UPDATE OF THE FLORIDA ECOLOGICAL GREENWAYS NETWORK

A report by

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June, 2004

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Introduction

The original Florida Ecological Greenways Network was completed by July 1998 using a variety of available GIS data layers to delineate large, connected areas of ecological significance statewide (Carr et al. 1998; Hoctor et al. 2000). Since then, new information on land use changes and new data and analyses regarding areas of ecological significance have become available. Designing conservation networks to protect natural resources must be an iterative process that incorporates new information and adjusts plans as needed (Noss and Cooperrider 1994; Hoctor 2003). For the Florida Ecological Greenways Network, this process includes deleting areas from consideration that have been developed and adding additional lands that meet the criteria as large, connected areas of ecological significance. This report covers the revision of the existing boundaries of the Florida Ecological Network to account for land use changes and to improve the delineation of areas of opportunity using new data and methods that enhance the identification of large, connected landscapes.

Methods

Based on discussions with staff from the Florida Fish and Wildlife Conservation Commission, The Nature Conservancy, and the Florida Natural Areas Inventory, it was determined that the Florida Ecological Greenways Network would be revised in two ways. First, any intensive development (residential, commercial, industrial) that has occurred within the boundaries of the Network since the original delineation would be deleted. Second, new data on areas of ecological significance and reanalysis of some original data would be compared to the Network and new areas would be added where they augmented large, connected landscapes.

Data for potential inclusion in the process was collected from the Florida Fish and Wildlife Conservation Commission, Florida Natural Areas Inventory, The Nature Conservancy, U. S. Fish and Wildlife Service, South Florida Water Management District (SFWMD), Southwest Florida Water Management District (SWFWMD), St. Johns Water Management District (SJRWMD), Suwannee River Water Management District (SRWMD), the Alachua County Forever Land Conservation Program, Dr. Joan Morrison for data on the Crested caracara (*Caracara cheriway*), and Dr. Tom Hoctor for data on the Florida black bear (*Ursus amercanus floridanus*).

The existing Florida Ecological Greenways Network was used as the base boundary for the analysis. New data on areas of ecological significance and some data used in the original delineation process were then examined for significance. Such areas were added to the Florida Ecological Greenways Network when they identified additional large, connected landscapes worthy of inclusion. Before this was done, all new areas of intensive development were deleted from both the Florida Ecological Greenways Network and areas of addition. Then, the new Network was optimized by filling in narrow gaps and deleting areas that were only marginally connected to the rest of the Network.

All GIS analysis was conducted using either ESRI's ArcView 3.2 or Arc-Info 8.1 software. Raster analysis was used in all cases except when buffering Crested caracara nest locations. The cell size used in the initial analysis of intensive land uses and additional priority ecological areas was 30 meters, and consolidation and optimization of the revised Florida Ecological Greenways Network was conducted at 90 meters.

A. Identification of Intensive Development

Two primary sources of information were used to identify areas of intensive development that would not be compatible with the conservation objectives of the Florida Ecological Greenways Network. We used land use data from each of the state's five Water Management Districts as the primary data source. The districts use the Florida Land Use, Cover, and Forms Classification System (FLUCCS) and both aerial photography and imagery to classify land use and land cover into a detailed hierarchical system that identifies residential, commercial, industrial, mining, agricultural, rangeland, natural/semi-natural uplands and wetlands, water bodies, disturbed lands, and transportation, waste management, communications, water supply, and energy production infrastructure. Resolution varies by Water Management District and ranges from approximately from 1/4 acre for wetlands and up to 5 acres for uplands.

All districts have completed a 1995 version of their land use data. Though several districts are working on 1999-2000 updates, we were only able to obtain 1999-2000 updated land use data for the Southwest Florida and St. Johns River Water Management Districts. Therefore these updated versions were used along with the 1995 land use data for SFWMD, SRWMD, and Northwest Florida Water Management District (NWFWMD) to identify intensive land uses. All residential, commercial, industrial, most institutional (except military), and all non-linear transportation, communication, sewage treatment, and energy production/distribution infrastructure was identified as intensive development. Linear features such as roads, gas pipelines, railroads, and power lines are not included since ecological greenways will have to cross such features.

To enhance the identification of new intensive development in the three districts without updated land used data, we examined DOQQ imagery from 1999-2000 to identify all areas where intensive development has occurred within or near the Florida Ecological Greeenways Network boundaries since 1995. The boundaries of areas that were included for examination included the Florida Ecological Greenways Network and preliminary data that identified areas more likely to be added to the Network. Imagery was compared to the intensive land use identified in the 1995 Water Management District data. All areas that appeared to be developed since 1995 were delineated as new intensive development. In questionable cases, areas were more frequently included as developed when they were near growing urban centers and were typically not included when they occurred in more rural landscapes.

Once the identification of new intensive land use was completed, we merged the 1999-2000 SWFWMD and SJRWMD land use data, the 1995 land use data for the three other Water Management Districts, and the new intensive land use data identified from the 1999-2000 DOQQ data to create one intensive land use dataset for comparison with the existing Florida Ecological Greenways Network and potential additions.

B. Collection and Consideration of Data to Identify Additional Areas of Ecological Significance

After collecting new data on areas of ecological significance, we conducted a meeting at The Nature Conservancy Office on May 1 to discuss suitable data and criteria for identifying areas of ecological significance that were sufficiently important to potentially add to the Florida Ecological Greenways Network. Representatives of The Florida Fish and Wildlife Conservation Commission, Florida Natural Areas Inventory, The Nature Conservancy, the Suwannee River Water Management District, and the Northwest Florida Water Management District attended the meeting. Data sources that were discussed included:

1) New existing and proposed conservation lands from Florida Natural Areas Inventory, the Water Management Districts, and potentially relevant landscape-level data from county land conservation programs.
2) New species and hotspot models from the Florida Fish and Wildlife Conservation Commission (FWC);
3) Species models created by Florida Natural Areas Inventory (FNAI) for the Florida Forever Needs Assessment;
4) A new Florida panther habitat model by the Florida Panther Subteam of the U.S. Fish and Wildlife Service (USFWS);
5) A Florida black bear habitat quality model by Dr. Tom Hoctor as part of his dissertation research;
6) New Crested caracara nest location data from Dr. Joan Morrison.
6) Ecoregional planning data from The Nature Conservancy;
7) Designated critical habitat for federally listed species from the USFWS;
7) Revised buffers around selected significant water bodies; and
8) Water resource data from FNAI's Florida Forever Needs Assessment.

The group determined that available existing and proposed conservation lands, habitat models for species requiring additional habitat protection analyzed in the FWC's "Habitat Conservation Needs of Rare and Imperiled Wildlife in Florida" (Cox and Kautz 2000), the FWC's updated species richness hotspots, FNAI's (2001) species habitat conservation priorities from the Florida Forever Needs Assessment, and the new USFWS Florida panther habitat model should be used to identify additional areas important for conserving biodiversity. In addition, we agreed to reanalyze Strategic Habitat Conservation Areas from FWC's "Closing the Gaps in Florida's Wildlife Habitat Conservation System" (Cox et al, 1994) and use Joan Morrison's Crested caracara nest location data to update the Network to better represent species that can use agricultural lands.

The group also discussed two water resource data sets for addressing additional protection of hydrological functions and aquatic ecosystems. FNAI (2001) identified buffers around important water bodies statewide as part of the Florida Forever Needs

Assessment. We agreed to use the 1000-foot buffers as additional areas of ecological significance. The Florida Forever Needs Assessment also included the identification of natural floodplains, and we discussed using these areas as a "bumpup" or overlap criterion that would be compared with moderately important areas of biodiversity significance for potential inclusion within the Florida Ecological Greenways Network.

