103-89627



Levy Nuclear Plant Project

Listed Species Assessment

Kathleen Substation



Table of Contents

1.0	INTRO	DUCTION	1
1.1	Kath	leen Substation Site Description	2
2.0	METH	DDOLOGY	3
2.1	Habi	tat Classification	3
2.2	Data	Review	3
2.3	Preli	minary Field Survey	4
3.0	RESUL	_TS	5
3.1	Habi	tat Classification	5
3.2	Data	Review	5
3.3	Preli	minary Field Survey	7
3.4	Plan	ts	7
3.	4.1	Piedmont Jointgrass	7
3.	4.2	Spoon-leaved Sundew	8
3.	4.3	Hartwrightia	8
3.	4.4	Celestial Lily	8
3.	4.5	Toothed Maiden Fern	8
3.5	Amp	hibians	9
3.	5.1	Gopher Frog	9
3.6	Rept	tiles	9
3.	6.1	Gopher Tortoise	9
3.	6.2	Eastern Indigo Snake	9
3.	6.3	Florida Pine Snake	0
3.7	Birds	۶1	0
3.	7.1	Limpkin1	0
3.	7.2	Florida Burrowing Owl1	0
3.	7.3	Little Blue Heron1	0
3.	7.4	Snowy Egret1	1
3.	7.5	Tricolored Heron1	1
3.	7.6	White Ibis1	1
3.	7.7	Florida Sandhill Crane1	2
3.	7.8	Bald Eagle1	2
3.	7.9	Wood Stork1	2
3.8	Marr	nmals1	3
3.	8.1	Sherman's Fox Squirrel1	3
3.	8.2	Florida Mouse	3
4.0	LISTE	D SPECIES SURVEYS	4
4.1	Gop	her Tortoise and Commensals1	4
4.2	East	ern Indigo Snake1	5



Bald Eagle	15
Wood Stork	16
SUMMARY	17
REFERENCES	19
	Bald Eagle Wood Stork SUMMARY REFERENCES

List of Tables

Table 1	Land Use/Land Cover Summary of the Kathleen Substation Site
Table 2	Protected Plants and Animals Potentially Occurring on the Kathleen Substation Site

List of Figures

- Figure 1 General Location Map
- Figure 2 USGS Topographic Map
- Figure 3 Habitat Classification Map
- Figure 4 Listed Species Map
- Figure 5 Soils Map
- Figure 6 Gopher Tortoise Suitable Soils Map

List of Appendices

- Appendix A Florida Natural Areas Inventory Element Occurrence Report
- Appendix B Listed Species Descriptions
- Appendix C Listed Species Consultation Areas



1.0 INTRODUCTION

Progress Energy Florida, Inc. (PEF) is committed to providing safe, reliable, and affordable energy to its customers. PEF provides electric service to 1.7 million customers and a population of more than 5 million people. The company maintains a diverse mix of power generating facility resources to ensure affordable, efficient, and reliable service. The Levy Nuclear Plant (LNP) and associated facilities are components in PEF's baseload generation plan. PEF is proposing to construct and operate two Westinghouse, AP1000 Reactors at the LNP site located in Levy County, Florida. Project requirements include several offsite linear facilities including a new blow down pipeline and approximately 180 miles of new transmission lines. PEF is continuing to pursue all licenses and permits necessary to construct and operate the LNP. These permits include a Combined Operating License (COL) from the Nuclear Regulatory Commission (NRC), a Clean Water Act Section 404 permit from the U.S. Army Corps of Engineers (USACE) and certification from the State under the Florida Electrical Power Plant Siting Act (PPSA).

On June 2, 2008, PEF submitted a Site Certification Application (SCA) to the Florida Department of Environmental Protection (FDEP) pursuant to the PPSA, Chapter 403, F.S., and Chapter 62-17, Florida Administrative Code (F.A.C.) requesting certification of the LNP, including the new transmission lines.

The Governor and Cabinet, sitting as the Siting Board, voted unanimously to approve the Administrative Law Judge's Recommended Order to grant full and final certification to PEF for the construction and operation of the LNP and associated facilities. The Final Order on Certification of PEF LNP Units 1 and 2 was granted on August 11, 2009 (Final Order). The Final Order for the project approved by the Siting Board contains a set of conditions that the project must abide by during the construction and operation of the plant and associated facilities. These are collectively referred to as the LNP Conditions of Certification (COC).

PEF has also submitted a Combined Operating License Application (COLA) to the NRC in July 2008. The USACE is a cooperating agency with the NRC and has participated in the development of a Draft Environmental Impact Statement (DEIS) for the project. The NRC issued the DEIS on the project in August 2010. The public comment period for the DEIS has closed. The NRC expects to issue a Final Environmental Impact Statement (FEIS) on the project around April 2012.

PEF has also submitted a permit application for wetland impacts under Section 404 of the Clean Water Act to the USACE. PEF has been working with the USACE to address additional information needs for the Section 404 permit. The USACE anticipates issuing a Record of Decision on the project sometime after the FEIS. The preparation of these various regulatory documents required the review of the potential impacts to listed species for the project.



To support this effort, Golder Associates Inc. (Golder) conducted preliminary assessments of listed plant and animal species occurrence within each of the transmission line rights-of-way (ROW) and substation sites. The purpose of the preliminary listed species assessments was to gather information regarding the existing habitat conditions within each transmission line ROW and substation site, document the occurrence of listed species, both plant and animal, and, based on the results of the field assessment and habitat conditions, develop species-specific surveys to be conducted prior to clearing and construction, in consultation with the Florida Fish and Wildlife Conservation Commission (FWC) and the U.S. Fish and Wildlife Service (USFWS).

Listed plant species are those plants that are listed by the USFWS under Title 50, Part 17 of the Code of Federal Regulations (50 CFR 17), or by the Florida Department of Agriculture and Consumer Services (FDACS) as endangered, threatened, of special concern, or commercially exploited. Listed animal species are those animals that are classified as endangered, threatened, or of special concern by the USFWS under 50 CFR 11-12, or by the FWC under Chapter 68-27, F.A.C.

The following presents the listed species assessment for the Kathleen Substation Site.

1.1 Kathleen Substation Site Description

The approximately 124 acre Kathleen Substation Site is located north of U.S. Highway 98, northwest of Interstate 4 and the city of Lakeland (Figure 1). The Site is located in an area dominated by mixed forested wetlands, cypress, freshwater marsh, wetland scrub, and existing electric power facilities. Figures 2 and 3 illustrate the Kathleen Substation Site on a USGS topographic map and a habitat classification map, respectively.



2.0 METHODOLOGY

Golder evaluated the likelihood of listed species occurrence within the Kathleen Substation Site through a combination of assessment of existing habitat type, quality, and extent, geographic information system (GIS) database queries, literature reviews, and field reconnaissance, described below.

2.1 Habitat Classification

Golder updated existing landuse/landcover and ecological habitat classifications within the Kathleen Substation Site utilizing the Florida Department of Transportation's 1999 Florida Land Use, Cover and Forms Classification System (FLUCFCS). The FLUCFCS classification system uses dominant components of the vegetative habitat or land use characteristics to assign landuse/landcover codes. Habitat classification is useful in the assessment of potential threatened and endangered species utilization of a site. Based upon the habitat present, inferences can be made regarding the potential for listed species occurrence.

In addition to the FLUCFCS, land use/land cover data was obtained from the Southwest Florida Water Management District (SWFWMD), dated 2007, and was updated based on field observations (Figure 3).

2.2 Data Review

Prior to field surveys, county-specific information regarding the presence of listed species was obtained from the Florida Natural Areas Inventory (FNAI), which maintains a database of documented occurrences of listed species throughout the State of Florida, as well as lists of federally listed species by county from the USFWS (http://www.fws.gov/northflorida/CountyList). The FNAI geographic information system (GIS) element occurrence data and the FWC bald eagle nest database were reviewed to assess the location of documented listed species occurrence within, adjacent to, or in the vicinity of the Site. In addition, a site-specific Element Occurrence Report from the FNAI was obtained, detailing known occurrences of listed species within and adjacent to the Kathleen Substation Site (see Appendix A). USFWS listed species consultation area data were also obtained and their geographic location in relation to the Site are presented in Appendix C.

In addition to review of FNAI, FWC, and USFWS data, references utilized for the listed species assessment include:

Beever, James W. III. 2006. Standardized State-Listed Animal Survey Procedures for Use in the Review of SWFRPC Projects. Southwest Florida Regional Planning Council, Hollywood, FL.

Coile, N.C. and M.A. Garland. 2003. Notes on Florida's Regulated Plant Index (Rule 5B-40), Botany Contribution 38, 4th edition. Florida Department of Agriculture & Consumer Services, Division of Plant Industry, Gainesville, FL.

Florida Natural Areas Inventory. 2001. Field Guide to the Rare Plants and Animals of Florida, http://www.fnai.org/FieldGuide/search_001.cfm (retrieved March 2010).



Humphrey, S.R., editor. 1992. "Rare and Endangered Biota of Florida, Volume I. Mammals." University Press of Florida, Gainesville, FL.

Moler, P.E., editor. 1992. "Rare and Endangered Biota of Florida, Volume III. Amphibians and Reptiles." University Press of Florida, Gainesville, FL.

Rodgers, J.A., H.W. Kale II and H.T. Smith, editors. 1992. "Rare and Endangered Biota of Florida, Volume V. Birds." University Press of Florida, Gainesville, FL.

Runde, D.E., J.A. Gore, J.A. Hovis, M.S. Robson and P.D. Southall. 1991. "Florida Atlas of Breeding Sites for Herons and Their Allies: Update 1986-89." Florida Game and Freshwater Fish Commission, Division of Wildlife, Nongame Wildlife Program Technical Report, No. 10, Florida Fish and Wildlife Conservation Commission, Tallahassee, FL.

Wood, Don A. 2001. "Florida's Fragile Wildlife – Conservation and Management" University Press of Florida, Gainesville, FL.

These data sources were used to prepare a comprehensive summary of listed species known to occur within Polk County, their habitat preferences, and regulatory status, which were then updated with results of field surveys and presence of suitable habitat to determine individual species' probability of occurrence on the Kathleen Substation Site (Table 2).

2.3 Preliminary Field Survey

A reconnaissance-level listed species survey was conducted at the Kathleen Substation Site concurrent with the jurisdictional wetland delineation field effort in October 2009, during which time the entire Site was traversed by pedestrian and vehicular surveys. Observations were made for the presence of listed species based upon sight, call, burrow, nest, track, scat, and probable habitat. Locations of observed listed species were marked upon aerial photographs and, where feasible, identified with flagging and coordinates recorded with a GPS receiver.



3.0 RESULTS

3.1 Habitat Classification

A summary of land use/land cover and corresponding acreages within the Kathleen Substation Site is presented in Table 1. The location and extent of vegetative communities and land use/land cover classifications are depicted on Figure 3.

The Kathleen Substation Site is dominated by forested wetland, freshwater marsh, wetland scrub, and wet prairie habitats, which comprise approximately 86 percent of the Site (Figure 3). Approximately 51 acres of the Site consist of mixed forested wetlands, 18 acres are classified as cypress, and wetland scrub comprises approximately 11 acres. Herbaceous wetlands include 23 acres of freshwater marsh and 3 acres of wet prairies. Approximately one acre of surface waters (ditches) occurs on the Site.

Uplands compose approximately 16 acres within the Site, and include the existing electric power facilities and roads (approximately 9 acres), improved pastures, and shrub and brushland (Figure 3).

3.2 Data Review

Based on the presence of suitable habitat as described in Beever (2006); Coile and Garland (2003); FNAI (2001); Humphrey (1992); Moler (1992); and Rodgers et al. (1992); and the Site location within the species' geographic ranges, a variety of listed species are likely to occur within the Kathleen Substation Site (Table 2).

Forested wetlands, wetland scrub, freshwater marshes, and wet prairies within the Kathleen Substation Site provide foraging habitat for listed species of wading birds, including limpkin (*Aramus guarauna*), little blue heron (*Egretta caerulea*), snowy egret (*Egretta thula*), tricolored heron (*Egretta tricolor*), white ibis (*Eudocimus albus*), Florida sandhill crane (*Grus canadensis pratensis*), and wood stork (*Mycteria americana*), as well as the bald eagle (*Haliaeetus leucocephalus*) and American alligator (*Alligator mississippiensis*).

Upland improved pasture and shrub and brushland provides suitable habitat for the gopher tortoise (*Gopherus polyphemus*), while the burrows of the gopher tortoise provide habitat for listed commensal species, including the Eastern indigo snake (*Drymarchon couperi*), Florida mouse (*Podomys floridanus*), gopher frog (*Rana capito*), and Florida pine snake (*Pituophis melanoleucus*).

Listed species of plants know to occur in Polk County with a moderate potential to occur at the Kathleen Substation Site based on the presence of suitable habitat include Piedmont jointgrass (*Coelorachis tuberculosa*), spoon-leaved sundew (*Drosera intermedia*), hartwrightia (*Hartwrightia floridana*), celestial lily (*Nemastylis floridana*), and toothed maiden fern (*Thelypteris serrata*).



According to the FNAI GIS database and the FNAI element occurrence report (Appendix A), there are no documented occurrences of listed species within or immediately adjacent to the Site, with the exception of an occurrence of Sherman's fox squirrel approximately one mile south of the Site reported in 2009.

The FWC bald eagle nest database (<u>https://public.myfwc.com/FWRI/EagleNests/nestlocator.aspx</u>) includes the location of active and inactive bald eagle nests documented by the FWC. The information contained within this database is current through the 2008-2009 nesting season, with accuracy of the nest locations is estimated to be within 0.1 mile of the true location. According to the FWC bald eagle nest database, there are no bald eagle nests within one mile of the Site.

The following federally listed species are reported from Polk County but are not expected to occur within the Kathleen Substation Site due to lack of burned, dry prairie habitat, scrub habitat, upland forested habitat, large open freshwater marshes, beaches and mudflats, or marine habitat within the Site: Florida grasshopper sparrow (*Ammodramus savannarum floridanus*), Florida scrub-jay (*Aphelocoma coerulescens*), crested caracara (*Caracara cheriway*), red-cockaded woodpecker (*Picoides borealis*), Everglade snail kite (*Rostrhamus sociabilis plumbeus*), bluetail mole skink (*Eumeces egregius lividus*), sand skink (*Neoseps reynoldsi*), Florida bonamia (*Bonamia grandiflora*), pygmy fringe-tree (Chionanthus *pygmaeus*), pigeon wings (*Clitoria fragrans*) short-leaved rosemary (*Conradina brevifolia*), Avon Park harebells (*Crotalaria avonensis*), scrub mint (*Dicerandra frutescens*), scrub buckwheat (*Eriogonum longifolium* var. *gnaphalifolium*), Highlands scrub hypericum (*Hypericum cumulicola*), Florida blazing star (*Liatris ohlingerae*), scrub lupine (*Lupinus aridorum*), Britton's beargrass (*Nolina brittoniana*), papery whitlow-wort (*Paronychia chartacea*), Lewton's polygala (*Polygala lewtonii*), wireweed (*Polygonella basiramia*), sandlace (*Polygonella myriophylla*), scrub plum (*Prunus geniculata*), wide-leaf warea (*Warea amplexifolia*), Carter's mustard (*Warea carteri*), and Florida ziziphus (*Ziziphus celata*).

The Kathleen Substation Site is located within the USFWS-designated consultation areas for the crested caracara and Florida scrub-jay (Appendix C). These species are unlikely to occur within the Kathleen Substation Site due to lack of suitable habitat, as discussed below.

The crested caracara is classified as threatened by both the FWC and USFWS. The caracara's range in Florida is now considerably smaller than was historically reported (Stevenson and Anderson 1994, Layne 1996), and this raptor apparently now occurs almost exclusively on privately owned cattle ranches in the south-central part of the state (Morrison and Humphrey, 2001). The region of greatest abundance for this subspecies is a five-county area north and west of Lake Okeechobee, including Glades, Desoto, Highlands, Okeechobee, and Osceola counties (USFWS, 1999). They prefer open country, including dry prairie and pasture lands with cabbage palm, cabbage palm/live oak hammocks, and shallow ponds and sloughs. Preferred nest trees are cabbage palms, followed by live oaks. Nesting pairs are generally monogamous and remain on territory year-round. No crested caracara have been documented in the



vicinity of the Kathleen Substation Site, and no areas of suitable habitat occur within or adjacent to the Site. It is therefore unlikely that any crested caracara occur within the Kathleen Substation Site.

Florida scrub-jays historically were distributed throughout the Florida peninsula in suitable scrub habitat in 39 of the 40 counties south of, and including, Levy, Gilchrist, Alachua, Clay, and Duval counties (Fitzpatrick et al., 1991). The distribution and status of the Florida scrub-jay across its entire range was updated during 1992 and 1993 (Fitzpatrick et al., 1994), with overall Florida population of scrub-jays divided into five subregions corresponding to the major sand deposits located on the peninsula. The Kathleen Substation Site does not occur within any of the five subregions. The Florida scrub-jay has extremely specific habitat requirements, occurring on well drained to excessively well-drained sandy soils supporting oak-dominated scrub, or xeric oak scrub. This community type is adapted to nutrient poor soils, periodic drought, high seasonal rainfall and frequent fires (Abrahamson, 1984). Xeric oak scrub on the Lake Wales Ridge is predominantly comprised of four species of stunted, low-growing oaks: sand live oak (Quercus geminata), Chapman oak, (Q. chapmanii), myrtle oak, (Q. myrtifolia), and scrub oak, (Q. inopina) (Myers, 1990). In optimal habitat for scrub-jays, these oaks are 1 to 3 m high, interspersed with 10 to 50 percent unvegetated, sandy openings, and a sand pine (Pinus clausa) canopy of less than 20 percent (Woolfenden and Fitzpatrick, 1990). As no areas of suitable xeric oak scrub habitat occur within the Kathleen Substation Site and no occurrences of scrub jay have been documented in the vicinity of the Site, it is unlikely that any scrub jays occur within the Kathleen Substation Site.

3.3 Preliminary Field Survey

Figure 4 depicts the locations of documented occurrences of listed species from the FNAI GIS database. Listed species known to occur in Polk County, their suitable habitat, presence of suitable habitat within the Site, likelihood of occurrence, regulatory status, and any field observations are summarized in Table 2. Species likely to potentially occur based upon presence of suitable habitat are discussed below. FNAI species descriptions for species likely to potentially occur are provided in Appendix B.

