

# *Assessment of Measures to Protect Wildlife Habitat in Pasco County*

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# ASSESSMENT OF MEASURES TO PROTECT WILDLIFE HABITAT IN PASCO COUNTY

## 1.0 INTRODUCTION

Pasco County's Comprehensive Plan outlines numerous measures for protection of wildlife habitat. These include policies to: 1) require preservation of natural vegetation on development projects; 2) protect threatened and endangered species; 3) encourage acquisition of environmentally sensitive lands; 4) develop a program of incentives for private landowners to manage land for wildlife; and 5) develop a plan to implement a local wildlife habitat protection and management program. Specific plans to implement these concepts have never been finalized. Consequently, Glatting Jackson was hired to develop a program for wildlife habitat protection that included an assessment of existing Comprehensive Plan language, and the development of mechanisms for the Land Development Code to ensure the protection of listed species in particular, and wildlife habitat in general. This report documents the technical information used both for developing recommendations for Pasco County staff, volunteer committees, and Commissioners, and the mechanisms proposed for the Land Development Code.

### 1.1 Natural Resource Protection: Scientific Basis

#### 1.1.1 Overview

Over the past two decades, trends in ecological research have included an emphasis on landscape level processes, with a concentration on ecosystem recovery, biodiversity, and landscape ecology (Kautz and Cox 2001, Soulè and Terborgh 1999, Peck 1998, Boyce et al. 1997, Fahrig and Merriam 1994, Noss and Cooperrider 1994, Wilson 1992, Noss 1992, Millsap et al. 1990, and Harris 1984). The results of these research endeavors indicate the necessity of the protection of core conservation areas with suitable buffer zones of varying land use intensities (Noss and Cooperrider 1994, Gurd et al. 2001). Furthermore, the functionality of these core areas is enhanced by the maintenance of landscape linkages between core conservation areas (Soulè and Simberloff 1986, Gurd et al 2001) and the minimization of habitat fragmentation (Saunders et al. 1991). Strategies to protect core areas, buffer zones, and landscape linkages at both regional and local levels have also received considerable attention (Noss and Cooperrider 1994, Margules and Pressey 2000, Pressey and Cowling 2001). In Florida, there have been numerous initiatives aimed at resource protection at the state or regional level including specially designated buffers to protect water quality, groundwater and wildlife habitat in the Wekiva and Econlockatchee River Basins (Brown et al.1990), identification of a statewide strategic wildlife habitat system (Cox et al. 1994), and efforts to manage extensive areas of Florida panther (*Puma concolor coryi*) habitat in south Florida (Maehr 1997).

#### 1.1.2 Conservation Biology

Justification for the conservation of interconnected, diverse, natural areas is well documented. Soulè and Simberloff (1986) contended that large-scale natural reserves were necessary to preserve minimum viable populations of keystone species of wildlife, biodiversity, and functioning ecosystems. Soulè and Terborgh (1999) edited the collection of numerous conservation biologists for an assessment of the scientific foundations of regional reserve networks, and summarized the state of the science. Their treatise supports the concepts of large-scale (top-down) conservation measures that ensure protection of large carnivores and biological



diversity through regional reserves that allow natural evolutionary processes without interference from man. Dunning et al. (1992) and Saunders et al. (1991) pointed to the need for understanding landscape-level processes that effect species diversity and the physical environment. Baker (1994 and 1992) pointed out the importance of natural processes such as fires and floods on species assemblages, and noted the importance of sustaining the effects of these perturbations, even after the landscape had been fragmented. Brown and Schaefer (1987) related the conservation of riverine buffers to protection of water quality, groundwater levels and wildlife habitat. Naugle et al. (1999) cited increased bird diversity in wetland complexes as opposed to individual wetlands that existed in relative isolation. Harris (1984) stressed the importance of Florida wetland systems as migratory pathways for migrating birds. Concomitantly, these areas provide floodplain protection, water quality protection, and natural linkages in the Florida landscape. Bennett (1999) emphasized the adjunct benefits of corridors for wildlife: protection of soil and water resources, recreational benefits, reduced sedimentation and enhanced water quality, and the provision of natural connections between urban and outer-urban nature reserves.

#### 1.1.3 Core Areas

With respect to size of core areas, ecologists would generally say: “The bigger, the better.” To illustrate, Schonewald-Cox (1983) reported a negative relationship between population size and reserve size in both ungulates and carnivores in various reserves around the world. In Florida, Harris and Wallace (1984) found that small, disjunct habitat islands (<75 acres) supported only 64% of the bird species that bred in nearby hardwood forests. The shape of core areas also is a consideration, with those characterized by a high ratio of area to perimeter being preferred. Thus, circular core areas are deemed superior to elongated or convoluted core areas because edges are farther removed from the center. Edges, particularly abrupt edges, may be “ecological traps” as noted for many species of nesting birds due to high rates of predation and brown-headed cowbird (*Molothrus ater*) parasitism in highly fragmented habitat and edge habitats (Wilcove et al. 1986, Brittingham and Temple 1983, Gates and Gysel 1978). In summary, the design of core areas should consist of the following six characteristics (Diamond and May 1976, Diamond 1975, Wilson and Willis 1975, World Conservation Strategy (IUCN 1980), Noss and Cooperrider 1994, Gurd et al. 2001):

1. Large areas are better than small areas.
2. A single large area is better than several small areas.
3. Areas close together are better than areas far apart.
4. Circular areas are better than elongated or linear areas.
5. Areas clustered compactly are better than areas spread linearly.
6. Interconnected areas are better than isolated areas..

#### 1.1.4 Buffer Zones

Conceptually, buffer zones around central core areas insure the integrity of the protected core area, thereby providing a transition zone between the core area and the land area beyond where intensified human practices and activities occur. However, any discussion of buffer zones immediately leads to a discussion of zone width. Machtans et al. (1996), Darveau et al. (1995), and Dickson et al. (1995) found that conservation of larger buffer zones (165-315 feet) adjacent to streams (riparian corridors) resulted in greater bird diversity - these “local” buffers provided connections to regional cores. Semlitsch and Jensen (2001) summarized data from studies of

reptile and amphibian use of uplands adjacent to natural wetlands. They concluded that a buffer zone of approximately 540 feet would be required to encompass 95 percent of a sample population of salamanders, and 240 feet would protect 90 percent of the nesting and hibernation sites of 3 species of turtles. They further concluded that a range of protective zones from approximately 200-700 feet could be considered depending upon the specific goals for protection of the wetland dependent species' aquatic, core and terrestrial habitat requirements. The most definitive study of buffer zones for wildlife in Florida has been the work on the Wekiva and the Econlockhatchee rivers (Brown et al. 1990a and Brown et al. 1990b). The latter study evaluated the minimum buffer width requirements (principally home range diameters) for amphibians, reptiles, birds, and mammals by habitat type – as follows:

- Wetland: 25 species, with minimum buffer widths ranging from approximately 50 to 700 feet.
- Wetland/upland: 116 species, with minimum buffer widths ranging from approximately 50 to 10,475 feet.
- Upland: 59 species, with minimum buffer widths ranging from approximately 50 to 13,500 feet.

Further analysis of these data revealed that approximately 45%, 60%, and 75% of wetland and wetland-dependent wildlife species in the Econlockhatchee Basin had home range diameters less than approximately 330, 650, and 1,000 feet, respectively (Schaefer and Brown 1992). Moreover, approximately 50% of these species could be accommodated in a zone of approximately 550 feet. This buffer zone width has been accepted widely, in lieu of additional data, as the minimum width of buffer zones for sensitive Florida wetland habitats, such as the Wekiva and Econlockhatchee Rivers.

#### 1.1.5 Habitat Connectivity (Landscape Linkages)

As with core areas and buffer zones, the characteristics of landscape linkages with respect to width, length, and position are particularly relevant. Dobson et al. (1999) recommended that connections between core areas be at least three times as wide as the distance that edge effects are likely to extend. Because movement patterns fall into four general categories: local, dispersal, nomadic, and seasonal, they stressed the need for a conservation strategy that matched the movement patterns of the species in the reserve. Although riparian areas can serve as excellent linkages for many species, a strategy that focuses solely on protecting these habitats may exclude obligate upland species or upland habitats necessary for breeding or forage for wetland species. Core areas that are farther apart may require wider linkages to be effective (Harrison 1992), in part because larger, wide-ranging mammalian predators require interior habitat for travel. Minimum linkage widths have been established for some mammalian species: black bear (*Ursus americanus*), 1.25 miles (Rogers 1987); cougar (*Puma concolor*), 3.1 miles (Hopkins et al. 1982); bobcat, 1.5 miles (Griffith and Fendley 1982); and white-tailed deer (*Odocoileus virginianus*) 0.4 mile (Nelson and Mech 1987). However, in the most definitive study of space use by large carnivores in a localized landscape to date, Bier (1995) suggested that corridors designed for cougars should be >325 feet wide if the total distance to be spanned is <2,625 feet, but >1,300 feet wide for distances of 0.5 – 5 miles.



#### 1.1.6 Effects of Fragmentation

The ecological pitfalls of habitat fragmentation and the lack of focus on large-scale systems also have been well documented. Forest interior birds have been affected by predators and brood parasites as a result of changes in the characteristics of their historically forested habitat (Askins 1994). Even grazing pressure and the subsequent impacts to vegetation in streams and adjacent riparian zones have resulted in some degradation of bird habitat quality (Popotnik and Giuliano 2000). Florida black bears (*U. a. floridanus*) have been restricted primarily to large, public holdings (Harris 1988). Florida panthers have been isolated from other populations of panthers, and suffer from genetic isolation as well as direct impacts such as mortality from vehicles (Maehr 1997). Some mammal populations were driven to extinction in western parks in part due to human activity adjacent to the park (Newmark 1995). Saunders et al. (1991) pointed out the changes in the physical environment of natural lands exposed to fragmentation, and emphasized the need to consider neighboring land uses in order to maintain species diversity. Gurd et al. (2001) found most reserves in North America to be of insufficient size to ensure the conservation of large mammals, but suggested that immigration corridors and buffer zones that combine small reserves into larger assemblages would improve the likelihood of long-term survival.

#### 1.1.7 Methods for Implementing Regional Conservation Planning

Recently, strategies for large-scale conservation planning have been the focus of numerous books and scientific articles. Soulè and Terborgh (1999) summarized reserve design and selection, buffer sizes, and described the pitfalls of developing a continental conservation strategy. Bennett (1999) provided a comprehensive assessment of international efforts to conserve landscape linkages, and illustrated numerous examples of successful programs throughout the world. Noss and Cooperrider (1994) provided a detailed explanation of the various scales at which biodiversity must be considered, and explained a strategy for establishing large core reserves and buffer zones. This plan is particularly applicable in Pasco County because of the presence of several tracts of public lands compatible with sustaining wildlife habitat value, and adjacent lands with varying components of conservation. Pressey and Cowling (2001) and Margules and Pressey (2000) gave similar strategies for systematic conservation planning that is similar to the methods employed during this study. Margules and Pressey (2000) outlined a six-step process that consisted of the following:

- Compile data on the biodiversity of the planning region,
- Identify conservation goals for the planning region,
- Review existing conservation areas,
- Select additional conservation areas,
- Implement conservation actions, and
- Maintain the required values of conservation areas.

#### 1.1.8 Local Conservation Initiatives

Conservation planning begins at the landscape level, but it must include local strategies that support the larger perspective. Most current environmental regulations act at the local level, so there is already substantial protection to some important natural systems (i.e., wetlands), albeit isolated in context. Highway underpasses and tunnels have been shown to be an effective means of providing passage by Florida panthers and other mammals (Foster and Humphrey 1995, Yanes et al. 1995, Mansergh and Scotts 1989, and Reed 1981); this “local” strategy mitigates

some of the impacts roads generally cause to connectivity of habitat linkages. Haas (1995) found that birds used wooded patches in otherwise altered landscapes; therefore conservation of “local” patches of habitat was shown to have some value for highly mobile species. Local connections to regional cores have been argued to have deleterious effects, such as transmission of contagious diseases, passage of destructive fires, increased exposure to predators, and domestic animals (Hess 1994, Simberloff and Cox 1987), as well as the spread of noxious or invasive species. However, most of these factors can be managed to some degree, and are generally thought to be less important than sustaining viable connections to core reserves. Finally, Exum et al. (2000) found that even highly urbanized wetlands in Seminole County, Florida sustained functions relating to water quality treatment, flood abatement, groundwater benefits, reduced sedimentation, and nutrient uptake. Conservation of these “local” wetlands was beneficial even in highly urbanized systems.

## **1.2 Natural Resource Protection: Existing Regulations and Policies**

### **1.2.1 State Wetland Regulations**

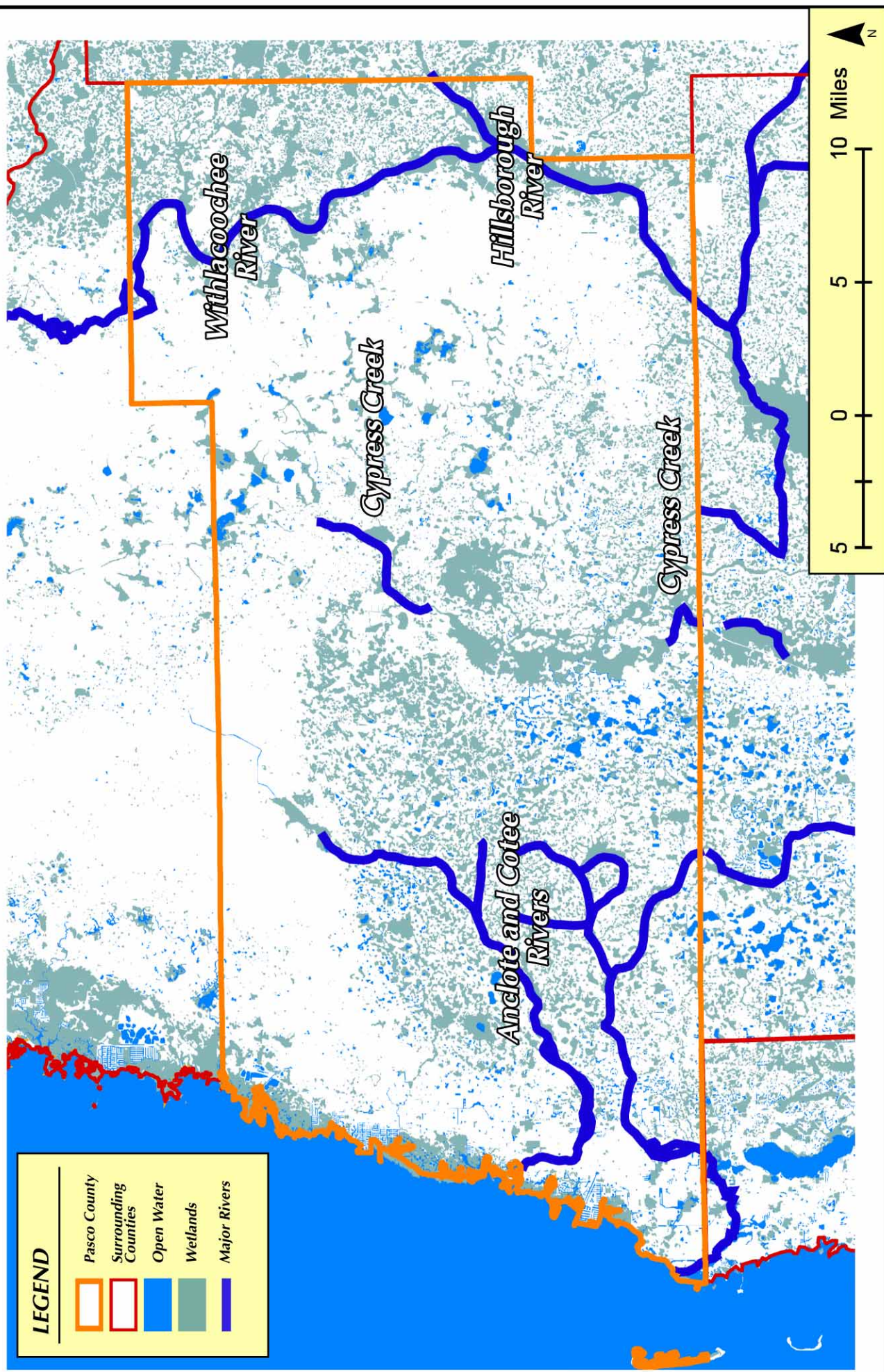
The development of a resource protection strategy at the state level began decades ago. State government has had regulations in place to protect wetlands and aquatic dependent species of wildlife since the 1970’s (Southwest Florida Water Management District (SWFWMD) 2001). Protection of wetlands greater than 0.5 acre, establishment of buffer zones adjacent to wetlands, and the development of policies that require mitigation have substantial effects on preservation of wetlands and the area of land required for conservation. Based on SWFWMD land cover maps, approximately 122,250 acres (25%) of land in Pasco County are wetlands and surface waters (**Figure 1**). In addition, stormwater protection requirements of the SWFWMD will ensure some degree of flood protection and water quality treatment. The protection of wetland systems, water quality, and floodplains systems, to a lesser degree, indirectly protects wildlife habitat associated with these natural resources.

### **1.2.2 Federal Wetland Regulations**

The ACOE, under Section 404 of the Clean Water Act, exerts regulatory authority for dredge and fill activities over the “waters of the United States,” including wetlands. Applicants seeking approval for impacts to wetlands are required to prepare one of several types of permits that generally includes the area of proposed wetland impacts, proposed mitigation, economic analyses, a public interest review, and avoidance and minimization efforts. The US Environmental Protection Agency (EPA) and the US Fish and Wildlife Service (USFWS) may comment on an ACOE permit application. A recent Supreme Court decision has limited the regulatory authority of the ACOE over isolated wetlands, so that they are limited in scope to those wetlands that are connected to waters of the United States. Still, the area of wetlands in the County that are under the regulatory authority of both the state and federal government is extensive. Under any future development scenario, it is unlikely that a high percentage of this



**Figure 1**



acreage will be removed because of engineering constraints, conversion costs, and existing regulations. Thus, remaining wetland systems in Pasco County will provide a substantial framework of natural habitat.

### 1.2.3 Threatened and Endangered Species

The regulations established to protect threatened or endangered species by state (Florida Fish and Wildlife Conservation Commission (FWCC)) and federal (USFWS) wildlife agencies are frequently isolated in context and imposed on a species-by-species basis. Consequently, their effects are mostly “local” and seldom coordinated on a regional basis. Still, the regulations do result in the conservation of some habitat for listed species, and preservation of lands not protected by other regulatory agencies.

