

**Eco-Link Description** 



CLOSING THE GAPS IN FLORIDA'S WILDLIFE HABITAT CONSERVATION SYSTEM

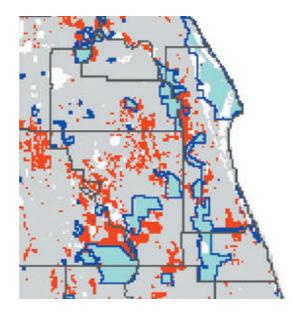
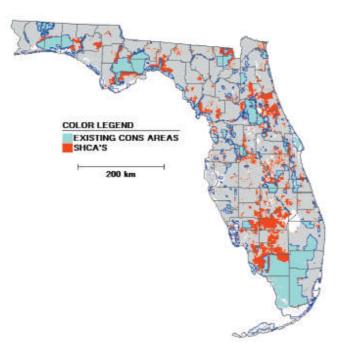


Figure 1. Proposed Strategic Habitat Conservation Areas for Florida





### EXECUTIVE SUMMARY

This report describes habitat areas in Florida that should be conserved if key components of the state's biological diversity are to be maintained. The project employed a computerized Geographic Information System to manipulate geographic data sets and create distribution maps for selected species of wildlife, threatened species of plants, and rare plant communities. The geographic data sets used in the project included a statewide land-cover map derived from Landsat satellite imagery; over 25,000 geographically referenced points documenting known occurrences of rare animals, plants, and communities; digitized maps of public and private lands devoted to some extent to conservation; a digitized general soils map; a digitized map of the statewide road network; a digitized map of selected private lands; and a digitized map of county boundaries.

Drawing from techniques recently developed in the fields of wildlife management and conservation biology, the Geographic Information System was used to assess the degree of security provided to rare species by the current system of conservation lands and to identify important habitat areas not currently protected. The lands recommended in the report for additional protection are referred to as **Strategic Habitat Conservation Areas** and are displayed in Figure 1. Strategic Habitat Conservation Areas depict lands needed to meet <u>minimum</u> conservation goals for the following:

- \* 30 species of wildlife inadequately protected by the
- current system of conservation lands,
- high quality sandhill sites,
- high quality scrub sites,
- \* high quality pine rocklands sites,
- \* high quality examples of tropical hardwood hardwoods,
- \* bat maternity caves and winter roost caves,
- \* wetlands important to the breeding success of eight species of wading birds, and
- \* lands important to the long-term survival of 105 globally rare species of plants.

#### CLOSING THE GAPS IN FLORIDA'S WILDLIFE HABITAT CONSERVATION SYSTEM

During the course of this project, a large database of known locations of many animals, plants, and natural communities was assembled. A separate set of maps, referred to as **Regional Biodiversity Hot Spots** maps, was created to display as much of this information as possible within each of the 11 Regional Planning Council regions of Florida. The Regional Biodiversity Hot Spots maps display the following information:

- areas where large numbers of 52 selected species co-occur,
- \* areas supporting rare plant and wildlife communities,
- \* over 25,000 known locations of rare plants, animals, and natural communities,
- county boundaries and conservation land boundaries, and
- \* coastal areas that support key components of biological diversity.

Each regional map is accompanied with a description of the biological resources occurring in key areas within each region. The purpose of the Regional Biodiversity Hot Spots maps is to convey more detailed information on the known locations of as many components of biological diversity as possible, regardless of whether or not they fall within proposed Strategic Habitat Conservation Areas, to help meet the need for conservation information at regional and local levels.

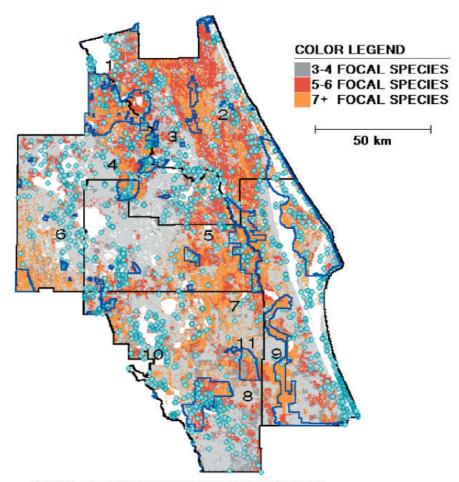


Figure 166c. Hot spots of biological resources and rare species occurrence records.

Area 7. North central Osceola and south central Orange counties, east of St. Cloud (Econlockhatchee River Swamp and surroundings, including Big Bend Swamp, Lake Conlin, and Four-mile Swamp). Portions of the area make up a Strategic Habitat Conservation Area for Audubon's crested caracara, Florida sandhill crane, red-cockaded woodpecker, mottled duck, wood stork, and other colonial wading birds. Additional rare species recorded in the area include bobcat, southern bald eagle, American swallow-tailed kite, southeastern American kestrel, limpkin, little blue heron (rookery), snowy egret (rookery), white ibis (rookery), great egret (rookery), wild turkey, eastern indigo snake, gopher tortoise, and nodding pinweed.