3.4 Plants

3.4.1 Piedmont Jointgrass

Piedmont jointgrass is classified as state threatened, but is not listed federally. It is a perennial grass that grows up to approximately 1 m tall, with an inflorescence in the form of a jointed, cylindric spike to approximately 8 cm in length during June to July. It occurs within marshes and edges of ponds in Alachua, Brevard, Calhoun, Hernando, Highlands, Lake, Marion, Martin, Orange, Palm Beach, Pasco, Putnam, Santa Rosa, Seminole, St. Lucie, Volusia and Washington Counties. No individuals were observed within the Kathleen Substation Site.



3.4.2 Spoon-leaved Sundew

The spoon-leaved sundew is classified as threatened in the State of Florida, but is not listed federally by the USFWS. It is an insectivorous plant with leaf blades that are densely covered with stalked mucilaginous glands which secrete sugary nectar to attract insects. It has white to pinkish flowers from April-November. Spoon-leaved sundew occurs in shallow freshwater wetlands such as bogs and wet prairies within Alachua, Bay, Calhoun, Duval, Escambia, Franklin, Gulf, Hernando, Highlands, Hillsborough, Lake, Leon, Levy, Marion, Okaloosa, Osceola, Pasco, Polk, Putnam, Santa Rosa, Sumter, Volusia and Walton counties. No individuals were observed within the Kathleen Substation Site.

3.4.3 Hartwrightia

Hartwrightia is classified as threatened in the State of Florida but is not listed federally by the USFWS. It is a perennial herb with a single, erect stem, 2 - 3 feet tall, rising from a basal rosette of leaves 3 - 10 inches long with rounded tips and leaf bases tapering to a long leaf stalk. Leaves are alternate and reduced upward along the stem to bracts. All parts of the plant are dotted with glistening, sticky glands. The inflorescence is large and open with flat-topped clusters of pink to whitish flower heads at ends of stiff branches present during the late summer to fall. Hartwrightia typically occurs in seepage slopes, edges of baygalls and springheads, wet prairies, and flatwoods with wet, peaty soils. No individuals were observed within the Kathleen Substation Site.

3.4.4 Celestial Lily

The celestial lily is classified as state threatened, but is not listed by the USFWS. It is a perennial herb from a bulb with a single, tall, slender stem, and few basal grass-like leaves sometimes more than 2 feet long. The flowers are more than 1.5 inches across with 6 dark blue spreading petals that open around 4 PM and close by dusk between August and October. Celestial lily is the only iris-like species in Florida whose flowers open in the late afternoon in the fall. They typically occur in wet flatwoods, prairies, marshes, and cabbage palm hammocks edges. No individuals were observed within the Kathleen Substation Site.

3.4.5 Toothed Maiden Fern

Toothed maiden fern is classified as a threatened in the State of Florida, but is not listed federally. The toothed maiden fern has large, evergreen fronds 2 - 6 feet long, with hairy, brown or tan leafstalks. Leaflets 4 - 10 inches long, 1.5 inches wide, with hairy veins and sharply hook-toothed margins. The sori occur in many, parallel rows between veins on underside of leaflets. Preferred habitats include cypress swamps, sloughs, and floodplains. No individuals were observed within the Kathleen Substation Site.



3.5 Amphibians

3.5.1 Gopher Frog

The gopher frog is listed as a species of special concern by the FWC, but is not listed federally by the USFWS. The gopher frog is a medium-sized, boldly spotted frog with a chunky appearance. Gopher frogs are found in dry, sandy uplands that include isolated wetlands or large ponds within one mile. Breeding occurs in seasonal or more permanent wetlands. Gopher frogs are nocturnal, spending the daytime hours in stump holes, tunnels, or burrows (particularly those of gopher tortoises) (FNAI, 2001). No individuals were within the Kathleen Substation Site.

3.6 Reptiles

3.6.1 Gopher Tortoise

Gopher tortoises are listed as a threatened species in the State of Florida due to loss of preferred habitat, which includes xeric upland areas that are prime parcels for development. Gopher tortoises are protected by state law, Chapter 68A - 27.004, F.A.C. According to FWC regulations, construction activities or land disturbance are to be avoided within a 25-foot buffer zone around gopher tortoise burrows; where burrow avoidance is not practicable, a permit for the excavation and relocation of gopher tortoises is required. The FWC Gopher Tortoise Permitting Guidelines, revised April 2009, describe regulations and permits required for disturbance of gopher tortoises, including the protocols for surveying, burrow excavation, and relocation of gopher tortoises.

Gopher tortoises are medium-sized terrestrial turtles that dig burrows for shelter, typically in dry sandy areas where the depth to the seasonal high water table is greater than 45 centimeters (FWC, 2009). Gopher tortoises are commonly found in dry upland habitats, such as sandhills, scrub, xeric oak hammock, and dry pine flatwoods. They are also found in pastures and old fields (FNAI, 2001). The breeding season for gopher tortoises is generally considered to be spring, but males may attempt to mate from April through December. During May and June, females deposit 3-12 eggs in the sand mounds in their burrow mounds or in other nearby open sandy sites. Incubation depends upon climate and takes from 80 to 110 days. Other listed species such as the Eastern indigo snake, gopher frog, and Florida mouse may utilize gopher tortoise burrows.

No gopher tortoise burrows were observed on the Kathleen Site (Figure 4).

3.6.2 Eastern Indigo Snake

The Eastern indigo snake, classified as threatened by the FWC and the USFWS, is a large, stout-bodied snake reaching lengths up to 8 feet. Eastern indigo snakes may be found in habitats ranging from mangrove swamps and wet prairies to xeric uplands and scrub, often wintering in gopher tortoise burrows. Breeding occurs November – April, with eggs laid in May or June (Moler, 1992). No individuals were observed within the Kathleen Substation Site.



3.6.3 Florida Pine Snake

The Florida pine snake is listed as a species of special concern by the FWC. The Florida pine snake is a large, stocky, tan or rusty colored snake with an indistinct pattern of large blotches on a lighter background. Adults may reach lengths greater than 7 feet. Florida pine snakes are found in habitats with relatively open canopies and dry sandy soils, in which they burrow. They often coexist with pocket gophers and gopher tortoises. Florida pine snakes spend most of time below ground with occasional surface activity from spring through fall, especially May - October. Eggs are laid June – August and hatch in September and October (FNAI, 2001). No individuals were observed within the Kathleen Substation Site.

3.7 Birds

3.7.1 Limpkin

The limpkin is classified as a species of special concern by the FWC, but is not listed federally. It is a large, brown feathered, long-billed, long legged wader of swamps and marshes. Limpkins inhabit mangroves, freshwater marshes, swamps, springs and spring runs, and pond and river margins. They are also found along lake margins in peninsular Florida and swales, strand swamps, sloughs, and impoundments in south Florida and may also forage in ruderal areas such as sugarcane fields and the banks of irrigation canals. Limpkins utilize a wide range of nesting sites, including mounds of aquatic vegetation and marsh grasses among cypress knees and high up in trees. Nesting generally occurs from late February - May in north Florida and late January - March in central Florida, and possibly earlier in south Florida (FNAI, 2001). No individuals were observed within the Kathleen Substation Site.

3.7.2 Florida Burrowing Owl

Florida burrowing owls are classified as a species of special concern by the FWC, but are not listed federally by the USFWS. They are opportunistic feeders, preying on invertebrates, small mammals, and other birds. Burrowing owls are small, ground-dwelling owls with long legs, white chin strip, round head, and a stubby tail. They will often dig their own burrows, and prior to egg laying will line the entrance and burrows with materials such as palm fronds and grass clumps. In Florida, burrowing owl burrows are considered active (potentially having eggs or unfledged young) from February 15 to July 10. The female lays 7 to 10 eggs, which she incubates for 28 to 30 days (FWC, 2011). No individuals were observed within the Kathleen Substation Site.

3.7.3 Little Blue Heron

The little blue heron is classified as a species of special concern by the FWC, but is not listed by the USFWS. The little blue heron is a medium-sized heron, with a purplish to maroon-brown head and neck, small white patch on throat and upper neck, a and slate blue body. The largest nesting colonies of little blue herons occur in coastal areas, but they prefer to forage in freshwater lakes, marshes, swamps, and streams. Little blue herons nest in a variety of woody vegetation types, including cypress, willow, maple,



black mangrove, and cabbage palm. They usually breed in mixed-species colonies in flooded vegetation or on islands. Little blue herons are mostly resident throughout year, but numbers in north Florida in winter are lower than numbers during spring, summer, and fall (FNAI, 2001). No individuals were observed within the Kathleen Substation Site.

3.7.4 Snowy Egret

The snowy egret is classified as a species of special concern by the FWC, but is not listed by the USFWS. The snowy egret is a medium sized, all-white wading bird. Adults have black legs with bright yellow feet. Snowy egrets occur in Florida in all seasons, but are generally less common in winter. Snowy egrets nest both inland and in coastal wetlands, with nests placed in many types of woody shrubs, especially mangroves and willows. Almost all nesting is over shallow waters or on islands that are separated from shoreline by extensive open water. Snowy egrets feed in a variety of permanently and seasonally flooded wetlands, streams, lakes, and swamps, and in manmade impoundments and ditches. A wide variety of wetland types must be available within 7 miles to support breeding colonies (FNAI, 2001). Nesting may begin as early as January in southern Florida. Egg laying occurs primarily between late March and June, but may continue into August (Ogden, 1996b). No individuals were observed within the Kathleen Substation Site.

3.7.5 Tricolored Heron

The tricolored heron is classified as a species of special concern by the FWC, but is not listed by the USFWS. It is a medium sized heron with dark slate coloration on the head, neck, and body that contrasts with the white rump, belly, and undertail. Most tricolor nesting colonies occur on mangrove islands or in willow thickets in fresh water, but nesting sites include other woody thickets on islands or over standing water. Egg laying can begin as early as February in south Florida and continue into August (Ogden, 2001c). Tricolored herons prefer coastal environments, but will feed in a variety of permanently and seasonally flooded wetlands, mangrove swamps, tidal creeks, ditches, and edges of ponds and lakes. Tricolored herons are permanent residents and found throughout Florida in all seasons, except they are rare in winter in the western Panhandle and also somewhat less common inland during winter (FNAI, 2001). No individuals were observed within the Kathleen Substation Site.

3.7.6 White Ibis

The white ibis is classified as a species of special concern by the FWC, but is not listed by the USFWS. The white ibis is found throughout Florida in a wide variety of habitats, including freshwater and brackish marshes, salt flats and salt marsh meadows, many types of forested wetlands, wet prairies, swales, seasonally inundated fields, and man-made ditches. White ibis typically nest in Florida from March to August. Nesting occurs in trees, shrubs, cactus, and grass clumps, from ground level to a height of approximately 50 feet. Eggs incubate for a period of approximately 22 days and young begin leaving the nest around 9 to 16 days of age, but complete independence from the parents does not occur until 40 to 50 days of age (FWC, 2003). No individuals were observed within the Kathleen Substation Site.



3.7.7 Florida Sandhill Crane

The Florida sandhill crane is classified as threatened by the FWC, but is not listed by the USFWS. The Florida sandhill crane is indistinguishable from the greater sandhill crane, which winters in Florida. Greater sandhill cranes generally arrive in Florida in October and leave in March. Florida sandhill cranes typically start nesting in late December and continue through June. Sandhill cranes create nest mounds of plant material in herbaceous wetlands. The female will lay two eggs, which incubate for 28 to 32 days. Fledging occurs at about 67 days (FWC, 2003). No individuals were observed within the Kathleen Substation Site.

12

3.7.8 Bald Eagle

The bald eagle was removed from the USFWS endangered species list on June 28, 2007, and is no longer protected under the Endangered Species Act, but remains protected under the Bald and Golden Eagle Protection Act and the Migratory Bird Treaty Act (U.S. Department of Interior, 2007). The bald eagle was delisted by the FWC through adoption of the Bald Eagle Management Plan on April 9, 2008 (FWC, 2008). The FWC Bald Eagle Management Plan recommends maintaining a 660-ft buffer zone, with certain activities allowable within between 330 and 660 ft of an active nest outside of the nesting season. No individuals were observed within the Kathleen Substation Site; according to the FWC bald eagle nest database, there are no nests within a one-mile radius of the Kathleen Substation Site.

3.7.9 Wood Stork

The wood stork is classified as endangered by the USFWS and the FWC. Wood storks utilize a variety of habitats, including cypress/gum ponds, forested wetlands, river swamps, marshes (freshwater and saltwater), and bays. The wood stork is highly gregarious in its nesting and feeding behavior. They are tactile feeders (vision is seldom used to locate or catch prey) and usually forage in shallow water (6 to 20 inches). Small fish are the primary food items, but storks also consume crustaceans, salamanders, tadpoles, and insects. The distance between nesting colonies and feeding areas can range up to 60 miles or more, although the average distance is typically 12 to 15 kilometers (km) (7 to 9 miles) (Ogden, 1996a). The USFWS has defined "core foraging areas" (CFAs) for wood storks in central Florida to be that area within 15 miles of the colony, and within north Florida to be the area within 13 miles of the colony. Colonies are located on coastal islands and on willow islands in swamps, cypress swamps, impoundments, and other inundated areas. Nesting has been reported throughout the year. Nests are platforms of sticks formed in tall cypress trees and, less often, mangroves. Typically, three to five eggs are laid and incubate for 28 to 32 days before hatching, while the young fledge in 50 to 55 days. The Kathleen Substation Site is located within the CFA of four wood stork colonies (Appendix C), although no individuals were observed within the Site.



3.8 Mammals

3.8.1 Sherman's Fox Squirrel

Sherman's fox squirrel (*Sciurus niger shermani*), classified as a Species of Special Concern by the FWC, is not listed federally by the USFWS. Sherman's fox squirrels are larger than gray squirrels and have tails almost as long as their head and torso length. They typically occur in sandhills, pine flatwoods, pastures, and other open, ruderal habitats with scattered pines and oaks. They depend on a variety of oak trees for seasonal food and nest material; longleaf pine cones and seeds are important foods. Sherman's fox squirrels are active year-round in Florida (FNAI, 2001). No individuals were observed within the Kathleen Substation Site.

3.8.2 Florida Mouse

The Florida mouse is classified as a species of special concern by the FWC, but is not listed by the USFWS. It is distinguished from all other mice within its range by the presence of five plantar tubercles on the hind feet versus six or seven in *Peromyscus* spp. The Florida mouse is found in xeric upland communities with sandy soils, including scrub, sandhill, and ruderal sites where they inhabit the burrows of the gopher tortoise. In the absence of gopher tortoises, Florida mice will dig their own burrows or use those of oldfield mice. The Florida mouse is active year-round except on especially cold nights (FNAI, 2001). No individuals were observed within the Kathleen Substation Site.



4.0 LISTED SPECIES SURVEYS

The results of the preliminary listed species assessment will be used to develop a detailed listed species survey plan for the Kathleen Substation Site. PEF will consult with the FWC and the USFWS to review the listed species assessment and obtain consensus on the location, timing, and methodology for conducting the detailed species-specific surveys prior to clearing and construction.

Following FWC and USFWS consultation, surveys will be conducted within the Kathleen Substation Site prior to clearing and construction in accordance with the survey protocols. The results of those detailed surveys will be provided to the FWC and USFWS, and coordination will occur with the FWC on appropriate impact mitigation methodologies.

Based upon the results of the preliminary listed species assessment and proposed impacts associated with construction of the Kathleen Substation, pre-clearing surveys and additional evaluations are proposed for the following species: gopher tortoise and commensals, Eastern indigo snake, bald eagle, and wood stork.

4.1 Gopher Tortoise and Commensals

PEF will conduct surveys for gopher tortoises within the Kathleen Substation Site in accordance with the FWC-approved Gopher Tortoise Management Plan (adopted in 2007) and FWC Gopher Tortoise Permitting Guidelines (revised April 2009), or subsequent FWC-approved versions of the Plan or Guidelines. A burrow survey covering a minimum of 15 percent of the potential gopher tortoise habitat to be impacted by development will be conducted in order to apply for a relocation permit. Potential gopher tortoise habitat includes those areas classified as preferred habitat, as described in Section 3.5.1, underlain by acceptable soils with depth to the water table of greater than 31-45 centimeters, as defined by FWC in Table 2 of the Gopher Tortoise Permitting Guidelines. Soil types within the Kathleen Substation Site are illustrated in Figure 5; areas of acceptable gopher tortoise soils within the Kathleen Substation Site are identified on Figure 6.

Immediately prior to capturing tortoises for relocation, a 100 percent survey will be conducted to locate and mark all potentially occupied tortoise burrows and to subsequently remove the tortoises. Burrow survey methods will follow Gopher Tortoise Permitting Guidelines Appendix 4, Methods for Burrow Surveys on Development (Donor) and Recipient Sites. Surveys will be conducted within 90 days of application submittal to the FWC; and will not be conducted within 30 days of any ground disturbance or clearing activities on the Donor Site. The gopher tortoise surveys will be conducted during the months of April through October.

PEF will minimize impacts to gopher tortoises through maintenance of a minimum 25-foot buffer zone around all burrows to the greatest extent practicable. Where gopher tortoise burrow avoidance is not feasible, PEF will coordinate with and provide the FWC a detailed gopher tortoise relocation permit



application for the Kathleen Substation Site in accordance with the FWC-approved Gopher Tortoise Management Plan and Gopher Tortoise Permitting Guidelines. This permit application will provide information on the location for on-site recipient areas and/or any off-site FWC-approved recipient site, as well as appropriate mitigation contributions.

Any commensal species observed during the burrow excavations that are listed by the USFWS or FWC will be relocated in accordance with the applicable guidelines for that species.

4.2 Eastern Indigo Snake

Prior to clearing and construction, PEF will perform a survey for Eastern indigo snakes in accordance with the *Survey Protocol for the Eastern Indigo Snake, Drymarchon couperi, in North/North-Central Florida* established by the USFWS North Florida Ecological Services Field Office (NFESFO) in February 2011. Pedestrian surveys will be conducted during the period from October 1st through April 30th along established transects within areas to be impacted by construction of the transmission facilities. The impact area will be surveyed a minimum of five times per the *Survey Protocol* with surveys being conducted under the optimum temperature range of 60° F – 70° F.