We agreed to further investigate the Florida black bear habitat model with Thomas Eason, the FWC's Bear Management Section Leader, and Randy Kautz from FWC's Office of Environmental Service in an additional meeting. After reviewing the model methods and results, we agreed that the model was suitable for use to revise boundaries of the Network and that values of 75% probability and greater should be used as the threshold for priority areas in the revision process.

The data the group determined not to incorporate in the process included The Nature Conservancy's Ecoregional Planning data and the USFWS critical habitat areas for various listed species. The ecoregional planning data was not used because it was not conducted in a consistent manner for the entire state, had a high degree of overlap with the existing Florida Ecological Greenways Network, and could be superseded with more specific data on habitat needs being used in the process. The available critical habitat areas were either already incorporated within the Network or represented areas (such as Piping Plover wintering sites) that were peripheral to the goals of the Florida Ecological Greenways Network.

Another meeting was held in October 28, 2003 to review draft changes to the Florida Ecological Greenways Network with the same participants. The result of this meeting was to accept the process developed while further exploring the use of size thresholds when spatially optimizing the Network. After this work was completed, the proposed changes to the Florida Ecological Greenways Network were presented to the Florida Greenways and Trails Council on May 20, 2004.

C. Data and Criteria Used to Identify Additional Areas of Ecological Significance (See Table 1)

1) Existing and proposed conservation lands

Existing conservation lands were obtained from FNAI, SRWMD, SWFWMD, and SJRWMD and represented updates at least through the end of 2002. Data from FNAI included updates through 2003. All such lands were considered to be priority areas for potential addition.

Florida Forever and Save Our Rivers land acquisition proposals were obtained from FNAI, SRWMD, SWFWMD, SJRWMD, and SFWMD. Data from the Water Management Districts included updates through 2002 while Florida Forever project areas included updates through 2003. In addition, proposed conservation lands from the Alachua County Forever land acquisition program were used. All such official land conservation projects were used as priority areas for potential addition.

2) New FWC habitat models for species requiring additional habitat protection

We used all new habitat data for all species that were identified in Cox and Kautz (2000) as needing additional habitat protection including seal salamander (*Desmognathus monticola*), Cedar Key mole skink (*Eumeces egregius insularis*), rimrock crowned snake

(*Tantilla oolitica*), painted bunting (*Passerina ciris*), silver rice rat (*Oryzomys palustris natator*), Sanibel island rice rat (*Oryzomys palustris sanibeli)*, Florida salt marsh vole (*Microtus pennsylvanicus dukecampbelli*), and Florida key deer (*Odocoileus virginianus clavium*). We used all identified habitat for these species as priority areas for potential addition.

Based on discussions with Randy Kautz, we only used priority areas identified for the Louisiana waterthrush (*Seiurus motacilla*) (Cox and Kautz 2000). Also based on discussions with Randy Kautz, Cooper's hawk (*Accipiter cooperii*) habitat is still too broad to be equivalent to Strategic Habitat Conservation Areas for other species and additional prioritization is needed before its habitat data can be used.

Other species were identified as requiring additional habitat conservation but habitat models have not yet been created for them including Georgia blind salamander (*Haediotriton wallacei*), four-toed salamander (*Hemidactylium scutatum*), striped mud turtle (*Kinosternon baurii*), Florida keys mole skink (*Eumeces egregius egregius*), and lower keys marsh rabbit (*Sylvilagus palustris hefneri*). Without such models, these species could not be explicitly included within the revision process.

Table 1. Data used to identify new areas of ecological significance

Data Layer	**Criterion/Threshold**
Existing conservation lands	All such lands
Proposed conservation lands	All such lands
New FWC habitat models	Only habitat models for species needing additional protection beyond existing conservation areas and Strategic Habitat Conservation Areas including: seal salamander, Cedar Key mole skink, rimrock crowned snake, painted bunting, silver rice rat, Sanibel island rice, Florida salt marsh vole, Florida key deer, and Louisiana waterthrush (priority areas only)
FWC species richness hotspots	Areas that are potential habitat for 9 or more focal species
FWC SHCAs for species that can use agricultural lands. This is to correct the deletion of agricultural SHCAs in the original delineation of the Florida Ecological Greenways Network.	Only SHCAs for species that can use many agricultural lands including: Florida sandhill crane, southeastern american kestrel, mottled duck, American swallow-tailed kite, short-tailed hawk, and Florida grasshopper sparrow
USFWS Florida panther conservation zones	All areas except intensive development within the Primary and Dispersal Zones for the Florida panther. Areas identified as panther habitat within the Secondary Zone and additional Strategic Habitat Conservation Areas for the Florida panther
Crested caracara nesting zone habitat	All natural, semi-natural, and improved grasslands and rangelands, open freshwater

	marshes and wet prairie, and flatwoods with very low tree densities within 2500 meters of nest locations
FNAI species habitat conservation priorities	Priority levels 1 and 2 from the Florida Forever Needs Assessment data layer; priority levels were determined by the overlap of species habitat with greater rarity and poorly protected habitat
Florida black bear habitat model	all areas having a habitat quality index (based on probability) of 75% or higher
FNAI priority surface water protection buffers	Natural and semi-natural land cover within 1000 foot buffers around various designated water bodies including Outstanding Florida Waters, Aquatic Preserves, water bodies containing significant seagrass beds, National Estuarine Research Reserves, shellfish harvesting areas, and National Wild and Scenic Rivers
FNAI natural floodplains and "bumpup" criteria	all areas within natural floodplains that also contained moderately significant FWC species richness hotspots (5-8 species), or FNAI moderate species habitat priorities (priority level 3), or the 50-74% probability range of the Florida black bear habitat model

3) FWC species richness hotspots

The FWC also updated their species richness hotspots data by combining all species models done in their 1994 report (Cox et al. 1994) and the 2000 report (Cox and Kautz 2000). We analyzed these data using different methods for reclassifying into high, medium, and low priority levels. First, all areas containing habitat for no species were deleted from the statistical analysis. Then, areas containing potential habitat for 1 to 26 species were reclassified using ESRI's ArcView 3.2. All three methods examined (equal area, natural breaks, quantiles) resulted in the same species richness levels being included in the 3 priority levels (Table 2).

Table 2. Priority levels for FWC's species richness hotspots

Priority Level	**Number of Species**
High	9-26 species
Medium	5-8 species
Low	1-4 species

4) Reanalysis of SHCAs for species using agricultural landscapes

One of the modeling methods used in the original delineation of the Florida Ecological Greenways Network created a bias against incorporating suitable agricultural

lands for certain species requiring additional habitat conservation. Before identifying Hubs, areas of agricultural land use including improved pasture, croplands, and other uses were deleted from consideration. This step deleted some FWC SHCAs that should have been retained. Therefore, SHCAs for certain species that either depend, or can use, agricultural lands (Cox et al. 1994; Kautz and Cox 2001) were reanalyzed for addition. The species assessed included Florida sandhill crane (*Grus canadensis pratensis*), southeastern american kestrel (*Falco sparverius paulus*), mottled duck (*Anas fulvigula*), American swallow-tailed kite (*Elanoides forficatus*), short-tailed hawk (*Buteo brachyurus*), and Florida grasshopper sparrow (*Ammodramus savannarum floridanus*). The Florida panther (*Puma concolor coryi*) and crested caracara were also reanalyzed but were also combined with new habitat analyses that are discussed below.

All SHCAs for these species that overlapped with natural/semi-natural lands or pasture and cropland (except sugarcane) were included as priority areas.