#### CLOSING THE GAPS IN FLORIDA'S WILDLIFE HABITAT CONSERVATION SYSTEM

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FLORIDA GAME AND FRESH WATER FISH COMMISSION

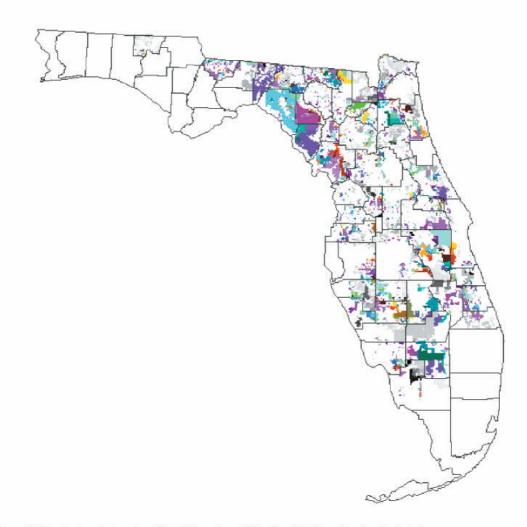


Figure 18. Private land parcels larger than 130 ha (320 acres) were digitized for all but 18 counties using plat directories.

We created a map of privately owned parcels larger than 130 ha (320 acres) using plat directories dated 1987-1990 (Florida Plats, 1289 Bowan Blvd., Clermont, Florida). The boundaries of individual parcels were transferred onto 1:126,720 scale county road maps prepared by the Florida Department of Transportation and digitized for all but 18 counties (for which no plat maps have been published). The resulting map (Figure 18) is helpful in identifying lands that might be more easily conserved through one of a variety of land-conservation techniques.

### **Critical Lands and Waters Identification Project (CLIP)**

**Cooperative Effort** 

- Century Commission for Sustainable Florida
- Florida Natural Areas Inventory, Florida State University
- GeoPlan Center, University of Florida
- Florida Fish & Wildlife Conservation Commission (FWC)
- Statewide natural resource spatial database
- Prioritizes Biodiversity, Landscapes, & Water
- Identifies Florida's "Green Infrastructure":
  - ecosystem function, biodiversity, and the health of human communities are linked.

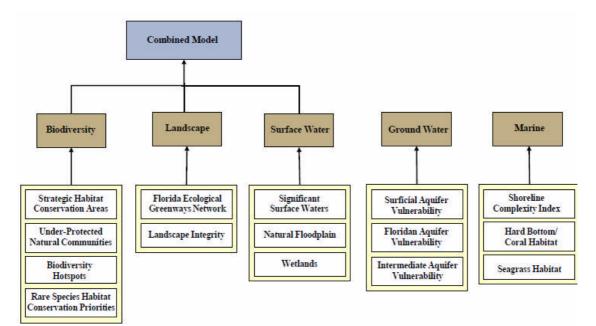
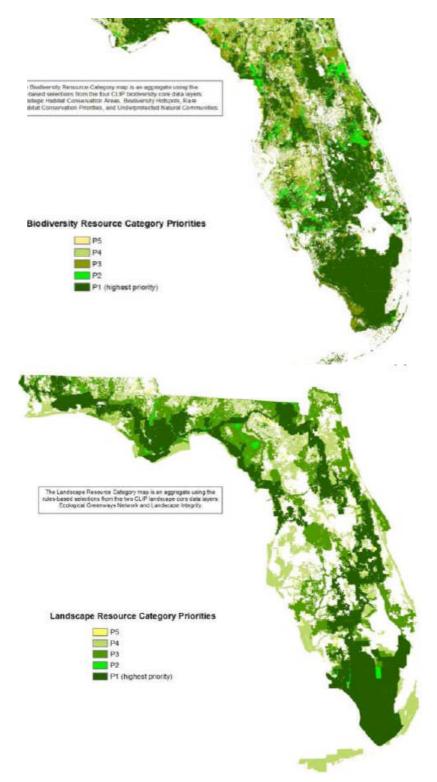


Figure 16. There are 15 core data layers that are organized into 5 resource categories: Biodiversity, Surface Water, Landscape, Marine, and Groundwater. Then, the aggregated CLIP Priorities are selected using a combination of rules-based selections and overlap between core data layers in the Biodiversity, Surface Water, and Landscape categories. In the CLIP Database Version 1.0, the Marine and Groundwater resource categories and core data are considered "placeholder" information that will continue to be developed to be integrated with the other resource categories in future iterations of CLIP.

## **Critical Lands and Waters Identification Project (CLIP)**



This map separated to expression CLIP priorities. The sum of version of the CLIP priorities are based on rules based selections from each of the 5 core data largers within the Biodiversity, Surface Water, and Landboore Resource Categorees and oversite between the Biodiversity, Barteon Water, and Landscape Resource Categories.

