

Florida Forever Decision Support Data

Documentation

Florida Natural Areas Inventory

May 2010

**Funded by the
Florida Department of Environmental Protection,
Division of State Lands**



FLORIDA FOREVER DECISION SUPPORT DATA

The Florida Forever Decision Support Data consist of eight geographic data layers derived from the Florida Forever Conservation Needs Assessment data layers. The Assessment, originally created in December 2000, is a set of geographic data for 15 natural resource types specifically targeted for protection by the Florida Forever program (G. Knight et al. 2000). Detailed descriptions of these data may be found in the Florida Forever Conservation Needs Assessment Technical Report, Version 3.3 (FNAI 2010a) and overview maps of the Needs Assessment and Decision Support data are available online (www.fnai.org). Each data layer is divided into several priority classes to help focus conservation efforts. Although the original Needs Assessment data are useful for establishing baselines and measuring progress of the Florida Forever program, the scope and complexity of the data made interpretation difficult for decision-makers evaluating potential acquisition projects. The creation of the Florida Forever Decision Support Data is an effort to provide a more concise picture of the natural resources within projects and across the state and to eliminate redundancy among similar data. Based on recommendations of the Florida Forever Analysis working group some of the original Assessment data layers were combined into functional groups. In addition, some individual resource types were re-prioritized. Table 1 shows the original Conservation Needs Assessment data layers and the Florida Forever Decision Support data sets into which they are combined.

Several of the original Conservation Needs Assessment data layers are not included as part of the Florida Forever Decision Support Data. **Archaeological and Historical sites** (measures F1 and F2) were not included because cultural resource experts have not identified a method for prioritizing these sites in a quantifiable manner. Division of Historical Resources provides a separate evaluation of cultural resources on Florida Forever projects. **Imperiled species** (measure B6) and **forest land to maintain recharge** (measure G2) are not included because they are sufficiently captured by other data layers and will only be used in reporting progress of the Florida Forever program.

The Florida Forever Decision Support Data were designed for use in two primary analyses: 1) the Florida Forever Tool for Efficient Resource Acquisition and Conservation or F-TRAC (FNAI 2010b) and 2) the Single Resource Evaluation (FNAI 2010c). The data are used differently in each analysis but the primary purpose of both is to help inform acquisition decisions. Table 1 also identifies which data are used in each analysis.

Table 1. Derivation of the Florida Forever Decision Support Data from the original Conservation Needs Assessment and the analysis type that uses each data layer.

FL Forever Measure	Conservation Needs Assessment Data Layers	Decision Support Data Sets	Analysis Type
B1 B2	Strategic Habitat Conservation Areas FNAI Habitat Conservation Priorities	Species	F-TRAC, Single Resource Evaluation
B4 C6	Under-represented Ecosystems Fragile Coastal Resources - Uplands	Natural Communities	F-TRAC, Single Resource Evaluation
B3 B5	Significant Landscapes, Linkages, and Conservation Corridors Landscape-sized Protection Areas	Landscapes	Single Resource Evaluation
C4 C5	Natural Floodplain Significant Surface Waters	Surface Waters	F-TRAC, Single Resource Evaluation
C7 C6	Functional Wetlands Fragile Coastal Resources - Wetlands	Wetlands	F-TRAC, Single Resource Evaluation
G1	Sustainable Forestry	Forestry	F-TRAC, Single Resource Evaluation
D3	Aquifer Recharge	Aquifer Recharge	F-TRAC, Single Resource Evaluation
E2	Recreational Trails	Trails Network	Single Resource Evaluation

Resource Descriptions

The following resource descriptions rely on knowledge of how some of the original Conservation Needs Assessment data layers were created. Please refer to the Conservation Needs Assessment Technical Report Version 3.3 (FNAI 2010a) for complete descriptions of the original data from which the decision support data (described below) are derived.

SPECIES

The current Species model is based on species information contained in the 2009 Strategic Habitat Conservation Areas (SHCA) as modified for the Florida Forever Conservation Needs Assessment (FNAI 2010a) and the FNAI Habitat Conservation Priorities Version 3 data layers. The 2009 SHCAs identify areas of habitat that are essential to sustain a minimum viable population for focal species of terrestrial vertebrates that were not adequately protected on existing conservation lands. The SHCAs include habitat data for 62 terrestrial vertebrate species, primarily on private lands, and are prioritized into five priority classes based on rarity (FNAI State and Global ranks). The FNAI Habitat Conservation Priorities layer was designed to identify areas important for species habitat based on both species rarity and species richness. FNAI mapped occurrence-based potential habitat for 248 species of

plants, invertebrates, and vertebrates, including aquatic species. Twenty-eight species were included in both the final SHCA and FNAI habitat analyses. In order to minimize redundancy between these two layers we combined the data following a rules-based approach as shown in Table 2.

