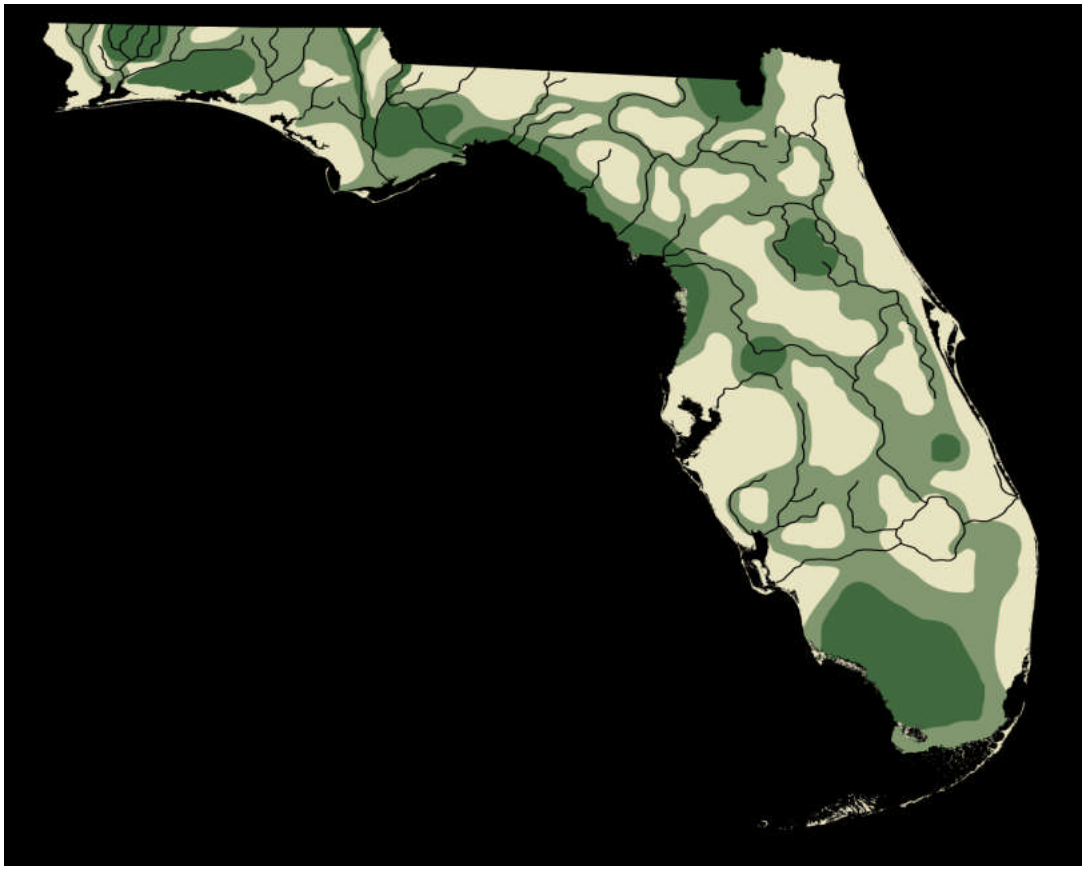
Florida's Evolving Large-scale Ecological Greenways System

By Doug Alderson & Dan Pennington

The female adult bear paused while ambling through the Osceola National Forest. She raised her head and sniffed. A male bear was in the area, one whose scent she didn't recognize. He had wandered in from the Ocala National Forest to the south. Their eventual mating would help affirm the reconnection between two of Florida's major black bear populations, forming the basis for a proposed ecological greenway connecting two large conservation areas.

For decades, a largely held belief was that the establishment of "islands" of national parks, wildlife refuges and other public lands was enough to ensure the survival of North America's bountiful wildlife. But far ranging animals such as Florida panthers and black bears don't necessarily check their movements at park or refuge boundaries, a fact that is true for many animal and plant species with smaller more compact ranges. Thus, in the 1930s and 40s, the idea of connecting large conservation areas with wildlife movement corridors first emerged.

In Florida, a peninsular state with distinct limits of geographic connectivity, skyrocketing population and sprawling growth were resulting in the dramatic disappearance of native landscapes, open space and wildlife habitats. Natural undisturbed areas have become increasingly fragmented with the ranges of many species being reduced or truncated. As a means to address these issues and provide some protection for fragmentation sensitive species, the concept of critical wildlife corridors—or ecological greenways— was being explored, debated and tested by Florida researchers such as Larry Harris and Reed Noss of the University of Florida.