Pedestrian surveys are intended to locate Eastern indigo snakes above ground and to identify refugia for subsequent inspection of the impact area. Underground refugia commonly used by this species include active or inactive burrows excavated by gopher tortoises or other species, natural ground holes, and hollows at the base of trees. Above ground refugia include thick shrub formations, the base of thick palmetto (*Serenoa repens* or *Sabal etonia*) ground litter, trash piles, abandoned structures, and crevices of rock-lined ditch walls. The preferred inspection methods when underground refugia are present in the impact area include the excavation of burrows or natural holes in the ground. Excavation of burrows will be conducted in conjunction with any permitted gopher tortoise relocation activities. If an Eastern indigo snake is located during excavation procedures, all activities must be temporarily halted in order to photograph the specimen and subsequently allow it to move out of harm's way, and the USFWS is to be notified as soon as possible and forwarded all pertinent information. PEF will submit a Final Survey Report to USFWS after the completion of all Eastern indigo snake survey activities. During construction, PEF will comply with the USFWS Standard Protection Measures for the Eastern Indigo Snake (2004).

4.3 Bald Eagle

Based on the FWC bald eagle nest database, no nests occur within one mile of the Kathleen Substation Site, therefore no impacts to the eagle would be anticipated in association with construction of the Kathleen Substation Site. Prior to clearing and construction, PEF will update the bald eagle nest location and status (active/inactive) information within and adjacent to the Kathleen Substation Site.

In accordance with the FWC Eagle Management Guidelines, for construction areas that fall within 330 feet of an active or alternate bald eagle nest, construction activities will be conducted only during the non-



nesting season (May 16 - September 30). Any construction activities that fall within 660 feet of the nest during the nesting season will be conducted following USFWS-approved Bald Eagle Monitoring Guidelines, dated 2007, or USFWS-approved subsequent versions. In areas where adverse impacts to nests cannot be avoided, resulting in nest disturbance, an FWC Eagle Permit is required, as authorized by Section 372.072, F.S., and Rule 68A-16.002, F.A.C, and minimization and conservation measures outlined in the FWC Bald Eagle Management Plan are to be followed, as applicable.

4.4 Wood Stork

Nesting wood storks primarily feed in wetlands between 5 and 40 miles from their colonies (Ogden 1990), with Core Foraging Areas (CFA) surrounding nesting colonies within north, central, and south Florida defined as 13, 15, and 18.6 miles, respectively. This circular area around a nesting colony is considered the minimum area necessary to provide enough prey biomass to support the adults and new offspring during a nesting season. It is believed that loss of suitable wetlands within these CFAs may reduce foraging opportunities for the wood stork. The Kathleen Substation Site is located within the CFAs of four wood stork colonies (Appendix C).

The USFWS has developed a Wood Stork Key for Central and North Peninsular Florida and a Wood Stork Effect Determination Key for South Florida to facilitate evaluation of potential adverse effects upon wood storks associated with a particular project. Impacts to wetlands within a CFA that provide wood stork foraging habitat must be compensated through provision of mitigation that provides for equal or greater wood stork foraging habitat value, measured as either functional units of wood stork foraging habitat (Central and North Peninsular Florida) or the estimated prey biomass available on an annual basis (South Florida).

PEF will prepare a wood stork foraging habitat assessment for the Kathleen Substation Site, consistent with the Wood Stork Key for Central and North Peninsular Florida, to quantify the loss of wood stork foraging habitat units associated with expansion of the substation. PEF will utilize site-specific data for each wetland, including functional assessment evaluation utilizing the UMAM, vegetative community composition, suitability as wood stork foraging habitat, estimated hydroperiod, and acreage of impact to evaluate the potential loss of foraging opportunities resulting from expansion of the Kathleen Substation.



5.0 SUMMARY

To support the permitting effort and the federal regulatory process, Golder has prepared an evaluation of listed species occurrence within the Kathleen Substation Site. Along with consultation with the FWC and USFWS, this listed species evaluation will facilitate the development of detailed listed species surveys to be conducted prior to clearing and construction, including specific locations and protocols.

The Kathleen Substation Site contains approximately 16 acres of uplands and 108 acres of wetlands and surface waters, which provide potential habitat for a variety of listed species. Based upon field reconnaissance, database queries, presence of suitable habitat, and literature reviews, a total of seven species of listed birds are highly likely to occur within the Kathleen Substation Site, as identified in Table 2. Detailed listed species surveys are recommended for the gopher tortoise, gopher tortoise burrow commensal species, and the Eastern indigo snake. Specific listed species survey locations, timing, and methodology will be determined in consultation with the FWC and USFWS.

PEF will conduct surveys for gopher tortoises within the Kathleen Substation Site in accordance with the FWC-approved Gopher Tortoise Management Plan (adopted in 2007) and FWC Gopher Tortoise Permitting Guidelines (revised April 2009). PEF will minimize impacts to gopher tortoises during construction through maintenance of a minimum 25-foot buffer zone around all burrows to the greatest extent practicable. Where gopher tortoise burrow avoidance is not feasible, PEF will coordinate with the FWC and submit a detailed gopher tortoise relocation permit application for the Kathleen Substation Site in accordance with the FWC-approved Gopher Tortoise Management Plan and Gopher Tortoise Permitting Guidelines prior to clearing and construction.

PEF will perform a survey for Eastern indigo snake in accordance with the *Survey Protocol for the Eastern Indigo Snake, Drymarchon couperi, in North/North-Central Florida* established by the USFWS NFESFO in February 2011. Pedestrian surveys will be conducted during the period from October 1st through April 30th along established transects within areas to be impacted during construction. During construction, PEF will comply with the USFWS Standard Protection Measures for the Eastern Indigo Snake (2004).

Prior to clearing and construction, PEF will update the bald eagle nest location and status information within and adjacent to the Kathleen Substation Site. In accordance with the FWC Eagle Management Guidelines, for construction areas that fall within 330 feet of an active or alternate bald eagle nest, construction activities will be conducted only during the non-nesting season. Any construction activities that fall within 660 feet of the nest during the nesting season will be conducted following USFWS-approved Bald Eagle Monitoring Guidelines. In areas where adverse impacts to nests cannot be avoided, PEF will obtain the information required for an FWC Eagle Permit from the FWC, and minimization and conservation measures outlined in the FWC Bald Eagle Management Plan will be followed, as applicable.



PEF will prepare a wood stork foraging habitat assessment for the Kathleen Substation Site, consistent with the Wood Stork Key for Central and North Peninsular Florida, to quantify the loss of wood stork foraging habitat units associated with expansion of the substation. PEF will utilize site-specific data for each wetland, including functional assessment evaluation (UMAM), vegetative community composition, suitability as wood stork foraging habitat, and estimated hydroperiod to evaluate the potential loss of foraging opportunities resulting from expansion of the Kathleen Substation.



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Florida Power Corporation d/b/a Progress Energy Florida, Inc. Kathleen Substation

FLUCFCS Code	Description	Acreage within Substation Site
211	Improved Pastures	6.49
320	Shrub and Brushland	0.85
511	Ditches	1.34
621	Cypress	18.29
630	Wetland Forested Mixed	50.88
631	Wetland Scrub	11.11
641	Freshwater Marshes	23.11
643	Wet Prairies	3.33
743	Spoil Areas	0.02
814	Roads and Highways	1.14
831	Electric Power Facilities	7.57
	TOTAL	124.13

Land Use/Land Cover Summary of the Kathleen Substation Site

Florida Power Corporation d/b/a Progress Energy Florida, Inc. Kathleen Substation

		Habitat	Likelihood of	Statu	IS	
Species	Habitat of Occurrence	Present on Site (Y/N)	Occurrence	LISEWS	FWC	Observed
	AMPHIBIANS		on one		1110	
Rana capito	Sandhill and scrub with isolated wetlands or				I	
Gopher frog	large ponds; commensal with gopher tortoises	No	Low	N	SSC	No
	BIRDS			•		•
<i>Ammodramus savannarum floridanus</i> Florida grasshopper sparrow	Frequently burned dry prairie habitat with patchy open areas sufficient for foraging; may persist in pasture lands that have not been intensively managed	No	Unlikely	E	E	No
Aphelocoma coerulescens Florida scrub-jay	Low-growing oak scrub habitat	No	Unlikely	Т	Т	No
Aramus guarauna Limpkin	Freshwater marshes, swamps, springs, spring runs, pond, river, and lake margins	Yes	High	N	SSC	No
Athene cunicularia floridana Florida burrowing owl	Dry prairie, sandhill, pastures	Yes	Low	N	SSC	No
Egretta caerulea Little blue heron	Freshwater lakes, marshes, swamps, and streams, cypress	Yes	High	N	SSC	No
<i>Egretta thula</i> Snowy egret	Wetlands, streams, lakes, and swamps, manmade impoundments, ditches	Yes	High	N	SSC	No
Egretta tricolor Tricolored heron	Wetlands, ditches, pond and lake edges, coastal areas	Yes	High	N	SSC	No
<i>Eudocimus albus</i> White ibis	Freshwater and brackish marshes, salt flats, forested wetlands, wet prairies, swales, man- made ditches	Yes	High	Ν	SSC	No
Falco sparverius paulus Southeastern American kestrel	Open pine habitats, woodland edges, prairies, pastures	Yes	Low	N	т	No
Grus canadensis pratensis Florida sandhill crane	Prairies, freshwater marshes, and pastures	Yes	High	N	Т	No
Haliaeetus leucocephalus Bald Eagle	Coastal areas, bays, rivers, lakes, or other bodies of water	Yes	Medium	N	Ν	No

Florida Power Corporation d/b/a Progress Energy Florida, Inc. Kathleen Substation

		Habitat	Likelihood of	Status		
Species	Habitat of Occurrence	Present on Site (Y/N)	Occurrence on Site	USFWS	FWC	Observed
<i>Mycteria americana</i> Wood stork	Cypress strands and domes, mixed hardwood swamps, freshwater marshes	Yes	High	E	Е	No
Picoides borealis Red-cockaded woodpecker	Mature pine woodlands	No	Unlikely	E	Е	No
<i>Platalea ajaja</i> Roseate spoonbill	Tidal flats, coastal and freshwater marshes	No	Low	Ν	SSC	No
Polyborus plancus audubonii Audubon's crested caracara	Open country, dry prairie, pasture lands with cabbage palm, cabbage palm/live oak hammocks	No	Unlikely	т	т	No
Rostrhamus sociabilis plumbeus Everglade snail kite	Large open freshwater marshes and lakes with shallow water less than 4 feet deep and a low density of emergent vegetation	No	Low	E	E	No
Rynchops niger Black skimmer	Coastal waters, including beaches, bays, estuaries, sandbars, tidal creeks (foraging), and also inland waters of large lakes, phosphate pits, and flooded agricultural fields	No	Unlikely	N	SSC	No
Sterna antillarum Least tern	Coastal areas throughout Florida; nesting limited to well-drained sand or gravel areas with little to no vegetation.	No	Unlikely	N	т	No
	MAMMALS		•	•		•
Eumops floridanus Florida bonneted bat	Roosts in palms and hollow trees and in buildings	No	Low	Ν	Т	No
Podomys floridanus Florida mouse	Xeric upland communities with sandy soils, including scrub, sandhill, and ruderal sites; potential gopher tortoise burrow commensal	Yes	Medium	N	SSC	No
<i>Puma concolor coryi</i> Florida panther	Extensive blocks of mostly forested communities; large wetlands that are generally inaccessible to humans are important for diurnal refuge; will tolerate improved areas in a mosaic of natural communities	No	Unlikely	E	E	No

Florida Power Corporation d/b/a Progress Energy Florida, Inc. Kathleen Substation

		Habitat	Likelihood of	Status				
Species	Habitat of Occurrence	Present on	Occurrence		EWC	Observed		
<i>Sciurus niger shermani</i> Sherman's fox squirrel	Sandhills, pine flatwoods, pastures and other open, ruderal habitats with scattered pines and oaks	Yes	Low	N	SSC	No		
Ursus americanus floridanus Florida black bear	Large areas of forested uplands, forested wetlands	No	Low	N	Т	No		
	REPTILES	•	•	•	•			
Alligator mississippiensis American alligator	Most permanent bodies of fresh water, including marshes, swamps, lakes, and rivers	Yes	Medium	T (SA)	SSC	No		
<i>Drymarchon couperi</i> Eastern indigo snake	Broad range of habitats, from scrub and sandhill to wet prairies and mangrove swamps; often commensal with gopher tortoises	Yes	Medium	т	т	No		
<i>Eumeces egregius lividus</i> Bluetail mole skink	Well-drained sandy uplands above 100 feet, usually with an abundance of scattered shrubs and lichens; favors rosemary, oak, and sand pine scrubs; occasional in turkey oak barrens, sandhill, and xeric hammock	No	Unlikely	Т	т	No		
Gopherus polyphemus Gopher tortoise	Dry upland habitats, including sandhills, scrub, xeric oak hammock, and dry pine flatwoods; also pastures, old fields	Yes	Medium	Ν	т	No		
Lampropeltis extenuata Short-tailed snake	Sandhill, xeric hammock, sand pine scrub	No	Unlikely	N	т	No		
<i>Neoseps reynoldsi</i> Sand skink	Principally rosemary scrub, but also in sand pine and oak scrubs, scrubby flatwoods, turkey oak ridges within scrub, and along edges of citrus groves occupying former scrub	No	Unlikely	т	т	No		
Pituophis melanoleucus mugitus Florida pine snake	Sandhill, old fields and pastures, sand pine scrub, scrubby flatwoods; often commensal with gopher tortoises and pocket gophers	Yes	Medium	N	SSC	No		
Pseudemys concinna suwanniensis Suwannee cooter	Rivers, large streams	No	Unlikely	N	SSC	No		
PLANTS								

Florida Power Corporation d/b/a Progress Energy Florida, Inc. Kathleen Substation

		Habitat	Likelihood of	kelihood of Status		
Species	Habitat of Occurrence	Present on Site (Y/N)	Occurrence on Site	USFWS	FWC	Observed
<i>Bonamia grandiflora</i> Florida bonamia	Openings or disturbed areas in white sand scrub	No	Unlikely	Т	E	No
<i>Calamintha ashei</i> Ashe's Savory	Dry pinelands and sand pine scrub in canopy openings and disturbed areas	No	Unlikely	N	Т	No
Calopogon multiflorus Many-flowered grass-pink	Dry to moist flatwoods with longleaf pine, wiregrass, saw palmetto	No	Unlikely	N	E	No
Centrosema arenicola Sand butterfly pea	Sandhill, scrubby flatwoods, dry upland woods	No	Unlikely	N	E	No
Chionanthus pygmaeus Pygmy fringe-tree	Scrub, sandhill, and xeric hammock, primarily on the Lake Wales Ridge	No	Unlikely	E	E	No
Cladonia perforata Perforated reindeer lichen	Rosemary scrub on FL Panhandle coasts, Lake Wales Ridge, and Atlantic Coast Ridge	No	Unlikely	N	E	No
<i>Clitoria fragrans</i> Pigeon wings	Turkey oak barrens with wire grass, bluejack and turkey oak; also scrub and scrubby high pine	No	Unlikely	т	E	No
Coelorachis tuberculosa Piedmont jointgrass	Freshwater habitats	Yes	Medium	N	Т	No
Conradina brevifolia Short-leaved rosemary	White sand scrub on the Lake Wales Ridge	No	Unlikely	E	E	No
<i>Crotalaria avonensis</i> Avon Park harebells	Scrub communities of the Lake Wales Ridge	No	Unlikely	E	E	No
Dicerandra frutescens Scrub mint	Sand pine scrub and sandhill on the Lake Wales Ridge	No	Unlikely	E	E	No
Drosera intermedia Spoon-leaved sundew	Freshwater habitats	Yes	Medium	N	т	No
Eriogonum longifolium var. gnaphalifolium Scrub buckwheat	Sandhill, oak-hickory scrub on yellow sands, high pineland between scrub and sandhill, turkey oak barrens	No	Unlikely	т	E	No
Hartwrightia floridana Hartwrightia	Seepage slopes, edges of baygalls and springheads, wet prairies, flatwoods	Yes	Medium	N	Т	No

Florida Power Corporation d/b/a Progress Energy Florida, Inc. Kathleen Substation

		Habitat	Likelihood of	Statu	IS	
Species	Habitat of Occurrence	Present on	Occurrence			Observed
	On an anotal as in white sound complex and	Site (T/N)	on Site	035W3	FWC	
Hypericum cumulicola	Open patches in white sand scrubs and rosemary halds and occasionally in openings in					
Highlands scrub hypericum	scrubby flatwoods and oak scrubs over vellow	No	Unlikely	E	E	No
3	sands of the Lake Wales Ridge					
Hypericum edisonianum	Depressions in scrub, cutthroat seeps,	Voc	Low	N	с	No
Edison's ascyrum	flatwoods ponds, lake margins, wet prairies	Tes	LOW	IN		NO
Illicium parviflorum	Banks of spring-run or seepage streams,	Yes	Low	N	F	No
Star anise	bottomland forest, hydric hammock, and baygall	103	LOW			NO
Lechea cernua	Usually ancient dunes with evergreen scrub	No	Unlikelv	N	Т	No
Nodding pinweed	oaks, mature scattered pine or oak forests	_				_
Lecnea divaricata	Scrub and scrubby flatwoods	No	Unlikely	N	E	No
	Resemany halds transitional to oak scrub:					
Florida blazing star	scrubby flatwoods and disturbed scrub	No	Unlikely	E	E	No
Lupinus aridorum	Openings in sand pine and rosemary scrub on	Nia	l halileale.		_	Nia
Scrub lupine	the Winter Haven Ridge	INO	Unlikely	E	E	INO
Matelea floridana	Pinelands, temperate forests	No	Linlikely	N	F	No
Florida spiny-pod		NO	Offlikely			NO
Nemastylis floridana	Freshwater habitats	Yes	Medium	N	E	No
Celestial lily						
Nolina brittoniana	Scrub, sandhill, scrubby flatwoods, and xeric	No	Unlikely	E	E	No
Onbioglossum palmatum	Nammock		-			
Hand fern	and wet hammocks	Yes	Low	N	E	No
	Found in mesic flatwoods and dry prairies: wet					
Panicum abscissum	flatwoods: edges of depressional marshes: wet				_	
Cutthroat grass	prairies; and, on the ecotones between	Yes	Low	N	E	No
	flatwoods and drainageways					
Paronychia chartacea	Scrub babitat of the Lake Wales Ridge	No	Linlikely	т	F	No
Papery whitlow-wort	Control Habitat of the Lake Wales Muye		Officery	'		
Pecluma plumula	Tree branches or limestone in hammocks, wet	Yes	Low	N	E	No
Plume polypody	woods, and limesinks				-	