Table 2. Priority classes for the species decision support data layer.

Priority	Description	Acres
Priority 1	Priority 1 for SHCA or FNAI Habitat Conservation Priorities	1,790,542
Priority 2	Priority 2 for FNAI Habitat Conservation Priorities	650,493
Priority 3	Priority 2 for SHCA or Priority 3 for FNAI Habitat Conservation Priorities	12,531,846
Priority 4	Priority 3 for SHCA or Priority 4 for FNAI Habitat Conservation Priorities	5,550,397
Priority 5	Priority 4 for SHCA or Priority 5 for FNAI Habitat Conservation Priorities	1,608,032
Priority 6	Priority 5 for SHCA or Priority 6 for FNAI Habitat Conservation Priorities	1,478,180
TOTAL		23,609,490

NATURAL COMMUNITIES

The natural community data layer combines the natural community data from the under-represented ecosystems and fragile coastal resources – uplands. (Note that coastal wetlands are included in the Wetlands decision support data). This data layer was prioritized based on Global Rank of the natural communities. Table 3 lists the natural communities, their G-ranks, and acreage statewide.

Table 3. Natural community type, G-rank, and acreage for natural community decision support data.

Natural Community	G-rank	Acres
Upland glade	G1	308
Pine rockland	G1	10,230
Lake Wales Ridge scrub	G2	285,578
Other scrub	G2	106,863
Rockland hammock	G2	11,333
Dry prairie	G2	188,200
Seepage slope	G3	12,140
Sandhill	G3	545,533
Sandhill upland lake	G3	110,394
Fragile coastal uplands (dune, coastal grassland, coastal strand, maritime hammock)		94,364
<i>NOTE: coastal scrub, rockland hammock included as stand-alone communities</i>		
Upland hardwood forest	G4	442,066
Pine flatwoods	G4	1,045,469
TOTAL		2,556,361

LANDSCAPES

The Landscapes Decision Support Data includes the Ecological Greenways as revised by Tom Hctor in 2008 for the Critical Lands and Water Identification Project and the Landscape-sized Protection Areas data layer. These datasets formerly were combined to create an overall Landscapes Decision Support Data layer; now, however, they are retained as separate layers but used in concert to provide a single resource evaluation of projects based on Landscapes.

The Ecological Greenways Network was prioritized into 8 priority classes based on the following criteria:

- 1) Potential importance for maintaining or restoring populations of wide-ranging species (e.g., Florida black bear and Florida panther)
- 2) Importance for maintaining a statewide, connected reserve network from south Florida through the panhandle.
- 3) Other important landscape linkages that provide additional opportunities to maintain statewide connectivity especially in support of higher priority linkages.
- 4) Importance as a riparian corridor to protect water resources, provide functional habitat gradients, and to possibly provide connectivity to areas within other states.

The top two priorities, Critical Linkages 1 and 2, were selected based on several factors, including how critical an area is to completing a connection in the Network and between existing conservation lands; the threat of land conversion; and the feasibility of acquisition. For a detailed report on critical linkages, please contact Tom Hoctor, Geoplan Center, University of Florida.

The Landscape-sized Protection Areas were prioritized by resource experts into three classes based on their contribution to the protection of biodiversity and overall ecological integrity.

For a complete description of how the Ecological Greenways and Landscape-sized Protection Areas are used to assign a single resource rank to projects for Landscapes please see the Single Resource Evaluation Documentation (FNAI 2010c)

Table 4 lists the priorities and acreage statewide for the individual Ecological Greenways and Landscape-sized Protection Areas data layers.

Table 4. Priority classes and acreages for the Landscapes decision support data.

Ecological Greenways Priority	Acres	Landscape-sized Protection Areas	Acres
Critical Linkages 1	8,148,894	Priority 1	1,966,402
Critical Linkages 2	2,310,582	Priority 2	2,878,210
Priority 1	1,386,845	Priority 3	1,860,158
Priority 2	2,525,845	-	-
Priority 3	1,237,231	-	-
Priority 4	1,028,506	-	-
Priority 5	1,165,315	-	-
Priority 6	4,078,041	-	-
TOTAL	21,881,259	TOTAL	6,704,770

SURFACE WATERS

The significant surface water protection and natural floodplain data sets were combined into a single data layer with 7 priority classes. An explanation of the two original data sets is required to understand the combined priorities.