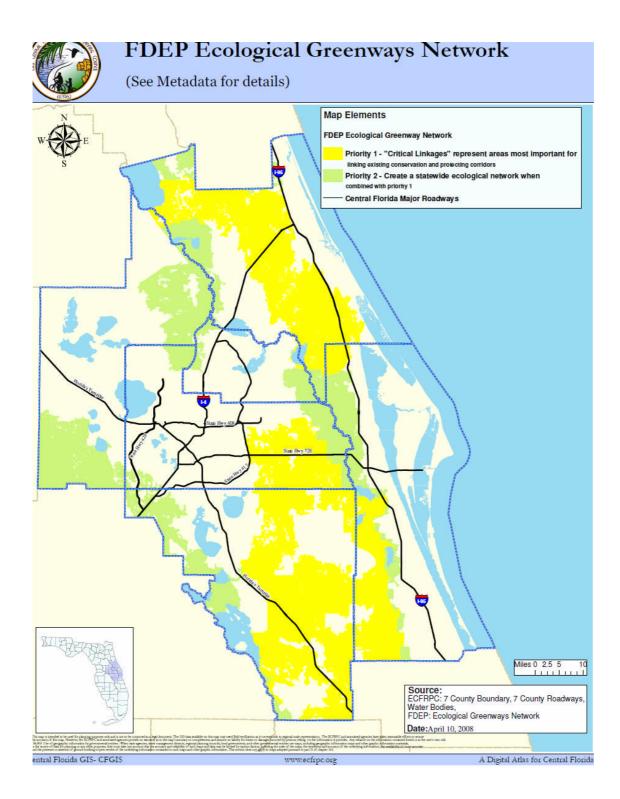
#### **CLIP** Priorities

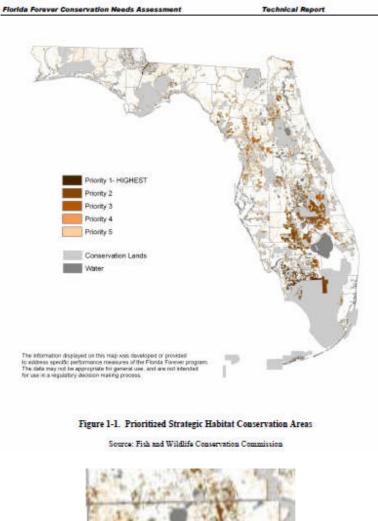


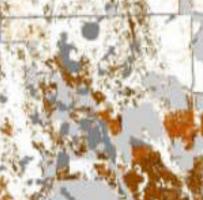
# Consensus All CLIP Priorities

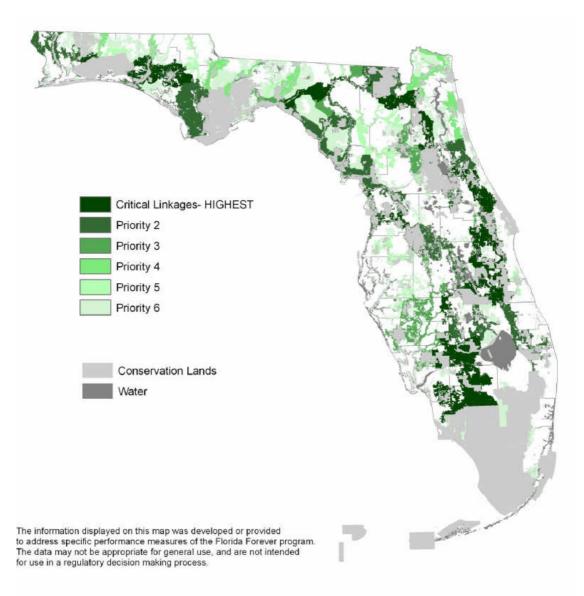
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ACRES	All	Private Land
P1	17,218,379	7,851,530
P2	3,352,322	3,141,509
P3	5,185,983	5,044,738
P4	3,669,599	3,635,669
P5	877,450	876,531



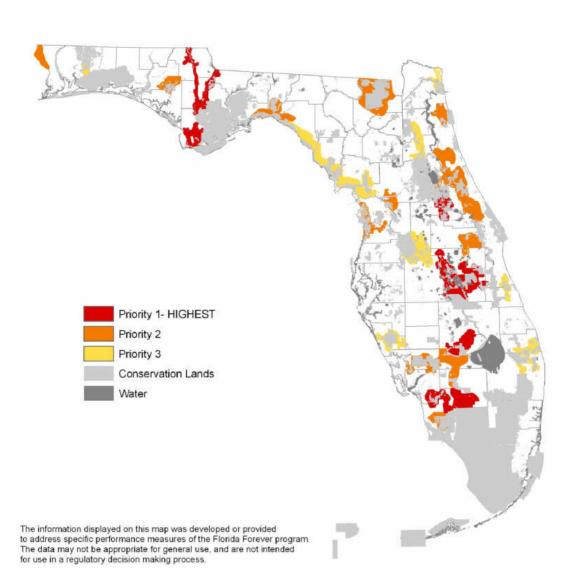






#### Figure 3-1. Significant Landscapes, Linkages and Conservation Corridors (Ecological Greenways Network)

Source: University of Florida Geoplan Center and Department of Environmental Protection/Office of Greenways and Trails