A visionary graphic indicating possible ecological greenway connections from one end of the state, to the other. Adapted from: Noss, R. F. 1987. Protecting natural areas in fragmented landscapes. Natural Areas Journal 7:2-13. Actual routes of connectivity may evolve/change overtime as land conservation opportunities arise or as other lands develop.

By sustaining ecological connectivity and allowing wildlife to move more freely within conserved greenways, it was reasoned, species' genetic and population viability could be enhanced and wildlife would re-colonize depopulated conservation areas given the opportunity. Instead of having a species' range reduced to isolated habitat islands, conservation lands would once again be part of connected ecological systems, especially after restoration plans were implemented on lands degraded by past human activities such as fire suppression and degraded ground and surface water hydrology.

By the early 1990s Florida began to put forth the funding, will and vision to establish a system of ecological corridors. The Florida Greenways Project, created in 1991 by 1000 Friends of Florida and the Conservation Fund, led to the creation of the Florida Greenways Commission by then Governor Lawton Chiles in 1993. Their mission was to develop a coordinated greenways approach involving the delineation of conservation corridors developed through programs such as Preservation 2000, Florida Forever and the voluntary participation of private landowners with an emphasis placed on private property rights and adequate compensation for greenway use through their lands.

Florida's First Greenway

A prime opportunity to create the state's first greenway of considerable length came in 1991 with the deauthorization of the Cross Florida Barge Canal – an ill-conceived east to west shipping canal that was to bisect the State of Florida from Palatka to the Gulf of Mexico, using the valley of the Ocklawaha River to the coastal divide, and then following the Withlacoochee River basin. With deauthorization, the purpose of the canal lands was changed from commercial shipping to recreation and conservation and the Cross Florida Greenway was born, stretching from the Gulf of Mexico near Inglis to the St. Johns River near Palatka, spanning nearly 80,000 acres. Eventually, the name of Marjorie Harris Carr was added to the Greenway to honor the leader who galvanized opposition to the canal. The Florida Office of Greenways and Trails (OGT), part of the Florida Department of Environmental Protection, was established in 1993 to manage this greenway as an initial anchoring component of a larger statewide system.

Today, the 110-mile Marjorie Harris Carr Cross Florida Greenway features almost 250 miles of multi-use trails pass by communities such as Ocala, Belleview, Palatka, Inglis and Dunnellon, utilized by two million annual visitors that include hikers, bicyclists, birders, wildlife

watchers, outdoor photographers and horseback riders. Campers utilize three full-service campgrounds—Rodman, Ross Prairie and Santos—as well as several primitive campsites.

The multi-use aspects of the Cross Florida Greenway shows that people and the economy benefit from greenways creation in addition to wildlife through growth in ecotourism via compatible trail usage, enhanced wildlife viewing opportunities, and associated benefits. "Greenways can be the perfect marriage for long distance trails such as the Florida National Scenic Trail," says Jim Wood, assistant director of OGT. "The trail currently connects several major conservation hubs."

Wood emphasized that wide ecological greenways are different than narrow trail corridors. Though ecological greenways may include recreational trail corridors and a mix of desirable recreational uses (hiking, biking, canoeing/kayaking), recreation use is secondary and the principal guiding objectives are to support wildlife and their habitats, ecological connectivity and sustaining ecosystem services.