Florida Power Corporation d/b/a Progress Energy Florida, Inc. Kathleen Substation

		Habitat	Likelihood of	Statu	S	
Species	Habitat of Occurrence	Present on	Occurrence		EWC	Observed
Pecluma ptilodon	Rockland hammocks strand swamps wet	Sile (1/N)	on Site	036403		
Swamp plume polypody	woods	Yes	Low	N	E	No
Peperomia humilis	Shell mounds and limestone outcrops in mesic	Vaa	Low	N	Г	Na
Terrestrial peperomia	hammocks, coastal berms, cypress swamps	res	LOW	IN	E	INO
Platanthera integra	Wet pine flatwoods, wet prairies, depressions	Yes	Low	N	F	No
Yellow fringeless orchid	within pinelands	103	LOW		_	NO
Polygala lewtonii	Oak scrub, sandhill, and transition zones	No	Unlikely	F	F	No
Lewton's polygala	between high pine and turkey oak barrens	110	Offinitory	–		110
Polvoonella basiramia	Rosemary phase of sand pine scrub on white			_	_	
Wireweed	sands at higher elevations of the Lake Wales,	No	Unlikely	E	E	No
Dolucionalla murianhulla	Winter Haven, and Bombing Range Ridges					
Polygonella mynophylla Sandlaco	Open, sandy areas within scrub, mostly on white sands	No	Unlikely	E	E	No
Prunus geniculata	white salids					
Scrub plum	Sandhill and oak scrub	No	Unlikely	E	E	No
Pteroglossaspis ecristata						
Giant orchid	Sandhill, scrub, pine flatwoods, pine rocklands	No	Low	N	I	No
Rhynchospora	Found in pipe flatuweds sorub and the					
megaplumosa	flatwoods-sandscrub transitional zone	No	Unlikely	N	E	No
Large-plumed Beaksedge						
Salix floridana	Springheads, edges of spring runs, hydric	No	Unlikely	N	F	No
Florida willow	hammocks, floodplains		Crimitory		-	110
Schizachyrium niveum	Rosemary, sand pine, and oak scrub	No	Unlikely	Ν	Е	No
Scrub bluestem			,			
Stylisma abolita	Pinelands, sandhills, scrub	No	Unlikely	N	Е	No
Thelyptoris serreta						
Toothed maiden fern	Cypress swamps, sloughs, floodplains	Yes	Medium	N	E	No
Warea amplexifolia				_		
Wide-leaf warea	Sandhill with longleaf pine and wiregrass	No	Unlikely	E	E	No
Warea carteri	Sandhill, scrubby flatwoods, inland and coastal	Nie	Lielikeh			Na
Carter's mustard	scrub	INO	Unlikely	E	E	INO

Florida Power Corporation d/b/a Progress Energy Florida, Inc. Kathleen Substation

Protected Plants and Animals Potentially Occurring at the Kathleen Substation Site Polk County, Florida

		Habitat	Likelihood of	Status		
Species	Habitat of Occurrence	Present on Site (Y/N)	Occurrence on Site	USFWS	FWC	Observed
<i>Ziziphus celata</i> Florida ziziphus	Oak-hickory scrub, scrubby flatwoods, or sandhills on yellow sand of the Lake Wales Ridge	No	Unlikely	Е	Е	No

Notes:

N = Not Listed

T = Threatened

E = Endangered

SSC = Species of Special Concern

T(SA) = Threatened due to similarity in appearance to a federally listed species

FIGURES










FIGURE 5 KATHLEEN SUBSTATION SOIL IDENTIFICATION TABLE

SOIL ID	DESCRIPTION	COUNTY
6	Eaton mucky fine sand, depressional	Polk
7	Pomona fine sand	Polk
9	Lynne sand	Polk
19	Floridana mucky fine sand, depressional	Polk
26	Lochloosa fine sand	Polk
32	Kaliga muck	Polk
35	Hontoon muck	Polk
40	Wauchula fine sand	Polk
58	Udorthents, excavated	Polk



X Progress Energy

FIGURE 6

Property Boundary and Substation: Progress Energy Florida, 2009; Roads: Florida Department of Transportation, 2010; Soils: U.S. Department of Agriculture, Natural Resources Conservation Service, 2006; Aerials: FDOT, 2008

APPENDIX A

FLORIDA NATURAL AREAS INVENTORY ELEMENT OCCURRENCE REPORT

NOTE: THIS ATTACHMENT INCLUDES FLORIDA NATURAL AREAS INVENTORY (FNAI) ELEMENT OCCURRENCE MAPS AND DATA FOR THE KATHLEEN SUBSTATION, EXTRACTED FROM THE POLK-HILLSBOROUGH-PINELLAS FNAI ELEMENT OCCURRENCE REPORT.



1018 Thomasville Road Suite 200-C Tallahassee, FL 32303 850-224-8207 fax 850-681-9364 www.fnai.org

Stacy Rizzo Golder Associates, Inc. 6026 NW 1st Place Gainesville, FL 32607

Dear Ms. Rizzo,

Thank you for your request for information from the Florida Natural Areas Inventory (FNAI). We have compiled the following information for your project area.

Project:	Pinellas-Hillsborough-Polk
Date Received:	November 24, 2009
Location:	Pinellas, Hillsborough, and Polk Counties

Element Occurrences

A search of our maps and database indicates that currently we have several Element Occurrences mapped within the vicinity of the study area (see enclosed maps and element occurrence tables). Please be advised that a lack of element occurrences in the FNAI database is not a sufficient indication of the absence of rare or endangered species on a site.

The Element Occurrences data layer includes occurrences of rare species and natural communities. The map legend indicates that some element occurrences occur in the general vicinity of the label point. This may be due to lack of precision of the source data, or an element that occurs over an extended area (such as a wide ranging species or large natural community). For animals and plants, Element Occurrences generally refer to more than a casual sighting; they usually indicate a viable population of the species. Note that some element occurrences represent historically documented observations which may no longer be extant.

Several of the species and natural communities tracked by the Inventory are considered **data sensitive**. Occurrence records for these elements contain information that we consider sensitive due to collection pressures, extreme rarity, or at the request of the source of the information. The Element Occurrence Record has been labeled "Data Sensitive." We request that you not publish or release specific locational data about these species or communities without consent from the Inventory. If you have any questions concerning this please do not hesitate to call.

Likely and Potential Rare Species

In addition to documented occurrences, other rare species and natural communities may be identified on or near the site based on habitat models and species range models (see enclosed Biodiversity Matrix Reports). These species should be taken into consideration in field surveys, land management, and impact avoidance and mitigation.

FNAI habitat models indicate areas, which based on land cover type, offer suitable habitat for one or more rare species that is known to occur in the vicinity. Habitat models have been developed for approximately 300 of the rarest species tracked by the Inventory, including all federally listed species.



Florida Resources and Environmental Analysis Center

Institute of Science and Public Affairs

The Florida State University



November 30, 2009

FNAI species range models indicate areas that are within the known or predicted range of a species, based on climate variables, soils, vegetation, and/or slope. Species range models have been developed for approximately 340 species, including all federally listed species.

The FNAI Biodiversity Matrix Geodatabase compiles Documented, Likely, and Potential species and natural communities for each square mile Matrix Unit statewide.

Managed Areas

Portions of the site appear to be located within Lake Park and Cone Ranch, both managed by Hillsborough County. Portions of the site also appear to be located within the Lower Hillsborough Flood Detention Area and Upper Hillsborough, both managed by the Southwest Florida Water Management District.

The Managed Areas data layer shows public and privately managed conservation lands throughout the state. Federal, state, local, and privately managed conservation lands are included.

Land Acquisition Projects

This site appears to be located within the Green Swamp Florida Forever BOT Project, which is part of the State of Florida's Conservation and Recreation Lands land acquisition program. A description of this project is enclosed. For more information on this Florida Forever Project, contact the Florida Department of Environmental Protection, Division of State Lands.

Florida Forever Board of Trustees (BOT) projects are proposed and acquired through the Florida Department of Environmental Protection, Division of State Lands. The state has no regulatory authority over these lands until they are purchased.

The Inventory always recommends that professionals familiar with Florida's flora and fauna should conduct a site-specific survey to determine the current presence or absence of rare, threatened, or endangered species.

Please visit www.fnai.org/trackinglist.cfm for county or statewide element occurrence distributions and links to more element information.

The database maintained by the Florida Natural Areas Inventory is the single most comprehensive source of information available on the locations of rare species and other significant ecological resources. However, the data are not always based on comprehensive or site-specific field surveys. Therefore, this information should not be regarded as a final statement on the biological resources of the site being considered, nor should it be substituted for on-site surveys. Inventory data are designed for the purposes of conservation planning and scientific research, and are not intended for use as the primary criteria for regulatory decisions.

Information provided by this database may not be published without prior written notification to the Florida Natural Areas Inventory, and the Inventory must be credited as an information source in these publications. FNAI data may not be resold for profit.

Thank you for your use of FNAI services. If I can be of further assistance, please give me a call at (850) 224-8207.

Sincerely, Alicia C. Newberry

Alicia C. Newberry Data Services Coordinator Encl

Tracking Florida's Biodiversity



ELEMENT OCCURRENCES DOCUMENTED ON OR NEAR Pinellas-Hillsborough-Polk (Map 7 of 7)

INVENTORY			Global	State	Federa	State	Observatio	n	
Map Label	Scientific Name	Common Name	Rank	Rank	Status	Listing	Date	Description	EO Comments
DRYMCOUP*143	Drymarchon couperi	Eastern Indigo Snake	G3	S3	LT	LT	1970-	No general description given	INDIGO OBSERVED BY MARTY MARTIN IN 1970 (MOLER INTER- VIEW OF GODLEY & MARTIN, 1982-03-27).
SCIUSHER*125	Sciurus niger shermani	Sherman's Fox Squirrel	G5T3	S3	Ν	LS	1988-07-28	Cypress Swamp; Mesic Flatwoods	. 1988-07-28: B.A. Millsap, GFC, observed 1 adult male.
GYMNCHAP*26	Gymnopogon chapmanianus	Chapman's Skeletongrass	G3	S3	Ν	Ν	1987-11-02	1987-11-02: Flatwoods (Hall).	1987-11-02: Infrequent; scattered in flatwoods; specimen taken [leaves, inflor., and few roots] (Hall).
HALILEUC*461	Haliaeetus leucocephalus	Bald Eagle	G5	S3	PS	Ν	2003	No general description given	Nest status 1995-2003: Continuously active. (U03FWC01FLUS). Previous data (note different format) NEST: 1987-1988 ACTIVE; FLEDGED YOUNG 1987-1988.
GOPHPOLY*1260	Gopherus polyphemus	Gopher Tortoise	G3	S3	Ν	LT	2008-07-25	2008-07-25: one adult tortoise foraging in grassy road that passe through mesic flatwoods; area is moderately disturbed by a clearing and an ORV trail (PNDHER03FLUS).	2008-07-25: one adult tortoise foraging in s grassy road that passes through mesic flatwoods (PNDHER03FLUS).

Biodiversity Matrix Report Map 7 of 7

Scientific Name	Common Name	Global Rank	State Rank	Federal Status	State Listing
Matrix Unit ID: 33085					
Likely					
Drymarchon couperi Grus canadensis pratensis Mycteria americana	Eastern Indigo Snake Florida Sandhill Crane Wood Stork	G3 G5T2T3 G4	S3 S2S3 S2	LT N LE	LT LT LE
Potential					
Aimophila aestivalis Athene cunicularia floridana Bonamia grandiflora Calamintha ashei Calopogon multiflorus Carex chapmanii Centrosema arenicola Chionanthus pygmaeus Corynorhinus rafinesquii Eriogonum longifolium var. gnaphalifolium Eumeces egregius lividus Gopherus polyphemus Gymnopogon chapmanianus Heterodon simus Lechea cernua Matelea floridana Mustela frenata peninsulae Nemastylis floridana Neofiber alleni Nolina atopocarpa Nolina brittoniana Panicum abscissum Paronychia chartacea ssp. chartacea Picoides borealis Pituophis melanoleucus mugitus Podomys floridanus Polygala lewtonii Pteroglossaspis ecristata Rana capito Rostrhamus sociabilis plumbeus Salix floridana Sciurus niger shermani Warea carteri Zonburanthos simpoonii	Bachman's Sparrow Florida Burrowing Owl Florida Bonamia Ashe's Savory Many-flowered Grass-pink Chapman's Sedge Sand Butterfly Pea Pygmy Fringe Tree Rafinesque's Big-eared Bat Scrub Buckwheat Blue-tailed Mole Skink Gopher Tortoise Chapman's Skeletongrass Southern Hognose Snake Nodding Pinweed Florida Spiny-pod Florida Long-tailed Weasel Celestial Lily Round-tailed Muskrat Florida Beargrass Britton's Beargrass Cutthroat Grass Paper-like Nailwort Red-cockaded Woodpecker Florida Pine Snake Florida Muse Lewton's Polygala Giant Orchid Gopher Frog Snail Kite Florida Willow Sherman's Fox Squirrel Carter's Warea Papa Liky	$\begin{array}{c} G3\\ G4T3\\ G3\\ G3\\ G2G3\\ G3\\ G2Q\\ G3\\ G2Q\\ G3\\ G3G4\\ G4T3\\ G5T2\\ G3\\ G3\\ G2\\ G3\\ G2\\ G3\\ G2\\ G3\\ G2\\ G3\\ G3\\ G3\\ G3\\ G3\\ G3\\ G3\\ G3\\ G3\\ G3$	S3 S3 S3 S3 S3 S3 S2 S3 S2 S3 S3 S3 S3 S3 S3	ヱヹ゙゙゙゙ヱヱヱヱヱヱヱヱヱヱヱヱヱヱヱヱヱヱヱヱヱヱヱヱヱヱヱヱヱヱ	N \$\$U\$U\$U\$U\$U\$U\$U\$U\$U\$U\$U\$U\$U\$U\$U\$U\$U\$U\$
Matrix Unit ID: 33086	···· -·· ,				
Likely					
Drymarchon couperi Grus canadensis pratensis Mycteria americana	Eastern Indigo Snake Florida Sandhill Crane Wood Stork	G3 G5T2T3 G4	S3 S2S3 S2	LT N LE	LT LT LE

Definitions: Documented - Rare species and natural communities documented on or near this site.

Biodiversity Matrix Report Map 7 of 7

INVENTORY Scientific Name	Common Name	Global Rank	State Rank	Federal Status	State Listing
Potential					
Aimophila aestivalis	Bachman's Sparrow	G3	S3	Ν	Ν
Athene cunicularia floridana	Florida Burrowing Owl	G4T3	S3	Ν	LS
Bonamia grandiflora	Florida Bonamia	G3	S3	LT	LE
Calamintha ashei	Ashe's Savory	G3	S3	Ν	LT
Calopogon multiflorus	Many-flowered Grass-pink	G2G3	S2S3	Ν	LE
Carex chapmanii	Chapman's Sedge	G3	S3	Ν	LE
Centrosema arenicola	Sand Butterfly Pea	G2Q	S2	Ν	LE
Chionanthus pygmaeus	Pvamv Fringe Tree	G3	S3	LE	LE
Corvnorhinus rafinesquii	Rafinesque's Big-eared Bat	G3G4	S2	Ν	Ν
Eriogonum longifolium var. gnaphalifolium	Scrub Buckwheat	G4T3	S3	LT	LE
Eumeces eareaius lividus	Blue-tailed Mole Skink	G5T2	S2	LT	LT
Gopherus polyphemus	Gopher Tortoise	G3	S3	N	I T
Gymnopogon chapmanianus	Chapman's Skeletongrass	G3	S3	N	N
Heterodon simus	Southern Hognose Snake	G2	S2	N	N
l echea cernua	Nodding Pinweed	G3	S3	N	ΙT
Matelea floridana	Florida Spiny-pod	G2	S2	N	IF
Monotropsis revnoldsiae	Pyany Pines	G10	S1	N	IF
Mustela frenata neninsulae	Florida Long-tailed Weasel	G5T3	53	N	N
Nemastylis floridana	Celestial Lilv	G2	S2	N	IF
Neofiber alleni	Round-tailed Muskrat	C2 C3	62 63	N	
Nolina hrittoniana	Ritton's Beargrass	C3	63		
Panicum abscissum	Cutthroat Grass	G3	63		
Picoides borealis	Red-cockaded Woodpacker	G3	S2		
Pituophis melanoleucus mugitus	Florida Pine Snake	G4T3	52 53		
Podomus floridanus	Florida Mouso	6413	62	N	
Polugala lautonii	Lowton's Polygola	63	00 62		
Polygala lewionii Dioroglogogopia agriatata	Cient Orohid	63	00 60		
Plerogiossaspis ecristata	Gant Orchid	6263	52	IN N	
Rana capilo Restribumuo essistellis numbeus	Speil Kite	GS CACETOO	33 62		
Rostmamus sociabilis plumbeus	Shall Kite	G4G513Q	52		
	FIORIDA VIIIOW	GZ OFTO	52	IN N	
Sciurus niger snermani	Sherman's Fox Squirrei	G513	53		
vvarea carteri	Carter's warea	G3	53	LE	
Zephyrantnes simpsonii	Rain Liiy	G2G3	5253	IN	LI
Matrix Unit ID: 33087					
Likely					
Drymarchon couperi	Eastern Indigo Snake	G3	S3	LT	LT
Grus canadensis pratensis	Florida Sandhill Crane	G5T2T3	S2S3	Ν	LT
Mycteria americana	Wood Stork	G4	S2	LE	LE
Potential					
Aimophila aestivalis	Bachman's Sparrow	G3	S3	Ν	Ν
Asplenium heteroresiliens	Wagner's Spleenwort	GNA	S1	N	Ň
Athene cunicularia floridana	Florida Burrowing Owl	G4T3	S3	N	LS
Bonamia grandiflora	Florida Bonamia	G3	S3	LT	LE
Calamintha ashei	Ashe's Savory	G3	53	<u> </u>	
Carex chapmanii	Chapman's Sedge	G3	S3	N	LE

Definitions: Documented - Rare species and natural communities documented on or near this site.

