida because of extreme rarity (5 or fewer occurrences or less than 1000 individuals) or because of extreme vulnerability to extinction due to some natural or man-made factor.
- S2 = Imperiled in Florida because of rarity (6 to 20 occurrences or less than 3000 individuals) or because of vulnerability to extinction due to some natural or manmade factor.
- S3 = Either very rare and local throughout its range (21-100 occurrences or less than 10,000 individuals) or found locally in a restricted range or vulnerable to extinction from other factors.
- S4 = apparently secure in Florida (may be rare in parts of range)

- S5 = demonstrably secure in Florida
- SH = of historical occurrence throughout its range, may be rediscovered (e.g., ivory-billed woodpecker)
- SX = believed to be extinct throughout range
- SA = accidental in Florida, i.e., not part of the established biota
- SE = an exotic species established in Florida may be native elsewhere in North America
- SN = regularly occurring, but widely and unreliably distributed; sties for conservation hard to determine
- SU = due to lack of information, no rank or range can be assigned
- S? = not yet ranked (temporary)

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

- LE = Listed as Endangered Species in the List of Endangered and Threatened Wildlife and Plants under the provisions of the Endangered Species Act. Defined as any species which is in danger of extinction throughout all or a significant portion of its range.
- PE = Proposed for addition to the List of Endangered and Threatened Wildlife and Plants as Endangered Species.
- LT = Listed as Threatened Species. Defined as any species which is likely to become an endangered species within the foreseeable future throughout all or a significant portion of its range.
- PT = Proposed for listing as Threatened Species.
- C = Candidate Species for addition to the list of Endangered and Threatened Wildlife and Plants. Defined as those species for which the USFWS currently has on file sufficient information on biological vulnerability and threats to support proposing to list the species as endangered or threatened.
- E(S/A) = Endangered due to similarity of appearance.
- T(S/A) = Threatened due to similarity of appearance.
- N = Not currently listed, not currently being considered for listing.

STATE LEGAL STATUS

ANIMALS (Listed by the Florida Game and Fresh Water Fish Commission - FGFWFC)

- LE = Listed as Endangered Species by the FGFWFC. Defined as a species, subspecies, or isolated population which is so rare or depleted in number or so restricted in range of habitat due to any man-made or natural factors that it is in immediate danger of extinction or extirpation from the state, or which may attain such a status within the immediate future.

- LT = Listed and Threatened Species by the FGFWFC. Defined as a species, subspecies, or isolated population which is acutely vulnerable to environmental alteration, declining in number at a rapid rate, or whose range or habitat is decreasing in area at a rapid rate and as a consequence is destined or very likely to become an endangered species within the foreseeable future.
- LS = Listed as Species of Special Concern by the FGFWFC. Defined as a population which warrants special protection recognition, or consideration because it has a inherent significant vulnerability to habitat modification, environmental alteration, human disturbance, or substantial human exploitation which, in the foreseeable future, may result in its becoming a threatened species.
- N = Not currently listed, nor currently being considered for listing.

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

- LE = Listed as Endangered Plants in the Preservation of Native Flora of Florida Act. Defined as species of plants native to the state that are in imminent danger of extinction within the state, the survival of which is unlikely if the causes of a decline in the number of plants continue, and includes all species determined to be endangered or threatened pursuant to the Federal Endangered Species Act of 1973, as amended.
- LT = Listed and Threatened Plants in the Preservation of Native Flora of Florida Act. Defined as species native to the state that are in rapid decline in the number of plants within the state, but which have not so decreased in such number as to cause them to be endangered.
- N = Not currently listed, nor currently being considered for listing.
- † = These species have aspecial Federal or State Status as described below:

Falco peregrinus (peregrin falcon) - Migrant and wintering falcons observed in Florida include *F. p. anatum* (Federally listed as LE), *F. p. tundrius* (Federally listed as E(S/A) - endangered due to similarity of appearance, and State listed as LE), and variuos hybrids of native and introduced species (Federally listed as E(S/A) - endangered due to simialrity of appearance).