5) Florida panther habitat data

The USFWS is implementing the South Florida Multi-Species Recovery Plan (USFWS 1999) to meet the recovery goals for all federally listed species in the region. As part of that process, a team of experts has developed a new Florida panther conservation zone map for southwest Florida. The Primary Zone, which is considered to be the most important area for protecting a self-sustaining population of the Florida panther, and the Dispersal Zone, which is needed to protect a landscape linkage for panthers to move around in areas in south-central Florida, were both used as priority areas.

The Secondary Zone, which includes additional areas that panthers use and could significantly enhance population viability with additional habitat restoration, was also used. However, due to the smaller amount of existing habitat within this zone, priority areas were only identified when they also overlapped with panther habitat also identified by the USFWS team. Finally, Florida panther SHCAs (Cox et al. 1994; Kautz and Cox 2001) were also used only when they overlapped with panther habitat identified by the team. SHCAs were important to represent the best available habitat area for potential panther restoration north of the Caloosahatchee River.

6) Crested caracara nesting zone habitat

The crested caracara has also been the subject of additional research since delineation of the original Florida Ecological Greenways Network. Data on nest locations has been significantly enhanced since delineation of the crested caracara SHCAs (Joan Morrison, personal communication; Morrison 1997; Cox et al. 1994). This nest data collected by Dr. Joan Morrison was used to identify nesting area foraging habitat that is potentially most critical for maintaining viable nesting territories. Based on recommendations from Dr. Morrison, new land cover data from FWC was used in combination with Water Management District land use data to identify all suitable habitat within 2500 meters of each nest location. The FWC is currently creating an updated land cover map for the state that was completed only for south Florida when the Network revisions were conducted. All natural, semi-natural, and improved grasslands and rangelands were included as habitat. Open freshwater marshes and wet prairie, and flatwoods with very low tree densities were also identified as potential habitat. As with

the Florida panther, the original FWC SHCAs for the crested caracara were also identified as priority areas when they overlapped with land cover and land use classes that serve as caracara habitat.

7) FNAI species habitat conservation priorities

FNAI conducted a species analysis using their element occurrence data and Water Management District land use data as part of the Florida Forever Needs Assessment (FNAI 2001). Habitat models for all species analyzed were combined where species with highest rarity and least protected on existing conservation lands receiving the highest priority. Therefore, priority areas in their model were determined by the amount of overlap of species with high levels of rarity and low levels of protection on existing conservation lands. FNAI recommended using priority levels 1 and 2 as priority areas for potential addition. We also used level 3 areas as moderate priorities in the modeling process.

8) Florida black bear habitat model

As part of his dissertation, Dr. Tom Hoctor developed a statewide black bear habitat model using multiple logistic regression modeling (Hoctor 2003). This model assessed the relationship between known locations of black bears (using radio telemetry data provided by the FWC and the University of Florida) with habitat and landscape variables including habitat classes, habitat diversity, habitat density, habitat patch size, road densities (using many different variations of road classes), roadless areas (also using different variations of road classes), density of intensive land uses, and distance from intensive land uses and major roads. The modeling technique determines what variables are most important for determining black bear occurrence and creates a probability surface identifying the likelihood of bear habitat. This probability surface can be used as bear habitat quality map where higher probabilities can be considered equivalent to higher habitat suitability. After discussions with Thomas Eason and Randy Kautz of FWC, all areas having a probability value of 75% or higher were used as priority areas for potential addition. We also used values of 50%-74% to represent areas of moderate significance.

9) FNAI priority surface water protection buffers

Although buffering of significant aquatic ecosystems was incorporated in the delineation of the Florida Ecological Greenways Network through the identification of coastal and riverine linkages/buffers during the original modeling process, we determined that using FNAI surface water buffer data from the Florida Forever Needs Assessment might identify some important additional areas. We used all the areas identified within 1000 foot buffers around various designated water bodies including Outstanding Florida Waters, Aquatic Preserves, water bodies containing significant seagrass beds, National Estuarine Research Reserves, shellfish harvesting areas, and National Wild and Scenic Rivers. However, these buffers were only included as priority areas when they also overlapped with natural and semi-natural land cover.

10) FNAI natural floodplains and "bumpup" criteria

The overlap between hydrological resources and areas of moderate ecological significance for biodiversity conservation was used in the delineation of the Florida Ecological Greenways Network. We developed a new overlap criterion for the identification of additional priority areas for potential addition. As part of the Florida Forever Needs Assessment, FNAI identified natural floodplains. Such areas are important for protecting hydrological functions and they also are frequently important areas for biodiversity conservation. Therefore, all areas within natural floodplains that also contained moderately significant FWC species richness hotspots (5-8 species), or FNAI moderate species habitat priorities (priority level 3), or the 50-74% probability range of the Florida black bear habitat model were also identified as priority areas for potential addition.

D. Consolidation of the existing Florida Ecological Greenways Network and additional areas of ecological significance

All new priority ecological areas above were then combined with the existing Florida Ecological Greenways Network. All areas that overlapped with intensive development were deleted. Then all remaining areas that were 5,000 acres or larger were identified and all smaller areas were deleted.

The new base Network boundary was then optimized and analyzed to delineate only areas that could be considered large, well-connected landscapes. The first step of the optimization process involved filling in very small gaps in the Network (180 meters wide or smaller) where there was suitable natural and semi-natural land uses. Then all holes in the Network that were smaller than 5,000 acres were identified. Within these gaps, all natural and semi-natural lands connected to the Network were added. However, based on the second meeting with the review committee, three other thresholds for gaps (1,000 acres, 2,500 acres, and 10,000 acres) were also investigated to determine how much difference the size threshold made in the acres added to the Network through optimization. Then, a neighborhood analysis was conducted to identify all connections that were less than 270 meters wide within new areas not in the original Florida Ecological Greenways Network boundary, and all such areas were deleted.

Finally, areas that were less than 50,000 acres and not connected to the larger statewide Network were also deleted. This threshold was selected because it matches the threshold used in the Florida Forever Needs Assessment for delineating large landscapes (FNAI 2001). This resulted in two areas being deleted: a 5,000-10,000 acre patch near Ft. Myers, and another 5,000-10,000 acre patch near St. Petersburg. Though these areas are important for conservation, they do not contribute to the protection of a larger, connected statewide greenways Network. It should also be noted that two large conservation hubs in the Florida Keys have been retained. One includes mostly protected waters in the primary Keys, which was largely included in the original Florida Ecological Greenways Network. The other is Dry Tortugas National Park. These hubs are hydrologically connected to the rest of the Network, but there is obviously no continuous land connection between the Keys and the rest of south Florida.

Results

The inclusion of the new ecological data results in some significant additions to the Florida Ecological Greenways Network (See Figures 1-6). In particular, there were two major "gaps" in the original delineation process that are filled through these new data and analyses. The first gap was the way open agricultural landscapes were handled in the southern half of peninsular Florida. Though rangelands and unimproved pasture could be included in the delineation of hubs in the original analysis, improved pasture and other open agricultural land uses were deleted. These areas can provide important habitat for some species of conservation interest (focal species), and the incorporation of such lands in south-central and southwest Florida better represents landscape and habitat conservation opportunities (Figure 6).

The second gap occurs in the region between the Apalachicola National Forest and Eglin Air Force Base. Data on ecological significance was relatively sparse in the original delineation process, but recent analyses indicate that this region is a biodiversity hotspot of at least national significance (Stein et al. 2000). The new data incorporated in this analysis allowed for much better representation of this landscape. Features of note include the delineation of a wider landscape linkage between the Apalachicola National Forest and Econfina Creek/Sand Mountain with several options to facilitate connectivity across this region (Figure 2). Also, aquatic biodiversity is extremely important in this area, and the new Network incorporates more connected stream networks that are important for conserving both riparian and aquatic biodiversity.