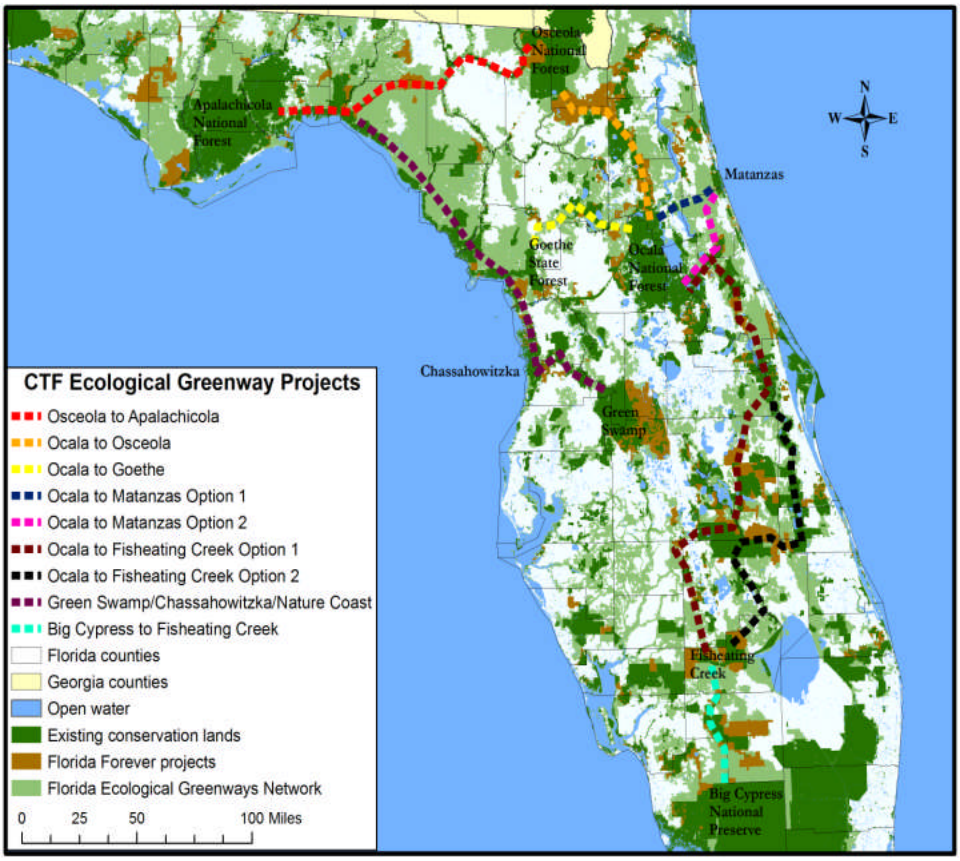
A bicyclist on a forested section of the Withlacoochee State Trail - the longest paved rail trail in the state – Photo by Doug Alderson.

Since the Cross Florida Greenway was created statewide, regional and local greenway development efforts have expanded to spearhead the evolution of a statewide system of greenways and trails for recreation, conservation and alternative transportation. To help manage the system the OGT gets 1.5% annual allocation of Florida Forever monies that goes toward purchasing recreational trail corridors and connectors as part of its mandate. OGT also assists other agencies in identifying and establishing broader ecological greenways for wildlife and helps coordinate the combined efforts of many public and private entities toward establishment of a functional statewide ecological and recreational greenway system. Further, the Florida Ecological Greenways Network priorities are used to guide acquisition of Florida Forever projects that are most important for protecting large, intact landscapes and wildlife corridors.

Expanding the System for Wildlife in the Face of Developing Landscapes

Important beneficiaries of Florida's ecological greenways are wide ranging animals such as the Florida black bear and the Florida panther as well as many smaller animal and plant species where genetic and population viability are sustained overtime within a secure system of sizable habitat nodes and functionally designed connectors. In this regard, both bears and panthers are considered "umbrella species" because protection of their large home ranges benefits a host of other species found within their habitat. Working to develop a system of large habitat nodes with reasonably sized connectors to meet the viability needs of panthers and bears helps assure a wide diversity of smaller less wide ranging creatures are maintained. In the future, a functionally connected set of conservation lands will also facilitate adaptation of species to climate change by allowing range shifts further north as temperatures rise and inlands as sea level rises.

A 2004 study by biologists with the University of Florida, Auburn University and the Florida Fish and Wildlife Conservation Commission (FWC), identified the importance of establishing a protected corridor between the Osceola National Forest and the Ocala National Forest (known as the O2O project) for Florida black bear populations. This is an area with growth pressures south and west of the expanding Duval and Flagler Counties urban/suburban limits.