### 1.2.4 Pasco County

Despite these existing state and federal programs, any proactive or comprehensive protection of natural resources in individual counties is left to local efforts, which must then be tied to an overall natural resource plan. Over the years, the County has developed natural protection policies that have the potential to provide further protection of Countywide resources. The County’s Comprehensive plan outlines measures to protect wildlife, acquire land, protect major river systems, and partner with other resource agencies to accomplish regional conservation objectives. No land development regulations are currently in place that explicitly protect wildlife habitat, although the recently adopted amendments to Objective 2.7 of the Comprehensive Plan do include measures that lead indirectly to wildlife habitat protection.

## **2.0 IDENTIFYING REGIONAL WILDLIFE LINKAGES**

Based on input from the Technical Advisory Committee during their initial meeting on April 5, 2001, a list of seven (7) objectives was defined as relevant to developing a regional conservation strategy for wildlife habitat within the County. The primary objective for conserving regional wildlife habitat was the maintenance of biodiversity of both ecological communities and wildlife species. The remaining criteria, relating to the ability to maintain wildlife linkages, manage wildlife habitat, and restore wildlife habitat, were concluded to be important aspects of regional habitat quality. In addition to sustaining biodiversity, the TAC identified other factors important to protecting high quality wildlife habitat in the County.

- Protection of landscape linkages (particularly including riparian systems);
- Protection of tracts in close proximity to existing conservation lands, both within and outside of the County;
- Conservation of representative portions of all ecological communities within the County;
- Protection of conservation lands of sufficient size to support large mammals; and
- Assurance of the ability to manage lands for natural processes that affect habitat quality, with allowance for natural patterns of fire, flood, and complex species interactions.

Incorporating the protection of biodiversity into the context of other regional issues specific to Pasco County required an extensive review of additional data sources. Noss et al. (1999) suggested that reserve selection typically employed one of three methods: 1) special elements known to have high conservation value, 2) representation, and 3) focal species. They also stated that the preferred method of reserve selection would include components of all three of these methods, and ultimately, this was our final reserve selection methodology.



## 2.1 Data Compilation

Existing Geographic Information Systems (GIS) databases covering lands within and outside of the County were compiled to facilitate analyses. Those databases that directly influenced the identification of regional wildlife linkages included:

### 2.1.1 Biodiversity hotspots

The Florida Fish and Wildlife Conservation Commission's (FFWCC) conducted two comprehensive analyses, termed "Closing the Gaps," of wildlife habitat in Florida (Cox and Kautz 2000, Cox et al. 1994). Although these analyses were performed on a statewide basis, the breadth of species included in the analyses and habitat types represented provide the strongest, and most readily available data, for a wildlife study at the scale of the area of Pasco County. The data utilized for this study included the focal species selected in the 1994 study and the rare and imperiled species selected in the 2000 study. The species represented wildlife ranging from common (wild turkey, *Meleagris gallopavo*; river otter, *Lutra canadensis*) to extremely rare (piping plover, *Charadrius melodus*; Florida scrub jay, *Aphelocoma coerulescens*). Of the 130 species for which the FFWCC completed models, 45 species occur in Pasco County (**Table 1**) with the maximum aggregation of 26 species occurring together in at least one hotspot area. It should be noted that the highest species diversities noted within the studies occurred within a limited number of habitats including sand pine scrub, sandhill, xeric oak scrub, coastal strand, hardwood swamp, and bottomland hardwoods (typically associated with riverine systems) (see **Figure 2**).

### 2.1.2 Hydrography

An assessment of the rivers, streams and tributaries in Pasco County was conducted using the hydrography database of the SWFWMD supplemented with a review of 7.5 minute Quadrangle Maps from the U.S. Geological Survey and 1994 and 1999 Digital Ortho Quarter Quadrangle (DOQQ) photography. The extent of the Hillsborough, Withlacoochee, Pithlachascotee, and Anclote Rivers were identified, along with their named tributaries within areas that were not highly urbanized (**Figure 1**).

### 2.1.3 Digital Ortho Quarter Quadrangle (DOQQ) Aerial Photography

DOQQ aerial photography from 1994 (**Figure 3**), and 1999 DOQQ (**Figure 4**) were used in this study.

### 2.1.4 Public / Conservation Lands

A variety of data were used to identify public and conservation lands. Lands that were added to the database included tracts that had been acquired by fee, or less than fee by the SWFWMD; lands held by other state or federal agencies; lands owned by Pasco County; lands managed by the Florida Natural Areas Inventory (FNAI) or other private conservation agencies; or public municipalities that owned property associated with wellfields (**Figure 5**). Not all of these lands are currently being managed for conservation purposes, but for the most part, the current uses are consistent with the overall conservation strategy associated with regional wildlife linkages. All of these lands were categorized as public/conservation lands with the expectation that they would

**Table 1**

**Focal Species from the FFWCC Gap I<sup>1</sup> and Gap II<sup>2</sup> analyses that occur in Pasco County, Florida. (For those species listed by the FFWCC as threatened (T), endangered (E), or species of special concern (SSC), their status is listed in parenthesis.)**

**AMPHIBIANS AND REPTILES**

**Common Name**

American alligator (SSC)  
Central Florida crowned snake  
Eastern diamondback rattlesnake  
Eastern indigo snake (T)  
Eastern tiger salamander  
Florida pine snake (SSC)  
Gopher frog (SSC)  
Gopher tortoise (SSC)  
Peninsula crowned snake  
Peninsula mole skink  
Short-tailed snake  
Spotted turtle  
Suwannee cooter

**Scientific Name**

*Alligator mississippiensis*  
*Tantilla relicta*  
*Crotalus adamanteus*  
*Drymarchon corais couperi*  
*Ambystoma tigrinum*  
*Pituophis melanoleucus mugitus*  
*Rana capito aesopus*  
*Gopherus polyphemus*  
*Tantilla relicta*  
*Eumeces egregious onocrepis*  
*Stilosoma extenuatum*  
*Clemmys guttat*  
*Pseudemys concinna suwanniensis*

**BIRDS**

**Common Name**

American oystercatcher  
American swallow-tailed kite  
Black rail  
Black-crowned night-heron  
Brown pelican (SSC)  
Cooper's hawk  
Cuban snowy plover  
Florida burrowing owl  
Florida sandhill crane (T)  
Florida scrub jay  
Hairy woodpecker  
Least bittern  
Limpkin (SSC)  
Marian's marsh wren  
Osprey  
Piping plover (T)  
Scott's seaside sparrow  
Short-tailed hawk

**Scientific Name**

*Haematopus palliates*  
*Elanoides forficatus*  
*Laterallus jamaicensis*  
*Nycticorax nycticorax*  
*Pelecanus occidentalis*  
*Accipiter cooperii*  
*Charadius alexandrinus*  
*Athene cunicularia floridana*  
*Grus canadensis pratensis*  
*Aphelocoma coerulescens*  
*Picoides villosus*  
*Ixobrychus exilis*  
*Aramus guarauna*  
*Cistothorus palustris marianae*  
*Pandion haliaetus*  
*Charadrius melodus*  
*Ammodramus maritimus peninsulae*  
*Buteo brachyurus*

## Table 1 continued

### BIRDS - Continued

#### Common Name

Southeastern American kestrel (T)  
Southern bald eagle (T)  
Swainson's hawk  
Wild turkey  
Wilson's plover  
Yellow-crowned night heron

#### Scientific Name

*Falco sparverius paulus*  
*Haliaeetus leucocephalus*  
*Limnothlypis swainsonii*  
*Meleagris gallopavo*  
*Charadrius wilsonia*  
*Nyctanassa violacea*

### MAMMALS

#### Common Name

Bobcat  
Florida black-bear (T)  
Florida mink  
Florida mouse (SSC)  
Fox squirrel (T)  
Northern yellow bat  
River otter  
Round-tailed muskrat

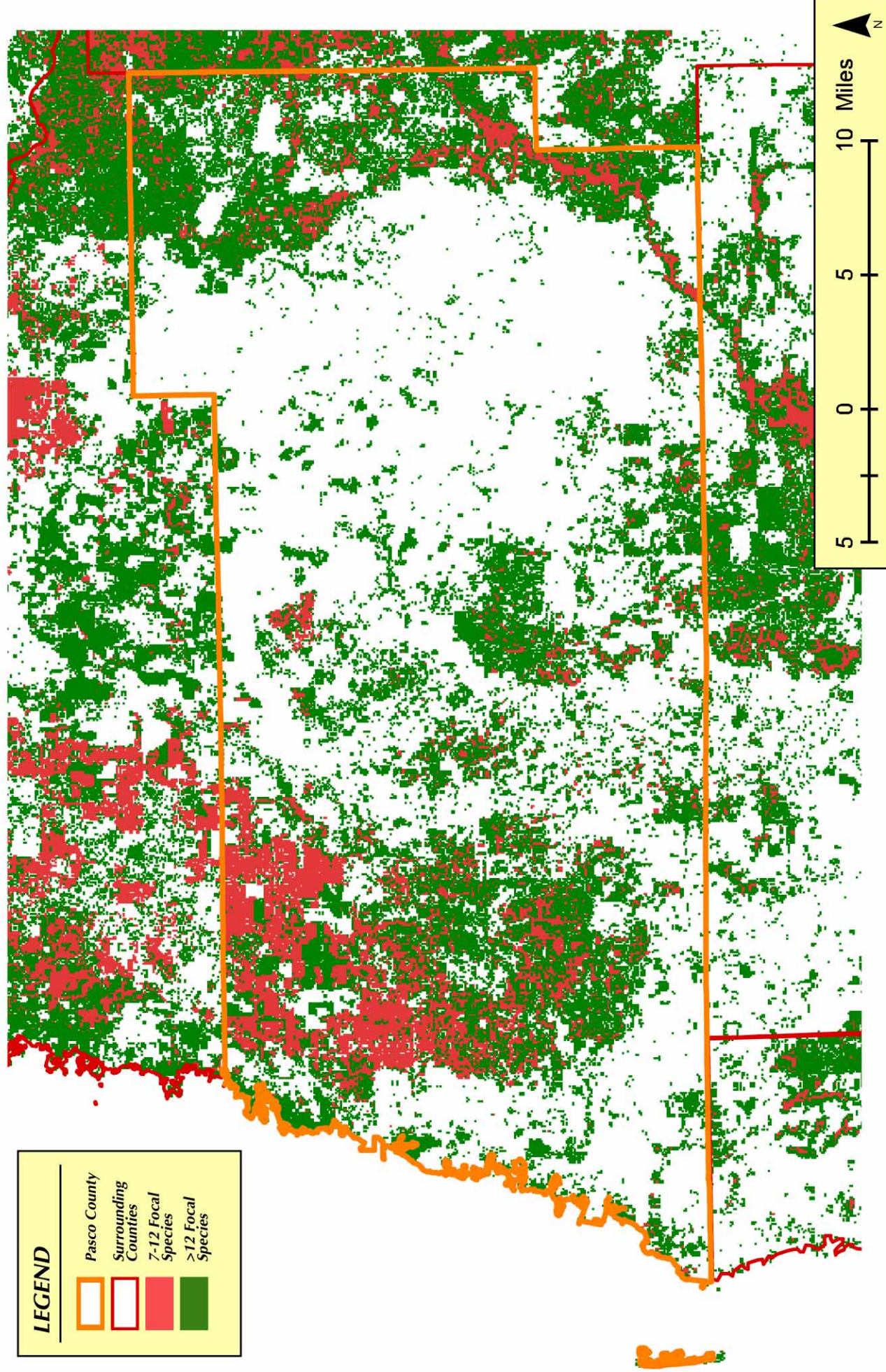
#### Scientific Name

*Lynx rufus*  
*Ursus americanus floridanus*  
*Mustela vison*  
*Podomys floridanus*  
*Sciurus niger*  
*Lasiurus intermedius*  
*Lutra canadensis*  
*Neofiber alleni*

<sup>1</sup> Cox, J. A., R. S. Kautz, M. MacLaughlin, and T. Gilbert. 1994. Closing the Gaps in Florida's Wildlife Habitat Conservation System. Florida Game and Freshwater Fish Commission Office of Environmental Services.

<sup>2</sup> Cox, J. A., and R. S. Kautz. 2000. Habitat Conservation Needs of Rare and Imperiled Wildlife in Florida. Florida Fish and Wildlife Conservation Commission Office of Environmental Services.





Source: "Hotspots of Biological Diversity" were included in the FFWCC Species Richness Gap Analysis

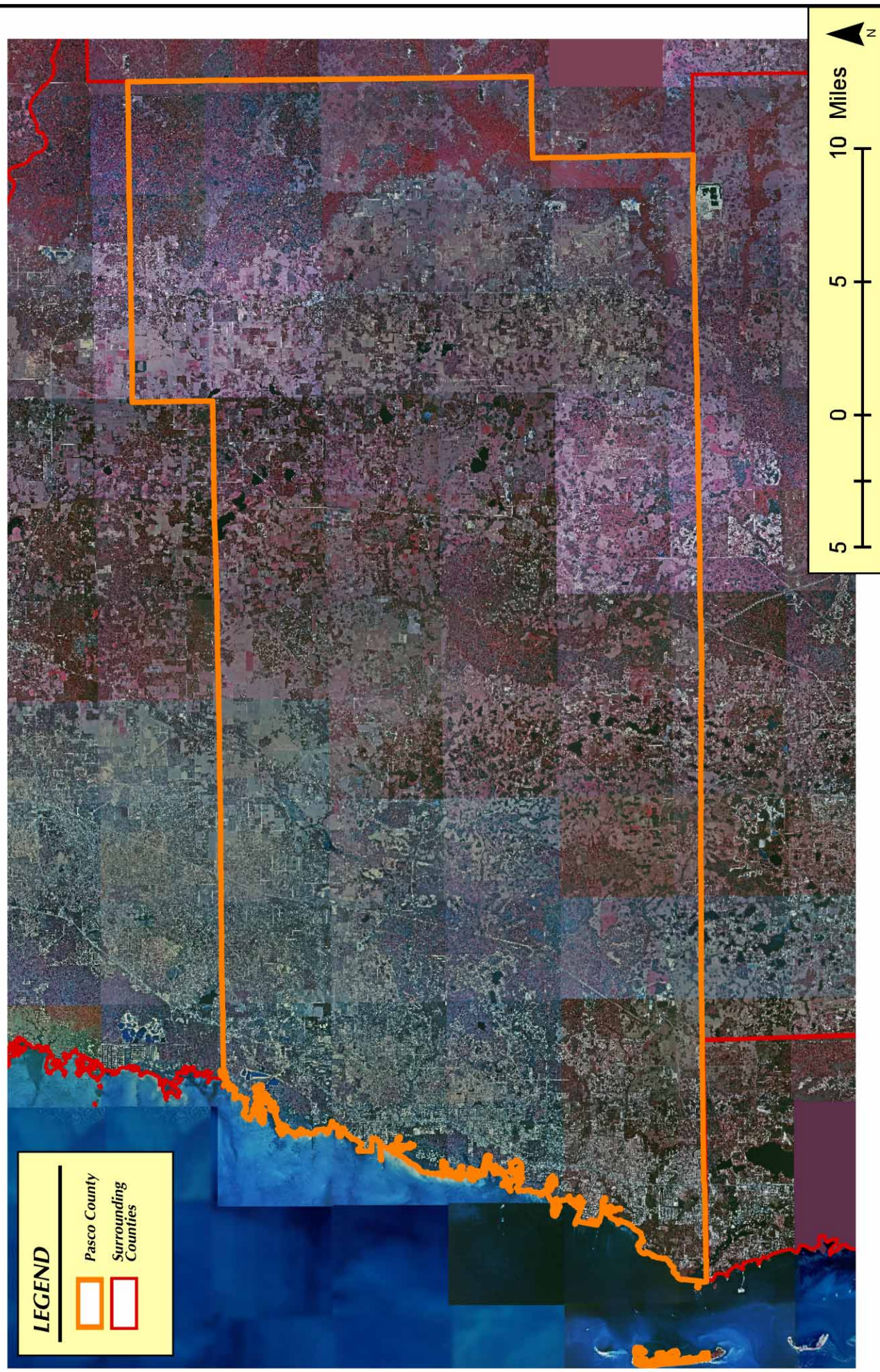
**Figure 2**  
**Hotspots of Biological Diversity (FFWCC)**