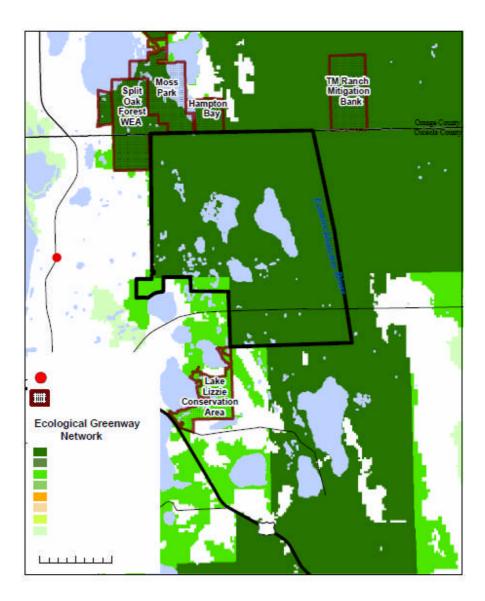


#### Figure 5-1. Landscape-sized Protection Areas

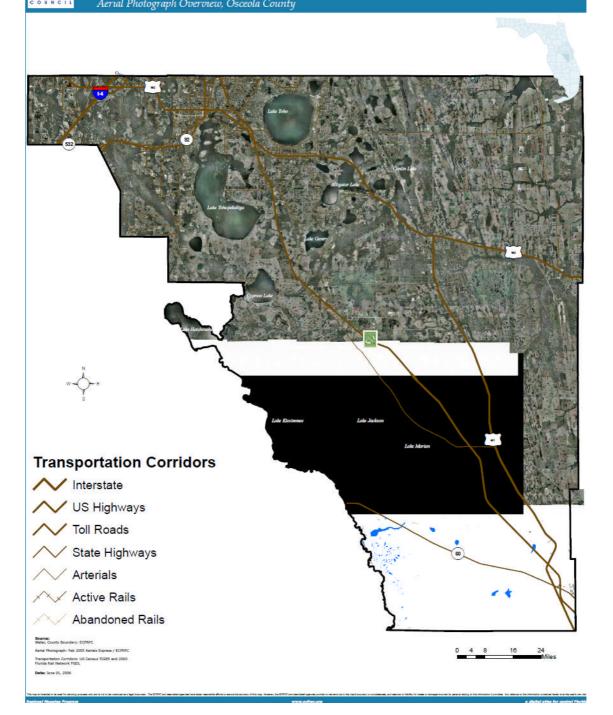
Source: Natural resource experts from Florida Natural Areas Inventory, Florida Fish and Wildlife Conservation Commission, The Nature Conservancy, and University of Florida

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Florida Natural Areas Inventory





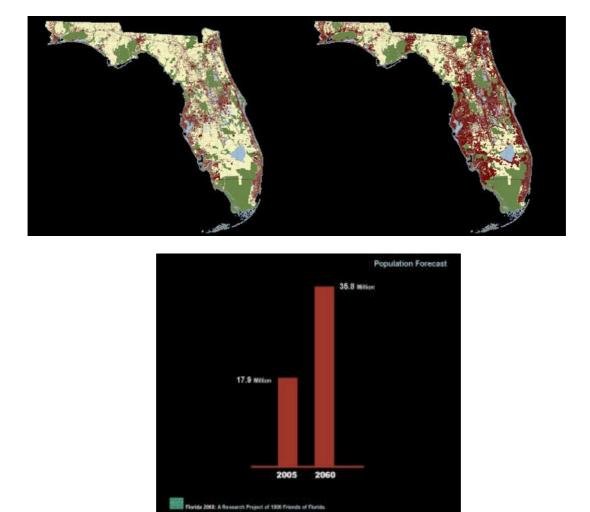




By the GeoPlan Center At the University of Florida

> Paul D. Zwick Margaret H. Carr

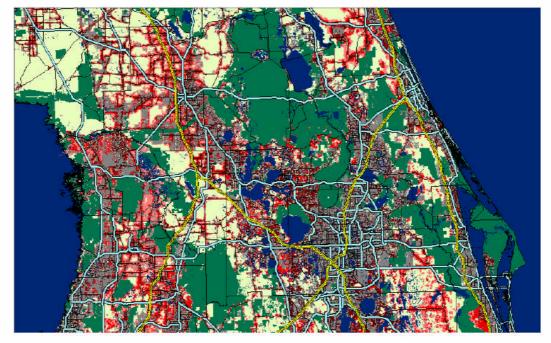
August 15, 2006



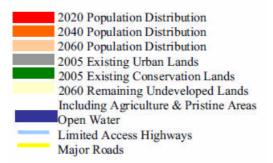
If the historic patterns of development continue over the next 50 years, Florida could stand to convert 7 million acres of additional land from rural to urban uses, including 2.7 million acres of native habitat.

Before & After - Florida 2060: A Research Project of 1000 Friends of Florida

Figure 6. Population distribution for 2020, 2040 and 2060 in central Florida.



Legend



### IMPORTANT ECOSYSTEM "SERVICES" OF GREEN INFRASTRUCTURE

- Sustain biodiversity.
- Protect areas from impacts of flooding, storm damage or drought.
- Protect stream and river channels and coastal shores from erosion.

• Provide a carbon sink. As an example, 100 acres of woodland can absorb emissions equivalent to 100 family cars.

• Offer pollution control. Vegetation has a significant capacity to attenuate noise and filter air pollution from motor vehicles. Wetland ecosystems are also effective in filtering polluted run-off and sewage.

• Provide natural "air conditioning." A single large tree can be equivalent to five room air conditioners and will supply enough oxygen for ten people.

• Provide microclimate control by providing shade, hold in humidity and blocking winds and air currents.

- Protect people from the sun's harmful ultraviolet rays.
- Cycle and move nutrients and detoxify and decompose wastes.
- Control agricultural pests and regulate disease carrying organisms.
- Generate and preserve soils and renew their fertility.
- Disperse seeds and pollinate crops and natural vegetation.