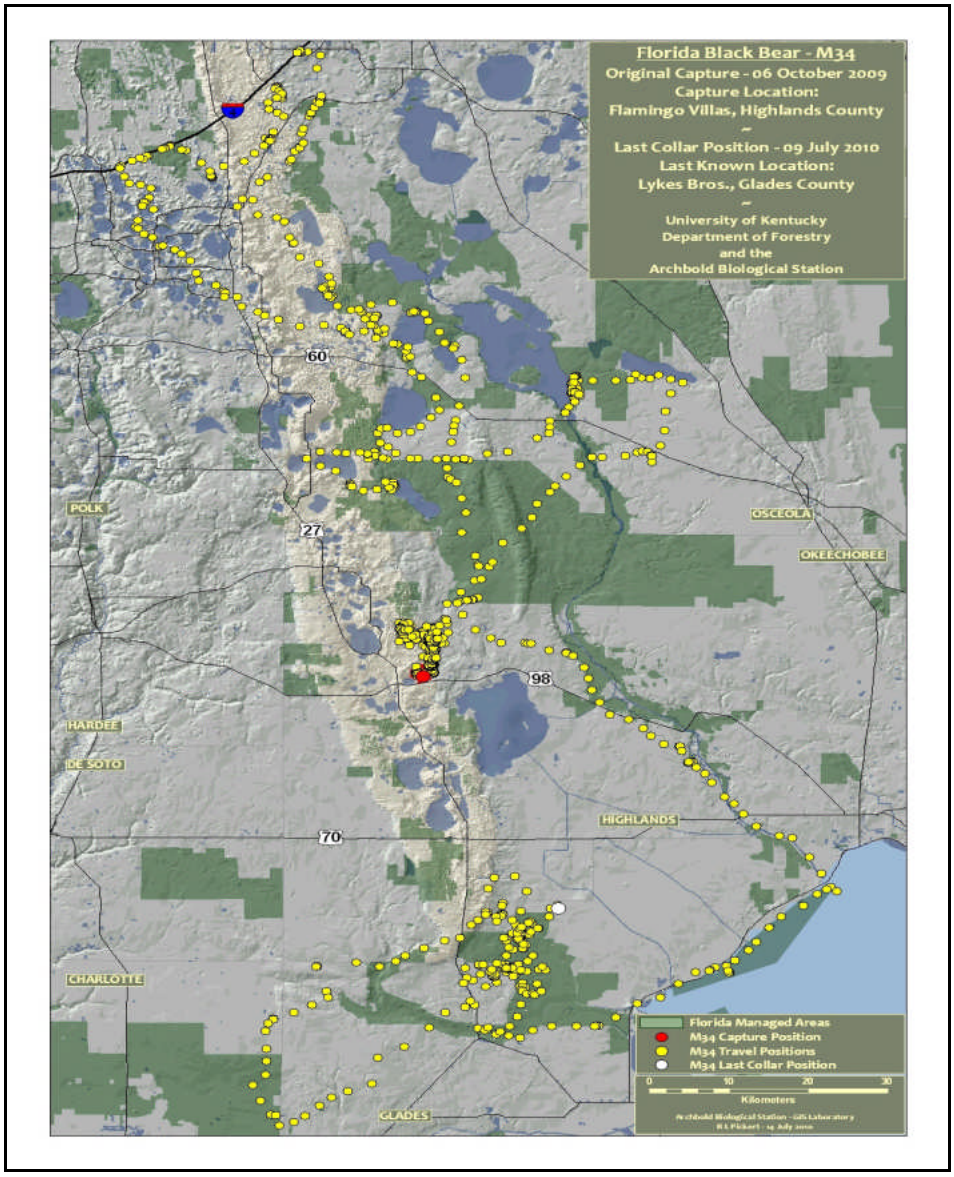


This map highlights the parts of the FEGN that are projects for the Conservation Trust for Florida. The mission of the Conservation Trust for Florida is to conserve the rural landscapes of Florida. They accomplish this by direct action--including conservation easements and land purchase--and by assisting rural landowners in retaining their traditional and productive land-use activities. The CTF focus is on working landscapes--farms, ranches, woodlots--as well as natural areas, and especially concerned with protecting or restoring *landscape connectivity.* *www.conserveflorida.org*

Non-invasive bear hair snares were employed followed by genetic analysis to evaluate bear usage in the proposed corridor. The study results show that several bears move between the two national forests and that some bears likely resided in the intervening corridor. Biologists note this may be a fairly recent re-connection, possibly due to the relatively high density of bears in the Ocala forest expanding to the connector area and north. Also, findings show that some mating between the two populations likely occurred. "Based on these results, we conclude that the Osceola-Ocala corridor is functional and provides genetic and demographic connectivity between Ocala and Osceola black bear populations," the biologists summarized. A wildlife oriented greenway corridor here would further benefit the Florida black bear and other protected species such as the red-cockaded woodpecker, gopher tortoise, Sherman's fox squirrel, swallow-tailed kite, eastern indigo snake, wood stork and various migratory birds. For this greenway's success, the immediate focus must be on protecting the functional connectivity of lands and habitats from encroaching development.

Of merit in landscape level greenway planning, bear tracking data to the south of the Ocala area has shown the effect of major roads such as Interstate 4 which divides the state into north and south portions. Major roads built across and through natural ecosystems often act as barriers and large heavily traveled interstates such as I-4 can effectively block natural movement patterns of animals. Previously state purchased conservation lands in the Green Swamp that extend across I-4 offer the potential for a large animal crossing/undercrossing to be planned and developed there, which would help foster genetic and population viability and keep the southern bear and panther populations from being isolated. In the future there remains a need for working with the Florida Department Of Transportation to build wildlife crossing structures along various

highways in critical locations across the state such as the above mentioned I-4 near the Green Swamp an even more important along I-4 in Volusia County within or near Tiger Bay State Forest.