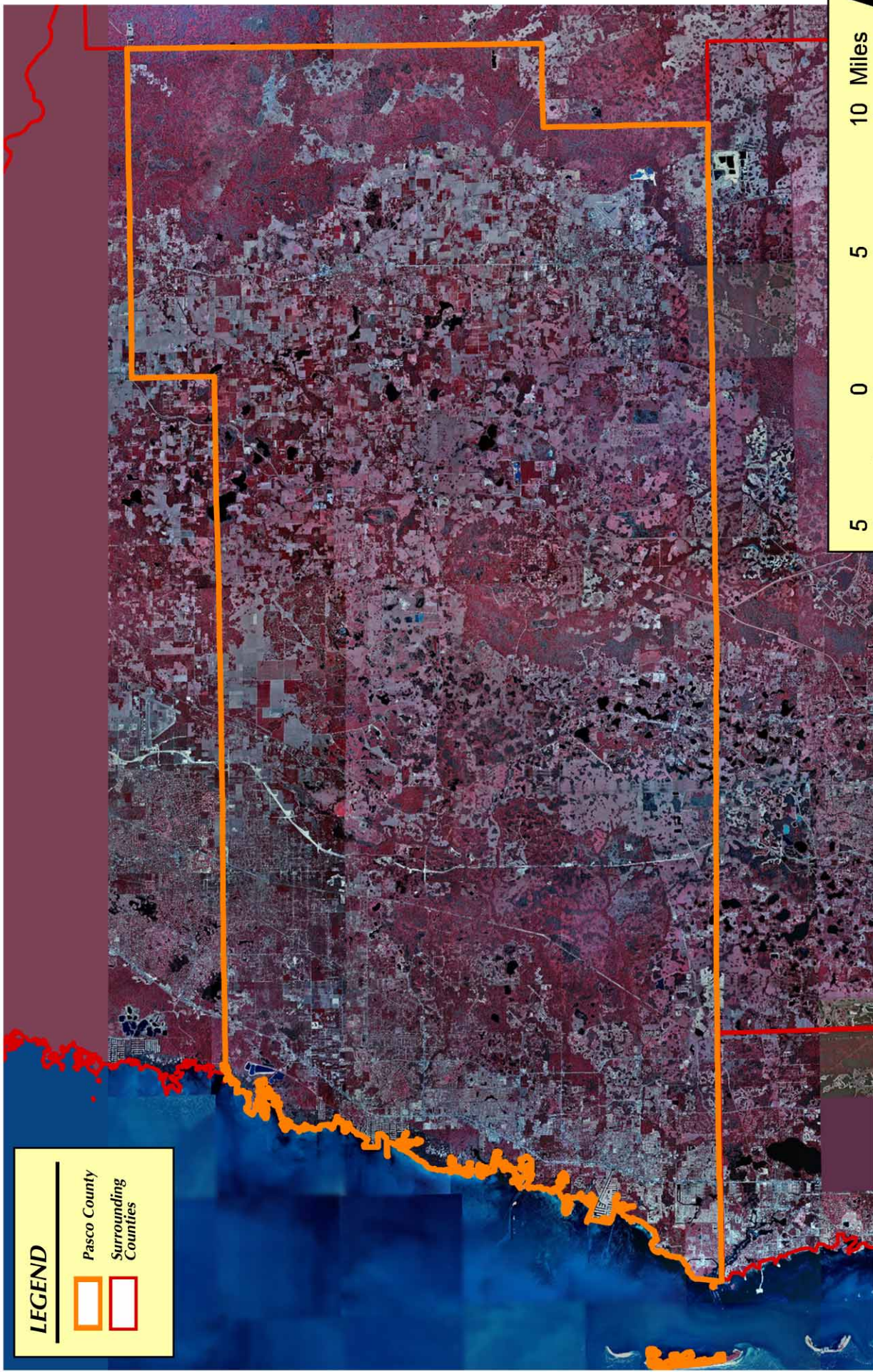
# *Pasco County, Florida*

**Figure 3**  
**1994 DOQQ Aerial Photography**

Source: 1994 USGS Digital Ortho Quarter Quad Aerial Photography







Source: 1999 USGS Digital Ortho Quarter Quad Aerial Photography

**Figure 4**  
**1999 DOQQ Aerial Photography**

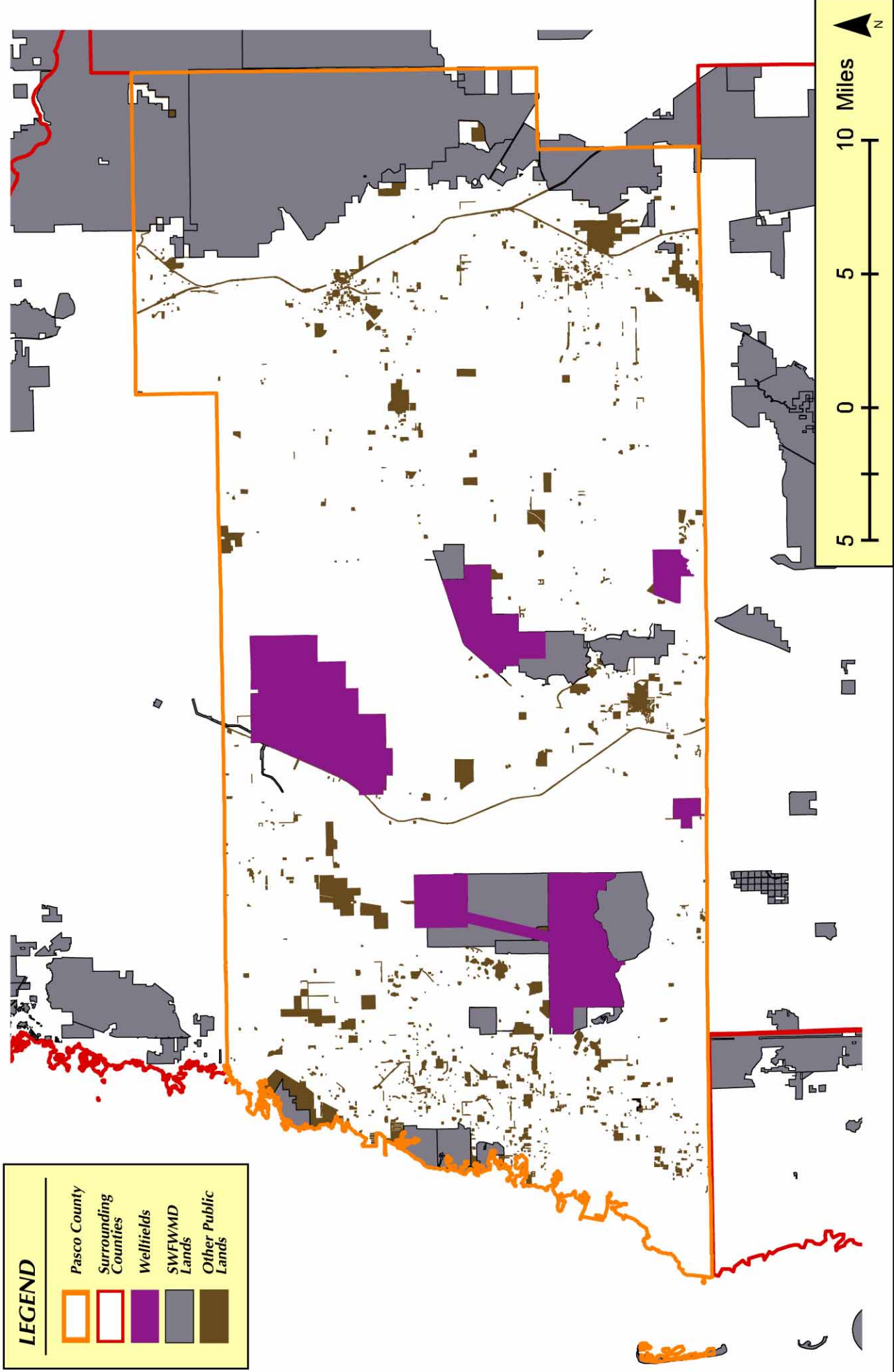
## *Pasco County, Florida*



# *Pasco County, Florida*

Source: Pasco County and Florida Natural Areas Inventory

**Figure 5**  
**Public Lands**



be characterized by extremely low intensity land use and/or management practices consistent with conservation purposes for the foreseeable future.

### 2.1.5 Historic Land Use

Mr. Barry Wharton, a member of the Technical Advisory Committee for this project, and an environmental consultant with HDR, Inc., independently conducted an analysis of historic land cover that existed in Pasco County in the mid to late 1800's. Mr. Wharton created a map of these historic land uses from soils maps prepared by the Soil Conservation Service (SCS) and data on dominant vegetation taken from surveyor's field notes recorded in the mid 1800's (**Figure 6**). His assessment was evaluated based on physiographic regions and the habitats that likely occurred within these regions and concluded that it was a likely representation of historic ecological communities associated with various soil types in Pasco County. These GIS data provided a beneficial projection of ecological communities historic to Pasco County prior to substantial influence by man.

## **2.2 Field Work**

### 2.2.1 Groundtruthing

Although relatively extensive overviews of Pasco County were conducted during numerous field investigations over the course of this study, there was no attempt to groundtruth the GIS database upon which these analyses have been based. These data have undergone extensive Quality Assurance and Quality Control reviews within their particular agencies, and our scope specified the use of existing GIS data. At the same time, our fieldwork did provide familiarity with natural systems in Pasco County, and generally confirmed the mapping efforts by the SWFWMD and FFWCC.

### 2.2.2 Helicopter Over Flight

In an attempt to gain familiarity with the signatures portrayed by the DOQQ aerial photography, and to collect specific information regarding wildlife habitat composition and land-use trends, a helicopter over-flight across the entire county was conducted on May 31<sup>st</sup>, 2001. This review provided invaluable information regarding trends of habitat alteration, the extent of agricultural communities in the County, the location of expanding development, and wildlife linkages. Data from this helicopter over flight were used to refine maps of proposed habitat linkages, and to make recommendations regarding potential measures of protection through the future ordinance.

## **2.3 Data Analysis**

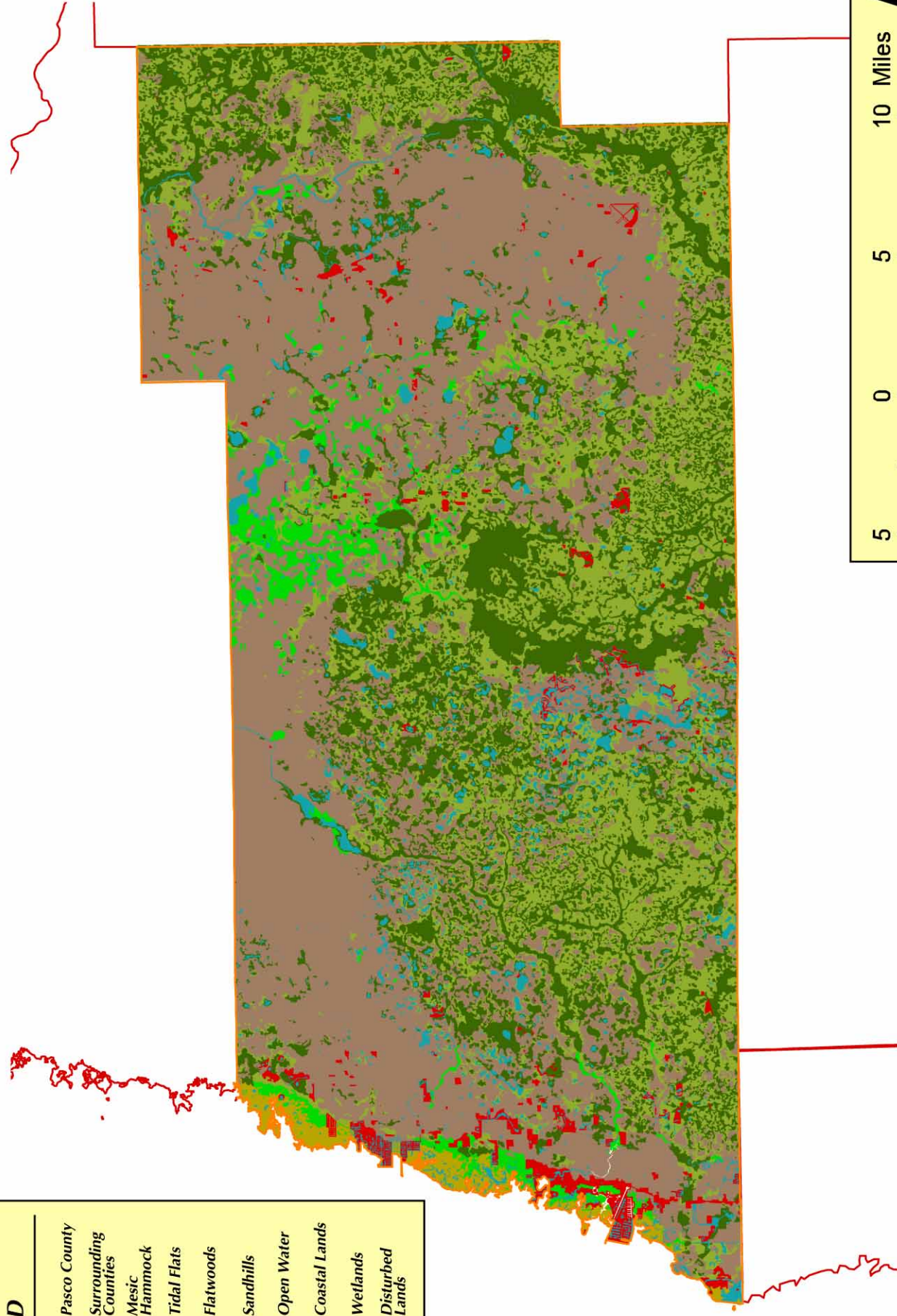
### 2.3.1 Critical Linkages

One stated objective of this study was to identify corridors, or linkages that would maintain a contiguous network of wildlife habitat between existing public lands. The conservation of these would serve as a significant base for the initiation of a comprehensive habitat protection program. The primary critical linkages were assumed to be closely connected to riparian habitats along major rivers and streams and/or associated with extensive freshwater wetland slough systems. The widths of these corridors would presumably vary depending upon the extent of wetlands, and the distance between public lands connected by the linkages.

As noted by Norris and Cooperrider (1994) and Dobson et al. (1999), linkages can serve several functions:

# LEGEND

- Pasco County
- Surrounding Counties
- Mesic Hammock
- Tidal Flats
- Flatwoods
- Sandhills
- Open Water
- Coastal Lands
- Wetlands
- Disturbed Lands



Source: Historic Natural Communities were mapped by Mr. Barry Wharton of HDR, Inc.

- Linkages as habitat
- Linkages for movement within home ranges (local movement),
- Linkages for dispersal, and
- Linkages for long-distance range shifts (seasonal migration).

Determining effective linkages that perform some or all of these functions can be achieved by the identification of a focal species of wildlife that would be representative of other species with similar habitat needs Dobson et al. (1999). Large animals with wide-ranging movement patterns can be an “umbrella” for numerous species of smaller animals. We selected white-tailed deer as a focal species for consideration of the minimal widths of differing critical linkages because of its relative ubiquity within the County, and its wide-ranging movement patterns. In application, each linkage has its own characteristics and likelihood of being used by white-tailed deer, or any other large mammal.

Nelson and Mech’s (1987) estimation of a minimum linkage width for white-tailed deer (0.4 mile, or slightly more than 2100 feet) is similar to the minimum area deemed to represent suitable habitat for white-tails by Short (1986) (100 acres, or a minimum width of 2100 feet). This distance is thought to be the minimum threshold if the linkage serves as habitat, since other authors have found substantially larger home ranges for white-tailed deer in the Coastal Plain (Marchinton and Hirth 1984). Therefore, for linkages in which the patches of habitat (public land) large enough to support white-tailed deer were more than approximately two miles apart, the critical linkage was designated to be at least 2200 feet in width to support viable linkages for this “umbrella” species.

GIS layers representing rivers and streams and public lands were overlaid on DOQQ aerial photography to define critical linkages of suitable habitat with existing public lands. Using data from biodiversity hotspots, and our thresholds for minimum corridor widths, we assessed potential linkages that would provide a network of habitat connections between the following public lands:

- Wellfields, including Cypress Creek, Cypress Bridge, Crossbar, North Pasco, Starkey and South Pasco (to various public lands),
- Recently-acquired lands associated with the Hillsborough River (to the Green Swamp),
- Crews Lake Park (to both the Starkey Wilderness Preserve and the Crossbar wellfields),
- The Starkey Wilderness Preserve (to the lands intended for purchase by the Southwest Florida Water Management District on the Connerton Ranch, and
- The Crossbar and Cypress Creek wellfields (to the Connerton purchase).

### 2.3.2 Ecological Planning Units

From the FFWCC biodiversity hotspot data, we identified areas that provided habitat for more than seven (7) focal species (**Figure 2**). (Seven species represents about 16% of the possible number of focal species that occur in the County.) The area encompassing habitat for seven or more focal species represents approximately 35% of the land area within Pasco County. These areas were determined to represent the high value biodiversity areas in the County. These areas may not represent all significant wildlife habitats in the County because of the resolution of the underlying data from satellite imagery, the large scale of the analysis (the entire state of Florida)



by FFWCC, and potential misidentification of some habitat types by satellite imagery interpretation software. Other important wildlife habitat does occur in areas with less than seven focal species (e.g., pastures that provide Florida black bear movement corridors, lone pine trees suitable for bald eagle (*Haliaeetus leucocephalus*) nesting. However, the biodiversity aggregation indicated by the areas that constitute habitat for seven or more focal species provides the most appropriate biodiversity index that is available for countywide analyses of regional wildlife connections. For the most part, areas of high biodiversity correspond with habitats high in species diversity including sandhill, hardwood swamp, and bottomland hardwoods, as noted by the FFWCC and confirmed during our helicopter over-flights and other field reviews.

High biodiversity areas were overlaid on a map of 1994 DOQQ aerial photography, hydrography data, and lands currently held in public ownership. Preliminary regional wildlife habitat linkages were delineated to include large aggregations of high biodiversity areas, riparian systems adjacent to rivers, named tributaries outside of urbanized areas, and public lands with current uses consistent with wildlife habitat protection. For the most part, the boundaries of these preliminary linkages followed the boundaries of public lands, natural vegetation communities adjacent to public lands, and natural and altered (i.e. pastures) habitats underlying high biodiversity areas. Other than the previously mentioned public lands, no attempt was made to delineate these preliminary linkages based on current ownership patterns, but rather on the extent of natural vegetation or other altered habitats (i.e. pastures) underlying high biodiversity areas

The resulting preliminary linkages were then evaluated for potential connections to natural areas and potential wildlife corridors outside of the County. The assessment of wildlife habitat connectivity to adjacent counties was made to ensure that the linkages in Pasco County were not isolated from other significant systems in adjoining counties. As a result, consideration of other protection strategies, land acquisition strategies, and habitat conservation programs of adjacent counties were included in this analysis. Potential wildlife linkages occurring outside of Pasco County were derived using the same methods as described above for high biodiversity areas, along with an assessment of potential acquisition areas identified by the SWFWMD. Where deficiencies were noted, additional connections to regionally significant systems in Hillsborough or Hernando Counties were delineated using existing natural habitats, or altered habitats (i.e. pastures) that currently provide some wildlife use and/or could be restored to their natural condition.

These wildlife habitat linkages were then finalized by updating the linkages to reflect recent development patterns within the County. The preliminary map of wildlife linkages was overlaid on 1999 DOQQ aerial photography to evaluate the effects of recent development on the boundaries of the linkages. Based on notes from the helicopter over-flight, and the 1999 aerial photography, the boundaries of the wildlife habitat linkages were modified to remove recently developed areas. The areas removed primarily consisted of large-scale development projects and did not include low-density residential development or areas where natural habitats were converted to agricultural uses.

In many instances, major roads cross through (or are being constructed within) the identified wildlife habitat linkages and/or limited development occurs in or immediately adjacent to these areas defined as wildlife habitat linkages. These activities can minimize potential connectivity,

jeopardize the current quality of habitat, and degrade the ability for long-term management of wildlife. Still, conservation of the tracts adjacent to these roads could sustain the wildlife value, limit incompatible development along the roads, and elucidate the need for road enhancements favorable to wildlife movement. Moreover, the conservation of these areas is necessary to ensure the protection of representative portions of historic ecological communities, biodiversity hotspots, and major riparian systems.

Finally, critical connections between these regional linkages were defined by an assessment of the gaps between public lands and, primarily, wetland corridors that connect them. These critical linkages would serve as the priority for conservation through acquisition, mitigation, land use restrictions, and easement, and form the backbone of larger planning units.

## **2.4 Results**

### **2.4.1 Critical Linkages**

Critical wildlife linkages were identified for seven segments connecting public lands (**Figure 7**). The distance between public lands, the extent of alteration of natural linkages, and the nature of the riparian corridor served as criteria that were used to define the width of these linkages. These linkages total 10,946 acres, of which 1,176 acres (11%) are currently in public ownership (**Table 2**). Conservation efforts aimed at protecting these linkages should be the first priority of the habitat protection program, and other longer-term planning and acquisition strategies should build on the areas protected by these linkages.