Biodiversity Matrix Report Map 7 of 7

INVENTORY	0	Global	State	Federal	State
Scientific Name	Common Name	Rank	Rank	Status	Listing
Centrosema arenicola	Sand Butterfly Pea	G2Q	S2	Ν	LE
Corynorhinus rafinesquii	Rafinesque's Big-eared Bat	G3G4	S2	N	Ν
Eriogonum longifolium var. gnaphalifolium	Scrub Buckwheat	G4T3	S3	LT	LE
Eumeces egregius lividus	Blue-tailed Mole Skink	G5T2	S2	LT	LT
Gopherus polyphemus	Gopher Tortoise	G3	S3	N	LT
Gymnopogon chapmanianus	Chapman's Skeletongrass	G3	S3	N	Ν
Heterodon simus	Southern Hognose Snake	G2	S2	N	Ν
Lechea cernua	Nodding Pinweed	G3	S3	N	LT
Matelea floridana	Florida Spiny-pod	G2	S2	N	LE
Monotropsis reynoldsiae	Pygmy Pipes	G1Q	S1	N	LE
Mustela frenata peninsulae	Florida Long-tailed Weasel	G5T3	S3	N	Ν
Nemastylis floridana	Celestial Lily	G2	S2	N	LE
Neofiber alleni	Round-tailed Muskrat	G3	S3	N	Ν
Nolina brittoniana	Britton's Beargrass	G3	S3	LE	LE
Panicum abscissum	Cutthroat Grass	G3	S3	N	LE
Paronychia chartacea ssp. chartacea	Paper-like Nailwort	G3T3	S3	LT	LE
Picoides borealis	Red-cockaded Woodpecker	G3	S2	LE	LS
Podomys floridanus	Florida Mouse	G3	S3	N	LS
Polygala lewtonii	Lewton's Polygala	G3	S3	LE	LE
Pteroglossaspis ecristata	Giant Orchid	G2G3	S2	N	LT
Pycnanthemum floridanum	Florida Mountain-mint	G3	S3	N	LT
Rana capito	Gopher Frog	G3	S3	N	LS
Rostrhamus sociabilis plumbeus	Snail Kite	G4G5T3Q	S2	LE	LE
Salix floridana	Florida Willow	G2	S2	N	LE
Sciurus niger shermani	Sherman's Fox Squirrel	G5T3	S3	N	LS
Warea carteri	Carter's Warea	G3	S3	LE	LE
Matrix Unit ID: 33088					
Likely					
Drymarchon couperi	Eastern Indigo Snake	G3	S3	LT	LT
Grus canadensis pratensis	Florida Sandhill Crane	G5T2T3	S2S3	N	LT
Mesic flatwoods		G4	S4	N	N
Mvcteria americana	Wood Stork	G4	S2	LE	LE
Sciurus niger shermani	Sherman's Fox Squirrel	G5T3	S3	Ν	LS
Potential	•				
Agrimonia incisa	Incised Groove-bur	C3	S 2	N	
Aynnonia incisa Aimophilo postivolio	Rachman's Sparrow	63	02 62	N	
Annophila destivalis	Wagnar's Splannwort	GNA GNA	00 Q1	N	IN N
Aspienium neleroresiliens	Florido Burrowing Owl		01 62	IN N	
Alliene cunicularia nonuaria Ponomio grandiflaro	Florida Burlowing Owi	6413	33 62		
Donanna granuniora	Achola Sovery	63	33 62		
Calaminina asher	Chapman's Sadas	63	33 62	IN N	
Carex chapmann	Chapman's Seuge	63	33 62	IN N	
	Sanu Dullerily Pea	GZQ C2C4	52	IN N	
Corynoninus rainesquii Eriogonum longifolium vor gnonholifolium	Rainesques Dig-eared Bat	G3G4 C4T2	32 62		
	Conhor Tortoige	6413	33 62		
Guprierus poryprierius	Chapman's Skoletongroep	63	33 62	IN NI	
Gymnopogon chapmanianus Hotorodon simus	Southorn Hognoso Spake	63	33 60	IN NI	IN NI
neterodon sinus	Southern noghose Shake	GZ	32	IN	IN

Definitions: Documented - Rare species and natural communities documented on or near this site.

Biodiversity Matrix Report Map 7 of 7

Scientific Name	Common Name	Global Rank	State Rank	Federal Status	State Listing
Lechea cernua	Nodding Pinweed	G3	S3	Ν	LT
Matelea floridana	Florida Spiny-pod	G2	S2	N	LE
Monotropsis reynoldsiae	Pygmy Pipes	G1Q	S1	N	LE
Mustela frenata peninsulae	Florida Long-tailed Weasel	G5T3	S3	N	N
Nemastylis floridana	Celestial Lily	G2	S2	N	LE
Neofiber alleni	Round-tailed Muskrat	G3	S3	N	N
Nolina brittoniana	Britton's Beargrass	G3	S3	LE	LE
Panicum abscissum	Cutthroat Grass	G3	S3	N	LE
Paronychia chartacea ssp. chartacea	Paper-like Nailwort	G3T3	S3	LT	LE
Picoides borealis	Red-cockaded Woodpecker	G3	S2	LE	LS
Podomys floridanus	Florida Mouse	G3	S3	N	LS
Polygala lewtonii	Lewton's Polygala	G3	S3	LE	
Pycnanthemum floridanum	Florida Mountain-mint	G3	S3	N	LI
Rana capito	Gopher Frog	G3	S3	N	LS
Rostrhamus sociabilis plumbeus	Snail Kite	G4G513Q	S2	LE	LE
Salix floridana	Florida Willow	G2	S2	N	LE
Warea carteri	Carter's Warea	G3	\$3	LE	LE
Matrix Unit ID: 33089					
Likely					
Drymarchon couperi	Eastern Indigo Snake	G3	S3	LT	LT
Grus canadensis pratensis	Florida Sandhill Crane	G5T2T3	S2S3	Ν	LT
Mesic flatwoods		G4	S4	Ν	Ν
Mycteria americana	Wood Stork	G4	S2	LE	LE
Sciurus niger shermani	Sherman's Fox Squirrel	G5T3	S3	Ν	LS
Potential					
Agrimonia incisa	Incised Groove-bur	G3	S2	Ν	LE
Aimophila aestivalis	Bachman's Sparrow	G3	S3	Ν	Ν
Asplenium heteroresiliens	Wagner's Spleenwort	GNA	S1	Ν	Ν
Athene cunicularia floridana	Florida Burrowing Owl	G4T3	S3	Ν	LS
Centrosema arenicola	Sand Butterfly Pea	G2Q	S2	Ν	LE
Corynorhinus rafinesquii	Rafinesque's Big-eared Bat	G3G4	S2	Ν	Ν
Gopherus polyphemus	Gopher Tortoise	G3	S3	N	LT
Gymnopogon chapmanianus	Chapman's Skeletongrass	G3	S3	N	Ν
Heterodon simus	Southern Hognose Snake	G2	S2	N	Ν
Matelea floridana	Florida Spiny-pod	G2	S2	N	LE
Monotropsis reynoldsiae	Pygmy Pipes	G1Q	S1	N	LE
Mustela frenata peninsulae	Florida Long-tailed Weasel	G5T3	S3	N	Ν
Nemastylis floridana	Celestial Lily	G2	S2	N	LE
Neofiber alleni	Round-tailed Muskrat	G3	S3	N	N
Picoides borealis	Red-cockaded Woodpecker	G3	S2	LE	LS
Podomys floridanus	Florida Mouse	G3	S3	N	LS
Pycnanthemum floridanum	Florida Mountain-mint	G3	S3	N	LT
Rana capito	Gopher Frog	G3	S3	N	LS
Rostrhamus sociabilis plumbeus	Snail Kite	G4G5T3Q	S2	LE	LE

Matrix Unit ID: 33090

Definitions: Documented - Rare species and natural communities documented on or near this site.

Biodiversity Matrix Report Map 7 of 7

INVENTORY		Global	State	Federal	State
Scientific Name	Common Name	Rank	Rank	Status	Listing
Documented					
Gopherus polyphemus	Gopher Tortoise	G3	S3	Ν	LT
Likely					
Drymarchon couperi Grus canadensis pratensis Mesic flatwoods Mycteria americana Sciurus niger shermani	Eastern Indigo Snake Florida Sandhill Crane Wood Stork Sherman's Fox Squirrel	G3 G5T2T3 G4 G4 G5T3	S3 S2S3 S4 S2 S3	LT N N LE N	LT LT N LE LS
Potential					
Agrimonia incisa Aimophila aestivalis Asplenium heteroresiliens Athene cunicularia floridana Centrosema arenicola Corynorhinus rafinesquii Gymnopogon chapmanianus	Incised Groove-bur Bachman's Sparrow Wagner's Spleenwort Florida Burrowing Owl Sand Butterfly Pea Rafinesque's Big-eared Bat Chapman's Skeletongrass	G3 G3 GNA G4T3 G2Q G3G4 G3	S2 S3 S1 S2 S2 S2 S3	N N N N N N	LE N LS LE N N
Matelea floridana Monotropsis reynoldsiae Mustela frenata peninsulae Nemastylis floridana Neofiber alleni	Florida Spiny-pod Pygmy Pipes Florida Long-tailed Weasel Celestial Lily Round-tailed Muskrat	G2 G1Q G5T3 G2 G3	S2 S1 S3 S2 S3	N N N N	LE LE N LE N
Picoides borealis Podomys floridanus Pycnanthemum floridanum Rana capito Rostrhamus sociabilis plumbeus	Red-cockaded Woodpecker Florida Mouse Florida Mountain-mint Gopher Frog Snail Kite	G3 G3 G3 G3 G4G5T3Q	S2 S3 S3 S3 S2	LE N N LE	LS LS LT LS LE

Definitions: Documented - Rare species and natural communities documented on or near this site.

GLOBAL AND STATE RANKS

Florida Natural Areas Inventory (FNAI) defines an **element** as any rare or exemplary component of the natural environment, such as a species, natural community, bird rookery, spring, sinkhole, cave, or other ecological feature. FNAI assigns two ranks to each element found in Florida: the **global rank**, which is based on an element's worldwide status, and the **state rank**, which is based on the status of the element within Florida. Element ranks are based on many factors, including estimated number of occurrences, estimated abundance (for species and populations) or area (for natural communities), estimated number of adequately protected occurrences, range, threats, and ecological fragility.

GLOBAL RANK DEFINITIONS

- *GI* 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 or less than 10,0000 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.
- *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)
- *G#T#Q* Same as above, but validity as subspecies or variety is questioned.
- *GH* Of historical occurrence throughout its range, may be rediscovered (e.g., ivory-billed woodpecker)
- GNA Ranking is not applicable because element is not a suitable target for conservation (e.g. as for hybrid species)
- GNR Not yet ranked (temporary)
- **GNRTNR** Neither the full species nor the taxonomic subgroup has yet been ranked (temporary)
- *GX* Believed to be extinct throughout range
- *GXC* Extirpated from the wild but still known from captivity/cultivation
- GU Unrankable. Due to lack of information, no rank or range can be assigned (e.g., GUT2).

STATE RANK DEFINITIONS

Definition parallels global element rank: substitute "S" for "G" in above global ranks, and "in Florida" for "globally" in above global rank definitions.

Tracking Florida's Biodiversity

FEDERAL AND STATE LEGAL STATUSES (U.S. Fish and Wildlife Service – USFWS) PROVIDED BY FNAI FOR INFORMATION ONLY.

For official definitions and lists of protected species, consult the relevant state or federal agency.

FEDERAL LEGAL STATUS

Definitions derived from U.S. Endangered Species Act of 1973, Sec. 3. Note that the federal status given by FNAI refers only to Florida populations and that federal status may differ elsewhere.

- *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.
- *LE,XN* A non essential experimental population of a species otherwise Listed as an Endangered Species in the List of Endangered and Threatened Wildlife and Plants. LE,XN for Grus americana (Whooping crane), Federally listed as XN (Non essential experimental population) refers to the Florida experimental population only. Federal listing elsewhere for Grus americana is LE.
- **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.
- *LT,PDL* Species currently listed Threatened but has been proposed for delisting.
- *PT* Proposed for listing as Threatened Species.
- *C* Candidate Species for addition to the list of Endangered and Threatened Wildlife and Plants, Category 1. Federal listing agencies have sufficient information on biological vulnerability and threats to support proposing to list the species as Endangered or Threatened.
- *SAT* Threatened due to similarity of appearance to a threatened species.
- *SC* Species of Concern, species is not currently listed but is of management concern to USFWS.
- *N* Not currently listed, nor currently being considered for addition to the List of Endangered and Threatened Wildlife and Plants.

FLORIDA LEGAL STATUSES (Florida Fish and Wildlife Conservation Commission – FFWCC/ Florida Department of Agriculture and Consumer Services – FDACS)

Animals: Definitions derived from "Florida's Endangered Species and Species of Special Concern, Official Lists" published by Florida Fish and Wildlife Conservation Commission - FFWCC, 1 August 1997, and subsequent updates.

- *LE* Listed as Endangered Species by the FFWCC. 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 as Threatened Species by the FFWCC. 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.
- *LT** Indicates that a species has LT status only in selected portions of its range in Florida. LT* for Ursus americanus floridanus (Florida black bear) indicates that LT status does not apply in Baker and Columbia counties and in the Apalachicola National Forest. LT* for Neovison vison pop. 1 (Southern mink, South Florida population) state listed as Threatened refers to the Everglades population only (Note: species formerly listed as Mustela vison mink pop. 1. Also, priorly listed as Mustela evergladensis).
- *LS* Listed as Species of Special Concern by the FFWCC, defined as a population which warrants special protection, recognition, or consideration because it has an inherent significant vulnerability to habitat modification,

Tracking Florida's Biodiversity

environmental alteration, human disturbance, or substantial human exploitation which, in the foreseeable future, may result in its becoming a threatened species.

- LS* Indicates that a species has LS status only in selected portions of its range in Florida. LS* for Pandion haliaetus (Osprey) state listed as LS (Species of Special Concern) in Monroe County only.
- **PE** Proposed for listing as Endangered.
- *PT* Proposed for listing as Threatened.
- **PS** Proposed for listing as a Species of Special Concern.
- *N* Not currently listed, nor currently being considered for listing.

Plants: Definitions derived from Sections 581.011 and 581.185(2), Florida Statutes, and the Preservation of Native Flora of Florida Act, 5B-40.001. FNAI does not track all state-regulated plant species; for a complete list of state-regulated plant species, call Florida Division of Plant Industry, 352-372-3505 or please visit: http://DOACS.State.FL.US/PI/Images/Rule05b.pdf

- *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.
- **PE** Proposed by the FDACS for listing as Endangered Plants.
- *LT* Listed as 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. LT* indicates that a species has LT status only in selected portions of its range in Florida.
- *PT* Proposed by the FDACS for listing as Threatened Plants.
- *N* Not currently listed, nor currently being considered for listing.

Tracking Florida's Biodiversity

Green Swamp

Lake and Polk Counties

Group A Full Fee / Less-Than-Fee

Purpose for State Acquisition

The mosaic of cypress swamps, pine forests, and pastures known as the Green Swamp is a vital part of the water supply of central Florida. This project gives rise to four major river systems, has the highest groundwater elevation in the peninsula, and is important for maintaining the flow of water from the Floridan Aquifer. By preserving the mosaic of land use in this region, the Green Swamp Florida Forever project will protect the Floridan Aquifer and the several rivers; preserve a large area for wildlife; and provide areas for public recreation in the rapidly growing region between Tampa and Orlando. This project may also help complete the Florida National Scenic Trail, a statewide non-motorized trail that crosses a number of Florida Forever project sites.

Managers

The Fish and Wildlife Conservation Commission (FWC) is recommended as the manager for most of the project area. The Department of Environmental Protection's Division of Recreation and Parks (DRP) will manage the Overstreet Ranch and the area adjacent to Lake Louisa State Park, with Sections 3, 4, and 5, T24S, R26E being the southern extent of its management.

General Description

The project is a critical hydrological resource: it en-

Green Swamp FNAI Elements - July 2009		
Gopher Tortoise	G3/S3	
Eastern Indigo Snake	G3/S3	
Florida Mouse	G3/S3	
Swallow-tailed Kite	G5/S2	
Celestial Lily	G2/S2	
Florida Sandhill Crane	G5T2T3/S2S3	
Short-tailed Hawk	G4G5/S1	
Peninsular Floater	G3/S2	
Scrub Plum	G3/S3	
Florida Bonanta	G3/S3	

compasses the headwaters of four major rivers; the Withlacoochee, Oklawaha, Hillsborough, and Peace; and has the highest ground water elevation in the Peninsula. It is therefore considered critical to the recharge of the Floridan Aquifer. For this reason, it has been designated an Area of Critical State Concern. The area is a complex mosaic of disturbed uplands and wetlands intermixed with higher quality swamps. It is estimated that 90% of the native upland vegetation in the project has been disturbed by agriculture and development, but the project does contain some uplands with natural communities such as flatwoods and sandhills. The project has a moderate potential for archaeological or historical sites. The wetlands are threatened by sand mining and the uplands are threatened by residential, commercial and high-intensity recreational development.

Public Use

The project will become a wildlife management area and a state park, providing for such activities as hunting, hiking and nature appreciation. The less than fee parcel qualifies as a wildlife management area. The amount and nature of public use will be negotiated with the landowners.

Acquisition Planning

On December 10, 1992, the Land Acquisition Advisory Council (LAAC) added the Green Swamp project to the CARL Priority list. This fee-simple & lessthan-fee acquisition, sponsored by the Department of Environmental Regulations, consisted of approximately 230,000 acres, divided into Phase I (126,800 acres) and II (103,200 acres), multiple owners, and a 1991 taxable

Placed on list	1992
Project Area (Acres)	233,598*
Acres Acquired	69,447**
at a Cost of	\$115,321,102**
Acres Remaining	164,151
with Estimated (Tax Assessed) Value of	of \$194,407,313

*Previously only Phase 1 reported

**includes acreage acquired & funds expended by the Southwest Florida and St. Johns River Water Management Districts

Green Swamp - Group A / Full Fee / Less-Than-Fee

value of \$272,628,200. Two non-contiguous Phase I areas have been identified based on relative intactness of their natural communities. In general, priority areas are the relatively large contiguous parcels and strategic smaller parcels. In <u>Lake County</u>, the northern half of the western Phase I area extends south to the county line, less the subdivisions. Specifically in the <u>Lake Louisa</u> area, the Bradshaw ownership (acquired) is the most important tract.