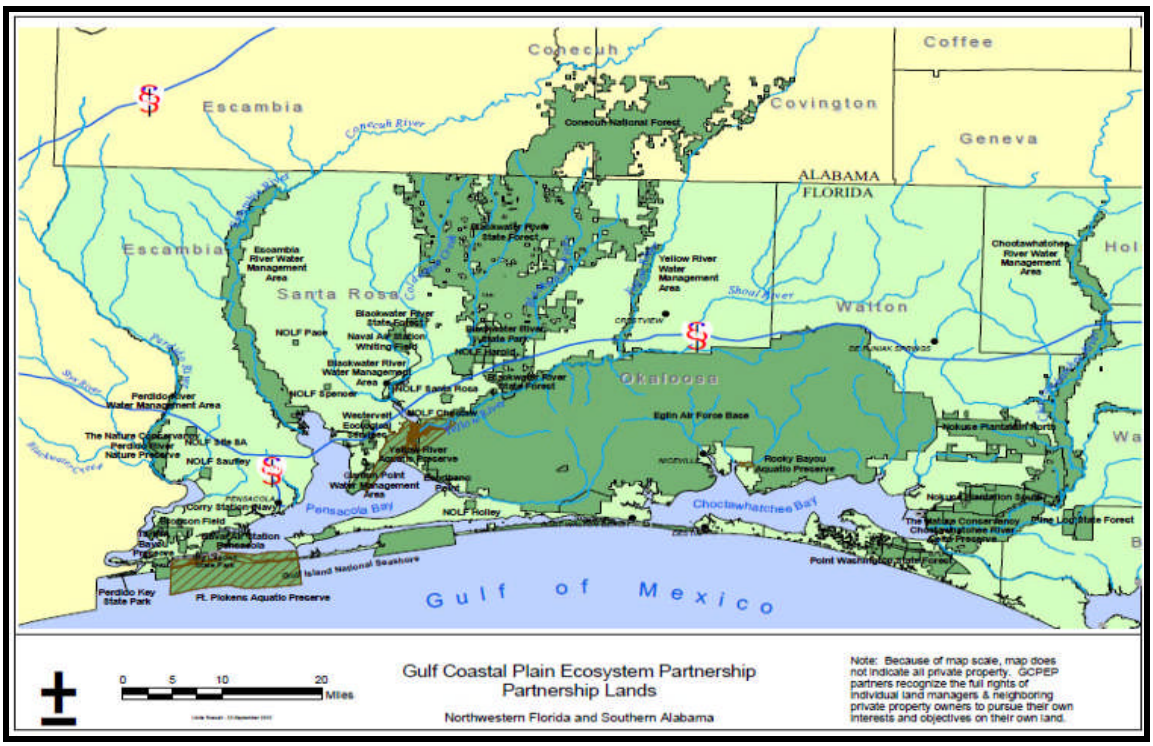


GPS collar map of Highlands County black bear m34 depicting the way I-4 interfered with him entering the green swamp and other areas north. Work by John J. Cox, Adjunct Assistant Professor of Wildlife and Conservation Biology, University of Kentucky.

The Ocala National Forest is the nexus for two other proposed ecological corridors extending east and west from the Forest hub (see map entitled CTF Ecological Greenway

Projects). One project to the east would link the Ocala forest to the 15,000-acres Matanzas State Forest/Faver-Dykes State park/Pellicer Creek Conservation Corridor. To the west, a goal is to delineate and protect a corridor from the Ocala forest to the Goethe State Forest in Levy County. Price's Scrub and the Lochloosa Nature Preserve, totaling 2,500 acres, are already protected parcels within this western corridor.

In the Florida Panhandle, a key greenway and ecological corridor connects the Eglin Air Force Base and other nearby Department of Defense Lands to the existing Blackwater State Forest and the adjoining Conecuh National Forest in Alabama (Blackwater with over 209,571 acres of woodlands, lakes, and streams and Conecuh with 83,000 acres - each are known for their longleaf pine/wiregrass ecosystems).