For a few of these connections, the critical linkage was defined along the edge of the forested wetland for riparian systems. This was particularly true of the connections from Cypress Creek south into Hillsborough County, and along the Hillsborough River from the Green Swamp southwest along the County boundary. For many of the other linkages, however, defining the extent of the corridor was more complicated.

As noted in Section 1.1, smaller buffer widths were used for shorter distance connections between public lands. Brown et al.'s (1990b) determination of a riparian linkage with 550-foot buffers was used for the much shorter connection from the Starkey Wellfield along South Creek to Brooker Creek in Hillsborough and Pinellas Counties. This linkage is more urban, already fragmented, and affected by recent, intense development. Likewise, the linkage from Cypress Creek south to Hillsborough County is urban and bisected by Interstate 75. Still, conservation of the forested wetlands along this connection was determined to represent a critical linkage. In several locations, the existing riparian corridor is over 2000 feet wide. The goal for this critical linkage was to have no area within the corridor less than 550 feet in width, and to protect the riparian wetlands and creek with a buffer at least 50 feet wide on both sides of the creek. The distance from the proposed Connerton purchase to Cypress Creek is less than 1 mile, and it was determined that a minimum corridor width of 550 feet would also suffice for this relatively short connection, particularly when the existing forested wetlands were included in this linkage. For the remaining linkages, a minimum corridor of 2200 feet was delineated because of the nature of the habitat, and the distance between public lands managed for natural resources.

#### *2.4.1.1 North Pasco to Crossbar*

This linkage follows the Pithlachascotee River to Crews Lake (including Crews Lake Park) along the Masaryktown Canal to the Crossbar Ranch wellfield. Although Crews Lake Park exists approximately midway between the north Pasco and Crossbar wellfields, it is an extensive link of this linkage that is not in public ownership. As a consequence, the maximum width of 2200 feet was recommended for this critical linkage. The Pithlachascotee River, Crews Lake and the Masaryktown Canal were used as the backbone for this critical linkage. In fact, certain portions of the Pithlachascotee River floodplain will likely encompass most of the 2200-foot corridor in the southern portion of this critical linkage. On the other hand, most of the 2200-foot wide buffer in the northern portion of this linkage is upland, and not afforded protection through existing regulatory mechanisms. This linkage encompasses broad flatwoods associated with the Pithlachascotee floodplain, the extremely dynamic hydrologic basin associated with Crews Lake, and the historic sandhill communities near the Crossbar Ranch.

#### *2.4.1.2 Crossbar to Connerton*

The Connerton Purchase serves as the terminus of three critical linkages. Though the owners of the Connerton Ranch, and the SWFWMD have not completed the transfer of land to public ownership, it is our understanding that, at the time of publication of this report, the transfer is likely. In addition, we believe that the area depicted on Figure 7 as the proposed SWFWMD purchase fairly accurately reflects the extent of land intended for transfer to the SWFWMD. For the Crossbar to Connerton connection, an attempt was made to define a 2200-foot wide corridor that included a broad expanse of herbaceous marshes in this portion of the County. As a result, much of the area encompassed by the Crossbar to Connerton critical linkage is comprised of seasonally flooded sandhill and flatwoods marshes. The mosaic of these wetlands and the adjacent uplands provides a diversity of seasonally flooded, mesic and xeric habitats that will be used by a variety of wildlife so long as the 2200-foot connection can be sustained. None of this land is in public ownership, though existing wetland regulations provide some protection for a substantial area within this critical linkage.

#### *2.4.1.3 North Pasco to Connerton*

This critical linkage also connects to the proposed Connerton Purchase. Throughout much of its approximately 4-mile course, this linkage follows the forested wetlands associated with Fivemile Creek. Although this linkage is affected by the Suncoast Parkway and S.R. 41, there is a substantial underpass under the Suncoast Parkway, and additional measures of protection of habitat can be implemented at the juncture with S.R. 41. Much of the western portion of this 2200-foot wide corridor is comprised of the forested wetlands and their associated floodplain in Fivemile Creek. This land includes extensive areas of flatwoods currently under agricultural and silvicultural use.

#### *2.4.1.4 Cypress Creek to Connerton*

This critical linkage also includes a connection to the Connerton Purchase at its northeast corner. Due to the relatively short length of this connection, the width of the linkage is only recommended at 550 feet. In addition, the majority of this linkage includes wetlands adjacent to Cypress Swamp that were historically associated with the mosaic of wetlands in the northeast corner of the Connerton Ranch. This critical linkage crosses Ehren Cutoff (S.R. 583) and there are apparently plans for a larger roadway in the future. Future considerations of wildlife

crossings along these roads should help facilitate passage of wildlife from the Cypress Creek wellfield to the Connerton purchase.

#### *2.4.1.5 Starkey to South Pasco*

Recent land acquisitions by the SWFWMD south of the Starkey Wellfield extend the protection of natural lands south from the Starkey wellfield into Hillsborough County. This critical linkage extends south of the SWFWMD lands along South Branch, a tributary of the Anclote River, ultimately to the connection with Brooker Creek in Hillsborough County. Much of this critical linkage has been affected by recent development. Due to the urban nature of the connection south of the SWFWMD lands, and the relatively short distance of this linkage, an 1100-foot buffer was proposed. A 550-foot wide extension to the east is recommended for connection to the South Pasco wellfield. Much of this connection is also urban, and the 550-foot buffer has been compromised throughout much of the proposed course to the South Pasco wellfield. Conservation plans for this critical linkage must be coordinated with similar measures initiated for Brooker Creek.

#### *2.4.1.6 Cypress Creek to Cypress Bridge*

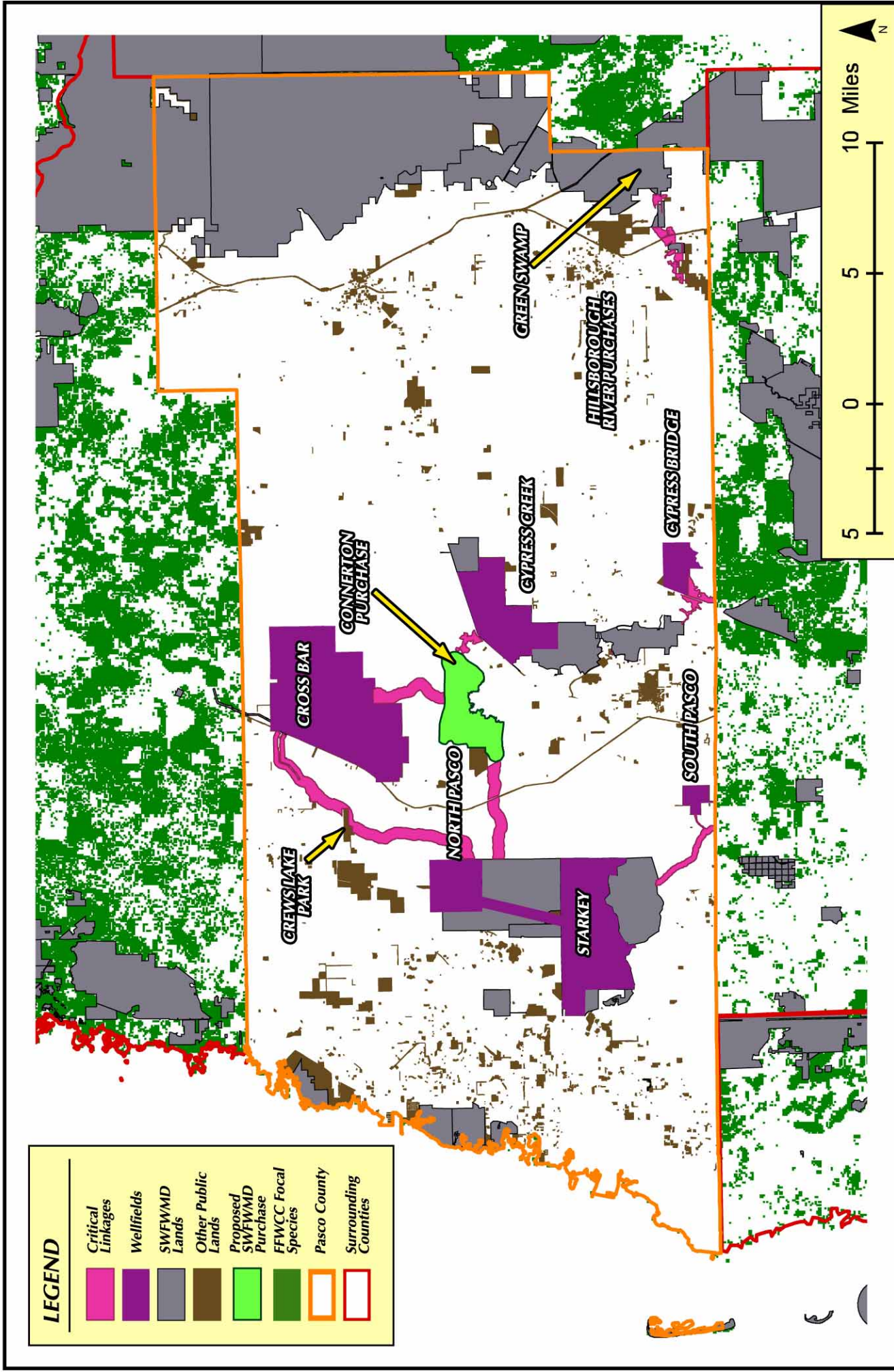
This relatively short connection is also urban in nature and would facilitate dispersal of wildlife through a highly altered landscape. However, this connection is relatively important because of its existence as a “bottleneck” between the large conservation lands associated with Cabbage Swamp and Cypress Swamp and the conservation lands in Hillsborough County. This linkage is drastically affected by SR 54, Interstate 75, and extensive development along its course. However, the forested wetlands associated with Cypress Creek and its floodplain still provide a substantial area of existing natural habitat that justifies consideration of this critical linkage.

#### *2.4.1.7 Hillsborough River to Green Swamp*

Extensive purchases by the SWFWMD have already taken place along the proposed Hillsborough River critical linkage. Although CR 39 currently crosses the Hillsborough River, the protection of the river and its floodplain in this portion of the County has already prioritized by the SWFWMD. For the most part, this portion of the river exists in an agricultural context, and includes an extremely wide forested floodplain throughout the critical linkage. Because of the sensitive nature of the Hillsborough River, the width and the value of these forested floodplains, the critical linkage was established at a width of 2200 feet. Much of this land is currently in public ownership; much of the rest is intended for acquisition by the SWFWMD.

### 2.4.2 Ecological Planning Units and the Agricultural Reserve

The extent of valuable habitat identified from the GIS analyses were overlain on maps of physiographic regions and major watersheds occurring within Pasco County to derive nine “management areas” warranting special consideration because of their ecological significance.



Source: Glatting Jackson and Pasco County



**Figure 7**  
**Critical Linkages (Corridors) of Wildlife Habitat**  
**Between Existing Public Lands**  
**Pasco County, Florida**

**Table 2****Acres of Private and Public Lands within Critical Linkages (Corridors) Connecting Public Lands<sup>1</sup>**

<b><u>Linkages</u></b>	<b><u>Acres of Private Land</u></b>	<b><u>Acres of Public Land</u></b>	<b><u>Total</u></b>
Starkey to Crossbar	2,575	330	2,905
Connerton to Crossbar	888	0	888
Starkey to Connerton	1,010	0	1,010
Connerton to Cypress Creek	206	0	206
Starkey to South Pasco	468	0	468
Cypress Creek to Cypress Bridge	377	0	377
Hillsborough to Green Swamp	511	841	1,352
<b>Subtotal</b>	<b>6,035</b>	<b>1,171</b>	<b>7,206</b>
Connerton Linkage <sup>2</sup>	3,735	5	3,740
<b>Total</b>	<b>9,770</b>	<b>1,176</b>	<b>10,946</b>

<sup>1</sup> See Figure 7 for a depiction of these connections.

<sup>2</sup> This represents an approximation of the area within the Connerton Ranch that is intended for purchase by the SWFWMD.



Eight of these areas were termed Ecological Planning Units, or EPU, resulting from the expectation that each would require a unique planning strategy to maximize its value to wildlife over the long-term planning horizon (**Figure 8**). Overall, the total area included within the eight EPU is approximately 190,000 acres. Of this total, approximately 110,000 acres (almost 60%) consist of lands currently held in public ownership (**Table 3**). The ninth management area was identified as the Agricultural Reserve (Ag Reserve); its value for wildlife is substantial, and sustaining agricultural land uses in this portion of the County is a pivotal component of habitat conservation in the County (**Figure 9**). The EPU and the Ag Reserve encompass a large area of land, but a focus on regional conservation based on the goals for regional conservation established by the TAC in April 2001, requires a strategy that is large in scale. The ability to conserve and manage expansive areas of diverse, natural lands also requires consideration of major systems and large tracts of land. As noted below, these EPU and the Ag Reserve do not represent conservation lands that must be completely acquired or totally precluded from development, but they provide general boundaries in which a more specific review of development plans would enhance wildlife habitat protection for the County. The EPU include the following:






**2.4.2.1 Coastal Marshes** – Though much of the area in the western portion of the County has been subject to intense development, there are still several areas of coastal marsh that provide substantial wildlife habitat and should be a high priority for protection. Though most of this EPU is wetland, there are some areas of upland coastal hammock that buffer these systems. The extent of the Coastal Marsh EPU and totals approximately 8900 acres (**Figure 8**). Much of this land is in public ownership (4300 acres), and/or under consideration for purchase.

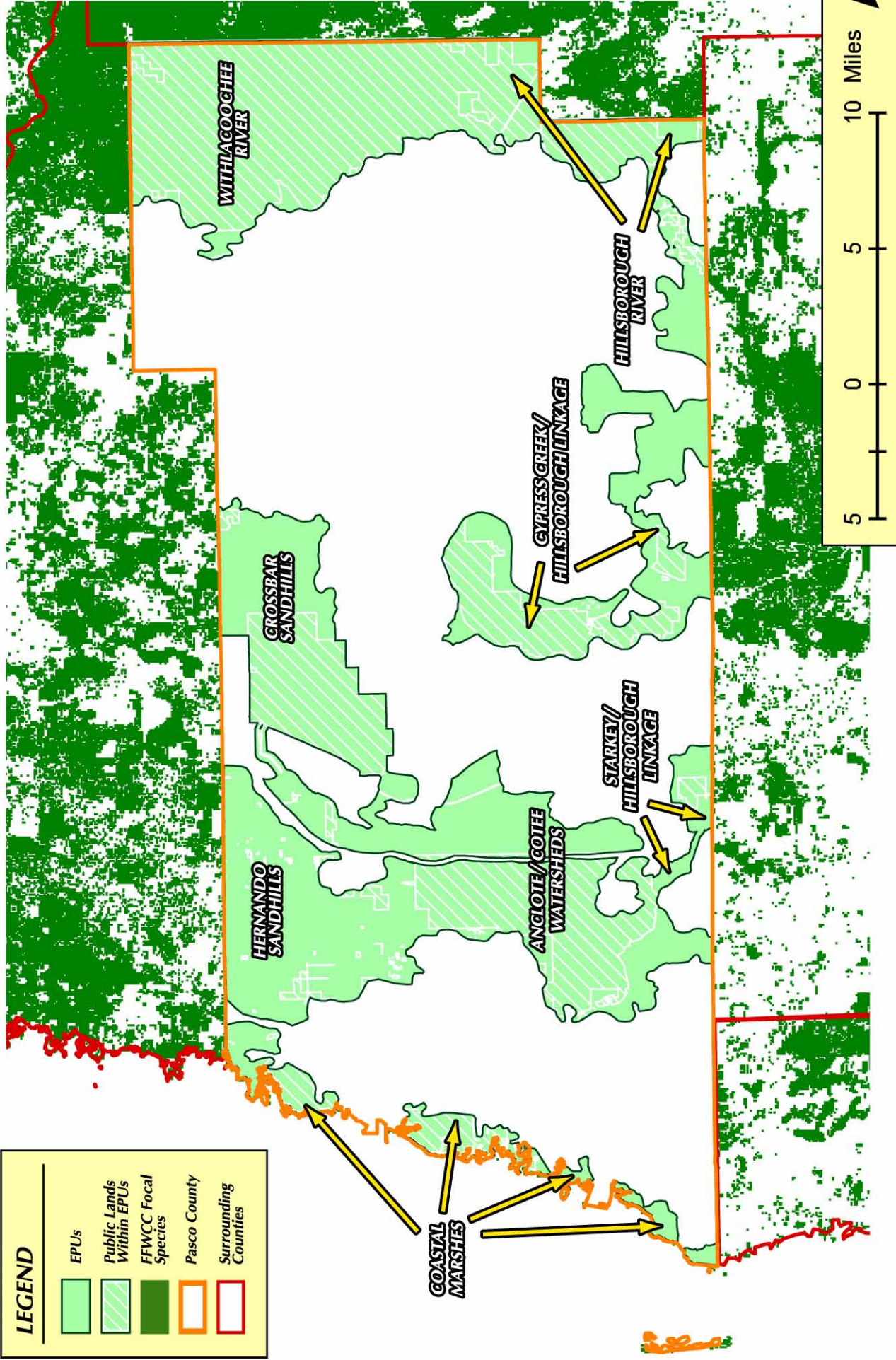
**2.4.2.2 Hernando Sandhills** – Although this EPU totals approximately 24,100 acres, the natural habitats within it are fragmented as a result of low-density residential development of 1 to 5 acres in size (**Figure 8**). Despite this fragmentation, there is still substantial longleaf pine/turkey oak (*Pinus palustris*)/(*Quercus laevis*) habitat remaining both on developed lots around existing homes and within undeveloped areas. However, the bulk of sandhill habitat remaining in this EPU occurs within the hundreds of acres of natural lands that have not been developed. These areas are bisected by an extensive network of roads (many of which are not paved), and construction of more individual residences is expected. New, larger-scale development has occurred in the recent past, and the County has approved more concentrated developments, particularly along County Line Road adjacent to Hernando County. Because of the maintenance of natural vegetation within developed lots and the large undeveloped portions still remaining, this EPU provides substantial habitat for sandhill species, which was also noted in the extremely high concentrations of biodiversity hotspots identified by the FFWCC. Though it likely is not realistic to acquire all of these lands and to manage them in one intact unit, strategic acquisitions, clustering of conservation areas, and master planning for this area could sustain substantial habitat for sandhill species.