The Black Bear Land Company, Ray, and Oswalt ownerships have also been acquired.Other large ownerships have been mapped and appraised.

On October 30, 1996, the LAAC approved a feesimple, 3,598-acre addition to the project boundary. The addition was distributed as follows: Phase I, 890 acres with a taxable value of \$995,830 and Phase II, 2,708 acres with a taxable value of \$3,030,000. The addition was sponsored by the DEP, consisted of multiple owners, and a total taxable value of \$4,025,830. LAAC also moved 19,000 acres from Phase II to Phase I and approved the deletion of the priority areas designation within Phase I.

On December 15, 1996, the Overstreet (acquired in 2006) and portions of the Jahna (acquired in a conservation easement) ownerships (11,383 acres) were transferred to the CARL Less-Than-Fee category.

On April 6, 2001, the Acquisition & Restoration Council (ARC) established a Florida Forever (FF) priority list consisting of Groups A & B. The Green Swamp Less-Than-Fee acreage went to Group A and the Full-Fee acreage went to Group B.

On June 6, 2002, the ARC approved combining the Green Swamp full-fee and less-than-fee categories into one Group A Less-Than-Fee category. Parcels can still be acquired in full-fee if appropriate.

Coordination

The Green Swamp Land Authority has acquired 17,948 acres within the project boundary and expended \$13,848,442. The SWFWMD has acquired considerable acreage adjacent to and partly within the overall project boundary. Section 51, ch. 99-2478, provided for the deletion of the provision setting out the membership of the Green Swamp Land Authority and that "[henceforth, the Green Swamp Land Authority shall mean the Department of Environmental Protection for purposes of [Section 380.0677, F.S.,] and statutes related thereto."

Management Policy Statement

The primary goals of management of the Green Swamp Florida Forever project are: to conserve and protect lands within areas of critical state concern; to conserve and protect significant habitat for native species or endangered and threatened species; to conserve, protect, manage, or restore important ecosystems, landscapes, and forests, in order to enhance or protect significant surface water, coastal, recreational, timber, fish or wildlife resources which local or state regulatory programs cannot adequately protect; and to provide areas, including recreational trails, for natural-resource-based recreation.

Management Prospectus

Qualifications for state designation The Green Swamp Florida Forever project has the size and wildlife resources to qualify as a wildlife management area.

Manager DEP has been recommended as manager. *Conditions affecting intensity of management* The primary management tools in the area to be managed by FWC involve prescribed introduction of fire and control of human access. Some pine forests will require restoration. The portion of the project adjacent to Lake Louisa, to be managed by DRP, is a high-need management area with emphasis on public recreational use and development and major resource restoration. The majority of the properties in this area are or were citrus groves. The portion of the project known as the Overstreet Ranch to be managed by DRP is within the Department of Transportation's Hillsborough Watershed mitigation/restoration area. The southwest portion has been identified for potential mitigation.

Timetable for implementing management and provisions for security and protection of infrastructure

Within the first year after acquisition, FWC's management activities will concentrate on site security, natural and cultural resource protection, and the development of a plan for long-term public use and resource management that is consistent with the goals and objectives stated for this project. Long-term management will include restoration of natural pine forests. Growing-season fire will be important in this restoration. FWC will emphasize the provision of old-growth forest, but for game species will also provide areas of successional vegetation in pine areas adjacent to wetlands. FWC also plans to provide high-quality habitat and protection for listed wildlife species. FWC will keep public facilities to a minimum, hiking and horseback trail in upland areas, and perhaps interpretive centers and wildlife observation towers in selected areas.

Green Swamp - Group A / Full Fee / Less-Than-Fee

Revenue-generating potential FWC expects no significant revenue from this project initially, but will continue to offer hunting opportunities. For the area next to Lake Louisa State Park, DRP also expects no significant revenue to be generated initially. After acquisition, it will probably be several years before any significant public use facilities are developed in the Lake Louisa area, and the amount of any revenue generated will depend on the nature and extent of public use and facilities.

Management Cost	Summary/FWC		
Category	1996/97	1997/98	1998/99
Source of Funds	CARL	CARL	CARL
Salary	\$18,290	\$43,100	\$77,650
OPS	\$0	\$0	\$1,000
Expense	\$43,280	\$37,900	\$30,000
000	\$0	\$28,500	\$29,200
FCO	\$0	\$0	\$0
TOTAL	\$61,570	\$109,500	\$137,850
Management Cost	Summary/DRP		
Category	1996/97	1997/98	1998/99
Source of Funds	SPTF/CARL	SPTF/CARL	SPTF/CARL
Salary	\$103,834	\$106,949	\$110,157
OPS	\$12,254	\$12,000	\$12,000
Expense	\$19,268	\$22,000	\$22,000
000	\$29,807	\$0	\$0
FCO	\$0	\$0	\$0
TOTAL	\$135,356	\$140,949	\$144,157

FOR IMMEDIATE RELEASE

FNAI's Biodiversity Matrix Online

The Biodiversity Matrix Map Server is a new screening tool from FNAI that provides immediate, free access to rare species occurrence information statewide. This tool allows you to zoom to your site of interest and create a report listing documented, likely, and potential occurrences of rare species and natural communities.

The FNAI Biodiversity Matrix offers **built-in interpretation** of the likelihood of species occurrence for each 1-square-mile Matrix Unit across the state. The report includes a site map and list of species and natural communities by occurrence status: Documented, Documented-Historic, Likely, and Potential.

Try it today: www.fnai.org/biointro.cfm

Please note: FNAI will continue to offer our Standard Data Report service as always. The Standard Data Report offers the most comprehensive information available on rare species, natural communities, conservation lands, and other natural resources.

www.fnai.org

APPENDIX B LISTED SPECIES DESCRIPTIONS

LIMPKIN Aramus guarauna

Order:GruiformesFamily:AramidaeFNAI Ranks:G5/S3U.S. Status:NoneFL Status:Species of Special ConcernU.S. Migratory Bird Treaty Act and state WildlifeCode prohibit take of birds, nests, or eggs.

Description: Large, long-billed, longlegged wader of swamps and marshes. Sports a deep brown color with white spotting and streaking. Bill is heavy and slightly decurved, allowing easy access to its preferred food, the apple snail (*Pomacea paludosa*). Call is an unmistakable loud, wild scream or wail.

© Karla Brandt

Similar Species: Long neck and bill of the limpkin help distinguish it from the slightly smaller, but similarly colored, immature night-herons (*Nycticorax* spp.). The immature white ibis (*Eudocimus albus*; see species account) has a long, decurved bill and long legs but is not brown all over with white flecking.

Habitat: Inhabits mangroves, freshwater marshes, swamps, springs and spring runs, and pond and river margins. Also lake margins in peninsular Florida and swales, strand swamps, sloughs, and impoundments in south Florida. May also forage in ruderal areas such as sugarcane fields and banks of irrigation canals. Wide range of nesting sites, including mounds of aquatic vegetation and marsh grasses, among cypress knees, and high in trees.

Seasonal Occurrence: Males generally appear to be resident where they breed, although there is some evidence of movement, possibly related to

Field Guide to the Rare Animals of Florida

Florida Natural Areas Inventory, 2001

LIMPKIN

Aramus guarauna

food availability. A partial migration was documented with color-banded birds from Wakulla Springs (Wakulla County) and Alexander Springs (Lake County); most females left their breeding territories, for parts unknown, in mid-summer and returned in mid-winter. Observations of large concentrations of limpkins are usually attributed to regional drought conditions. Nesting generally occurs late February - May in north Florida and late January - March in central Florida, and possibly earlier in south Florida.

Florida Distribution: Scattered sites in the panhandle and northern Florida, but generally widespread in central and southern Florida.

Range-wide Distribution: Resident in southeastern Georgia, Florida, Greater Antilles (rare or extirpated in Puerto Rico), and from southern Mexico to central Argentina.

Conservation Status: Occur on numerous lands owned by federal, state, and private entities, although this is no insurance against threats. A large and presumably stable population at Wakulla Springs State Park (Wakulla County) has experienced recent declines, possibly because of deteriorating water quality. Pollution, hydrological disruptions, and an increase in invasive plants threaten the health of the apple snail population and hence the limpkin.

Protection and Management: Maintain natural hydrological regimes and protect suitable habitat from pollution, development activities, and proliferation of exotic plants. Institute regular surveys and monitoring programs for both limpkins and apple snails, particularly in light of continued degradation and loss of Florida's wetlands.

Selected References: Robertson and Woolfenden 1992, Rodgers et al. (eds.) 1996, Stevenson and Anderson 1994.

FLORIDA BURROWING OWL Athene cunicularia floridana

Order:	Strigiformes
Family:	Strigidae
FNAI Ranks:	G4T3/S3
U.S. Status:	None
FL Status:	Species of Special Concern
U.S. Migratory B	ird Treaty Act and state Wildlife Code
prohibit take of b	irds, nests, or eggs.

Shad

© Barry Mansell

Description: Small, ground-dwelling owl with long legs, white chin stripe, round head, and stubby tail. Adults are boldly spotted and barred with brown and white. Juveniles plainer above with less spotting, and buffy below with little or no brown barring. Will often dig their own burrow and, prior to egg laying, will line burrow and entrance with various materials (e.g., grass clumps, palm fronds). After eggs are laid, entrance chamber is further adorned with more decorative and visible objects, such as paper scraps, plastics, tin foil, mirrors, graduation tassels, cigarette butts, and other non-natural materials.

FLORIDA BURROWING OWL

Similar Species: Not likely to be confused with other owl species. Differs from western subspecies in having darker upper parts with less buffy brown, and whiter spotting.

Habitat: High, sparsely vegetated, sandy ground. Natural habitats include dry prairie and sandhill. Makes extensive use of ruderal areas such as pastures, airports, ball fields, parks, school grounds, university campuses, road right-of-ways, and vacant spaces in residential areas.

Seasonal Occurrence: Predominately nonmigratory; maintains home ranges and territories while nesting.

Florida Distribution: Largest populations occur in southwest and southeast Florida. Depending on habitat availability, small, patchily distributed populations occur in the Keys and along the interior ridges of Florida from Highlands County to Madison County. A single disjunct population occurs at Eglin Air Force Base in Okaloosa County.

Range-wide Distribution: Resident in Florida and the Bahamas.

Conservation Status: Human activities have increased range in Florida but have exposed owls to additional threats. Largest concentrations of owls now reside in ruderal grasslands and lawns of residential and industrial areas. One of the largest populations is in Cape Coral, a large development in Lee County. Intensive cultivation and development of grasslands pose major threats. Permits for legal "take" of burrows also of concern. Human harassment (generally by children), predation by domestic animals, and vehicle collisions take toll on urban/ruderal birds. Predation by fire ants is also implicated in owl mortality.

Protection and Management: Educate residents in developments and owners of industrial or farm lands where owls occur to help limit harassment. Maintain optimum condition of natural and ruderal sites where owls occur; will likely require fire in natural areas and mowing in ruderal ones. Establish buffer zones and development plans that consider the needs of the owl, which may allow them to persist under otherwise precarious circumstances. Studies in Cape Coral showed owls appeared to prefer sites with between 25 and 75 percent of developable lots occupied.

Selected References: Bowen 2000, Poole and Gill (eds.) 1993, Robertson and Woolfenden 1992, Rodgers et al. (eds.) 1996, Stevenson and Anderson 1994.

Description: A very large, stout-bodied, shiny black snake reaching lengths as great as 8 ft. (244 cm). Black ventrally, but chin, throat, and sides of head may be reddish or (rarely) white. Scales typically smooth (no ridges), though adult males have keel on front half of some scales along back; anal scale undivided. Young similar to adults though often more reddish anteriorly, 17 - 24 in. (430 - 610 mm) at hatching. When encountered, often hisses, flattens neck vertically (from side to side), and vibrates tail, but rarely bites.

EASTERN INDIGO SNAKE Drymarchon corais couperi

Similar Species: Black racer (*Coluber constrictor*), which rarely exceeds 5 ft. (152 cm), is more slender, a duller sooty black usually with a white chin and throat, and has a divided anal scale. The mostly aquatic mud snake (*Farancia abacura*) is glossy black above and can grow to 6 ft. (183 cm), but has a reddish, rarely white, belly, with the coloration encroaching the sides, and a sharp-pointed tail tip.

Habitat: Broad range of habitats, from scrub and sandhill to wet prairies and mangrove swamps. In northern part of range, often winters in gopher tortoise burrows in sandy uplands but forages in more hydric habitats. Requires very large tracts to survive.

Seasonal Occurrence: Active nearly year-round in southern Florida but winters underground farther north. Lays eggs in May and June.

Florida Distribution: Statewide, including Upper and Lower Keys, but rare in panhandle.

Range-wide Distribution: Florida and southern Georgia; formerly extended from southern South Carolina to southeastern Mississippi.

Conservation Status: Rare in most areas, though species has been recorded from many public lands statewide; however, whether most of these support viable populations is uncertain. Major threats are habitat loss, degradation, and fragmentation, with associated highway mortality. Other threats include gassing of tortoise burrows for rattlesnakes, collection for pets, and deliberate persecution, all of which are illegal.

Protection and Management: Protect very large tracts (> 5000 acres = 2025 ha) of appropriate natural habitat unfragmented by roads; use prescribed fire as needed. Maintain gopher tortoise populations and dead stumps to provide natural subterranean refugia. Enforce bans on tortoise burrow gassing and on collection or molestation of snake. Avoid construction of roads through unfragmented habitat. Educate public to avoid wanton destruction of large snakes.

Selected References: Ashton and Ashton 1988b, Conant and Collins 1991, Ernst and Barbour 1989, Georgia DNR 1999, Lazell 1989, Moler (ed.) 1992, Mount 1975, Tenant 1997.

LITTLE BLUE HERON Egretta caerulea

Order:	Ciconiiformes
Family:	Ardeidae
FNAI Ranks:	G5/S4
U.S. Status:	None
FL Status:	Species of Special Concern
U.S. Migratory B	ird Treaty Act and state Wildlife Code
prohibit take of b	irds, nests, or eggs.

© Tom Vezo

immature © Jerry Lee Gingerich, DVM

Description: Medium-sized heron, with purplish to maroon-brown head and neck; small white patch on throat and upper neck; and slate-blue body. Bill is black towards tip, especially during breeding season, with the other exposed areas on the head appearing dark gray to cobalt blue. Legs are grayish to green, becoming black in breeding season. Immature birds are mostly white with pale slategray tips on primary wing feathers. Legs of young birds are yellowishgreen. Immature birds move into adult plumage during first spring and

may be boldly white/blue, looking like tie-dyed shirts. Immature birds retain yellowish legs during second year.

Similar Species: Plumage and eye of reddish egret (*Egretta rufescens*; see species account) are lighter in color, and base of bill is pinkish. Reddish egret has distinctive foraging behavior. Snowy egret (*E. thula*; see species account) and cattle egret (*Bubulcus ibis*) may look like juvenile little blues,

LITTLE BLUE HERON

but little blue has dark primary tips. Bill of snowy egret (*E. thula*) is solid black; snowy may have yellowish stripe up back of leg.

Habitat: Feeds in shallow freshwater, brackish, and saltwater habitats. Largest nesting colonies occur in coastal areas, but prefers foraging in freshwater lakes, marshes, swamps, and streams. Nests in a variety of woody vegetation types, including cypress, willow, maple, black mangrove, and cabbage palm. Usually breeds in mixed-species colonies in flooded vegetation or on islands.

Seasonal Occurrence: Mostly resident throughout year, but numbers in north Florida in winter are lower than numbers during spring, summer, and fall; becoming less abundant in Florida Keys.

Florida Distribution: Most recent population estimate is approximately 17,000 birds distributed among 240+ breeding colonies. Colonies are found nearly statewide, except rare in western panhandle and southern Florida Keys.

Range-wide Distribution: Breeds from Kansas, Missouri, and Tennessee to coastal Maine and south to Peru and central Brazil; range extends west to southern California and Sonora; winter range includes these areas and north to coastal Virginia; may wander to Canada after breeding season.

Conservation Status: Because the little blue heron lacks the showy plumes found on many other herons and egrets, this species did not suffer as much during the plume-hunting trade a century ago. Primary threats are alteration of natural hydroperiods in wetlands used for foraging and exposure to pesticides and heavy metal contamination. Population trends are downward, and breeding colonies have become smaller and more numerous. Illegal killings may occur since this species regularly forages at commercial fish farms and hatcheries. Long-term studies are needed on the possible adverse effects of cattle egrets, environmental contamination, and other threats.

Protection and Management: Protect breeding and foraging habitats through establishment of preserves and regulation of wetlands. Restore and maintain natural hydroperiods in degraded wetland areas. The Florida Fish and Wildlife Conservation Commission and the Department of Environmental Protection have developed setback distances around wading bird colonies of 330 ft. (100 m) to prevent human disturbance.

Selected References: Poole and Gill (eds.) 1995, Robertson and Woolfenden 1992, Rodgers and Smith 1995, Rodgers et al. (eds.) 1996, Runde et al. 1991, Stevenson and Anderson 1994.

SNOWY EGRET Egretta thula

Order:CiconiiformesFamily:ArdeidaeFNAI Ranks:G5/S3U.S. Status:NoneFL Status:Species of Special ConcernU.S. Migratory Bird Treaty Act and state WildlifeCode prohibit take of birds, nests, or eggs.

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Description: Mediumsized, all-white wading bird that has a "slight" appearance in comparison to other wading birds. Bill is black with a bright yellow, fleshy base, and the yellow extends back to the lores and eyes. Legs are black in adults; feet are bright yellow as though wearing gloves. Immatures have greenish legs that sometimes have a vellow streak on the back. Breeding-season adults have prominent plumes on shoulders, neck, and head.

Similar Species: Most often confused with juvenile little blue heron (*Egretta caerulea*; see species account), which is white with greenish-gray legs; however, tips of wing feathers are dusky, not pure white as in

snowy egret. Little blue heron also has a bi-colored bill, not the solid black bill found on the snowy egret. Great egret (*Ardea alba*) has solid black legs and orangish bill; white morph of the reddish egret (*E. rufescens*; see species account) has two-toned bill and grayish legs; cattle egret (*Bubulcus ibis*) has orangish legs and bill.