• Contribute to the health and wellbeing of our citizens. Accessible green space and natural habitats create opportunities for recreation and exercise, and studies have shown that this increases our creative play, social skills and concentration span.

• Contribute to a community's social cohesion. The active use of greenspaces, including streets and communal spaces, can encourage greater social interaction and contribute to a lively public realm. Participation in the design and stewardship of green space can help strengthen communities.

• Enhance economic value. Natural greenspaces can increase property values, reduce management overheads, and reduce healthcare costs.

Adapted from: Ecosystem Services, Ecological Society of America, 2000, at www.esa.org; and, Biodiversity by Design: A Guide for Sustainable Communities, Town and Country Planning Association (TCPA), England, 2004.

Appendix 3.	Urban suitability criteria	, rationale for us	se, and assigned
weights.			

<b>Urban Suitability Criterion</b>	Rationale for Use	Weight
Proximity to existing urban areas	New urban development tends to occur in close proximity to existing urban development.	29%
Presence/absence of wetlands	The presence of wetlands tends to increase the cost of urban development.	18%
Road density	New urban development tends to occur in areas of relatively higher road density.	14%
Proximity to coastline	The coast has historically been an attractor for urban development.	11%
Developments of Regional Impact (other than urban infrastructure projects like airports) and the West Bay Detailed Specific Area Plan (less the approved airport site)	Areas within approved DRIs and DSAPs are highly likely to develop. The only DSAP that was used, however, was West Bay in Bay County, because the other existing DSAPs fell in the path and pattern of new urban development and their boundaries did not affect the pattern or timing of new urban development.	10%
Proximity to major roads	Roads facilitate new urban development.	7%
Proximity to centroids of major urban areas (population greater than 30,000)	Major urban areas tend to accommodate more additional population than do smaller urban areas	7%
Proximity to open water	Access to the view of water has historically been an attractor for development.	4%

### A TIERED APPROACH TO CONSERVATION

Over the past few decades, a three-tiered approach to land conservation has evolved in Florida. The top tier includes large statewide and regional land acquisition and protection efforts intended to establish "islands" of protected and relatively intact habitats which are linked, where possible, by ecological greenways. These efforts have laid the foundation for a statewide green infrastructure in Florida.

The bottom tier includes programs directed at protecting habitats within neighborhoods and in backyards. Often grassroots in nature, these include the University of Florida's Florida Yards and Neighborhoods program and the National Wildlife Federation's Backyard Wildlife Habitat Program, both of which are targeted at individual citizens, families, and/or neighborhoods.

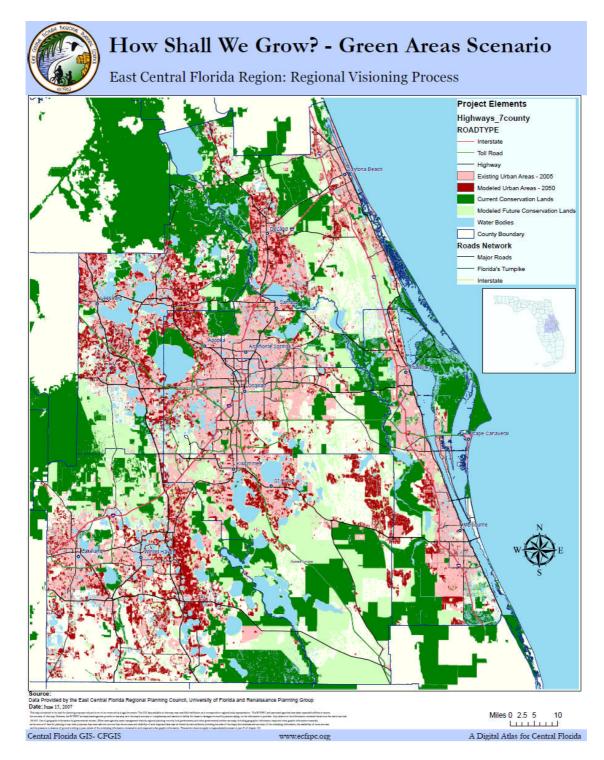
The middle tier focuses on creating regional and communitywide green infrastructure to promote conservation within large landholdings, large developments, and neighborhoods. This tier is perhaps the least evolved of the three, but includes better land use planning, development design, and best management practices by both the public and private sectors. It is the middle tier at which most development approvals are issued. This tier offers the greatest potential for better integration of human and wildlife habitat.

# THE TOP TIER: TOWARD A STATEWIDE GREEN INFRASTRUCTURE IN FLORIDA

Before the phrase "green infrastructure" had even been coined, Florida launched an ambitious series of land acquisition and conservation planning projects which laid the foundation for creating Florida's existing green infrastructure. Building on earlier state land acquisition programs, in 1990 Florida established the Preservation 2000 program. This 10-year program raised \$3 billion, and protected 1,781,489 acres of environmentally sensitive land. In 1999, the Florida Legislature created Florida Forever, also designed to dedicate \$3 billion to land acquisition over the following decade. As of December 2006, another 535,643 acres of environmentally sensitive land had been protected through this effort.