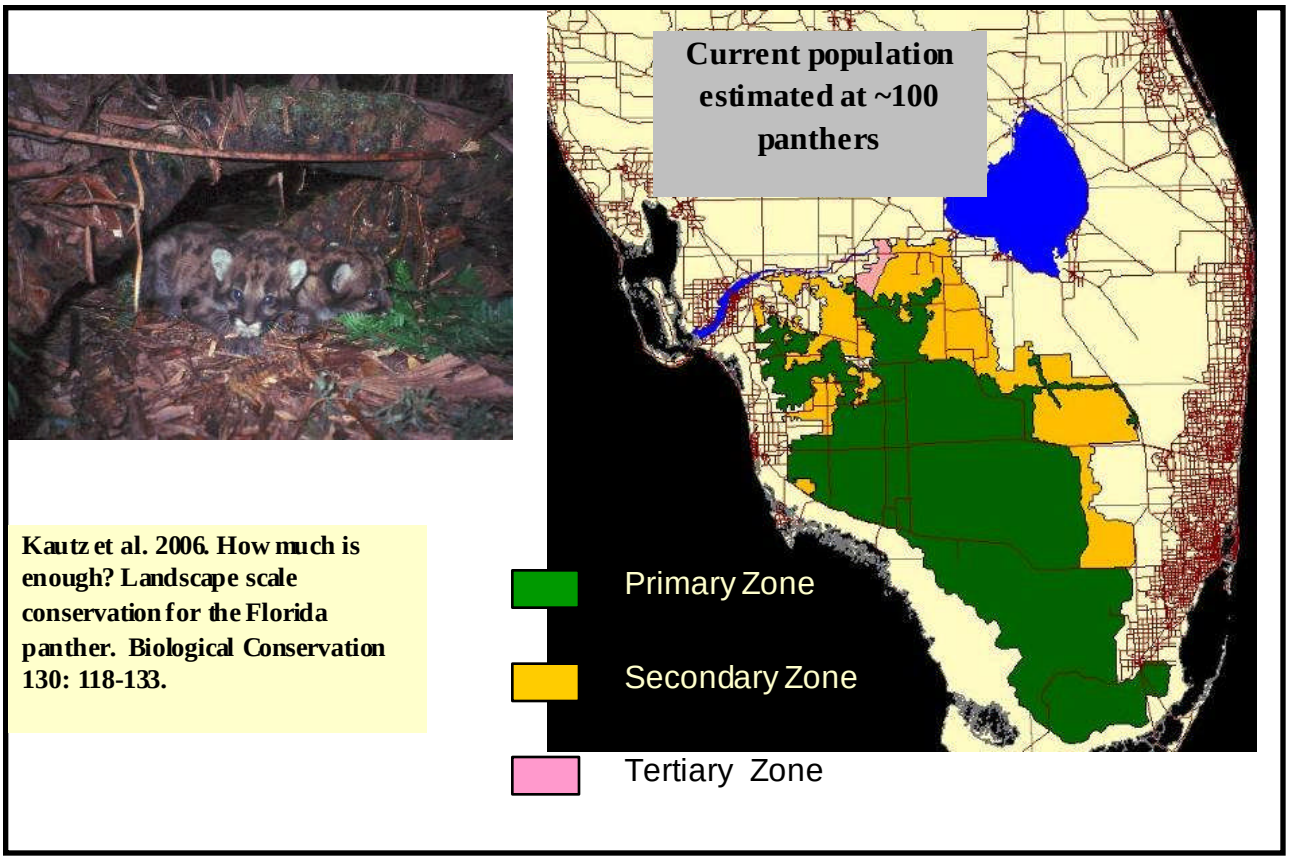


<u>GCPEP Partner Lands:</u> Department of Defense - 481,241; FL Division of Forestry - 226,265; NW FL Water Mgt. District - 118,715; National Forests in Alabama - 83,790; Florida Department of Environmental Protection - 57,270; Nokuse Plantation - 50,653; National Park Service- 24,795; The Nature Conservancy - 5,081; FL Fish & Wildlife Conservation Commission - 1,166; Westervelt Ecological Services - 1,190.52 = Total 1,050,166.52 acres.

Eglin has over 481,241,000 acres of managed habitat with extensive remnants and new restoration areas of longleaf pine and wire grass community with active red-cockaded woodpecker and a Florida black bear population. This effort has proceeded under The Gulf Coastal Plain Ecosystem Partnership and sustained staffing, support, and leadership from The Nature Conservancy.