Habitat: Nests both inland and in coastal wetlands with nests placed in many types of woody shrubs, especially mangroves and willows. Almost all nesting is over shallow waters or on islands that are separated from

SNOWY EGRET

shoreline by extensive open water. Feeds in many types of permanently and seasonally flooded wetlands, streams, lakes, and swamps, and in manmade impoundments and ditches. Usually prefers calm waters. A wide variety of wetland types must be available within 5 - 7 mi. (8 - 11 km) to support breeding colonies. Breeding success is tied to water-level fluctuations.

Seasonal Occurrence: Occurs in Florida in all seasons, but generally less common in winter, especially in western panhandle and northern counties.

Florida Distribution: Generally found throughout peninsular Florida; becoming less common inland in northern tier of counties (north of Alachua County) and in the western panhandle. Typically more common along coast throughout its range. Breeding documented for 43 Florida counties but more variable in western Florida panhandle and in some northern counties in the interior (north of Alachua County). Also rare or absent in southern Keys.

Range-wide Distribution: Northern limits of summer range extend from northern California to southern Montana, central Kansas, and Tennessee, east to Atlantic coast, and then north to coastal Maine; occurs south to southern Chile and central Argentina; winters in North America from northern California to Arizona, along the northern Gulf coast, and along Atlantic coast to South Carolina.

Conservation Status: Since the 1950s, numbers in Florida have been declining, possibly faster than declines of other herons and egrets. In 1989, this species was found in only 22 percent of the colonies where it formerly occurred. Persistent patterns of wetland destruction and alteration are probably eliminating large areas of essential habitat. Most impacts appear to affect quality of foraging habitat rather than areas immediately surrounding nesting colonies.

Protection and Management: Prevent rapid changes in water depth in managed wetlands that will likely adversely affect quality of foraging. Restore and maintain natural hydroperiods in degraded wetland areas. Protect breeding and foraging habitats through establishment of preserves and regulation of wetlands. The Florida Fish and Wildlife Conservation Commission and the Department of Environmental Protection have developed setback distances around wading bird colonies of 330 ft. (100 m) to prevent human disturbance.

Selected References: Poole and Gill (eds.) 2000, Robertson and Woolfenden 1992, Rodgers and Smith 1995, Rodgers et al. (eds.) 1996, Runde et al. 1991, Stevenson and Anderson 1994.

TRICOLORED HERON Egretta tricolor

Order:CiconiiformesFamily:ArdeidaeFNAI Ranks:G5/S4U.S. Status:NoneFL Status:Species of Special ConcernU.S. Migratory Bird Treaty Act and state Wildlife Codeprohibit take of birds, nests, or eggs.

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Description: Medium-sized heron with a slender neck. Body color appears two-toned with dark slate coloration on head, neck, and body that contrasts with white rump, belly, and undertail. A reddish-brown and white streak extends along the front of the neck. During breeding season, adults have white head plumes and rufous to whitish shoulders. Young birds (<1 year) have more reddishbrown on head, neck, and mantle: otherwise similar to adults.

Similar Species: Little blue heron (*Egretta caerulea*; see species account) and reddish egret (*E. rufescens*; see species

account) have solid dark colors; great blue heron (*Ardea herodias*) is larger and has white streak down neck but dark belly and underparts. Great blue heron also has a dark swath that extends back from eye and contrasts with lighter colored top of head.

Habitat: Most nesting colonies occur on mangrove islands or in willow thickets in fresh water, but nesting sites include other woody thickets on islands or over standing water. Prefers coastal environments. Feeds in a variety of permanently and seasonally flooded wetlands, mangrove swamps, tidal creeks, ditches, and edges of ponds and lakes. Seasonal variation in water levels are particularly critical to nesting success, so alteration of wetlands used during breeding season can have negative consequences. Field Guide to the Rare Animals of Florida Florida Natural Areas Inventory, 2001

TRICOLORED HERON

Seasonal Occurrence: Permanent resident and found throughout Florida in all seasons, except rare in winter in western Panhandle. Also somewhat less common inland in recent years, particularly during winter.

Florida Distribution: Most numerous along coast. Generally becoming less numerous in northern tier of counties (Alachua County northward). Nesting in panhandle and northern interior more variable and restricted leading to few inland reports in panhandle.

Range-wide Distribution: Occurs during breeding season from California to Texas and along northern Gulf coast; along Atlantic coast to Maine; south to central Brazil; leaves northern portion of range in winter.

Conservation Status: Once described as the most abundant heron in the state, but now much less common in interior. Long-term population trends are uncertain, but apparently declining. Need information on marked individuals to document in more detail the species' movement and wetland utilization patterns.

Protection and Management: Approximately 25 percent of nesting colonies occur in disturbed water impoundments or dredge-material islands, so

management opportunities exist. Create new nesting sites or stabilize established sites through management. Survey and monitor to document population trends.

Selected References: Poole and Gill (eds.) 1997, Robertson and Woolfenden 1992, Rodgers et al. (eds.) 1996, Runde et al. 1991, Stevenson and Anderson 1994.

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WHITE IBIS Eudocimus albus

Order:CiconiiformesFamily:ThreskiornithidaeFNAI Ranks:G5/S4U.S. Status:NoneFL Status:Species of Special ConcernU.S. MigratoryBird Treaty Act and state Wildlife Codeprohibit take of birds, nests, or eggs.



Description: Medium-sized wading bird with long, downward-curving bill. Adults white except for black tips on wings and pink to reddish coloration on exposed flesh around face, bill, and legs. Young birds are dark brown on wings, neck, head, and tail, but noticeable white patches occur on back and belly. Juveniles begin to acquire adult coloration near end of first year but retain some brown feathers on head and neck until third year.

Similar Species: Glossy ibis (*Plegadis falcinellus*) also has a downwardcurving bill but is uniformly dark. Adult glossy ibis has purplish coloration, and young birds are uniformly brown. An immature glossy ibis could be mistaken for a juvenile white ibis, but glossy ibis lacks the white patch on the back (best seen during flight) and belly is dark, not white. Bills of all egrets and herons are straight, not curved.

Habitat: Found in a wide variety of habitats, including freshwater and brackish marshes, salt flats and salt marsh meadows, many types of forested wetlands, wet prairies, swales, seasonally inundated fields, and man-made ditches. Adults prefer foraging in freshwater areas when feeding young. Young birds do not grow when fed a salty diet or when access to fresh water

WHITE IBIS

is limited. Forage by feeling with their bills and may forage effectively in turbid waters. Nests are placed on a variety trees, shrubs, and vines, and tend to be closer to ground than other colonially nesting wading birds.

Seasonal Occurrence: May be found throughout Florida during all seasons, but numbers in north Florida are smaller and diminish sharply in winter. Numbers also vary depending on local water levels and conditions. Spring and fall movements can be spectacular, with hundreds of individuals observed moving in long, V-shaped lines. Much of movement pattern seems nomadic; large-scale movements occur in other seasons in response to changing water levels. Dates of spring movements can be mid-February, and fall movements may begin in July and peak in September and October. In non-breeding season, Florida probably supports much of population that breeds to north in Georgia and North and South Carolina.

Florida Distribution: Found throughout Florida, but breeding season distributions more closely restricted to breeding colonies. Breeding sites rare in panhandle and may be less common in Keys. Seem to be nomadic when selecting annual nesting sites, so numbers can vary considerably from year to year.

Range-wide Distribution: Breeds from California south through Central America along Pacific coast; from northern South America through Caribbean and Antilles and north Gulf coast (with inland nesting in northern South America and southeastern U.S.); northward along Atlantic coast to Virginia.

Conservation Status: Population declines in Florida appear to have been pronounced over the past decades (around 50 percent from 1970 to 1990). However, declines in Florida have been offset to some degree by increasing numbers in other nearby states. Range-wide declines in Florida and neighboring states are believed to be occurring, but these can be difficult to document in the absence of thorough surveys.

Protection and Management: Protect colonial nesting sites from human disturbance. Florida Fish and Wildlife Conservation Commission and Department of Environmental Protection have developed setback distances around wading bird colonies of 330 ft. (100 m) to prevent such disturbance. These guidelines may serve to protect individual colonies, but primary long-term threat is degradation of wetlands through destruction, alteration, pollution, salinization, and other forms of disturbance. Large-scale restoration efforts in the Everglades, Lake Okeechobee, Kissimmee River, and elsewhere should prove beneficial.

Selected References: Poole and Gill (eds.) 1992, Robertson and Woolfenden 1992, Rodgers and Smith 1995, Rodgers et al. (eds.) 1996, Runde et al. 1991, Stevenson and Anderson 1994.

SOUTHEASTERN AMERICAN KESTREL Falco sparverius paulus

Order:	Falconiformes
Family:	Falconidae
FNAI Ranks:	G5T4/S3
U.S. Status:	None
FL Status:	Threatened
U.S. Migratory	Bird Treaty Act and state Wildlife Code
prohibit take of	birds, nests, or eggs.



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Description: Smallest falcon in U.S. and similar in size to the familiar mourning dove (Zenaida *macroura*). Sexes distinctive: male has blue-gray wings, while female is larger and has more uniformly rufous back and wings. Both sexes have a mustached black-andwhite facial pattern with strong perpendicular lines extending below eve and near ear, and a black band at base of rufous tail. Falcons in general have long, pointed wings and long tails, similar to doves. The alarm call, given frequently in flight, is killy, killy, killv.

Similar Species: The merlin (*Falco columbaris*), another falcon found in Florida, is larger and lacks the rufous back and tail found on kestrels. The sharp-shinned hawk (*Accipiter striatus*) has rounded wings and also lacks the rufous tail and back. Both the merlin and sharp-shinned hawk also are generally not found in Florida in summer (May - early September).

SOUTHEASTERN AMERICAN Falco sparverius paulus KESTREL

Habitat: Found in open pine habitats, woodland edges, prairies, and pastures throughout much of Florida. Availability of suitable nesting sites is key during breeding season. Nest sites are tall dead trees or utility poles generally with an unobstructed view of surroundings. Sandhill habitats seem to be preferred, but may also occur in flatwoods settings. Open patches of grass or bare ground are needed in flatwoods settings, since thick palmettos prevent detection of prey.

Seasonal Occurrence: Found throughout Florida year-round, but seasonal occurrence is complicated by arrival of northern migrants in winter. The subspecies that breeds in Florida is listed, but northern migrants are not listed. Northern migrants generally arrive in September and depart by March, but there are records outside these dates. All birds found in the breeding season (April through early September) should be treated as the listed subspecies.

Florida Distribution: Wintering birds found throughout Florida (including the Keys), but the breeding subspecies is non-migratory and most common in peninsular Florida, rare in the panhandle. Breeding subspecies appears to be extirpated from former nesting areas in south Florida (Miami-Dade County).

Range-wide Distribution: Found throughout most of North and South America, but the listed subspecies is restricted to the southeastern U.S., occurring from Louisiana east to South Carolina and south through the Florida peninsula.

Conservation Status: Population trends cannot be determined from available survey programs. Natural nesting and foraging habitats have certainly declined, as sandhill and open flatwoods habitats are converted to intensive agricultural lands and residential development. Pasture lands may be used by the breeding species but often lack snags used for nesting sites.

Protection and Management: A key habitat feature necessary for breeding is a suitable cavity tree. Cavity trees are usually excavated in large pines and, less frequently, oaks by various woodpeckers. Manage for dead tree snags on public lands. Nest-box programs have been used to augment populations in many areas. Protect large blocks of natural habitats; open fields and pastures also are needed to provide adequate foraging habitat.

Selected References: Loftin 1992, Robertson and Woolfenden 1992, Rodgers et al. (eds.) 1996, Stevenson and Anderson 1994, Stys 1993, Wood et al. 1988.

GOPHER TORTOISE *Gopherus polyphemus*

Order:	Testudines
Family:	Testudinidae
FNAI Ranks:	G3/S3
U.S. Status:	None in Florida; Threatened in Louisiana,
	Mississippi, and western Alabama
FL Status:	Species of Special Concern
Florida prohibit	s take, possession, sale, or purchase of
tortoises or their	r parts except by permit



Description: A medium-sized turtle (to 10 in. = 254 mm) fully adapted for life on land. Upper shell brown and relatively flat above; lower shell yellowish, without hinge, and projecting forward, especially in male; skin brown to dark gray. Forelimbs greatly expanded for digging; hind limbs reduced, stumpy, lacking any form of webbing between toes. Lower shell of male somewhat concave. Young: scales of carapace often with yellow centers, skin yellowish to tan; approximately 2 in. (51 mm) shell length at hatching.

Similar Species: The only other native land turtle in Florida, the box turtle (*Terrapene carolina*), is distinguished by its smaller size (to 8 in. =

203 mm), less stout feet, moveable hinge on lower shell, and often but not always by black and yellow upper shell. Tortoise burrows, which are useful in determining species' presence, typically have lower, flatter profile than more rounded burrows of armadillos; this reflects differences in cross-sectional shapes of the two animals.

Habitat: Typically found in dry upland habitats, including sandhills, scrub, xeric oak hammock, and dry pine flatwoods; also commonly uses disturbed habitats such as pastures, oldfields, and road shoulders. Tortoises excavate deep burrows for refuge from predators, weather, and fire; more than 300 other species of animals have been recorded sharing these burrows.

Seasonal Occurrence: Above-ground activity is greatly reduced during cold weather, with tortoises in northern Florida remaining below ground for months. Nonetheless, burrows are relatively conspicuous year-round.

Florida Distribution: State-wide except absent from the Everglades and Keys.

Range-wide Distribution: Lower Southeastern Coastal Plain, extending from southern South Carolina southward through lower Georgia and Florida and westward through southern Alabama, Mississippi, and extreme southeastern Louisiana.

Conservation Status: Despite its widespread occurrence throughout Florida, there is considerable concern about the declining abundance of this species. Much of its native habitat has been lost to agriculture, citriculture, forestry, mining, and urban and residential development. Although protected populations occur on many state, federal, and private conservation lands, recent development of a severe respiratory disease threatens even those.

Protection and Management: Manage large, undivided tracts of upland habitat to maintain native vegetative conditions; this generally requires periodic prescribed fire beneath trees to reduce brush and favor growth of grasses and forbs. Avoid building roads and houses in xeric uplands. Because of risk of introducing tortoises infected with respiratory disease to uncontaminated populations, tortoises should not be relocated except under strictly controlled programs.

FLORIDA SANDHILL CRANE Grus canadensis pratensis

Order:GruiformesFamily:GruidaeFNAI Ranks:G5T2T3/S2S3U.S. Status:Endangered (nonmigratory subspecies in Cuba and Mississippi only)FL Status:ThreatenedU.S. Migratory Bird Treaty Act and state Wildlife Code prohibit take of birds, nests, or eggs.



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Description: A tall, long-necked, longlegged bird with a clump of feathers that droops over the rump. Adult is gray overall, with a whitish chin, cheek, and upper throat, and dull red skin on the crown and lores (lacking in immatures); feathers may have brownishred staining resulting from preening with muddy bill. Immature has pale to tawny feathers on head and neck and a gray body with brownishred mottling. Flies with neck extended. Their distinctive rolling call can be heard from far away.

Similar Species: Indistinguishable from greater sandhill crane (*Grus canadensis tabida*), which winters in Florida. Greater sandhill crane generally arrives in Florida in October and leaves in March, so the date observed or definite evidence of reproduction may be used to differentiate the two. Great blue heron (*Ardea herodias*) is sometimes mistakenly

Field Guide to the Rare Animals of Florida

FLORIDA SANDHILL CRANE Grus canadensis pratensis

identified as a crane. This heron lacks the bald, red crown of the sandhill and flies with its neck tucked in, typical of herons and egrets. Whooping crane (*G. americana*) is white.

Habitat: Prairies, freshwater marshes, and pasture lands. Avoids forests and deep marshes but uses transition zones and edges between these and prairies or pasture lands. Will frequent agricultural areas like feed lots and crop fields, and also golf courses and other open lawns, especially in winter and early spring. Nest is a mound of herbaceous plant material in shallow water or on the ground in marshy areas. Favors wetlands dominated by pickerelweed and maidencane.

Seasonal Occurrence: Nonmigratory. Very sedentary, although may forage widely. Large influx of northern migratory subspecies in winter (October - March).

Florida Distribution: Most of peninsular Florida within appropriate habitat, though not as common south of Lake Okeechobee. Rarely reported west of Taylor County.

Range-wide Distribution: Florida range plus extreme southeastern Georgia (Okefenokee Swamp).

Conservation Status: Population estimate in 1975 of approximately 4,000 birds (25 percent are nonbreeding subadults) is still considered accurate. Habitat availability will become more and more of concern as Florida continues to lose open rangeland and native prairie to development and more intensive agricultural uses (e.g., citrus, row crops). Nesting success in human-altered areas is well below that of native areas. Shallow wetlands used by cranes are easily affected by drainage of adjacent uplands even if they are not directly disturbed. Florida sandhill cranes are found on federal and state lands and on local government lands (e.g., wellfields).

Protection and Management: Because of large home-range requirements, public lands do not protect large populations of cranes. Aquire land, through fee-simple acquisition and conservation easements on suitable ranchlands, in areas that bolster existing protected populations. Periodic fire important to retard invasion of woody vegetation in crane habitat. Filling drainage ditches to restore natural hydrological conditions important in some areas.

Selected References: Poole and Gill (eds.) 1992, Robertson and Woolfenden 1992, Rodgers et al. (eds.) 1996, Stevenson and Anderson 1994, Toland 1999a.

BALD EAGLE Haliaeetus leucocephalus

Order:	Falconiformes
Family:	Accipitridae
FNAI Ranks:	G4/S3
U.S. Status:	Threatened
	(proposed for delisting in 1999)
FL Status:	Threatened
U.S. Migratory	Bird Treaty Act and state Wildlife Code
prohibit take of	birds, nests, or eggs.



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immature © Barry Mansell

Description: Adult has white head, white tail, and large, bright yellow bill; other plumage is dark. Immatures dark with variable amounts of light splotching on body, wings, and tail; head and bill are dark. In flight wings are broad and wide and held horizontally, presenting a flat profile when soaring and gliding. Flies with slow, powerful wing-beats.

Similar Species: At a distance, in flight, eagle's size and lack of white in wings should help differentiate it from the crested caracara (*Caracara cheriway*; see species account), which also has a white head. Flattened aspect of the eagle's wings is unlike the teetering, V-shaped flight of the turkey vulture (*Cathartes aura*).