The proposed additions add 2.94 million new acres to the Florida Ecological Greenways Network. However, approximately 310,000 acres were lost from the Florida Ecological Greenways Network due to conversion to intensive development (Figure 7). Parts of the Network near Orlando were most affected, and the Three Lakes-Tosohatchee Critical Linkage and the Avon Park-Green Swamp Critical Linkage have been affected by development in the greater Orlando metropolitan area (Figure 7). With the 2.94 million acres of additions minus the 310,000 acres of losses from the original Ecological Greenways Network, the net gain in area is approximately 2.63 million acres. With the additions and deletions, the new Florida Ecological Greenways Network is now 25.62 million acres. However, even with the increase in acreage the percentage of the Network that is within existing conservation lands and public waters has stayed essentially the same with 52% in the original Network (Hoctor et al. 2000) and 51% in the new Network (Table 3). This is likely attributable to the large increase in public conservation lands since the delineation of the original Network. It should be noted that some of the additions to existing public conservation lands within the Network appear to be based on some open water being added to existing conservation lands in more recent conservation lands GIS data (See Table 3 and Table 4). The rest of the overall statistics for the revised Network and the original Florida Ecological Greenways Network are in Table 3 and Table 4.

Several steps within the update process resulted in additions of over 100,000 acres to the new Florida Ecological Greenways Network including: existing conservation lands, proposed conservation lands, FWC species richness hotspots, the Florida black bear habitat model, overlap of various criteria , and spatial optimization (Table 5).

The comparison of the different size thresholds for closing gaps in the new Network during spatial optimization did not result in significant differences in total acreage. For example, the difference between using a gap threshold of 1,000 acres or smaller and 5,000 acres and smaller was only 190,000 acres compared to a total of 2.94 million acres total added. Therefore, the original threshold of 5,000 acres was retained, especially since it matches the threshold used for determining hubs in the original Florida Ecological Greenways Network (Hoctor et al. 2000).

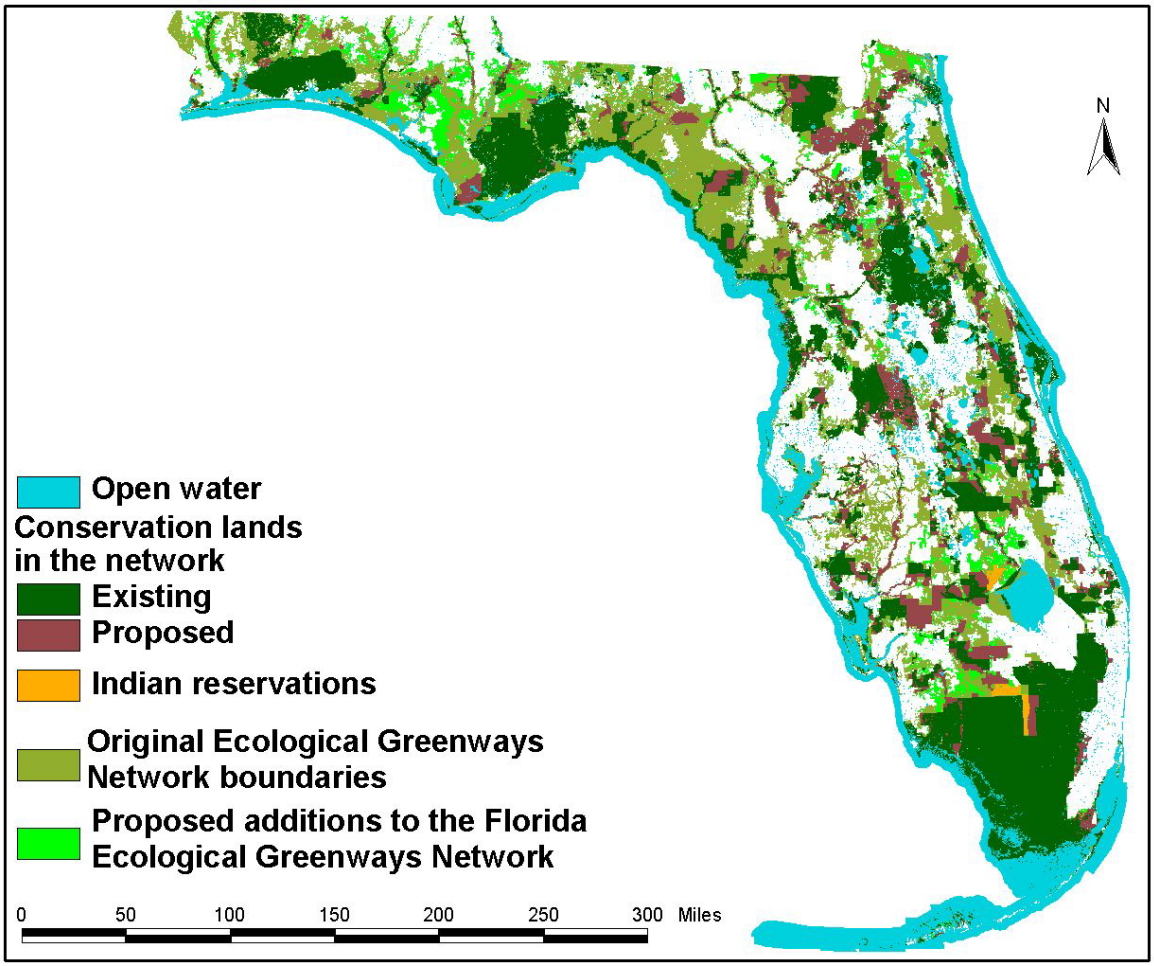

Figure 1. Proposed additions to the Florida Ecological Greenways Network. Elements of the Florida Ecological Greenways Network under open water are not shown.