**2.4.2.3 Pithlachascotee / Anclote Watersheds** – This EPU, totaling approximately 39,600 acres, includes a large portion of the watersheds of these two river systems, which occur in the west-central portion of the County (**Figure 8**). These rivers have been affected by development, particularly in the western portions of their course. Still, there are substantial areas of flatwoods within the overall watersheds, as well as mesic hammocks and forested wetland systems



**LEGEND**

	EPUs
	Public Lands Within EPUs
	FWCC Focal Species
	Pasco County
	Surrounding Counties



**Table 3****Acres of Public and Private Lands within Ecological Planning Units (EPUs)  
and the Agricultural Reserve**

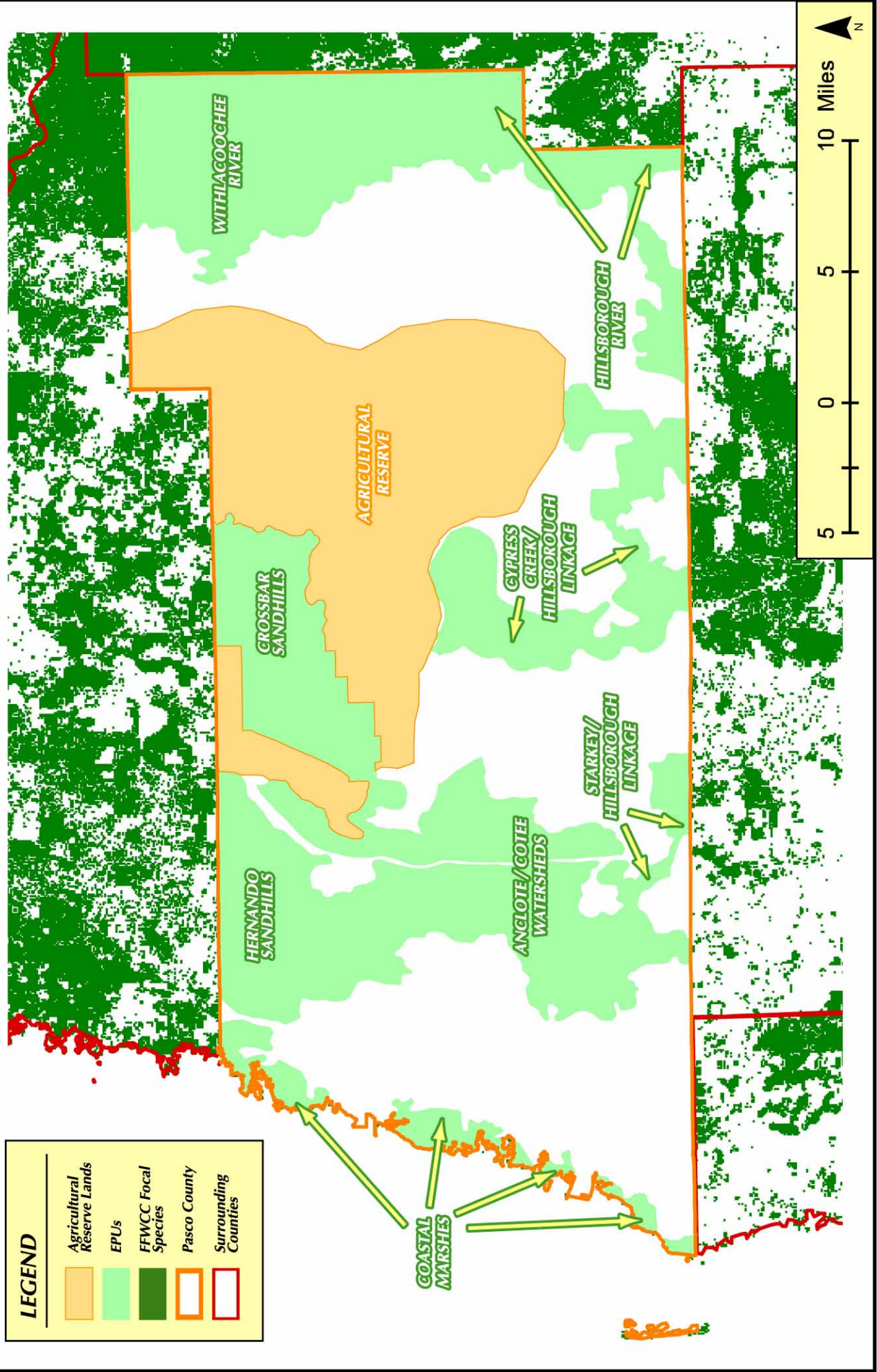
<b><u>EPU / Agricultural Reserve</u></b>	<b><u>Acres of Private Land</u></b>	<b><u>Acres of Public Land</u></b>	<b><u>Total</u></b>
Coastal Marshes	4,526	4,343	8,869
Hernando Sandhills	23,098	1,022	24,120
Anclote/Cotee	21,001	18,634	39,635
Starkey	5,954	646	6,600
Crossbar Sandhills	9,802	13,293	23,095
Cypress Creek	15,029	9,954	24,983
Withlacoochee River	2,230	44,073	46,303
Hillsborough	7,133	9,078	16,211
<b>Subtotal for EPUs</b>	88,773	101,043	189,816
<b>Subtotal Agricultural Reserve</b>	94,377	1,681	96,058
<b>Total</b>	183,150	102,724	285,874
<b>Percent</b>	64	36	100



**Figure 9**

**Agricultural Reserve Lands**

Source: Glattig Jackson



associated with the rivers and their tributaries. Vast areas of flatwoods, and limited amounts of sandhill systems, separate the origins of these rivers, but their convergence in an area of high wildlife biodiversity resulted in their inclusion in one EPU. This merger does not diminish the distinct importance of each individual river. Nevertheless, the conservation strategies for these two rivers and surrounding habitats can be synergistic and the similarities of habitat warrant their conservation in one EPU.

*2.4.2.4 Starkey / Hillsborough Linkage* – This EPU occurs in the southern portion of the Anclote River watershed which includes the Starkey Wellfield and other private ranch lands. These areas provide a continuum of natural habitat and potentially restorable altered habitat into Hillsborough and Pinellas Counties to the south from the Pithlachascotee / Anclote Watersheds EPU. Although a limited amount of natural habitats such as flatwoods and freshwater marsh systems occur within this EPU, altered habitats provide the primary connection from natural lands in the central portion of Pasco County to conservation lands and potential wildlife corridors in counties to the south. Sustaining the linkage, and habitat buffer associated with South Fork and Brooker Creek are key elements of the conservation strategy for this EPU. This EPU totals approximately 6600 acres (**Figure 8**).

*2.4.2.5 Crossbar Sandhills* ñ The north central portion of the County includes another area of historic sandhills within Pasco County identified as the Crossbar Sandhills EPU (**Figure 8**). This EPU totals approximately 23,100 acres. A substantial area of sandhill systems such as high pine and xeric oak scrub occur in this area. The Crossbar Wellfield constitutes a large area of this EPU, although some land included in this EPU is in private ownership. Current land uses within the Crossbar Sandhills may not necessarily be conducive to the perpetuation of all of the natural wildlife and sandhill vegetation, but it is assumed that the area will not be exposed to development pressure in the near term. The combination of sandhill communities, sandhill marshes, and agricultural areas in the surrounding vicinity help create a substantial connection of this sandhill community to rural lands to the north in Hernando County.

*2.4.2.6 Cypress Creek* ñ Cypress Creek begins in the northern portion of the County and flows south towards the Hillsborough River. In the process, the creek flows through Cypress Swamp and the channel fades into the vast extent of this forested wetland system. At the southern end of the County, this creek again coalesces into a discrete channel that continues to the Hillsborough River to the south. This EPU includes a small portion of the creek in the northern portion of the county, the Cypress Swamp, and the channel at the southern end of the county (**Figure 8**). This EPU, totaling approximately 25,000 acres, includes a vast area of forested wetland swamp and agricultural areas, which surround it to the north, west, and east. Conservation of its habitat value and the establishment of substantial buffers in rural and agricultural lands on either side are key to conserving the existing habitat value of the Cypress Creek EPU.

*2.4.2.7 Hillsborough River* ñ From its beginnings in the Green Swamp Preserve in the extreme eastern portion of the County to the substantial river system it becomes in the central portion of Hillsborough County, the Hillsborough River constitutes a major regional resource. This EPU (**Figure 8**) includes the headwaters of the River as well as a narrow portion of the adjacent floodplain in southeastern Pasco County that has been substantially altered to the edge of the forested wetland system bordering the River. Previous land acquisitions by the SWFWMD have

provided substantial protection to portions of the floodplain of the Hillsborough River in Pasco County. Conservation measures in these areas would expand the extent of protected wildlife habitat associated with the river system and buffer the narrow portion of the EPU in the corner of Pasco County. In total, this EPU includes approximately 16,200 acres, of which 9000 acres (55%) are in public ownership.

**2.4.2.8 Withlacoochee River** ñ This river system also arises from the forested wetlands in the Green Swamp Preserve. The majority of this EPU consists of conservation lands that have been protected through the Green Swamp Preserve and the Withlacoochee State Forest (**Figure 8**). However, certain portions of its channel in the extreme northern portion of Pasco County are outside of the area protected by Florida Division of Forestry and SWFWMD conservation areas. For the most part, the area associated with the Withlacoochee River in Pasco County is in public ownership. This EPU totals approximately 46,300 acres, of which almost 95% (44,000 acres) are in public ownership.

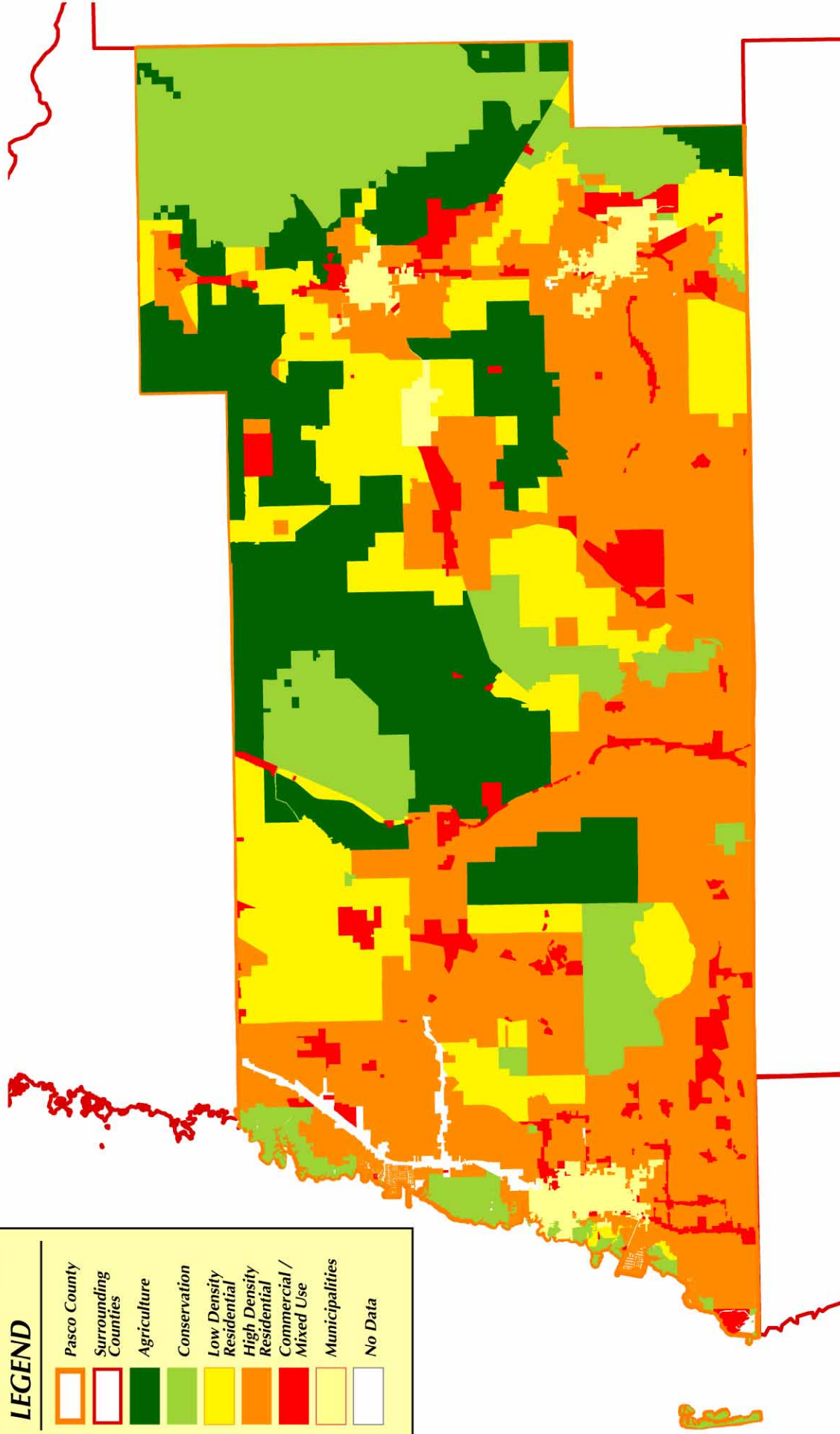
**2.4.2.9 Agricultural Reserve Lands** – This aggregation of approximately 96,000 acres represents a general definition of the broad extent of agricultural lands existing in the north-central portion of the County (**Figure 9, Table 3**). The Agricultural Lands comprise much of the “chocolate sands” of the historic sandhills in the north-central portion of the county, and still provide a substantial acreage of habitat for some species of wildlife. Much of this area has undergone agricultural management for decades, a process that is complementary to wildlife habitat protection. The sheer extent of the Agricultural Reserve Lands protects movement corridors for highly mobile species, while the natural vegetation managed within this area provides ample habitat for less mobile species. Moreover, these areas can provide a substantial buffer to lands managed solely for natural resource conservation and connect these conservation lands to regional wildlife linkages in Hernando County. However, the wildlife habitat protection generated by agricultural management would be minimized or eliminated under land uses consistent with the future land use map, such as residential development, as depicted on **Figure 10**. Maintenance of a strong agricultural economy within these lands would facilitate protection of wildlife habitat in this portion of the County and should receive considerable support from the County.

The boundaries of the critical linkages, EPUs, and the Ag Reserve were overlaid on the historic land cover map developed by Mr. Barry Wharton to evaluate the “representativeness” of the linkages for historic land covers within the County. This assessment included analyses of the types of habitats historically found in the County and currently found within the EPUs and Ag Reserve. Through the inclusion of the high biodiversity areas, these lands include at least some of the majority of the ecological communities historically found within Pasco County. These historic communities included sandhill communities, extensive areas of wetlands associated with named rivers and tributaries, pine flatwoods, mesic hammocks, and coastal systems.

One additional area was considered significant enough to be identified on the habitat conservation maps. This area was described as the Connerton Connection. It occurs between the Cypress Creek and the Anclote/Pithlachascotee EPUs. The FFWCC identified a substantial portion of the 8,000-± acre Connerton ranch as high value wildlife habitat. The parcel was somewhat isolated from other concentrations of biodiversity hotspots, but the proposed



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**NOTE: Categories of land use were merged based on similar development intensity.**  
Merged categories included: Agriculture (AG, AG/R); Conservation (CON, C/L, Water, R/OS);  
Low Density Residential (RES-1); High Density Residential (RES-3, 6, 9, 12, 24);  
Commercial / Mixed Use (ROR, IL, IH, MU, P/SP, AT)



preservation of lands in the Cypress Creek and Anclothe/Pithlachascotee watersheds make this connection even more significant. The SWFWMD has identified a substantial portion of the Connerton Ranch for acquisition, and is apparently negotiating to purchase at least a portion of this parcel. The ability to connect this system to the Pithlachascotee/Anclothe EPU to the west, the Cypress Creek EPU to the east and to the Crossbar Sandhills EPU to the north, was considered in defining critical linkages across the County. An estimate of the area proposed for purchase by the SWFWMD was used to define these critical linkages.

### **3.0 OBJECTIVES FOR CONSERVATION OF WILDLIFE HABITAT WITHIN CRITICAL LINKAGES, ECOLOGICAL PLANNING UNITS AND THE AG RESERVE**

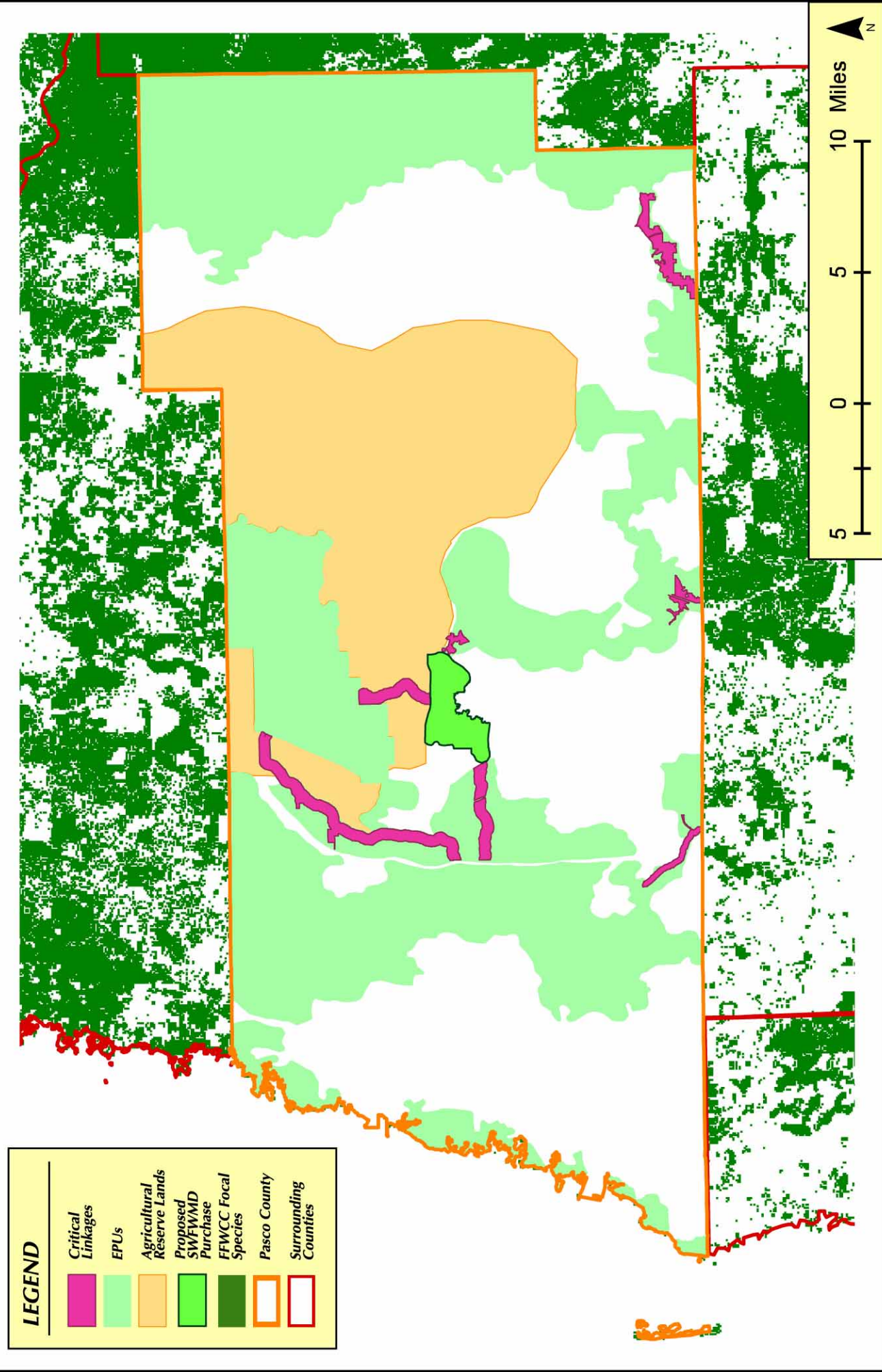
The critical linkages, EPU's and the Ag Reserve lands comprise a substantial area of the County (**Figure 11**). Any plan for conservation within these areas will require the use of a wide variety of land-use strategies. The proposed program for conservation of regional wildlife linkages builds on the regulatory and non-regulatory programs of the state and federal government to achieve the goals of the Comprehensive Plan. One outcome of this study is the recommendation that the County consider its own funding plan for land acquisition to leverage state or federal funds that may be available in the future (see Section 5.0 of this report). However, this is only one option that should be included in the overall plan for comprehensive wildlife protection. All other options should be explored including: density bonuses and land-use restrictions for conservation of unique habitats; large-scale planning efforts (i.e., sector plans) that allow preservation of wildlife habitat and clustering of development; transfer of development rights and other developer incentives for protection of wildlife habitat; rural and family lands protection act grants for Ag Reserve lands; and partnerships with other agencies and municipalities to achieve overall goals for regional wildlife protection. These objectives should be used as a guide during the upcoming review of the Comprehensive Plan and Land Development Code. Conservation objectives for critical linkages, EPU's and the Ag Reserve are suggested below:

#### **3.1 Critical Linkages**

In general, there should be a goal to conserve all of the area in these linkages with a suitable natural resource or conservation land use and management plan. It should also be a priority to reduce the number of, or eliminate future roads that cross these linkages. Under circumstances where road crossings are determined to be unavoidable, consideration should be given to the types and locations of highway underpasses and wildlife crossings that would allow wildlife to cross safely. Since many of these linkages follow streams or wetland systems, existing regulations relating to wetland and floodplain protection may serve as an important mechanism for the conservation of the wildlife corridors. Measures to protect these linkages, including incentives for private landowners, should build on the existing regulatory policies of local, state and federal agencies.