Habitat: Most commonly includes areas close to coastal areas, bays, rivers, lakes, or other bodies of water that provide concentrations of food sources, including fish, waterfowl, and wading birds. Usually nests in tall trees (mostly live pines) that provide clear views of surrounding area. In Florida Bay, where there are few predators and few tall emergent trees, eagles nest in crowns of mangroves and even on the ground.

BALD EAGLE

Seasonal Occurrence: In extreme southern Florida, most adults are resident, but most birds in northern and central Florida migrate north out of state after breeding season (late May - July). Juveniles and younger birds mostly migrate north in summer and may range as far as Canada. Also, in winter, some birds from northern populations migrate to northern Florida.

Florida Distribution: Florida has largest breeding population of any state outside Alaska. Breeds throughout most of peninsular Florida and Keys, mainly along coast in eastern panhandle, and is rare in western panhandle. Greatest concentrations of nesting eagles occur around Lake Kissimmee in Polk and Osceola counties, around Lake George in Putnam, Volusia, and Lake counties, lakes Jessup, Monroe, and Harney in Seminole and Volusia counties, along Gulf coast north of Tampa, and Florida Bay and southwest peninsula area.

Range-wide Distribution: North America. Breeding range extends from Alaska, across Canada, south to Baja California, the Gulf coast and Florida Keys, although very local in the Great Basin and prairie and plains regions in interior U.S., where range has expanded to include Nebraska and Kansas. Non-breeding range is generally throughout breeding range except in far north, most commonly from southern Alaska and southern Canada southward.

Conservation Status: Original population in Florida could be found throughout state and likely numbered well over 1,000 pairs. Population declined sharply after late 1940s, reaching a low of 120 active nests in 1973, and by 1978 was considered rare as a breeder. Use of pesticide DDT and related compounds and development of coastal habitat are probably chief causes of decline. Numbers have steadily increased, especially since 1989. In 1993, 667 active territories were reported, and in 1999, 996 active nests were recorded. Major threats include habitat loss because of development and commercial timber harvest; pollutants and decreasing food supply are also of concern.

Protection and Management: Monitored annually by Fish and Wildlife Conservation Commission (FFWCC). Continue acquisition of breeding territories and protection of foraging and roosting sites. Incorporate information known about buffer zones around nesting areas into state and local development regulations to help mitigate losses as Florida's human population continues to expand. Monitor pesticides and other environmental contaminants that affect reproduction and food supply.

Selected References: FFWCC 2001, Kale (ed.) 1978, Poole and Gill (eds.) 2000, Robertson and Woolfenden 1992, Rodgers et. al. (eds.) 1996, Stevenson and Anderson 1994.

HARTWRIGHTIA

Hartwrightia floridana Gray ex S. Watson Synonyms: none Family: Asteraceae (Composite) FNAI Ranks: G2/S2 Legal Status: US–none FL–Threatened Wetland status: US–OBL FL–FACW





Field Description: Perennial **herb** with a single, erect **stem**, 2 - 3 feet tall, rising from a basal rosette. **Rosette leaves** 3 - 10 inches long, entire, with rounded tips and leaf bases tapering to a long leaf stalk. **Stem leaves** alternate and reduced upward along the stem to bracts. **Inflorescence** large and open with flat-topped clusters of flower heads at ends of stiff branches. **Disc flowers** pink to whitish; no ray flowers. All parts of the plant dotted with glistening, sticky **glands**.

Similar Species: Hartwrightia is the only species in its genus. Vanilla plant and other species in the genus *Carphephorus* have large basal leaves and dark pink flower heads in terminal clusters but none have glistening glands.

Hartwrightia

Hartwrightia floridana

Habitat: Seepage slopes, edges of baygalls and springheads, wet prairies, and flatwoods with wet, peaty soils. Often with hooded pitcher plants or, in central FL, cutthroat grass.

Best Survey Season: Flowers late summer–fall; the rosette of sticky, glandular leaves is recognizable in spring and summer.

Range-wide Distribution: SE GA to central peninsular FL.



Florida Natural Areas Inventory, 2000

WOOD STORK Mycteria americana

Order:	Ciconiiformes
Family:	Ciconiidae
FNAI Ranks:	G4/S2
U.S. Status:	Endangered
FL Status:	Endangered
U.S. Migratory	Bird Treaty Act and state Wildlife Code
prohibit take of	birds, nests, or eggs.



Description: Very large, white wader with black in wings and a short black tail. Soars with neck and legs extended, displaying its long, broad wings; black flight feathers contrast with white along length of wings. Legs are dark and feet are beige. Adults have bare, scaly, dark-gray heads and necks and long, heavy, decurved bills. Head and neck of immature storks have grayish brown feathering, and their bills are yellowish.

Similar Species: American white pelicans (*Pelecanus erythrorynchos*) have a similar wing pattern and also soar but have short legs, white tail, and do not fly with necks extended. White ibis (*Eudocimus albus*; see species account) is much smaller and only has black on wing tips. Great egret (*Ardea alba*) lacks black on wings.

Habitat: Nests colonially in a variety of inundated forested wetlands, including cypress strands and domes, mixed hardwood swamps, sloughs,

WOOD STORK

and mangroves. Increasingly nesting in artificial habitats (e.g., impoundments and dredged areas with native or exotic vegetation) in north and central Florida. Forages mainly in shallow water in freshwater marshes, swamps, lagoons, ponds, tidal creeks, flooded pastures and ditches, where they are attracted to falling water levels that concentrate food sources (mainly fish).

Seasonal Occurrence: Post-breeding dispersal carries large numbers from more southern locales to more northern parts of range; in winter, northern birds move south. Annual and long-term use of nesting sites is very dependent on feeding conditions, which may be affected dramatically by altered hydrologic patterns. Colonies may form late November - early March in south Florida and February - March in central and northern Florida.

Florida Distribution: Locally rare to abundant in the peninsula and Big Bend, but generally rare or lacking in panhandle and the Florida Keys. Uncommon to rare in winter in north.

Range-wide Distribution: In U.S., breeds locally in South Carolina, Georgia, and Florida (formerly west to Texas). South, locally in lowlands from Mexico and northern Central America to South America (to western Ecuador, eastern Peru, Bolivia, northern Argentina), and rarely in Cuba and the Dominican Republic. Winters throughout breeding range except in South Carolina and Georgia.

Conservation Status: Many known breeding sites occur within public and private conservation lands. Dramatic decline in the large colonies (>500 individuals) formerly found in south Florida, and trend toward fewer birds distributed among smaller, more numerous colonies in central and northern Florida. Very sensitive to manipulation of water regimes and loss of wetland habitat, which affect both nesting sites and feeding areas.

Protection and Management: Survey colony sites and important feeding areas regularly. Essential to protect wetland areas, closely monitor water quality, and manage hydrologic patterns that consider the needs of the wood stork.

Selected References: Poole and Gill (eds.) 1999, Robertson and Woolfenden 1992, Rodgers et al. (eds.) 1996, Runde et al. 1991, Stevenson and Anderson 1994.

CELESTIAL LILY Nemastylis floridana Small Synonyms: none Family: Iridaceae (iris) FNAI Ranks: G2/S2 Legal Status: US–Mgmt Concern FL–Endangered Wetland Status: US–OBL FL–FACW



Alfred R. Schotz

Field Description: Perennial **herb** from a bulb with a single, tall, slender **stem**, occasionally branching on robust plants. **Basal leaves** few, grass-like, sometimes more than 2 feet long. **Stem leaves** small and scattered along the stem. **Flowers** more than 1.5 inches across, with 6 dark blue, spreading **petals and sepals (tepals)**; flowers open around 4 pm and close by dusk. **Stamens** with 3 coiled, yellow anthers; **style** divided into 6 narrow, pointed branches. **Fruit** an erect, oval capsule, about 0.5 inch long.

Similar Species: Blue-eyed grasses (*Sisyrinchium* spp.) are also in the iris family; they have much smaller blue flowers that are open throughout the day in the spring and summer. Celestial lily is the only iris-like species in FL to open in the late afternoon in the fall.

Related Rare Species: See Bartram's ixia (*Calydorea coelestina*), stateendangered, in this guide.

Celestial lily

Nemastylis floridana

Habitat: Wet flatwoods, prairies, marshes, cabbage palm hammocks edges.

Best Survey Season: Flowers from 4-6 pm, August–October.

Range-wide Distribution: Endemic to eastern counties of FL, primarily in the St. Johns River drainage.

Conservation Status: Once widespread in eastern FL, this species now occurs in about 15 managed areas, where it may be locally abundant if its habitat is frequently burned.

Protection & Management: Burn flatwoods and prairies every 2 - 3 years. Protect wetlands from draining, ditching, and conversion to pasture and pine plantation.

References: Coile 2000, Goldblatt 1975, Kral 1983, MacKiernan and Norman 1979, Small 1931b, Ward 1979, Wunderlin 1998, Wunderlin and Hansen 2000a.



FLORIDA PINE SNAKE Pituophis melanoleucus mugitus

Order:	Squamata
Family:	Colubridae
FNAI Ranks:	G4T3?/S3
U.S. Status:	None
FL Status:	Species of Special Concern
State possession	limit of one snake per person.





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Description: A large, stocky, tan or rusty colored snake with an indistinct pattern of large blotches on a lighter background; blotches more distinct posteriorly; venter white. May be dark brown in far western panhandle, where it intergrades with another subspecies. Body muscular, with keeled scales and undivided anal scale. Head relatively small, snout somewhat

FLORIDA PINE SNAKE Pituophis melanoleucus mugitus

pointed, four prefrontal scales, rostral scale extending upward between internasal scales. Adults 4 - 7 ft. (122 - 213 cm) or longer; young 15 - 24 in. (380 - 610 mm) at hatching. May hiss loudly and vibrate tail when encountered.

Similar Species: Most Florida snakes have only two prefrontal scales, and the rostral scale does not split the two internasals. Blotches of red rat snakes (*Elaphe guttata*) are smaller, more numerous (nearly 40), and more distinct. Eastern coachwhip (*Masticophis flagellum*) is more slender, usually darker anteriorly, lacks blotches, and has smooth scales and divided anal scale.

Habitat: Habitats with relatively open canopies and dry sandy soils, in which it burrows. Especially sandhill and former sandhill, including oldfields and pastures, but also sand pine scrub and scrubby flatwoods. Often coexists with pocket gophers and gopher tortoises.

Seasonal Occurrence: Spends most of time below ground; occasional surface activity from spring through fall, especially May - October. Eggs laid June - August; hatch in September and October.

Florida Distribution: Most of panhandle and peninsula south to Lake Okeechobee, extending southward along eastern ridge to Dade County, but absent from Keys. Possibly extirpated from some of more heavily developed counties such as Pinellas.

Range-wide Distribution: Southern South Carolina, southern Georgia, and most of Florida.

Conservation Status: Occurs on many state and federal lands in Florida. Threats include collection for pets (now restricted); highway mortality; and habitat loss and fragmentation from development, intensive agriculture, and mining.

Protection and Management: Maintain large, unfragmented blocks of xeric natural communities; can tolerate some habitat degradation. Manage habitats with fire to prevent succession to closed canopy forests.

Selected References: Ashton and Ashton 1988b, Conant and Collins 1991, Ernst and Barbour 1989, Franz 1986, Moler (ed.) 1992, Mount 1975, Tenant 1997.

FLORIDA MOUSE Podomys floridanus

Order: Family: FNAI Ranks: U.S. Status: FL Status: Rodentia Cricetidae G3/S3 None Species of Special Concern





Podomys foot © Dan Hipes

Peromyscus gossypinus foot © Dan Hipes

Description: A large mouse (7.3 - 8 in. = 179 - 203 mm), brownish to tawny above and whitish below. Flanks are often chestnut or orangish. Hind feet are large (0.86 - 1.1 in. = 23 - 28 mm), generally with five pads (plantar tubercles). Tail (3.12 - 3.8 in. = 80 - 95 mm) is indistinctly bicolored: gray-brown above, whitish below. Often has a faint skunk-like odor.

FLORIDA MOUSE

Similar Species: Distinguished from all other mice within its range by the presence of five plantar tubercles on the hind feet versus six or seven in *Peromyscus* spp. Oldfield mouse (*Peromyscus polionotus*) is generally smaller (4.7 - 6.0 in. = 122 - 153 mm) with a proportionally shorter tail (1.6 - 2.4 in. = 40 - 60 mm) that is sharply bicolored. Cotton mouse (*Peromyscus gossypinus*) is slightly smaller, but overlaps in body measurements to the degree that the number of plantar tubercles is the best distinguishing characteristic.

Habitat: Xeric upland communities with sandy soils, including scrub, sandhill, and ruderal sites where they inhabit burrows of the gopher tortoise (*Gopherus polyphemus*; see species account). In the absence of gopher tortoises, Florida mice will dig their own burrows or use those of oldfield mice.

Seasonal Occurrence: Active year-round except on especially cold nights.

Florida Distribution: Occurs from north-central Florida south to Highlands and Sarasota counties and along the Atlantic coast from St. Johns County south to Miami-Dade County.

Range-wide Distribution: Same as Florida distribution.

Conservation Status: Protected on several conservation lands throughout central Florida. Largest populations may occur within Ocala National Forest and the scrubs along Lake Wales Ridge.

Protection and Management: Preserve areas supporting sandhill and scrub. Use prescribed fire to maintain openings in scrub and encourage the growth of grasses and forbs important for food and cover. Protect populations of gopher tortoises.

Selected References: Brown 1997, Humphrey (ed.) 1992, Layne 1990, Lazell 1989, Whitaker 1996.

GOPHER FROG Rana capito (formerly R. areolata)

Order:	Anura
Family:	Ranidae
FNAI Ranks:	G3G4/S3
U.S. Status:	None
FL Status:	Species of Special Concern



© Dan Hipes

Description: A medium-sized, boldly spotted frog with a chunky appearance: body short and plump, head large with somewhat rounded snout, legs relatively short. Back with somewhat warty skin and prominent, often bronze-colored longitudinal ridge on each side behind eye. Dorsal pattern of irregularly shaped dark spots on background that may be cream, gray, or brown. Chin and throat spotted, belly usually unmarked posteriorly. Adults 2.5 - 4 in. (63 - 102 mm) (excluding legs). Call resembles a deep snore. Tadpole large, to 3.5 in. (89 mm), globose, olive green, with large black spots on sides of tail.

Similar Species: Leopard frog (*Rana sphenocephala*), which may share breeding ponds with gopher frog, has large, dark brown spots on a green to

GOPHER FROG

brown background; however, body is more slender, snout very pointed, and throat and chin plain white. Tadpoles of the two species are very similar. Southern toad (*Bufo terrestris*) has dry, very warty skin, no raised ridges along edges of back, a pair of large raised glands behind eyes, and blunt snout. Spadefoot toad (*Scaphiopus holbrookii*) has vertical black pupils in golden eyes, dry skin, and a pair of hourglass-like lines rather than spots on back. All treefrogs have enlarged pads on toes.

Habitat: Dry, sandy uplands, chiefly sandhill and scrub, that include isolated wetlands or large ponds within about 1 mi. (1.7 km). Occasional in dry pine flatwoods, xeric hammock, and disturbed examples of above. Breeds chiefly in seasonally flooded, temporary ponds, but also in some permanent waters. Nocturnal, normally spending daytime in stumpholes, tunnels, or burrows, especially those of gopher tortoise (*Gopherus polyphemus*).

Seasonal Occurrence: Migrates to ponds for breeding from October through April, though may also breed during summer in central and southern Florida.

Florida Distribution: Most of state excluding Everglades and Keys; potential but not documented for some counties indicated on map. Two subspecies: dusky gopher frog (*R. c. sevosa*) in western panhandle, Florida gopher frog (*R. c. aesopus*) in peninsula and eastern panhandle.

Range-wide Distribution: Southeastern Gulf and Atlantic Coastal Plains, from North Carolina to eastern Louisiana.

Conservation Status: Many protected conservation lands in Florida support gopher frogs, although attention to managing and protecting breeding habitat and migratory pathways is often insufficient.

Protection and Management: Maintain large tracts of native vegetation in sandy, upland habitats that include wetlands. Allow fires to burn through dry wetland basins in addition to uplands. Manage uplands for gopher tortoises. See recommendations for striped newt (*Notophthalmus perstriatus*).

Selected References: Ashton and Ashton 1988a, Bartlett and Bartlett 1999, Conant and Collins 1991, Franz 1986, Franz and Smith 1999, Moler (ed.) 1992, Mount 1975.

TOOTHED LATTICE-VEIN FERN

Thelypteris serrata (Cav.) Alston Synonyms: Meniscium serratum Cav. Family: Thelypteridaceae (maiden or marsh fern) FNAI Ranks: G5/S2 Legal Status: US-none FL-Endangered Wetland status: US-none FL-FACW



Field Description (photo and drawing, left: Fern with large, evergreen fronds 2 - 6 feet long, with hairy, brown or tan leafstalks. Leaflets 4 - 10 inches long, 1.5 inches wide, with hairy veins and sharply hook-toothed margins. Sori in many, parallel rows between veins on underside of leaflets.

Similar and Related Rare Species (see drawing, right): Lattice-vein fern (*Thelypteris reticulata*), state-endangered, is also a large evergreen fern with fronds to 6 feet long; leaflets are paired, 8 - 12 inches long and 2.5 inches wide, with entire, wavy, or round-toothed margins. It occurs in wet hammocks and cypress swamps in Broward, Collier, Dade, and Lee counties.

Stately maiden fern (Thelypteris grandis), state-endangered, has fronds to 5 feet long divided into finely cut leaflets, similar to the common marsh fern (Thelypteris kunthii); it occurs only in swamps in Collier County. Grid-scale maiden fern (Thelypteris patens), state-endangered, also resembles the common maiden fern; it occurs in 2 rockland hammocks in Dade County. See also creeping star-hair fern (Thelypteris reptans) in this guide.

Toothed lattice-vein fern

Habitat: Cypress swamps, sloughs, floodplains.

Best Survey Season: All year.

Range-wide Distribution: FL, Mexico, West Indies, Central and South America.

Conservation Status: Toothed lattice-vein fern occurs in several conservation areas and is also somewhat protected by wetland regulations.

Protection & management: Avoid logging, draining, or developing wetlands.

References: Coile 2000, FNA 1993, IRC 1999, Lellinger and Evans 1985, Nelson 2000, Wunderlin 1998, Wunderlin and Hansen 2000, Wunderlin and Hansen 2000a.



APPENDIX C LISTED SPECIES CONSULTATION AREAS