As these major land acquisition programs evolved, there was a growing awareness of the need to be more strategic in land acquisition, and a series of efforts were launched in the 1990s. In 1994, researchers from the Florida Fish andWildlife Conservation Commission (FWC) completed a very important report, Closing the Gaps in Florida's Wildlife Habitat Conservation. This cornerstone report used a geographic information system approach to identify key habitat areas to conserve in order to maintain key components of the state's biological diversity. These areas, known as Strategic Habitat Conservation Areas (SHCA), continue to serve as a foundation for conservation planning in Florida.

http://www.floridahabitat.org/wildlife-manual/wildlife-friendly-communities





# Economic Benefits of Land Conservation



# **Ecosystem Services**

Many economic benefits are considered "ecosystem services." These include necessities such as drinking water and food production; erosion control, flood regulation and storm protection; the holding and storage of carbon in forests; and values of open space for recreation and personal enjoyment.

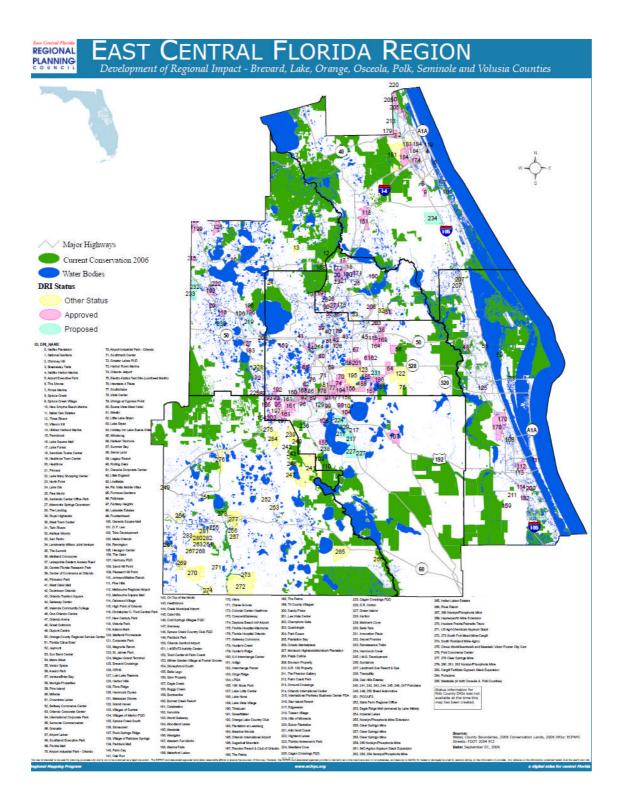
Historically, ecosystem services have been considered "free" to individuals and society. No monetary price was paid for them because they were presumably available to everyone.

In the mid 1980s, one of the earliest studies on ecosystem services estimated an average value of \$33 trillion per year for services provided by various ecosystems worldwide This included \$17 trillion for the storage, processing and cycling of nutrients; \$2.3 trillior for water purification and pollutant removal; and \$1.8 trillion for flood control and storm protection.<sup>30</sup>

In Florida, Defenders of Wildlife calculated in 2008 the economic impacts of 10 areas protected through Florida Forever and other state acquisition programs. **The total value of ecosystem services was estimated to be more than \$1.8 billion per year.** "Greater economic value can be gained from conservation areas that are well-managed and restored and by preventing overly intensive uses that diminish the natura and economic values," according to the report.<sup>31</sup> Furthermore, the report found that, value of these services will increase in the future as fewer natural areas are available for protection.

Defenders of Wildlife completed another 2008 study that examined the economic values provided by an 825-acre area in Collier County near Big Cypress National Preserve and Florida Panther National Wildlife Refuge. The study concluded that the economic value of the **benefits flowing from these natural lands that accrue to humans in a given year** (e.g. carbon sequestration, water supply, recreation, scenic views, etc.) **ranged from \$145 million to \$315 million** (values expressed in 2004 dollars).<sup>32</sup> The highest values were determined to come from water provision (via recharge, through infiltration and percolation of rainwater that provide a large share of the public water supply in the area), followed by carbon sequestration.

A 2006 Indian River County assessment found that **the annual value of ecosystem services derived from lands purchased by the county amounted to \$23.4 million,** including \$19 million derived from freshwater wetlands, \$3 million from coastal strand and \$600,000 from forests and scrub. **The annual value of services from all county public lands amounted to \$768 million.** The economic value of 14 ecosystem services from 12 ecosystem types was estimated based on published studies and original calculations using county environmental lands acreages and program expenditures data. The study concluded that of the \$67 million invested in the county environmental program for the preceding 15 years, the county lands paid for themselves in fewer than three years.<sup>33</sup>



#### Upper Econ Mosaic - Group B/Full Fee

## **Upper Econ Mosaic**

#### **Osceola and Orange Counties**

#### Purpose for State Acquisition

A broad expanse of flatwoods, scrub, swamps, marshes, and lakes east of St. Cloud is important for the survival of such wildlife as scrub jays, caracara, sandhill crane, and wading birds. The Upper Econ Mosaic project, by protecting much of this land, will preserve natural lands around existing conservation areas, maintain habitat that the diverse wildlife here needs to survive, and ensure that the public will still be able to enjoy this natural landscape as Orlando and St. Cloud continue their rapid growth.

#### Manager

Division of Forestry (DOF), Department of Agriculture and Consumer Services.