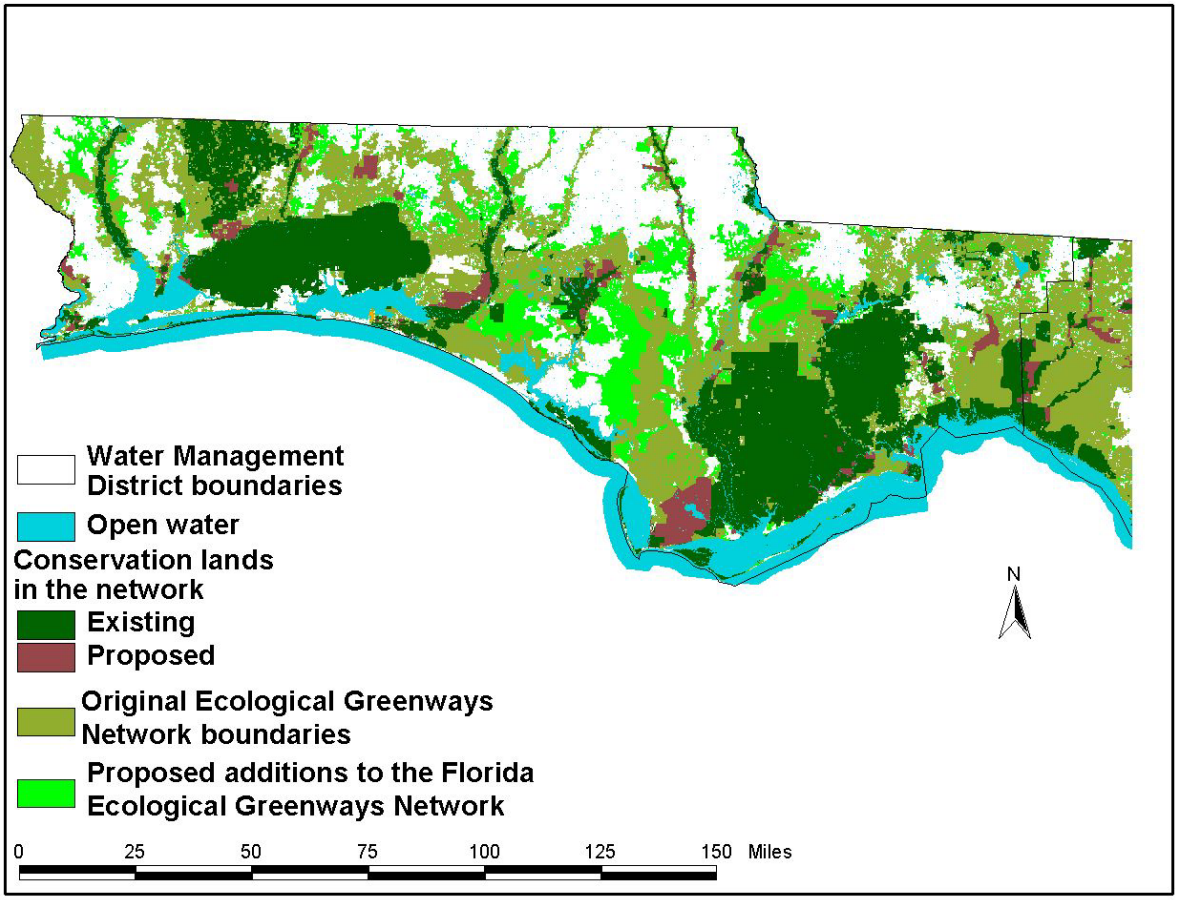

Figure 2. Proposed Florida Ecological Greenways Network in the Northwest Florida Water Management District.

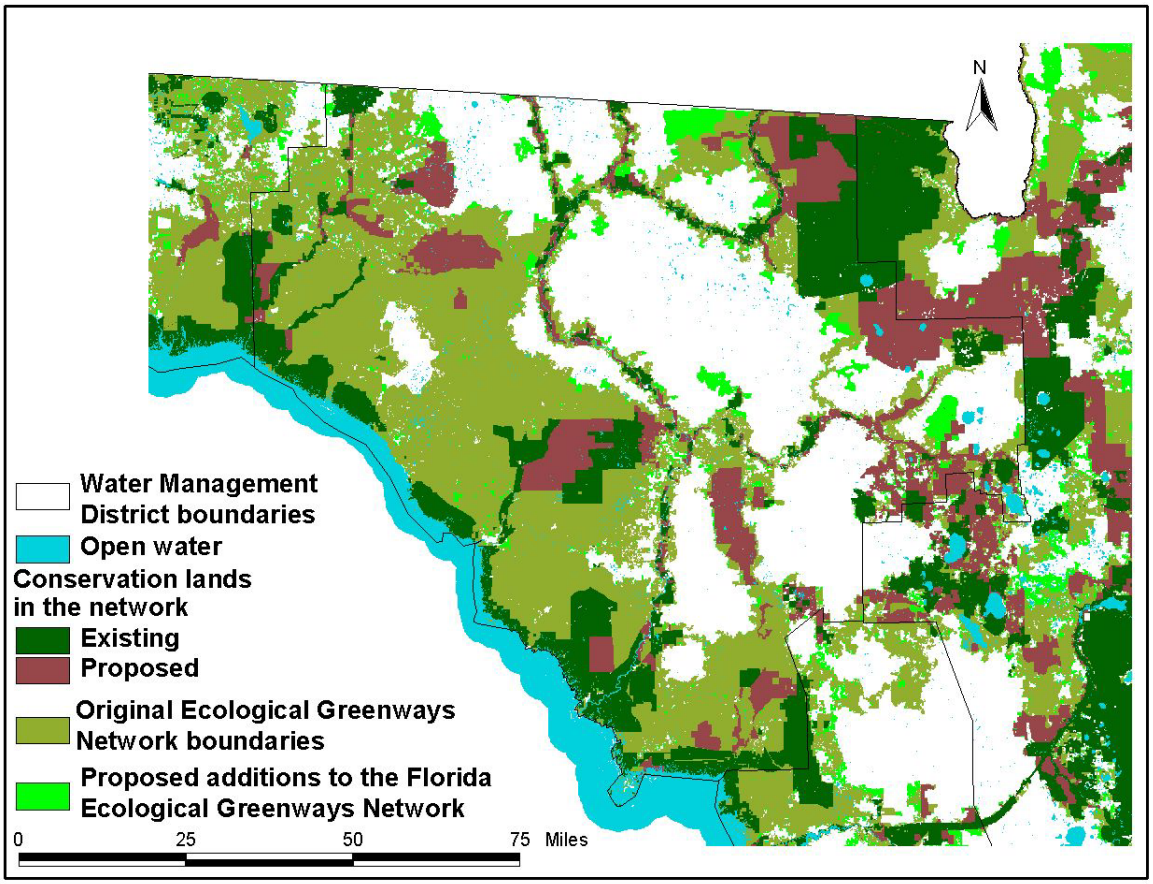

Figure 3. Proposed additions to the Florida Ecological Greenways Network in the Suwannee River Water Management District.

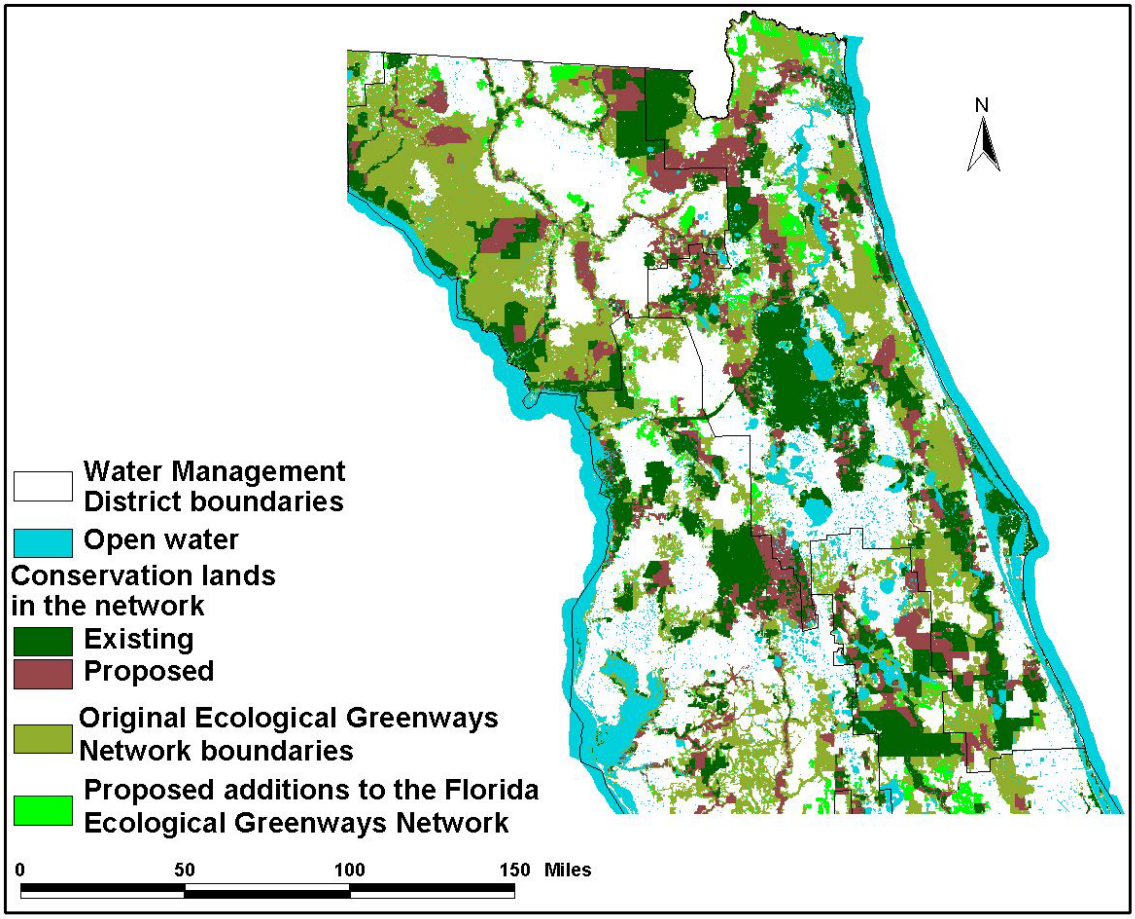

Figure 4. Proposed additions to the Florida Ecological Greenways Network in the St. Johns River Water Management District.