The significant surface water data identifies significant surface waters of the state, which include the following: Outstanding Florida Waters, National Scenic Waters and National Estuaries, shellfish harvesting areas, seagrass beds, springs, water supply and waters important for imperiled fish. We created 7 prioritized sub-models based on the waters listed above. These sub-models were combined into a single surface water model with 6 priority classes as shown in Table 5. Detailed methodology for the surface water model may be found in the Conservation Needs Assessment Technical Report Version 3.3 (FNAI 2009a).

Table 5. Priority classes and acreages for the significant surface waters data layer.

Priority	Acres
Priority 1	1,202,053
Priority 2	7,333,558
Priority 3	2,345,547
Priority 4	11,464,613
Priority 5	2,095,251
Priority 6	4,729,060
Priority 7	2,527,567
TOTAL	31,697,649

Natural floodplain was identified using 2003 FWC Landsat land cover data and to a lesser degree Water Management District land cover data. Detailed methodology for the floodplain data layer may be found in the Conservation Needs Assessment Technical Report Version 3.3 (FNAI 2009a). These data were prioritized based on the degree of “naturalness” of the floodplain, which was estimated through the use of FNAI Potential Natural Areas (PNA). The PNAs are ranked from P1 to P4 based on size, perceived quality, and type of natural community present. PNAs with these ranks were grouped into “high quality” natural areas. Floodplains within these areas were assigned the highest priority (Priority 1). PNAs ranked P5 are areas that do not meet the criteria for P1 – P4 but are nonetheless believed to be ecologically viable tracts of land representative of Florida’s natural ecosystems. Floodplains that occur within P5 areas were assigned Priority 2. Floodplains outside of PNAs were assigned Priority 3. Table 6 shows the priority classes for floodplain.

Table 6. Priority classes and acreages for natural floodplain data.

Priority	Acres
Priority 1 (floodplain within PNA 1-4)	679,632
Priority 2 (floodplain within PNA 5)	321,974
Priority 3 (floodplain outside PNAs)	411,848
TOTAL	1,413,454

Table 7 shows how the floodplain and significant surface water data sets were combined into the surface waters decision support data layer and describes the seven resulting priority classes.

Table 7. Priority classes for the surface waters decision support data layer.

Priority	Description	Acres
Priority 1	Priority 1 or 2 surface water <i>and</i> Priority 1 floodplain; OR Priority 1 surface water <i>and</i> Priority 2 floodplain	688,222
Priority 2	Priority 1 floodplain (no surface water); OR Priority 1 surface water (no floodplain); OR Priority 1 floodplain <i>and</i> Priority 3-6 surface water; OR Priority 2 floodplain <i>and</i> Priority 2 surface water; OR Priority 1 surface water <i>and</i> Priority 3 floodplain	1,909,186
Priority 3	Priority 2 floodplain (no surface water); OR Priority 2 surface water (no floodplain); OR Priority 2 floodplain <i>and</i> Priority 3-6 surface water; OR Priority 3 floodplain <i>and</i> Priority 2-3 surface water	7,036,441
Priority 4	Priority 3 floodplain (no surface water); OR Priority 3 surface water (no floodplain); OR Priority 3 floodplain <i>and</i> Priority 4-6 surface water	2,283,257
Priority 5	Priority 4 surface water (no floodplain)	10,659,883
Priority 6	Priority 5 surface water (no floodplain)	2,010,061
Priority 7	Priority 6 surface water (no floodplain)	7,134,700
TOTAL		31,721,750

WETLANDS

The wetlands data layer is based on wetlands identified in the Land Use Land Cover developed by the water management districts and Department of Environmental Protection. Wetlands were assigned priorities based on natural quality using a Land Use Intensity index (LUI) developed by Tom Hoctor at the University of Florida and the FNAI Potential Natural Areas (PNA).

The LUI characterizes the intensity of land use across the state on a scale of 1 – 10 with 10 being the least intense (most natural). Intensity is based on a multi-scale neighborhood analysis of five general categories of land use: natural, semi-natural (such as rangelands and pine plantation), improved pasture, agricultural/low-intensity development, and high intensity development. The assumption is that areas dominated by high intensity land uses are more likely to have severe ecological threats and much lower ecological integrity than areas dominated by natural land cover.