#### **General Description**

This project, together with Split Oak Mitigation Park and Moss Park, will protect about 35,000 acres in a region facing overwhelming threats from residential and commercial growth. It is a large expanse of habitat in the upper Kissimmee Basin region supporting a mosaic of high quality natural communities. The project encompasses the Econlockhatchee River Swamp, an Outstanding Florida Water and headwaters of the Econlockhatchee River, which flows north and east into the St. Johns through Orange and Seminole Counties. West of the river swamp the project includes all of four large lakes and has frontage on six others. The project is the site of several plants of conservation concern including scrub bay, nodding pinweed and Florida bear-grass. Rare animals include red-cockaded woodpecker, Sherman's fox squirrel, Florida sandhill crane, Florida scrub jay, and a large population of gopher tortoise.

FNAI Elements			
SCRUB	G2/S2		
Sherman's fox squirrel	G5T2/S2		
Florida sandhill crane	G5T2T3/S2S3		
Florida scrub jay	G5T3/S3		
Red-cockaded woodpecker	G3/S2		
Scrub bay	G3/S3		
Gopher tortoise	G3/S3		
Nodding pinweed	G3/S3		
19 elements known from project			

### Group B Full Fee

One non-significant archaeological site is known from the project. Development is the greatest long-term threat to the area.

#### Public Use

The project will be managed as a state forest, offering opportunities for fishing, boating, hunting, hiking and camping.

#### Acquisition Planning and Status

The essential parcels are the Church of Jesus Christ of Latter Day Saints and Holland Properties.

#### Coordination

The Donovan (972 acres) property in the project at the southwestern boundary is a Florida Communities Trust project selected for funding during cycle 5A/6A.

#### Management Policy Statement

The primary objectives of management of the Upper Econ Mosaic project are to maintain and restore the mosaic of natural communities, ranging from scrub to flatwoods and marshes, along the upper reaches of the Econlockhatchee River basin and to provide naturalresource-based recreation to the public in the rapidlygrowing Orlando area. Preserving the natural communities of the area will preserve one of the largest populations of red-cockaded woodpeckers in Florida, as well as other threatened wildlife such as Sherman's fox squirrels, and will enhance the conservation and recreation value of the adjacent Split Oak Mitigation Park and Moss Park.

1996
32,140
928*
\$2,817,895*
31,212

with Estimated (Tax Assessed) Value of \$34,993,257 \*Acquisitions by local government and Florida Communities Trust

The project should be managed under the multiple-use concept: management activities should be directed first toward preservation of resources and second toward integrating carefully controlled consumptive uses such as hunting and logging. Managers should control access to the project; limit public motor vehicles to one or a few main roads; thoroughly inventory the resources; restore hydrological disturbances; burn fire-dependent communities such as pine flatwoods and scrub in a pattern mimicking natural lightning-season fires, using natural firebreaks or existing roads for control; where appropriate, reforest pastures and pine plantations in the project area with original species; strictly limit timbering in old-growth stands and the hardwood swamps; and monitor management activities to ensure that they are actually preserving resources. Managers should limit the number and size of recreational facilities, ensure that they avoid the most sensitive resources, and site them in already disturbed areas when possible.

The project, which is 20 miles or less from Orlando and Kissimmee, includes most of the higher-quality undeveloped land from the Econlockhatchee River Swamp south and west to U.S. Highway 441, and is adjacent to an existing county park. It therefore has the size, configuration, and location to fulfill its primary objectives.

#### Management Prospectus

Qualifications for state designation Major communities represented on this project include mesic and wet flatwoods, strand swamp, dome swamp, depression marsh, basin marsh, scrub, scrubby flatwoods, flatwoods lake, xeric hammock, and blackwater stream. The project's size and diversity makes it desirable for use and management as a state forest. Management by the Division of Forestry as a state forest is contingent upon the state obtaining legal public access to the site and acquiring fee simple title to the core parcels.

Conditions affecting intensity of management There are no known major disturbances that will require extraordinary attention so the level of management intensity and related management costs is expected to be typical for a state forest.

*Timetable for Implementing Management* Once the core area is acquired and assigned to the Division of Forestry for management, public access will be provided for non-facilities related, low intensity outdoor recreation activities. Until specific positions are provided for the project, public access will be coordinated through the Division of Forestry's Orlando District Headquarters and management activities will be con-

#### Upper Econ Mosaic - Group B/Full Fee

ducted utilizing district personnel. The Division of Forestry will cooperate with and seek the assistance of other state agencies, local government entities and interested parties as appropriate.

Initial or intermediate management efforts will concentrate on site security, public and fire management access, resource inventory, and removal of existing trash. Steps will be taken to insure that the public is provided appropriate access while simultaneously affording protection of sensitive resources. Vehicular use by the public will be confined to designated roads and unnecessary access points will be closed. An inventory of the site's natural resources and threatened and endangered flora and fauna will be conducted to provide the basis for formulation of a management plan.