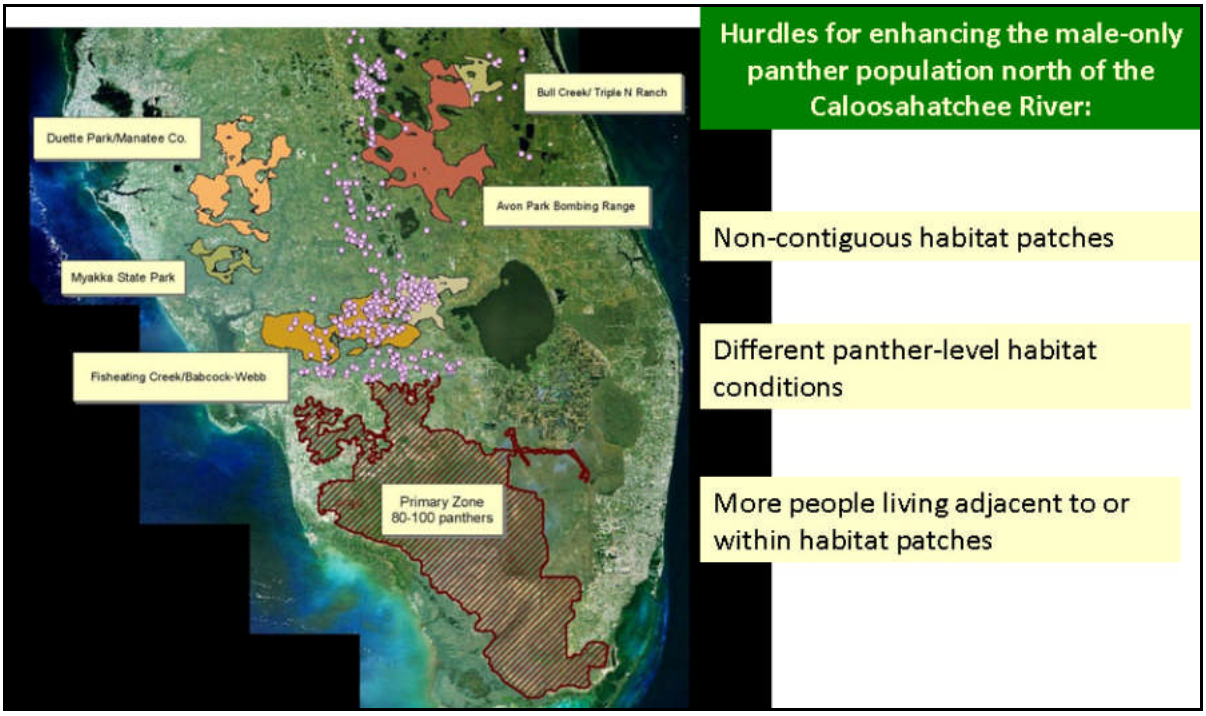
As with O2O Greenway, there are obvious opportunities for ecological corridor linkage to the east of Eglin. Private and public conservation lands have been identified with a future potential to link as far as the Tate's Hell State Forest and Apalachicola National Forest and beyond to St. Marks National Wildlife Refuge. Already, the private 50,653-acre Nokuse Plantation is a key link directly east of Eglin in this east-west corridor within which biologists are actively restoring habitats for wildlife. Black bears are starting to reappear on the property and the land is being used to relocate imperiled gopher tortoises. "Nokuse" is the Muskogee Creek word for black bear.

In south Florida, ecological greenway evolution is in full swing. A key priority is to create wildlife corridors for the only remaining mountain lion or cougar population east of the Mississippi River, the endangered Florida panther. The panther, which has been losing habitat due to land alteration and development pressures moving inland from the coastal growth areas, could also lose another 29% of its existing habitat with a one meter rise in sea level -- a likely occurrence by the end of the century, according to many experts. Given this prospect, emphasis would be on connecting the current southwest Florida panther habitat to conservation lands around Fisheating Creek, Babcock Ranch, Myakka River State Park, Kissimmee Prairie Preserve State Park and other locations north of the Caloosahatchee River.



Kautz et al. focused on identifying panther habitat south of the Caloosahatchee River but also delineated the last likely corridor that could encourage population expansion northward.

"Sea level rise is likely the biggest problem that will define Florida's future," said University of Florida professor Dr. Tom Hoctor, Director of the Center of Landscape Conservation Planning in a 2010 interview with Wild Muse. "Given the size of Florida's coastal human population, and the extremely flat topography, Florida stands to be impacted more than any other state by sea level rise, and even a conservative prediction of (1) one meter rise in sea level could have catastrophic consequences. It is already extremely difficult to balance continued development with environmental conservation in Florida, but sea level rise will greatly complicate this balance with the potential shift of millions of people away from the coasts to currently rural inland areas that are extremely important for conservation."