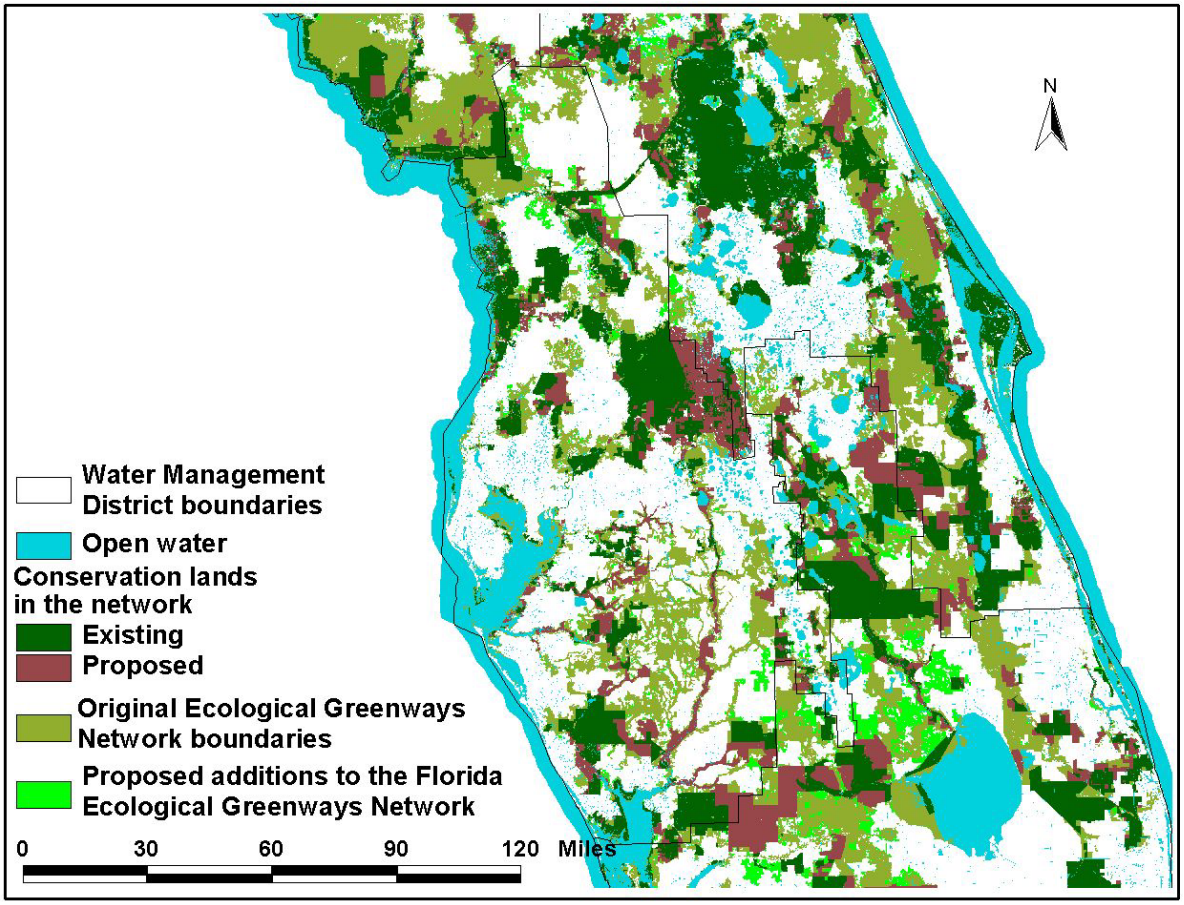

Figure 5. Proposed additions to the Florida Ecological Greenways Network in the Southwest Florida Water Management District.

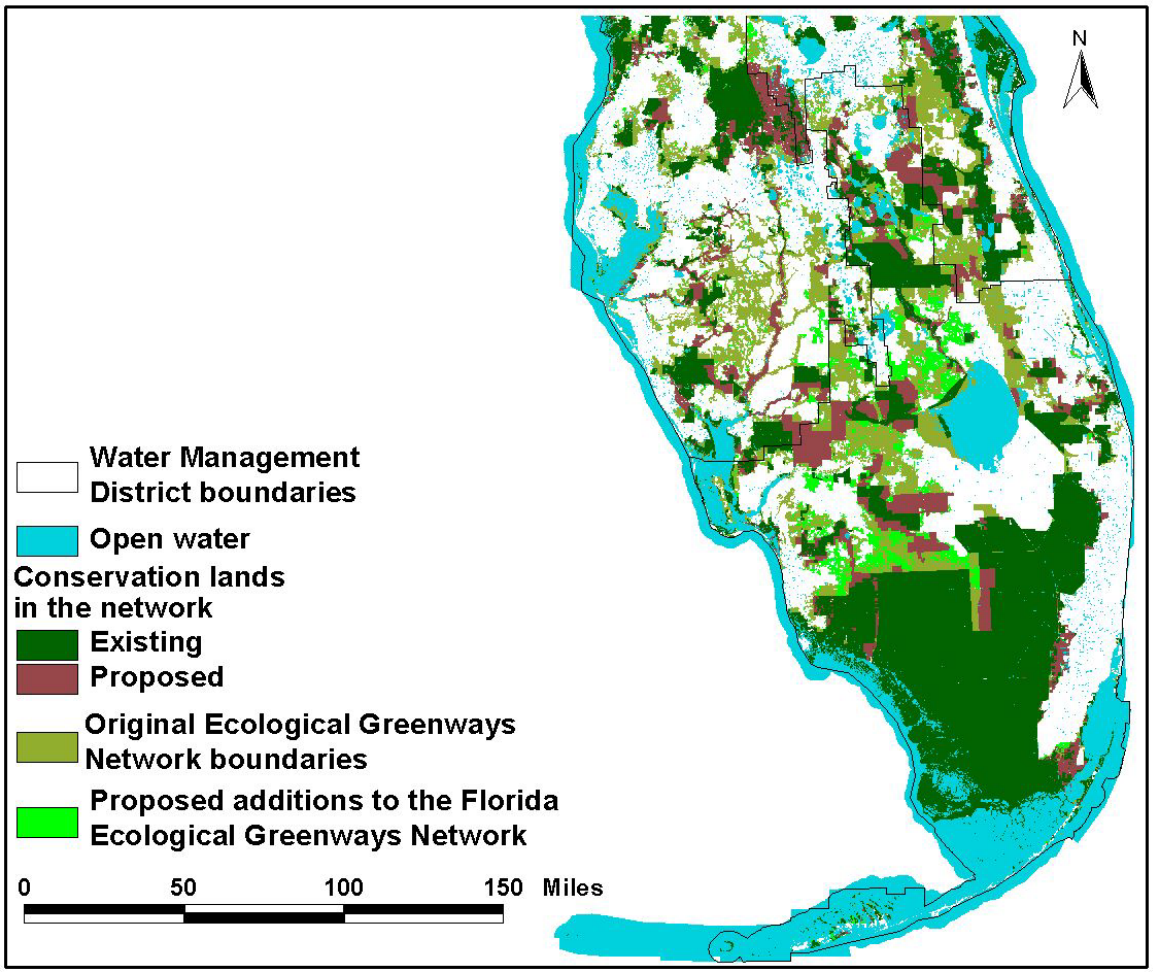

Figure 6. Proposed additions to the Florida Ecological Greenways Network in the South Florida Water Management District.