Measures to protect and maintain the natural vegetation communities, native wildlife, and natural processes (fires, floods, etc.) should be evaluated for each linkage. Every possible option for providing long-term protection of these linkages should be explored. These would include:





- Conservation easements with current landowners to allow continued use consistent with goals for protecting native wildlife;
- Acquisition;
- Prioritizing their use as mitigation for wetland or upland impacts that require permits;
- Grants for protection of wildlife habitat, wetlands, agriculture or other suitable use (see Section 5.0 of this report);
- Requiring strict adherence to wetland, floodplain, and protected species regulations and policies of Pasco County and other agencies (the protection of these linkages may also warrant development of specific criteria for resource protection, e.g. no impacts to wetlands, no encroachment into floodplains, etc.);
- An evaluation of development proposals to ensure that they take into consideration the location and potential for conservation of critical linkages, and smaller corridors that may also provide benefit to wildlife;
- Density transfers to other development properties (with bonuses for portions of the linkages that are not wetland or floodplain); and
- Land use, zoning or development restrictions.

Pasco County staff should meet as soon as possible with landowners who own property within these linkages to understand their goals for the future use of their properties, and how conservation might fit into their long-term management strategies for their land.

In addition to these general goals and measures, specific conservation priorities within each Critical Linkage should include:

#### 3.1.1 North Pasco to Crossbar

- Protection of the floodplain of the Pithlachascotee River, particularly the forested wetlands along the river channel;
- Measures to sustain the mature forested communities along the Pithlachascotee River and the adjacent flatwoods;
- Development of an appropriate wildlife crossing at the juncture of this linkage and US 41;
- Protection of the 100-year floodplain around Crews Lake and the Masaryktown Canal;
- Protection of the water sources that drive the dynamic hydroperiod within the Crews Lake basin;
- Conservation of native vegetation adjacent to the Masaryktown Canal; and
- Acquisition of additional lands adjacent to Crews Lake Park.

#### 3.1.2 Crossbar to Connerton

- Protection of the functions and values of isolated marshes within the linkage;
- An appropriate wildlife crossing at the juncture of this linkage with SR 52;
- Maintain the integrity of marshes and adjacent naturally vegetated upland areas;
- Measures to sustain the agricultural usage within and adjacent to this linkage; and
- Protection of the natural processes (fire, dynamic hydroperiods) that effect the habitat quality of the marshes and sloughs.

### 3.1.3 North Pasco to Connerton

- Protection of the floodplain of Fivemile Creek, particularly the forested wetlands along the flow-way;
- Protection of the eastern portion of this linkage through conservation easement, acquisition or other agreement with the landowner (this portion of the linkage is critical to the connection with the Connerton Purchase, and does not include a substantial wetland extent or 100-year floodplain that would provide some protection from development);
- Measures to maintain agricultural usage within and adjacent to this linkage;
- An appropriate wildlife crossing at the juncture of this linkage with SR 41;
- Measures to sustain the native communities along Fivemile Creek and the adjacent flatwoods; and
- Measures to sustain forested upland communities adjacent to linkage.

### 3.1.4 Cypress Creek to Connerton

- Protection of the forested wetlands that provide the majority of the area within this linkage;
- An assessment of options for ensuring the ability for wildlife to cross the existing and proposed roadways near Ehren Cutoff and SR 52;
- Protection of buffers adjacent to the forested wetlands that connect to the Cypress Creek swamp; and
- Measures to protect water quality entering the wetlands within the linkage and the Cypress Creek system.

### 3.1.5 Starkey to South Pasco

- Protection of the wetlands and floodplain along South Branch;
- Protection of naturally vegetated uplands adjacent to the wetland systems within the linkage;
- Maintain (or enhance) the linkage within existing developed areas;
- Coordination with efforts in Hillsborough County to protect the Brooker Creek corridor;
- Incentives for developers to use lands within the linkage as mitigation for impacts outside of the floodplain of South Branch; and
- Wildlife underpasses for roads that cross the linkage.

### 3.1.6 Cypress Creek to Cypress Bridge

- Protection of wetlands, floodplain, and buffers;
- Protection of the water sources for the Cypress Creek floodplain;
- Measures to protect wildlife crossings at I-75 and SR 54;
- Protection of the forested canopy for wetlands within and adjacent to Cypress Creek; and
- Consideration of the potential for connection of the Cypress Creek linkage south into Hillsborough County.

### 3.1.7 Hillsborough River to Green Swamp

- Continued acquisition of lands within the river floodplain;

- Protection of the forested wetlands within the linkage;
- Measures to sustain the agricultural usage within and adjacent to this linkage; and
- Through coordination with Hillsborough County and the SWFWMD, maintain connectivity to conservation lands in Hillsborough County.

## **3.2 Ecological Planning Units**

### **3.2.1 Coastal Marshes:**

- Conserve 95% of the overall land area in this EPU;
- Protect water quality;
- Eliminate additional impact to wetlands;
- Protect the remaining uplands adjacent to Coastal Marsh wetlands to provide a transition buffer;
- Seek ways to retrofit stormwater draining through this area; and
- Remediate/restore any previous impacts to wetland systems that can be rehabilitated.

### **3.2.2 Hernando Sandhills:**

- Conserve 40% of the land area in this EPU;
- Ensure the protection of existing populations of threatened and endangered species;
- Seek ways to prevent additional fragmentation of sandhill habitat;
- Protect connected blocks of suitable habitat for protected species of plants and animals; and
- Sustain the connection of natural lands within this EPU to the Pithlachascotee/Ancote watersheds EPU, and to regionally significant wildlife habitat in the southwest corner of Hernando County.

### **3.2.3 Pithlachascotee / Ancote Watersheds:**

- Conserve 60% of the land area in this EPU;
- Protect habitat associated with the headwaters of these river systems;
- Sustain a wildlife linkage from the northern portion of the county to the southern portion of the county;
- Prioritize the protection of scrubby flatwoods, scrub and mature forested uplands;
- Protect habitat associated with the riparian systems associated with the Pithlachascotee and Ancote Rivers and their tributaries; and
- Sustain the connection of natural lands within this EPU to the Hernando Sandhills and Starkey/Hillsborough Linkage.

### **3.2.4 Starkey Hillsborough Linkage:**

- Conserve 80% of the land area in this EPU;
- Sustain the connection to the Pithlachascotee/Ancote EPU to the north, and to the maximum extent practicable to the natural lands in Hillsborough County to the south;
- Prioritize the protection of scrubby flatwoods, scrub and mature forested uplands;
- Protect natural lands associated with the headwaters of the Ancote River;
- Protect natural lands adjacent to the Starkey Wellfield and other public ownership in this portion of the county.

### 3.2.5 Crossbar Sandhills:

- Conserve 80% of the land area in this EPU;
- Protection sandhill and scrub communities;
- Provide a connection to landscape linkages to the north in Hernando County;
- Ensure the protection of existing populations of threatened and endangered species;
- Ensure protection of wildlife habitat within the Crossbar Wellfields; and
- Along with the agricultural land uses adjacent to the Crossbar Wellfield, ensure connection to EPU's to the west and south.

### 3.2.6 Cypress Creek:

- Conserve 80% of the land area in this EPU;
- Protect intact wetland systems within the Cypress Creek floodplain;
- Protect upland habitat adjacent to the forested wetlands of the Cypress Creek Swamp;
- Protect the integrity of the 100-year floodplain;
- Establish compatible land uses immediately adjacent to the EPU; and
- Protect the integrity of the linkage to the south to Hillsborough County.

### 3.2.7 Hillsborough River:

- Conserve 95% of the land area in this EPU;
- Protect the integrity of the connection from the Green Swamp Preserve to the forested wetland systems in Hillsborough County;
- Maintain a landscape linkage across the narrow portion of the Hillsborough River floodplain in the southeast corner of Pasco County;
- Protect the integrity of the 100-year floodplain;
- Sustain agricultural uses as buffers to wildlife habitat associated with the Hillsborough River;
- Ensure that protective measures in Pasco County blend with similar conservation measures in Hillsborough and Sumter Counties;
- Prioritize land acquisition efforts in the narrowest portions of this EPU; and
- Facilitate the purchase and restoration of natural upland systems.

### 3.2.8 Withlacoochee River:

- Conserve 99% of the land area within this EPU;
- Ensure the sustained protection of lands under government control within the Withlacoochee River basin;
- Protect the corridor of the river outside of public ownership in the northern portion of Pasco County;
- Protect the integrity of and/or prioritize the acquisition of the 100 year floodplain;
- Work with Hernando County to ensure continuation of the landscape linkage associated with the Withlacoochee River north of Pasco County;
- Sustain agricultural uses as buffers to wildlife habitat associated with the Withlacoochee River; and
- Ensure appropriate land uses within the Withlacoochee State Forest and the Green Swamp Preserve.

### **3.3 Agricultural Reserve Lands**

- Maintain the critical connections between the Crossbar Wellfield and Cypress Creek EPU, and the Connerton Connection;
- Maintain an agricultural presence within majority of the area;
- Protect habitat for listed species;
- Minimize conversion of remaining natural vegetation;
- Protect unique or rare habitats;
- Sustain wetland hydrology;
- Protect scrub, sandhill, and mature uplands forested habitats; and
- Protect wetland systems.

### **4.0 OBJECTIVES FOR CONSERVATION OF WILDLIFE HABITAT IN AREAS OUTSIDE OF ECOLOGICAL PLANNING UNITS**

There is substantial wildlife habitat value within areas not defined as EPU or the Ag Reserve as described above, including not only the Connerton Connection, but also unidentified areas within urban and rural areas of the County. The need for “local” conservation strategies that supplement the regional conservation programs was emphasized by the TAC in the April 2001 review of technical issues related to the conservation of wildlife habitat in the county. Local conservation strategies would include conservation of wildlife habitat and unique natural resources in all portions of the county. Consequently, the lack of inclusion of certain portions of the county in an EPU or the Ag Reserve does not imply that the area has no wildlife habitat value. In fact, it is likely that some areas zoned for high intensity residential use may still have habitat occupied by state- or federally-listed species of plants or animals. As a consequence, protection of habitat for threatened and endangered species, conservation of rare or unique natural communities, protection of buffers to wetland systems, and incentives for developers to conserve uplands and wetlands connected to EPU, and critical linkages within the Ag Reserve should all be components of a comprehensive local conservation strategy. Objectives for local conservation measures on lands outside of EPU and the Ag Reserve include the following:

#### **4.1 Connerton Connection:**

- Maintain connection between Anclothe / Pithlachascotee Watershed, Crossbar Sandhill and Cypress Creek EPU;
- Protect unique or rare habitats;
- Minimize road crossings of lands set aside for conservation; and
- Encourage the planting of native species.

#### **4.2 Remaining Lands:**

- Protect habitat for listed species;
- Protect unique or rare habitats;
- Merge conservation areas into large blocks;
- Sustain wetland hydrology;
- Protect scrub, sandhill, and mature upland forested habitats;
- Conserve and replant native vegetation; and



- Protect wetland systems.

## **5.0 FUNDING OPTIONS AND GRANT PROGRAMS**

In addition to planning restrictions and incentives, there are numerous sources of funding for conservation measures. These include local, state and federal funding sources for outright purchase, as well as transfer of development rights, dedication (including purchase) of conservation easements, and numerous other methods. We assessed numerous options for funding options and grant programs, and they are listed below:

### **5.1 Real Estate Tools**

Numerous options exist for providing incentives to private landowners for the transfer of their lands into a conservation program. These options include outright purchase, transfer of development rights, purchase of conservation easements, protection of agricultural uses, and many other variations on these themes. Various real estate tools for private land conservation with a description of the particular type of transaction, its advantages and disadvantages, are presented in **Table 4**.

### **5.2 Local Funding Options**

Potential local funding sources are included in **Table 5** along with advantages and disadvantages of each strategy. In addition, a summary of the acquisition programs of other counties, and the money allocated for conservation lands to date, are presented in **Table 6**.

### **5.3 State and Federal Funding Options**

A wide array of federal and state options exist for generating funds for the purchase of conservation lands; purchase of conservation easements for agricultural lands, wetlands or wildlife habitat; cost sharing programs for land management activities, such as restoring wetland and coastal lands (**Table 7**).

### **5.4 Grant Programs**

A wide variety of state and federal grant money is available for programs that are relevant to the conservation of wildlife habitat. These grants can help with analyses of proposed programs, fund trail-acquisition programs, and assist with brownfield or redevelopment programs. These programs may be ancillary to conservation efforts, but they can be a part of a comprehensive program for implementing sustainable development practices for natural and built environments. The list of possible grant programs is, along with websites for additional information, is presented in **Table 8**.

## **6.0 RECOMMENDATIONS**

The comprehensive protection of wildlife habitat in the County will require a multi-faceted approach that involves various departments and individuals. In general, these programs should incorporate planning strategies, acquisition and conservation actions, mitigation plans, developer incentives, and partnerships. The following recommendations encompass these aspects of a comprehensive strategy for incorporating wildlife conservation into the County's decision-making process:

## **6.1 Planning strategies**

- Designate critical linkages for conservation, and develop a program that includes land-acquisition, developer and landowner incentives that will ensure their long-term protection;
- Adopt and use EPU as planning units so that their conservation can be individually, and collectively ensured;
- Minimize road crossings over rivers, named tributaries, critical linkages and EPUs;
- Develop regulations and county programs that:
  - i.* Protect important riverine habitats, including wetlands and the 100-year floodplain within critical linkages and EPUs,
  - ii.* Protect unique upland habitats in the County,
  - iii.* Protect habitats for threatened, endangered, or species of special concern, and connect them to critical linkages and EPUs, and
  - iv.* Protect riverine corridors for rivers and their named tributaries;
- Develop and adopt a land-use strategy that provides more specificity regarding density-bonus programs, and provides guidance as to how sector planning, clustering, transfers of development rights, and other regional planning measures can be used to protect wildlife habitat;
- Provide specific direction as to how developers can be given incentives for conserving habitat in critical linkages, EPUs, and the Ag Reserve;
- Develop a program for the long-term protection of native habitats in existing and proposed wellfields;
- Require management plans for developments over a certain size (40 acres), and ensure that they consider the protection of large areas of biologically diverse habitat that can be managed in perpetuity;
- Designate County personnel to work with the EPU program, including developing a system to monitor the progress toward achieving goals for conservation within each EPU; and
- Assess, on an annual basis, the success of protection measures for threatened, endangered, and species of special concern.

## **6.2 Maintaining the agricultural lifestyle and economy**

- Sustain the agricultural land use in large, contiguous blocks where there is a sustained focus on similar agricultural endeavors;
- Assess the opportunities that become available through the Rural and Family Lands Protection Act; and
- Seek other ways to protect wildlife habitat values in the Ag Reserve by encouraging the long-term conservation of wildlife habitat in these areas through easements, purchase of development rights or agreements with landowners.

### **6.3 Acquisition and conservation strategies**

- Establish a committee to oversee the land acquisition process (using County, or external funds);
- Establish criteria for evaluating parcels proposed for acquisition;
- Establish priorities for the purchase of natural lands in critical linkages and in EPUs; and
- Consider a voter referendum for funding a land-acquisition program.

### **6.4 Mitigation and developer incentive strategies**

- Focus mitigation efforts into critical linkages and EPUs;
- Develop a program for encouraging developers to participate in the conservation of lands in critical linkages and EPUs;
- Encourage the development of a mitigation bank within critical linkages and EPUs; and
- Designate a regional mitigation park (within a critical linkage or EPU) that can be used by the FFWCC as a Wildlife Resources Mitigation Park.

### **6.5 Partnerships**

- Establish frequent communication, and working agreements with regional, state, and federal managers of natural resources within or adjacent to Pasco County. These should particularly include the SWFWMD, the ACOE, the FFWCC, and the USFWS.

## **7.0 SUMMARY AND CONCLUSIONS**

Pasco County contracted Glatting Jackson to prepare a comprehensive wildlife habitat protection program for the county. This study included:

- 1) A review of scientific literature,
- 2) An assessment of existing regulations that protect wildlife,
- 3) Methods for identifying critical linkages (corridors),
- 4) The identification of Ecological Planning Units (EPUs) and the Agricultural Reserve and defining objectives for their conservation,
- 5) Measures for protecting locally valuable wildlife habitat, and
- 6) Recommendations for implementation of the wildlife protection plan.