The PNAs are ranked from P1 to P4 based on size, perceived quality, and type of natural community present. PNAs with these ranks were grouped into “high quality” natural areas. PNAs ranked P5 are areas that do not meet the criteria for P1 – P4 but are nonetheless believed to be ecologically viable tracts of land representative of Florida’s natural ecosystems.

Table 8 shows how both the LUI and PNAs were applied to help refine the prioritization of functional wetlands. Table 9 lists the wetland priorities and their acreages.

Table 8. Prioritization method for wetlands based on Land Use Intensity index and FNAI Potential Natural Areas.

Land Use Intensity Index	PNA 1 - 4	PNA 5	Non-PNA
10 (<i>lowest intensity</i>)	Priority 1	Priority 2	Priority 2
9	Priority 2	Priority 3	Priority 3
8	Priority 3	Priority 3	Priority 4
7	Priority 3	Priority 4	Priority 4
6	Priority 4	Priority 4	Priority 5
5	Priority 4	Priority 5	Priority 6
4	Priority 5	Priority 6	Priority 6
1 - 3	Priority 6	Priority 6	Priority 6

Table 9. Priority classes and acreages for wetlands decision support data.

Priority	Acres
Priority 1	4,400,160
Priority 2	2,231,177
Priority 3	2,422,856
Priority 4	1,683,268
Priority 5	318,908
Priority 6	288,786
TOTAL	11,345,155

TRAILS NETWORK

A Trail Opportunities Network was developed as part of the Florida Greenways and Trails System to identify a set of potential trail corridors that provide a connected set of linear recreational opportunities statewide (Florida Department of Environmental Protection and Florida Greenways Coordinating Council 1998, 2004). The Trails Network is designed to provide opportunities to move along trails systems from major city to major city and from those urban areas to sites of historic, cultural and ecological significance. The trail opportunities are composed of sub-network corridors for hiking, multi-use, and paddling. Version 3.3 is based on the 2008 Update and Prioritization of Florida's Trail Network (Goodison et al. 2008; <http://www.floridatrailnetwork.com/download.html>).

For the Florida Forever Decision Support Data we combined the sub-network corridors for hiking and multi-use into a single prioritized set of corridors; paddling trails were excluded. If trail types overlapped, the segment retained the priority of the highest ranked segment. Because the original corridors are 4 km wide, analyses based on trails can be calculated in acres or kilometers. One acre of

trail corridor approximates 1 m of linear trail segment. Table 10 lists the trail priorities and their linear corridor distances.

Table 10. Priority classes and acreages for trails network decision support data.

Priority	Description	KM
Priority 1	High Priority designation based on recreation potential	6,312
Priority 2	Medium Priority designation based on recreation potential	2,437
Priority 3	Low Priority designation based on recreation potential	3,842
TOTAL		12,591

SUSTAINABLE FORESTRY

The Sustainable Forestry data layer identifies existing pinelands (natural and planted) and former pinelands that are potentially available for forest management. Prioritization is based on 4 criteria set by the Division of Forestry: whether trees are natural or planted, size of tract, distance to market, and hydrology. Large tracts of natural pine on mesic soils (versus very dry or wet) that are within 50 miles of a mill receive the highest priority. Former pinelands that currently do not have trees receive the lowest priority (Table 11).

Table 11. Criteria used to prioritize the sustainable forestry data layer.

CRITERIA (% influence on score)	DATA LAYER	SCORE
NATURAL VS. PLANTED PINE (24%)	WMD land cover	
natural		10
plantation		8
Potential <i>(agricultural lands that could be restored to pine)</i>		0
SIZE (33%)	WMD land cover	
≥ 7,500 acres		10
2,500 – 7,500 acres		5
<2,500 acres		1
MILES TO MARKET (33%)	Natural Resource Planning Services, Inc.	
< 50 mi		10
50 - 100 mi		5
≥ 100 mi		1
HYDROLOGY (10%)		
Mesic	Pinelands not in the dry or wet categories (see below)	10
Dry	Davis Map (historic longleaf area)	5
Wet	NWI – wet pinelands	1

The forestry data were scored based on the 4 criteria above, resulting in a grid with grid cell scores ranging from 273 to 990. The highest potential score was 1000:

Natural pine	+	>7,500 acres	+	<50 mi to market	+	mesic site	
10 pts X 24%	+	10 pts X 33%	+	10 pts X 33%	+	10 pts X 10%	
230 pts	+	330 pts	+	330 pts	+	100 pts	= 1000

We divided the resulting data layer into 4 priority classes and added a fifth class for “potential” pineland (agricultural lands that could be restored to pineland). The breaks for the 4 priority classes were determined based on the type of information represented by the four criteria.