Table 3. Area of land in various land ownership categories within the proposed revised Florida Ecological Greenways Network.

Land Use	Acres	Percentage of model results
Public ownership	10,986,038	42.9%
Open water (outside existing conservation areas)	2,171,150	8.5%
Proposed public conservation lands	2,997,282	11.7%
Private ownership in wetlands[a]	2,594,194	10.1%
Private ownership in 100 yr. floodplain[a]	877,740	3.4%
Private ownership in uplands[a]	5,874,638	22.9%
Totals	25,601,250	100.0%

[a] Acres of private ownership in wetlands, floodplains, and uplands is calculated as if all proposed public acquisitions are/will be completed.

Table 4. Area of land in various land ownership categories within the original Florida Ecological Greenways Network (from Hoctor et al. 2000).

Land Use	Acres	Percentage of model results
Public ownership	8,228,269	34.8%
Open water (outside existing conservation)	4,098,082	17.4%
Proposed public conservation lands	2,504,277	10.6%
Private ownership in wetlands[a]	1,782,191	7.5%
Private ownership in 100 yr. floodplain[a]	1,667,995	7.1%
Private ownership in uplands[a]	5,337,960	22.6%
Totals	22,969,520	100.0%

[a] Acres of private ownership in wetlands, floodplains, and uplands is calculated as if all proposed public acquisitions are/will be completed.

Table 5. Acres added to the Florida Ecological Greenways Network by each priority criterion or model step.

Priority Category or Model Step	**Acres Added to Network**
Existing Conservation Lands	346,496
Proposed Conservation Lands	252,210
Florida Black Bear Habitat Model	314,114
FWC Species Richness Hotspots	314,214
Additional SHCA Analysis	45,730
New FWC Habitat Models	12,264
FNAI Species Habitat Conservation Priorities	30,684
Florida Panther Primary and Dispersal Zones	89,246
Florida Panther Secondary and SHCA Habitat	46,084
Crested caracara Nest Buffer Habitat and Crested caracara SHCA Habitat	118,696
FNAI Surface Water Protection Priorities	60,192
Bump Up Floodplains	112,708
Combination of Various Priorities	691,494
Network Optimization	600,732

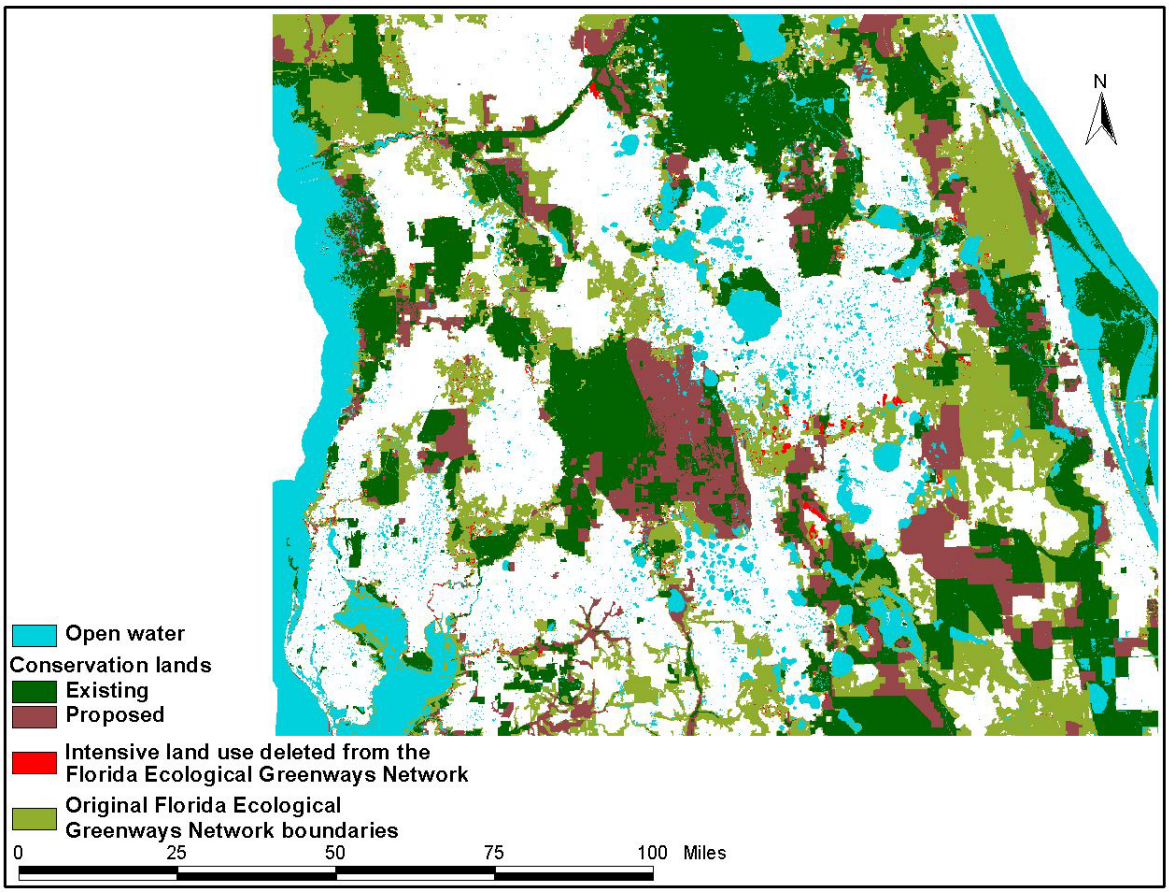

Figure 7. Areas deleted from the Florida Ecological Greenways Network in central Florida due to conversion to intensive land uses.

Discussion

The additions to the Florida Ecological Greenways Network add a net of 2.63 million acres. Spatially, these additions appear to address the major perceived deficiencies in the original Network in south-central/southwest Florida and in the Florida panhandle. Additions in south Florida, if protected, will provide a much better habitat base for species of conservation interest and will better represent large landscapes and linkages. The landscape linkage between Apalachicola National Forest and Eglin Air Force Base is one of the highest conservation priorities in the state (the western half is within the Eglin-Econfina Creek Critical Linkage). The additions will enhance opportunities for functional connectivity by widening the linkage between Apalachicola National Forest and Econfina Creek and providing more alternatives than relying on one narrow corridor.

No new landscape linkages were specifically added in the revision process since the addition and optimization process appears to have sufficiently addressed adding large, connected areas of ecological significance to the original Florida Ecological Greenways Network. However, there are two regional-scale linkages that could enhance the function of the Network, particularly for the Florida black bear. One potential addition would provide an alternative connection to following the upper Suwannee River where increasing development threatens the integrity of the corridor. This linkage heads due west from Pinhook Swamp to connect to the Alapaha River (Figure 8). The second linkage would provide an alternative to the existing Ocala National Forest-Osceola National Forest landscape linkage (which encompasses two Critical Linkages) (Figure 9). Neither linkage is critical to the Florida Ecological Greenways Network, but both represent good opportunities to close small gaps in the existing proposed additions to enhance Network function and provide alternatives as development continues to impede functional connections. These linkages could be officially added to the Network, or could remain as areas of interest noted within this report and for future planning activities.