Potential measures to accomplish a Countywide protection program include land conservation and acquisition, land-use restrictions, developer incentives, partnerships with key agencies and environmental groups, and a comprehensive mitigation strategy. The defined objectives for the conservation of critical linkages, EPUs, the Ag Reserve, and other valuable wildlife habitat should provide the impetus for development of Comprehensive Plan and Land Development Code language for the implementation of this program.

## **APPENDIX**

Real Estate Tools for Private Lane Conservation	Table 4
Potential General Local Funding Sources	Table 5
Florida County Land Acquisition Program Matrix	Table 6
Summary of Potential State and Federal Natural Lands Funding Programs	Table 7
Summary of Potential Grant Programs	Table 8

**TABLE 4****Real Estate Tools for Private Land Conservation \***

<b>Program Title</b>	<b>Description</b>	<b>Advantages</b>	<b>Disadvantages</b>
Fee Simple Transactions	Landowners voluntarily sell land to a private landowner or a qualified government agency or nonprofit organization. Also, a qualified government agency or nonprofit organization can buy controlling interest in property.	Private land transactions place few direct financial burdens on municipal resources; the seller benefits by receiving money from the sale and the buyer benefits by having control over how the land is used. With a sale/lease-back agreement, the purchaser can recoup a small portion of the purchase price.	The costs associated with fee simple transactions can be high because land is generally at its full market value; there is no assurance that land sold in the private market will not be developed; land purchased for conservation purchases may be taken out of agricultural production; the cost of managing land that is acquired can be high; private individuals may not be able to secure adequate financing to acquire land; and public acquisition of land removes land and its value from the county tax roll, which can affect other property owners and county budgets.
Donating Development Rights	Landowners voluntarily agree to donate the development rights on their land to a qualified public agency or nonprofit organization. Landowners do not give up title to the land. Also, they may restrict public access, or sell, give or transfer their property as they desire.	Donating a conservation easement can significantly reduce the donor's federal and state income taxes, local property taxes and their heir's estate taxes. Under the IRS code, qualified conservation easement donations can be treated as charitable gifts, which may reduce the value of the donor's taxable estate. Also, the donation of an easement, whether during landowner's life or by bequest, can reduce the value of the farm upon which estate taxes are calculated. Estate taxes are assessed at death on total assets greater than \$600,000 for individuals.	In order to utilize the income tax deduction one needs fairly high income. Similarly, in order to use the estate tax deduction one must have assets totaling greater than \$600,000. Often, valuable land belongs to people who will not financially benefit from donating an easement; and a source of funds for monitoring easements may need to be obtained.

## Real Estate Tools for Private Land Conservation

Program Title	Description	Advantages	Disadvantages
Donating Land	Landowners voluntarily agree to transfer land to a qualified public agency or nonprofit organization as a charitable gift.	Landowners who make any of the types of donations are eligible for an income tax deduction. The amount of the deduction varies depending on the type of donation. Also, donations reduce heirs' federal estate taxes. And donations made to nonprofit organizations may be sold to generate funds for purchase of other properties in need of protection.	Even with the effect of income and estate tax benefits, the owner will never realize as much financial benefit through a donation as he/she would through an outright sale.
Selling Development Rights	Landowners voluntarily agree to sell the development rights on their property to a qualified government agency or nonprofit organization that has established a program for acquiring development rights. Landowners do not give up title to the land. Also, they may restrict public access, or sell, give or transfer their property as they desire. This program is called purchase of agricultural conservation easements (PACE). These programs are usually run by public agencies or nonprofit organizations operating locally or at the state level. PACE programs are often funded by bonds.	PACE programs help stabilize farmland values and strengthen the future of farming in communities where they are implemented. Because the proceeds from the sale of development rights are usually spent close to home on capital improvement or to acquire additional farmland, these programs help support the local economy. Farmers also use the income from selling development rights to reduce their debt loads, establish funds for retirement or distribute money to heirs. Also, the land remains on local property tax rolls.	Funds for purchasing and monitoring easements may not be available.



Real Estate Tools for Private Land Conservation			
Program Title	Description	Advantages	Disadvantages
Leasing Development Rights	Landowners voluntarily agree to lease the development rights on their property to a qualified public agency or nonprofit organization that has established a program to acquire development rights for a specified period of time. As outlined above, landowners retain rights and title to the land. May be included in an established PACE program	See Selling Development Rights	See Selling Development Rights
Term Conservation Easements	Conservation easements are the most secure tools available to landowners for protecting rural lands. Conservation easements are perpetual restrictions on subdivision, development, and other land uses, tailored to the agricultural and ecological goals of the landowner. These restrictions are negotiated and enforced by non-profit organizations known as land trusts, or by public agencies. Most easements are permanent: term easements	In return for donating a qualified conservation easement, a landowner may claim an income tax deduction based on the value of the rights forgone. The reduction in ranch value associated with a conservation easement also can lower estate and gift taxes, helping families pass their land intact to the next generation.	While conservation easements limit development, they do not affect other private property rights.

See: <http://www.fl-panther.com/tools/html>

**TABLE 5**  
**POTENTIAL GENERAL LOCAL FUNDING SOURCES**

<b>Source</b>	<b>Description and Payment</b>	<b>Repayment</b>	<b>Advantages</b>	<b>Disadvantages</b>
<b>General Obligation Bonds -- Limited or Unlimited Tax</b>	Loan taken out by a city or county against the value of taxable property, funds provided immediately	By all taxpayers over 10-30 years	Makes funds available immediately; distributes cost of acquisition; ties payment to benefits received; potentially lowers interest costs	Increases taxes; competes with other local services for limited resources; separates payment from benefit; involves finance charges, so may be politically difficult; constrained by debt ceilings
<b>Revenue Bonds (or "rate-supported bonds)</b>	Loan paid from the proceeds of a tax levied for the use of a specific public project, or with the proceeds of fees charged to those who use the facility that the bonds finance, funds provided immediately	By rate payers over 10-30 years	Makes funds available immediately; ties payment to benefits received; may not need voter approval; not constrained by debt ceilings	Increases rates or fees; interest costs potentially higher than GO bonds
<b>Taxable Bonds</b>	Bonds subject to taxes	By all taxpayers over 10-30 years	Not subject to requirements of Tax Reform Act	Highest interest rates of all bond types

<b>Source</b>	<b>Description and Payment</b>	<b>Repayment</b>	<b>Advantages</b>	<b>Disadvantages</b>
<b>Community Redevelopment Agency (CRA) Tax Increment Financing Bonds</b>	Financing mechanism used to stimulate economic development in a blighted area – assessed valuation of real property within the redevelopment area is frozen – taxes are paid at this base level while improvements are made–any increase in the assessed value of the property or additional sales tax revenues makes up the tax increment, which is used to pay project costs or repay the bonds or other obligations that helped finance the project, funding available immediately	By all taxpayers within sub area.	Ties payment to benefit received within sub area.	Revenue dependent upon growth in assessed value within sub area.
<b>Lease Purchase and Certificates</b>	Lease-purchase arrangements that allow a government to pay over time, immediate use of property while being purchased	By all taxpayers within 5-10 years	Provides a means of buying on credit without issuing debt	High interest rates, may not relate payment to benefits received
<b>Revolving Loans</b>	Loan this is automatically renewed upon maturity, funding available immediately	By rate payers over 10-20 years	Makes funds available immediately; ties payment to benefits received; potentially lower interest costs	Increase rates; reporting and administration may be burdensome; may not be in accordance with county priorities

<b>Source</b>	<b>Description and Payment</b>	<b>Repayment</b>	<b>Advantages</b>	<b>Disadvantages</b>
<b>Bond Banks</b>	Funding varies	By taxpayers or rate payers over 10-30 years	Particularly helpful for small communities; lowers cost of issuance	Issuance of bonds may be delayed while sufficient number of communities apply
<b>Property Taxes (See attached Florida County Land Acquisition Programs Matrix)</b>	Tax on real property, funding available immediately	Commercial and residential property owners	Steady source of revenue, less affected by changes in the economy than other taxes; relatively easily administered; revenues easily predictable; tax burden is fairly equitably distributed	Least popular tax since it is paid in a large lump sum check as opposed to small additions to purchases; may not relate payment to benefits received
<b>Sales and Use Tax</b>	Tax on sales of goods or services, funds available immediately	Purchaser or goods or services	Easy to collect; reporting costs are low; a small percentage can generate substantial revenue; most popular tax among taxpayers	Funds may be insufficient; may not relate payment to benefits received

<b>Source</b>	<b>Description of Payment</b>	<b>Repayment</b>	<b>Advantages</b>	<b>Disadvantages</b>
<b>Real Estate Transfer Tax</b>	Tax on the sale of property – increases with the size of the property being sold, funds available immediately	Sometimes the Seller, sometimes the Buyer	Proceeds often deposited into land banks; Florida has led the way in requiring that a portion of the funds be used for land conservation; can create substantial funds particularly in fast growing communities	Can Inflate real estate values and slow the market; since revenues from the tax fluctuate with the market, income can be difficult to predict; politically difficult
<b>Special Assessment Districts</b>	Separate units of government that manage specific resources within defined boundaries, funding available immediately	By assessed customers at time of construction. If bonded, over 10-30 years	Makes funds available immediately; matches payments and benefit; predictable stream of money	Requires legislative approval; may seriously impact assessed customers

<b>Source</b>	<b>Description of Payment</b>	<b>Repayment</b>	<b>Advantages</b>	<b>Disadvantages</b>
<b>Business Improvement District (BID)</b>	Assesses property owners within set boundaries for additional services – establish a partnership between property owners and businesses in downtown or commercial areas for the purpose of improving the business climate in a defined area, funding available immediately	Assessed residents or business owners	Created and funded with the approval of residents – gives a sense of ownership, responsibility and accountability; matches payments and benefits	Politically difficult if residents feel services should already be provided by existing government structure; no dedicated city or county-wide funding stream for park facilities (doesn't address the needs of the entire system); inequitable financing method (not found in poorer neighborhoods).
<b>Municipal Services Taxing (MSTU)</b>	Assesses property owners within defined area for funding for stormwater, paving and other infrastructure needs	Assessed residents or business owners.	See above BID description	See above BID description
<b>Benefit Assessment District</b>	Assessment and provision of benefits to a defined community – not a separate unit of government – levy on property, funding available immediately	By assessed customers	Matches benefits to assessment; makes funds available immediately	No partnership, structure or separate government body which may make administration more difficult
<b>User charges</b>	Fee that covers the cost of a service, funds available immediately	By rate payers immediately	Eliminates need for borrowing or reserves; exempt from tax limitation laws	Impractical for large projects; may make rates erratic from year to year; seldom covers entire cost of service



<b>Source</b>	<b>Description of Payment</b>	<b>Repayment</b>	<b>Advantages</b>	<b>Disadvantages</b>
<b>Reserves</b>	Funds reserved/set-aside for specific use, funds available in future	By rate payers each year until reserve is adequate	Eliminates need for borrowing; improves financial stability of system	Can be politically difficult; difficult to "protect" reserves for intended use; impractical for large projects
<b>Mitigation Financing</b>	Developer set-aside of land on or off-site, funds available in future	Developers of a project	Eliminates need for borrowing; protects sensitive natural areas and has application for redevelopment including parks; one-time cost; gives local governments flexibility in their land use decisions; can protect larger areas rather than small scattered areas	Can be politically difficult if private developer is unwilling
<b>Negotiated Exactions or Impact Fees (hookups, systems development or capital fees)</b>	One-time to offset cost of infrastructure caused by new development, funds available immediately	By developers or customers immediately	Requires new customers to pay for impacts they place on system	Ineffective where there is little or no growth; affects housing affordability
<b>Public-Private Ventures</b>	Partnership between private investor and public sector to provide a service on public land, availability of funds varies	By private investors and taxpayers	Coordinated effort to provide alternative transportation and recreation facilities	Coordination can be complicated and time consuming

<b>Source</b>	<b>Description of Payment</b>	<b>Repayment</b>	<b>Advantages</b>	<b>Disadvantages</b>
<b>County Road Program</b>	Funding for bicycle/pedestrian facilities and trails, availability of funds varies	Taxpayers	Coordinated effort to provide alternative transportation and recreation facilities	Coordination can be complicated and time-consuming
<b>Impact Fees and Utility Connection Fees</b>	Fees charged to off-set the costs of concurrent development of public infrastructure, such as parks, roads, and utilities.		Provides a revenue stream based on growth	Can be politically unpopular

TABLE 6

Florida County Land Acquisition Programs Matrix

PROGRAM DETAILS																					
	Boca Raton	Brevard	Broward	Duval	Flagler	Hernando	Hillsborough	Indian River	Lee	Marion	Martin	Miami-Dade	Monroe	Orange	Palm Beach	Pinellas	Polk	Sarasota	Seminole	St. Lucie	Volusia
County Population	69,994	400,000	1,423,700	741,500		125,008	928,700	~105,000	426,500		119,370	2,070,600	80,000	880,000	1,000,000	888,100	550,000	311,000	350,000	186,905	
Year Established	1991	1980	1989	1999	1988	1993	1987 & 90	1992	1996	1988	1989 & 1998	1991	1987 F.S.	1992	1991 / 1999	1972, 1980, 1986, 1990-99 and 2000-10	1994	1971-1999	1990	1984	1987
Funds Allotted	\$12 mill.	\$55 mill.	\$75 mill.	\$21 mill.	\$7.8 mill.	\$350-400,000/yr	\$121 mill.	\$26 mill.	\$80+ mill.	\$20 mill.	\$20 mill. & \$43 mill.	\$90 mill.	\$1.5 mill/year	\$25 mill.	\$100/\$150 mill.	\$168.4 mill. +	\$20 mill.	\$53 mill.	\$20,280,000 mill.	\$20 mill.	\$20 mill.
	ad valorem	ad valorem	ad valorem	general rev.	ad valorem	ad valorem	ad valorem	ad valorem	ad valorem	ad valorem	ad valorem & \$0.1 sales tax	ad valorem	St. Park surch. & tourist impact tax	bonded from a public serv. tax	ad valorem	ad valorem & infra. sales tax	ad valorem	ad valorem	ad valorem	ad valorem	ad valorem
Length of Time to Pay Bond	25 years	20 years	not to exceed 30 years.	not applicable		30 years		not to exceed 15 years	7 years		Refinanced until 2011		Not applicable	Not Available	20 years	2009	20 years		20 years	15 years	
Total Program Budget (yearly)	not available	~\$10.5 million (much of this was for acquisition)	Total Budget: \$75 million	Initial funding is \$21 million from the general fund. Plan to seek funding from private donors and from a ballot initiative in Fall 2000 for an additional 50 million.		\$350-400,000		~\$5 million	\$12 million less 10% for management		None-Just Staff		Varies. Currently \$15 million.	Total of \$25 million	Current Bond \$150 Mill Total	\$168.4 million Total	2.7 million (1.7 million for acquisition, 1 million in separate management fund. Only interest is used for management.)		Not established yet	not available	
PROGRAM MECHANICS																					
Total Land Acquired	285 acres (212 in conjunction with Palm Beach County)	~13,000 acres	975.57 acres	not available				~ 7,000 acres	18 properties totalling 1,171 acres		3390 Acres		1,800 acres	12,400 acres	22,535 acres, additional 12,784 acres proposed	ESL: 4666.9 acres to date; 7,166.9 acres estimated total	7,755 acres (partnered on 7,151 acres)		~ 4,000 acres	5,500 acres	
Matching Funds (percentages)	Yes with FCT and Palm Beach County.	More than 90% acquired with partner funds. CARL, FCT, SJWMD.	10%	100% to date. Anticipate some independent purchases in the future.		about 90% of funds have been matched by other private agencies.		FCT: 60%, SJRWMD: 15%, CARL: 20%, FIND: 5%.	matching funds are sought but to date none have been received.		53% total matched funds: CARL 35%, SJRWMD 5%, FCT 10%.		~ 25% of lands have been matched by FCT.	On about 50% of properties with WMD.	Matching through state and federal programs. Land acquired by TNC.	Percentages not available but extensive program with FCT, SJRWMD, DEP/Greenway.	84% WMD, 8% FCT.		Approx. 28% of funds matched: state, DOT, SJWMD, Sanford Airport SOR.	All properties matched. 50% FCT, 30% CARL, 20% SOR.	