Table 12 describes the justification and lists acreage for each priority class.

Table 12. Descriptions, scores, and acreages for the priority classes of the forestry data layer.

Priority Class	Scores	Description	Total Acres
Priority 1	950-990	Contains at least the top scores for all criteria except Hydrology and at least the middle score for Hydrology.	2,923,834
Priority 2	737-894	Contains at least the middle scores for three of the criteria and top score for Size or Distance to Market	2,012,338
Priority 3	522-693	Contains at least the middle scores for all criteria except Hydrology.	3,081,562
Priority 4	273-495	Contains remainder of pinelands not captured above.	132,657
Priority 5	N/A	Potential pinelands	3,429,984
Total			18,211,711

AQUIFER RECHARGE

The aquifer recharge base data layer was developed by Advanced Geospatial, Inc. (AGI) and further prioritized by FNAI in consult with AGI and Florida Geological Survey. The priority classes are based on the following data inputs: soil hydraulic conductivity, proximity to karst features, depth to water and overburden, overlap with Springs Protection Areas and overlap with buffers to public water supply wells. Detailed methodology for the aquifer recharge model may be found in the Conservation Needs Assessment Technical Report Version 3.3 (FNAI 2009a). Table 13 lists the recharge priorities and acreages.

Table 13. Priority classes and acreages for aquifer recharge decision support data.

Priority	Description	Acres
Priority 1	Very High Priority designation based on aquifer recharge potential & vulnerability	1,005,961
Priority 2	High Priority designation based on aquifer recharge potential & vulnerability	3,253,838
Priority 3	Medium-High Priority designation based on aquifer recharge potential & vulnerability	6,226,784
Priority 4	Medium Priority designation based on aquifer recharge potential & vulnerability	7,579,290
Priority 5	Medium-Low Priority designation based on aquifer recharge potential & vulnerability	6,736,139
Priority 6	Low Priority designation based on aquifer recharge potential & vulnerability	8,626,369
TOTAL		33,428,381

REFERENCES

Duever, L. and J. Teisinger. 2001. Prioritization of Recreational Trail Opportunities for the State of Florida. Florida Department of Environmental Protection, Office of Greenways and Trails. Tallahassee, Florida.

Florida Department of Environmental Protection and Florida Greenways Coordinating Council. 1998. Connecting Florida's Communities with Greenways and Trails: The Five-Year Implementation Plan for the Florida Greenways and Trails System. Florida Department of Environmental Protection, Office of Greenways and Trails. Tallahassee, Florida.

Florida Department of Environmental Protection and Florida Greenways Coordinating Council. 2004. 2004 Update and Prioritization of Florida's Trail Network. Florida Department of Environmental Protection, Office of Greenways and Trails. Tallahassee, Florida.

Florida Panther Subteam of the Multi-Species/Ecosystem Recovery Implementation Team for South Florida. 2002. Landscape Conservation Strategy for the Florida Panther in South Florida. U.S. Fish and Wildlife Service. Vero Beach, Florida.

Goodison, C., K. Norris, and A. Thomas. 2008. 2008 Update and Prioritization of the Recreational Trail Opportunity Maps for the State of Florida. GeoPlan Center, University of Florida.

Knight, G., J. Oetting, and A. Knight. 2000. Florida Forever Conservation Needs Assessment Summary Report. Florida Natural Areas Inventory. Tallahassee, Florida.

Florida Natural Areas Inventory. 2010a. Florida Forever Conservation Needs Assessment Technical Report, Version 3.3. Florida Natural Areas Inventory. Tallahassee, Florida.

Florida Natural Areas Inventory. 2010b. Florida Forever Tool for Efficient Resource Acquisition and Conservation: Model Documentation and Project Evaluation, May 2010. Florida Natural Areas Inventory. Tallahassee, Florida.

Florida Natural Areas Inventory. 2010c. Florida Forever Single Resource Evaluation Documentation.
Florida Natural Areas Inventory. Tallahassee, Florida.