The next step in the process is adding new areas within the Florida Ecological Greenways Network to the existing priority classes including Critical Linkages (Hoctor et al. 2002). In most areas this will likely involve adding the new areas based on their proximity to existing priority classes. However, this process might also provide the opportunity to reconsider some priorities including increasing and decreasing some priorities and consolidation of some priority classes (such as the current priority 2 and priority 3 classes). One particular area of interest is the landscape linkage between Apalachicola National Forest and Eglin Air Force Base. Recent activities to protect what is now called the Northwest Florida Greenway may justify inclusion of this entire landscape linkage within Critical Linkages, whereas only the western half is currently designated as a Critical Linkage (the Eglin-Econfina Creek Critical Linkage).

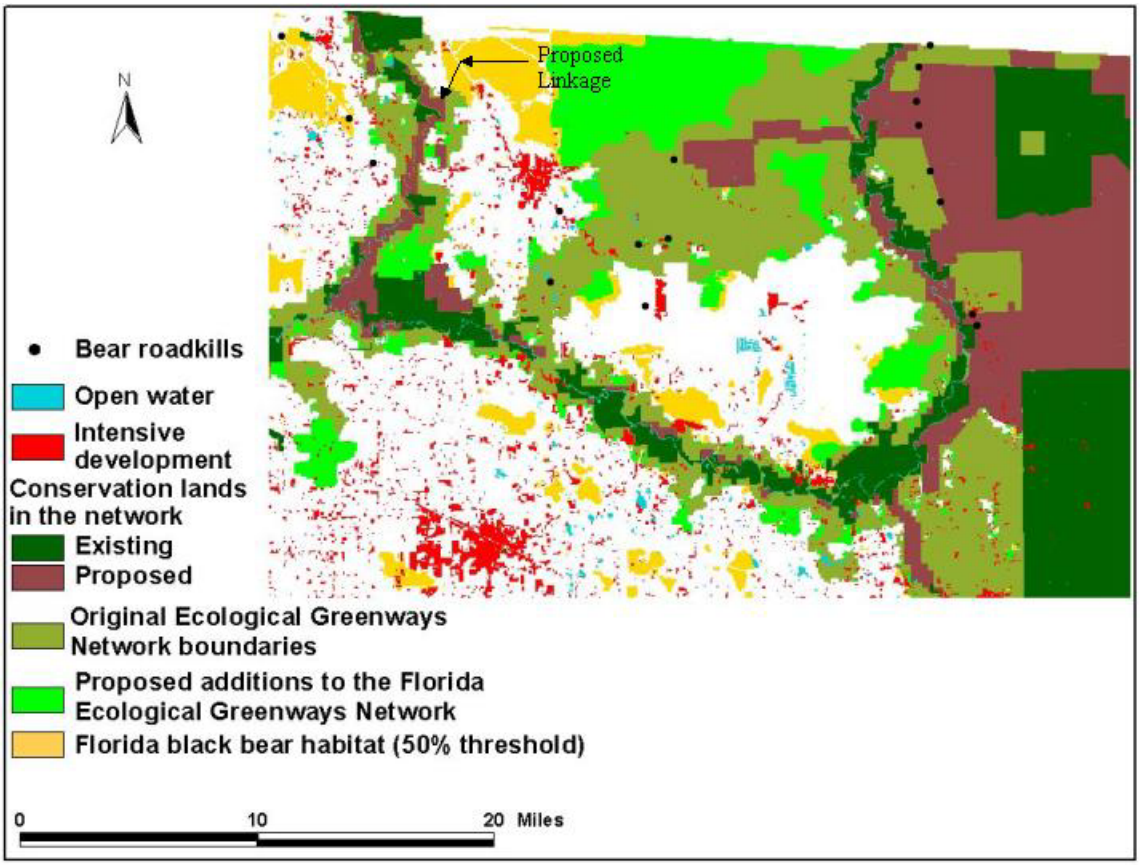

Figure 8. The Alapaha River corridor is located in the upper left corner of the figure. The proposed additional linkage would connect that large addition block to the east of the Alapaha River to the river via the black bear habitat represented in orange.

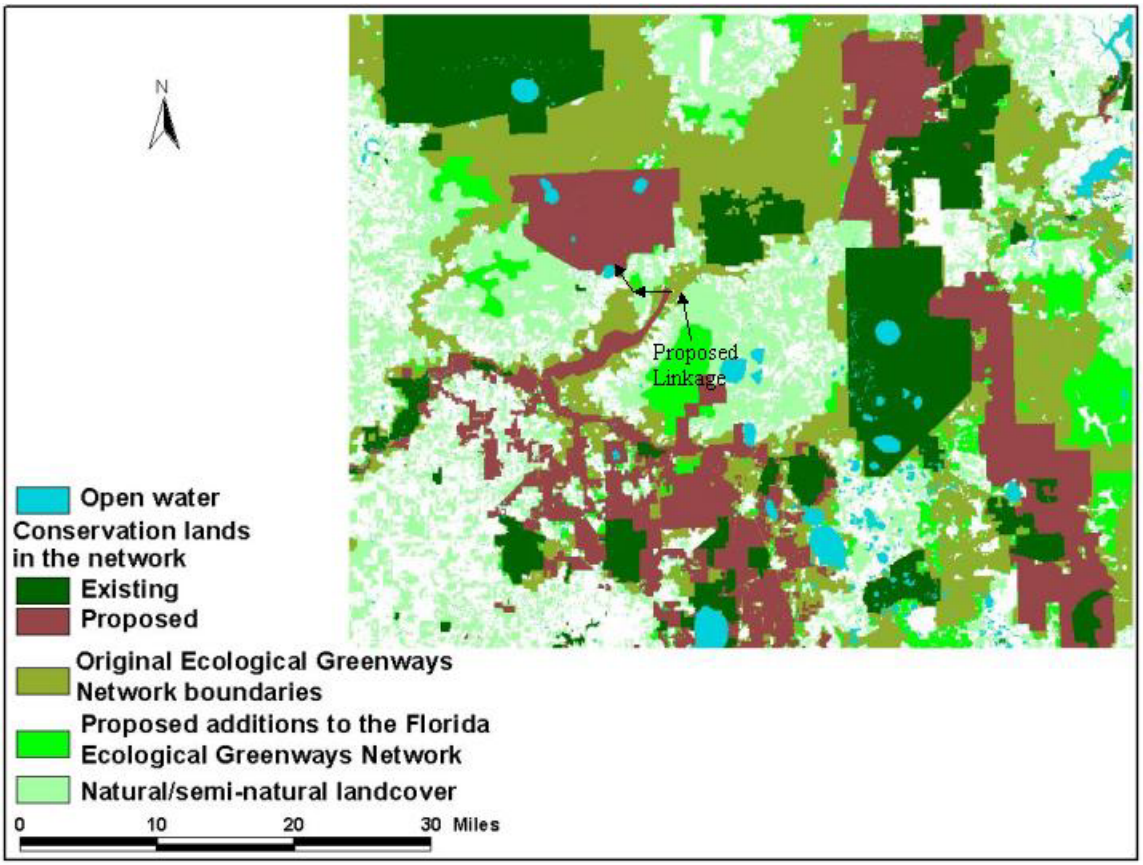

Figure 9. A small gap in the proposed additions could be closed to provide an alternative connection between the Ocala National Forest and Osceola National Forest. The alternative linkage would connect the Sante Fe River corridor to the Osceola National Forest through the New River basin.

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