**TABLE 7**  
**Summary of Potential State and Federal Natural Lands Funding Programs**

Agency	Program Title/Contact	Primary Purpose	Acreage Affected	Funds Allocated
United States Department of Agriculture (USDA)/Natural Resource Conservation Service (NRCS)	Environmental Quality Incentives Program (EQIP) / <a href="http://www.nhq.nrcs.usda.gov/CCS/FB96OPA/MiscFB.html">http://www.nhq.nrcs.usda.gov/CCS/FB96OPA/MiscFB.html</a>	Provide technical, education, and financial assistance to install or implement structural, vegetative, and management practices called for in 5 to 10 year contracts for most agricultural land uses.	8,723,730	169,869,296
United States Department of Agriculture (USDA)/Natural Resource Conservation Service (NRCS)	Wetlands Reserve Program (WRP) / See <a href="http://www.nhq.nrcs.usda.gov/CCS/FB96OPA/MiscFB.html">http://www.nhq.nrcs.usda.gov/CCS/FB96OPA/MiscFB.html</a>	Participating landowners can establish conservation easements of either permanent or 30-year duration, or can enter into restoration cost-share agreements where no easement is involved.	1,048,629	N/A



Agency	Program Title/Contact	Primary Purpose	Acreage Affected	Funds Allocated
United States Department of Agriculture (USDA)/Natural Resource Conservation Service (NRCS)	Wildlife Habitat Incentives Program (WHIP) / See <a href="http://www.nhq.nrcs.usda.gov/CCS/FB96OPA/MiscFB.html">http://www.nhq.nrcs.usda.gov/CCS/FB96OPA/MiscFB.html</a>	Provide financial incentive to develop habitat for fish and wildlife on private lands. USDA provides cost-share assistance for initial implementation of wildlife habitat development practices that are required to last for a minimum of 10-years.	721,249	N/A
United States Department of Agriculture (USDA)/Natural Resource Conservation Service (NRCS)	Forestry Incentives Program (FIP) / See <a href="http://www.nhq.nrcs.usda.gov/CCS/FB96OPA/MiscFB.html">http://www.nhq.nrcs.usda.gov/CCS/FB96OPA/MiscFB.html</a>	Federal cost-share program available in counties designated by the Forest Service suitable for production of timber products. Up to 10K per person per year but no more than 65% of costs associated with tree planting, improving a stand of forest trees and site preparation for natural regeneration is available.	N/A	N/A

Agency	Program Title/Contact	Primary Purpose	Acreage Affected	Funds Allocated
United States Department of Agriculture (USDA)/Natural Resource Conservation Service (NRCS)	Farmland Protection Program (FPP) / See <a href="http://www.info.usda.gov/nrcs/fpcp/fpp.htm">http://www.info.usda.gov/nrcs/fpcp/fpp.htm</a>	Provides funds to purchase development rights to keep productive farmland in aricultural uses. Priority is given to those proposals that include a perpetual easement but 30-year commitments are also funded.	N/A	52,500,000
United States Department of Agriculture (USDA)/Natural Resource Conservation Service (NRCS)	Emergency Watershed Protection (EWP) / See <a href="http://www.nhq.nrcs.usda.gov/CCS/FB96OPA/MiscFB.html">http://www.nhq.nrcs.usda.gov/CCS/FB96OPA/MiscFB.html</a>	Provides financial and technical assistance to remove debris from streams, protect destabilized streambanks, establish cover on critically eroding lands, repairing conservation practices, and the purchase of flood plain easements. It is not necessary for sponsors and individuals to be experiencing a national emergency to be declared an eligible area.	N/A	N/A

Agency	Program Title/Contact	Primary Purpose	Acreage Affected	Funds Allocated
United States Department of Agriculture (USDA)/Natural Resource Conservation Service (NRCS)	Conservation Reserve Program (CRP) / See <a href="http://www.nhq.nrcs.usda.gov/CCS/FB96OPA/MiscFB.html">http://www.nhq.nrcs.usda.gov/CCS/FB96OPA/MiscFB.html</a>	Provides funding to voluntarily retire environmentally sensitive crop land for 10 to 15 years and establish approved conservation practices.	31,438,441	1,420,098,718
United States Department of Agriculture (USDA)/Natural Resource Conservation Service (NRCS)	Conservation Reserve Enhancement Program (CREP) / See <a href="http://www.nhq.nrcs.usda.gov/CCS/FB96OPA/MiscFB.html">http://www.nhq.nrcs.usda.gov/CCS/FB96OPA/MiscFB.html</a>	State and Federal partnership that provides annual rental payments and cost-share assistance to establish long-term resource conserving covers on eligible land.	1,145,291	2,423,500
United States Department of Agriculture (USDA)/Natural Resource Conservation Service (NRCS)	Resource Conservation and Development Program (RCD) / See <a href="http://www.nhq.nrcs.usda.gov/CCS/FB96OPA/MiscFB.html">http://www.nhq.nrcs.usda.gov/CCS/FB96OPA/MiscFB.html</a>	Authorized RC&D areas are locally sponsored areas designated by the Secretary of Agriculture that can obtain NRCS grants for land conservation, water management, community development, and environmental needs.	1,011,500	

Agency	Program Title/Contact	Primary Purpose	Acreage Affected	Funds Allocated
United States Department of Agriculture (USDA)/Forest Service	Forest Legacy Program (FLP)/See <a href="http://www.fla.org/publicpolicy/flweb.htm#descript">http://www.fla.org/publicpolicy/flweb.htm#descript</a>	Federal funding for up to 75% of the cost of conservation easements or fee acquisition of forest lands threatened with conversion to non-forest uses.	120,000	30,000,000
Florida Department of Environmental Protection (FDEP)	Conservation and Recreation Lands (CARL) and Environmentally Endangered Lands (EEL) / See <a href="http://www.dep.state.fl.us/stland/bia/index.htm">http://www.dep.state.fl.us/stland/bia/index.htm</a>	State monies available to conserve and protect unique natural areas, endangered species, unusual geologic features, wetlands and significant archaeological and historical sites.	1,400,000	2,000,000,000



Agency	Program Title/Contact	Primary Purpose	Acreage Affected	Funds Allocated
Florida Department of Environmental Protection (FDEP)/National Oceanic and Atmospheric Administration (NOAA)	Coastal Impact Assistance Program (CIAP) / See <a href="http://www.dep.state.fl.us/ospp/ciap/FAW/notice.html">http://www.dep.state.fl.us/ospp/ciap/FAW/notice.html</a>	The county portion of the plan is comprised of projects that will restore habitat, improve stormwater and wastewater management, control erosion, stabilize shorelines, construct artificial reefs, protect species and provide opportunities for environmental education. The state portion of the plan consists of projects that seek to restore or enhance state waterbodies of regional and/or statewide significance. Projects identified by state and county staff and subject to approval.	N/A	17,000,000

Agency	Program Title/Contact	Primary Purpose	Acreage Affected	Funds Allocated
United States Fish and Wildlife Service (USFWS)	Safe Harbor Program	Voluntary commitment of private and/or local state or county landowners to implement conservation actions outlined by the USFWS for listed or candidate species on their properties for a specified period of time. In return, landowners receive no additional regulatory burden in the future.		5,000,000
United States Fish and Wildlife Service (USFWS)	Candidate Conservation Program	Similar to the Safe Harbor Program however this program is administered specifically for lands that have candidate and proposed species for federal listing so the need to list theas threatened or endangered in the future can be avoided.		5,000,000

Agency	Program Title/Contact	Primary Purpose	Acreage Affected	Funds Allocated
United States Fish and Wildlife Service (USFWS)	Recovery Land Acquisition	Matching funds to private citizens and state and local governments to protect habitat for federally listed species.		11,000,000
United States Fish and Wildlife Service (USFWS)	Habitat Conservation Plan	Matching funds to private citizens and state and local governments to assist in the planning, development, and implementation of HCPs.		7,000,000
United States Fish and Wildlife Service (USFWS)	Habitat Conservation Plan Land Acquisition	Landowners that implement an HCP can apply for grants to purchase habitat for threatened and endangered species covered under the permit.		40,000,000
United States Fish and Wildlife Service (USFWS)	Endangered Species Landowner Incentives	Matching funding for landowners that enable them to conserve listed, proposed, candidate species, and species that are likely to become candidates.		4,025,000

Agency	Program Title/Contact	Primary Purpose	Acreage Affected	Funds Allocated
United States Fish and Wildlife Service (USFWS)	Partners for Fish and Wildlife	Grant program typically provided for the enhancement and restoration of habitat for threatened and endangered species and migratory birds.		251,000
Florida Fish and Wildlife Conservation Commission (FFWCC)	Land Acquisition Program / <a href="http://www.floridaconservation.org//">http://www.floridaconservation.org//</a>	Acquires lands that are inholdings or additions to state-owned, FFWCC managed areas. Most of the land is adjacent to Type 1 Wildlife Management Areas or Wildlife and Environmental Areas.	23,000	N/A
Audubon of Florida	Sanctuaries / See <a href="http://www.audubonofflorida.org/conservation/sanctuaries.html">http://www.audubonofflorida.org/conservation/sanctuaries.html</a>	Protect and preserve natural resources including the establishment and maintenance of nature sanctuaries.		
Land Trust Alliance	See <a href="http://www.lta.org/resources/tagrants.html">http://www.lta.org/resources/tagrants.html</a>	National conservation organization established to conserve land for people	4,700,000	



Agency	Program Title/Contact	Primary Purpose	Acreage Affected	Funds Allocated
	Florida Communities Trust / See <a href="http://www.dca.state.fl.us/ffct/">http://www.dca.state.fl.us/ffct/</a>	Provide technical resources and funding for communities to purchase coastal, conservation, recreation, and poen space land as a way to meet comprehensive plan goals.	39,500	185,000,000
		<b>Totals</b>	<b>50,348,340</b>	<b>3,876,891,514</b>

15209 Pasco County/Technical/Support Document/Summary funding opps.xls

**TABLE 8**  
**SUMMARY OF POTENTIAL GRANT PROGRAMS\***

<b>Name of Grant</b>	<b>Grant Purpose</b>	<b>Funding Agency</b>	<b>Typical Award</b>	<b>Application Cycle/Contact</b>
<b>Urban Infill and Redevelopment Assistance Grant Program</b>	Funds local government projects which revitalize urban areas, with an emphasis on a collaborative planning process (involving numerous stakeholders)	Florida Department of Community Affairs (DCA)	\$25,000-\$50,000	Applications due mid-September and mid-November, awards announced mid-October and mid-December, contact Susan Flemming at 850-922-6070 or see <a href="http://www.dca.state.fl.us/fhcd/programs/uiragp/">http://www.dca.state.fl.us/fhcd/programs/uiragp/</a> <b>(Did not receive appropriations this year. No Legislative support.)</b>
<b>Coastal Partnerships Initiative</b>	Promote the protection and effective management of Florida's coastal resources according to 4 categories: Remarkable Coastal Places, Community Stewardship, Access to Coastal Resources, and Working Waterfronts	Florida DCA, Florida Coastal Management Program/ National Oceanic and Atmospheric Administration (NOAA)	\$25,000-\$50,000	Applications reviewed annually, letters of intent due in August. NOFA and deadlines published in the Florida Administrative Weekly, contact Debbie Skelton at 850-922-5438 or see <a href="http://www.dca.state.fl.us/ffcm/FCMP/Grants/fcmpgrts.htm">http://www.dca.state.fl.us/ffcm/FCMP/Grants/fcmpgrts.htm</a> <b>(Submit application in August if receive funding the following July.)</b>

<b>Name of Grant</b>	<b>Grant Purpose</b>	<b>Funding Agency</b>	<b>Typical Award</b>	<b>Application Cycle/Contact</b>
<b>Recreational Trails Program</b>	Funds projects that provide, renovate, or maintain recreation trails	Florida Department of Environmental Protection/ Federal Department of Transportation	\$50,000-\$80,000	Applications due between February 15-March 15, 2001, contact Alexandra Weiss 850-488-3701 or see <a href="http://www8.myflorida.com/communities/learn/trails/resources/index.html">http://www8.myflorida.com/communities/learn/trails/resources/index.html</a>
<b>Greenways And Trails Acquisition Program</b>	Receives Florida Forever money to acquire land for greenways and trail projects	Florida Department of Environmental Protection, Office of Greenways and Trails	Vary greatly	Contact Cindy Radford-850-488-3701 or see <a href="http://www8.myflorida.com/communities/learn/trails/resources/index.html">http://www8.myflorida.com/communities/learn/trails/resources/index.html</a>  <b>(4.5 million; Criteria: Willing seller / Willing manager; meet requirements for greenways / trails; 25% match.)</b>
<b>Brownfields Economic Redevelopment Initiative</b>	Funds redevelopment projects for abandoned or underutilized industrial or commercial and potentially contaminated lands	US Environmental Protection Agency	\$50,000-\$200,000	Ongoing- (see <a href="http://www.epa.gov/brownfields/">http://www.epa.gov/brownfields/</a> ), or contact 202-260-9347

<b>Name of Grant</b>	<b>Grant Purpose</b>	<b>Funding Agency</b>	<b>Typical Award</b>	<b>Application Cycle/Contact</b>
<b>Waterfronts Florida Partnership</b>	To provide support for communities to revitalize and renew waterfront districts through environmental and cultural resource protection, support of the viable traditional waterfront economy, hazard mitigation, and public access to working waterfronts and coastal resources	Florida DCA, Florida Coastal Management Program	\$35,000	Pre-Application meetings held January-March 2001, Applications due April 2, 2001 (designations announced June 2001), contact 850-222-9813 or see <a href="http://www.dca.state.fl.us/ffc/m/FCMP/waterfronts/main.htm">http://www.dca.state.fl.us/ffc/m/FCMP/waterfronts/main.htm</a> <b>(Scaled back, federal money, DCA internally.)</b>
<b>Historic Preservation Grants</b>	Identifying, protecting, or rehabilitating historic and archaeological sites, and providing public information about these sites	Florida Department of State, Division of Historical Resources	\$5,000-\$25,000	Application reviewed twice per year, deadlines are August 31 and December 15, contact Robert Taylor 850-245-6333 or see <a href="http://dhr.dos.state.fl.us/bhp/grants">http://dhr.dos.state.fl.us/bhp/grants</a>
<b>Transportation Equity Act for the 21<sup>st</sup> Century (TEA-21)</b>	Provides funding for a wide variety of transportation projects, including roadways, transit, bicycle and pedestrian paths, scenic byways, bicycle and pedestrian paths, and recreational trails	FL Department of Transportation, Environmental Management Office/ US Dept. of Transportation	Vary greatly	Ongoing- See <a href="http://www.fhwa.dot.gov/tea21/">http://www.fhwa.dot.gov/tea21/</a> , or FDOT Planning Division- Dave Lee 850-414-4800

<b>Name of Grant</b>	<b>Grant Purpose</b>	<b>Funding Agency</b>	<b>Typical Award</b>	<b>Application Cycle/Contact</b>
<b>Florida Communities Trust/Florida Forever</b>	Funding for acquisition of land for open space, including active outdoor recreation sites provided that development does not have a detrimental impact to the site's natural resources	Department of Community Affairs	Vary Greatly	Application Cycle: May 29 <sup>th</sup> through August 13th, contact 850-922-2207 or see <a href="http://www.dca/state.fl.us/ffct/">http://www.dca/state.fl.us/ffct/</a>
<b>Recreation Development Assistance Program</b>	Provides funding for acquisition or development of land for public outdoor recreation use, 25-50% in-kind match required	Florida DEP, Bureau of Parks Design and Recreation Services	\$50,000-\$200,000	Applications due in September, contact Diane Langston 850-488-7896 or see <a href="http://www.dep.state.fl.us/stl and/bla/index.html">http://www.dep.state.fl.us/stl and/bla/index.html</a>

<b>Name of Grant</b>	<b>Grant Purpose</b>	<b>Funding Agency</b>	<b>Typical Award</b>	<b>Application Cycle/Contact</b>
<b>North America Wetlands Conservation Act Grants Program</b>	Provides matching grants to private or public organizations or to individuals who have developed partnerships to carry out wetlands conservation projects in the U.S., Canada, and Mexico.	U.S. Fish and Wildlife Service	Standard Grants: limited to \$1 million; Small Grants: may not exceed \$50,000	Standard Grants: March and July; Small Grants: First Friday in December See: <a href="http://grants.fws.gov/">http://grants.fws.gov/</a>
<b>Recreation Grants for State and Local Park Stewardship</b>	Provides a system for funding of Federal, State and local parks and conservation areas. Gives states and localities incentives to plan and invest in their own park systems.	The Land and Water Conservation Fund	Presently under review	Duane Westerholt (402) 471-5411 Nebraska Game & Parks Commission 2200 North 33 <sup>rd</sup> Street Lincoln, NE 68503 See: <a href="http://www.ncrc.nps.gov/lwc/f/index/htm">http://www.ncrc.nps.gov/lwc/f/index/htm</a>



<b>Name of Grant</b>	<b>Grant Purpose</b>	<b>Funding Agency</b>	<b>Typical Award</b>	<b>Application Cycle/Contact</b>
<b>Wetland Program Development Grant</b>	Increase the quantity and quality of wetlands in the U.S. by conserving and increasing wetland acreage, and improving wetland health.	Environmental Protection Agency (EPA)	Minimum match of 25%	Generally reviewed in the fall, Contact Sharon Ward (404) 562-9269 OR ward.Sharon@epa.gov
<b>Partners for Fish and Wildlife</b>	Restoration of wetland and riparian habitat	United States Fish and Wildlife Service (USFWS)	Up to \$10,000	Local USFWS office See: <a href="http://grants.fws.gov/">http://grants.fws.gov/</a>
<b>National Coastal Wetlands Conservation Grant Program</b>	Provides matching grants for acquisition, restoration management or enhancement of coastal wetlands.	United States Fish and Wildlife Service (USFWS)	Varies	Due June 22. Award announced by October 1. Contact: Sally Valdescogiano U.S. Fish and Wildlife Service Division of Fish and Wildlife Management Assistance and Habitat Restoration 4401 N. Fairfax Drive Room 840 Arlington, VA 22203 phone: (703) 358-2201 fax: (703) 358-2232 email:sally_valdescogiano@fws.gov

<b>Name of Grant</b>	<b>Grant Purpose</b>	<b>Funding Agency</b>	<b>Typical Award</b>	<b>Application Cycle/Contact</b>
<b>Landowner Assistance Programs</b>	Cooperative Forestry Assistance includes technical and financial assistance to help private landowners create sustainable forest land management plans and implement their forest stewardship objectives.	Department of Agriculture Forest Service	Federal reimbursement of approved landowner expenses may be up to 75%, to a maximum of \$10,000/year.	U.S. Dept. of Agriculture, Forest Service, P.O. Box 96090 Washington, DC 20090-6090 (202) 205-1389 <a href="http://www.fs.fed.us/spf/">www.fs.fed.us/spf/</a>
<b>Environmental Quality Incentives Program</b>	It provides technical, financial, and educational assistance to farmers and ranchers through the NRCS. The NRCS may designate a watershed, an area or a region of special environmental sensitivity as a priority area and give special consideration to applicants who have conservation plans that address the natural resource concern(s) for which the priority area was designated.	Department of Agriculture Natural Resources Conservation Services (NRCS)	Total cost-share and incentive payments are limited to \$10,000 per person per year and \$50,000 for the contract term of 5 to 10 years.	U.S. Department of Agriculture, Natural Resources, P.O. Box 2890 Washington, DC 20013 (202) 720-1845 <a href="http://www.nhqs.nrcs.usda.gov/CCS/FB960PA/EQIPfinal.html">www.nhqs.nrcs.usda.gov/CCS/FB960PA/EQIPfinal.html</a> .
<b>Wetlands Protection Development Grants</b>	Grants are intended to encourage wetlands protection program development or to enhance/augment existing effective programs. Project proposals must clearly demonstrate a direct link to increasing a state's, tribe's or local government's ability to protect its wetlands resources.	Environmental Protection Agency (EPA)	Vary greatly from state to state	U.S. EPA, Office of Wetlands Division 401 M Street, SW, Washington, DC 20460, Mail Code: 4502F (800) 832-7828 <a href="http://www.epa.gov/OWOW/wetlands/partners.html">http://www.epa.gov/OWOW/wetlands/partners.html</a> .

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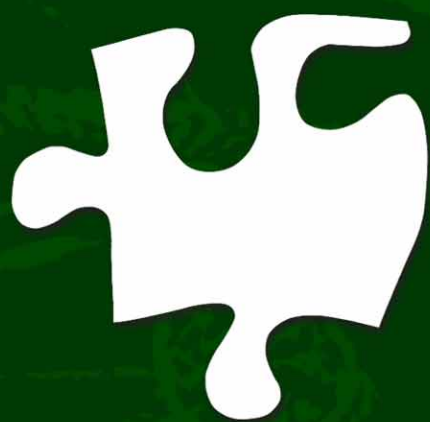


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