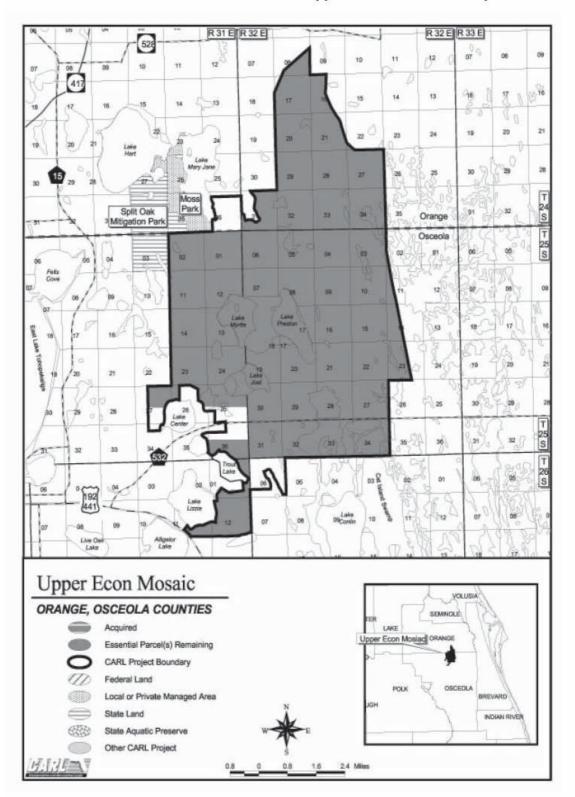
Prior to collection of necessary resource information, management proposals for this project can only be conceptual in nature. Long-range plans for this property will generally be directed toward the restoration of disturbed areas and maintenance of natural communities. To the greatest extent practical, disturbed sites will be restored to conditions that would be expected to occur in naturally functioning ecosystems. Management activities will also stress enhancement of the abundance and spatial distribution of threatened and endangered species.

An all season burning program will be established utilizing practices that incorporate recent research findings. Whenever possible, existing roads, black lines, foam lines and natural breaks will be utilized to contain and control prescribed and natural fires.

Timber management activities will primarily consist of improvement thinnings and regeneration harvests aimed at maintaining and perpetuating forest ecosystems. Stands will not have a targeted rotation age but will be managed to maintain a broad diversity of age classes ranging from young stands to areas with old growth characteristics. This will provide habitat for the full spectrum of species that would be found in the natural environment.

The resource inventory will be used to identify sensitive areas that need special attention, protection or management, and to locate areas that are appropriate for any recreational or administrative facilities. Infrastructure development will primarily be located in already disturbed areas and will be the absolute minimum required to allow public access for the uses mentioned above, to provide facilities to accommodate public use, and to administer and manage the property.

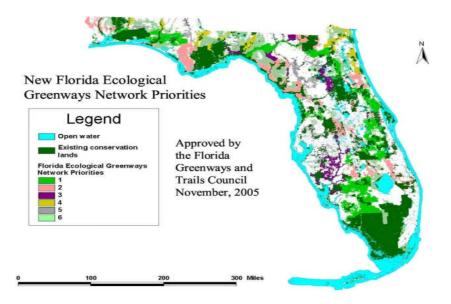
The Division will promote recreation and environmental education in the natural environment. Due to the



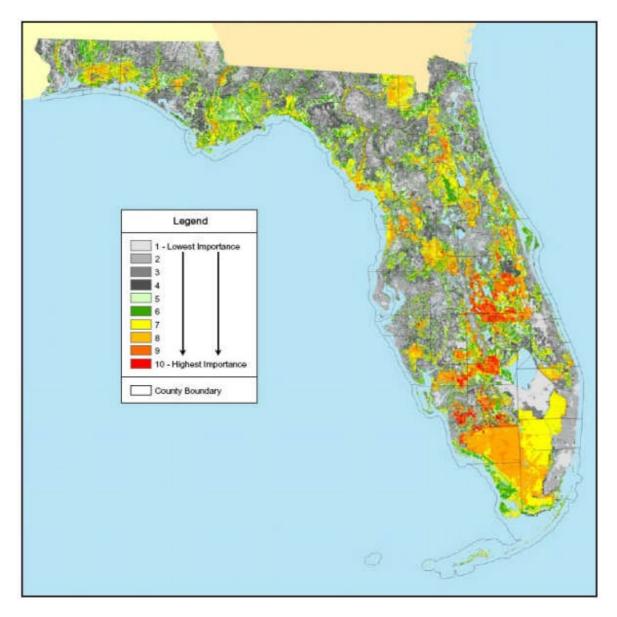
Upper Econ Mosaic - Group B/Full Fee



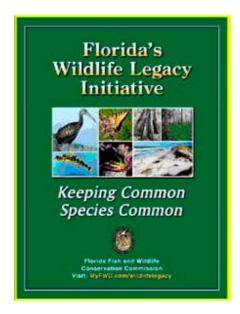
Photo Courtesy of GeoPlan Center Graphic Courtesy of Noss & Cooperrider, 1994



Florida Ecological Greenway Network. Courtesy of GeoPlan Center, UF



The Integrated Wildlife Habitat Ranking System, 2007. Photo courtesy Florida Fish and Wildlife Conservation Commission.



One outgrowth of the Wildlife Conservation Strategy is the Cooperative Conservation Blueprint. The Florida Fish andWildlife Conservation Commission, The Century Commission for a Sustainable Florida and Defenders ofWildlife are providing leadership on this project, the goal of which is to build agreement between government and private interests on using common priorities as the basis for state-wide land use decisions. When completed, it will include a fully unified set of Geographic Information System (GIS) data layers of conservation and development lands that will be available to all Floridians, and a package of recommended landowner incentives to apply the strategies statewide.