Potential panther habitat to the north is not as contiguous as that found to the south. The landscape has been altered to a greater degree as well.

Recovery plans for the Florida panther require establishing at least two other viable populations outside of its south Florida domain. The significant existing nodes of public land around the Osceola National Forest north through the Pinhook Swamp to the Okefenokee Swamp in Georgia is one of the sites being considered.

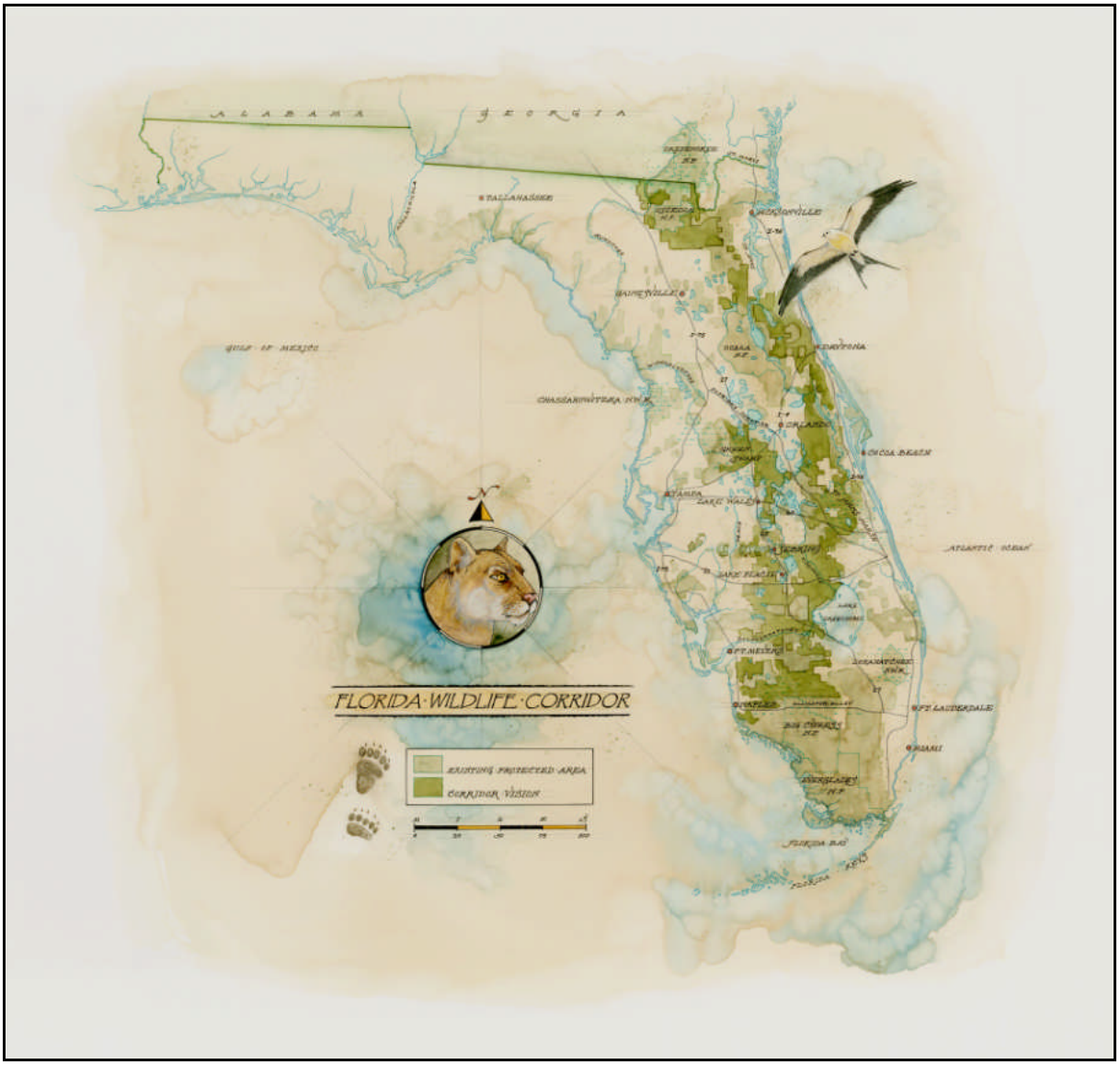
Another option recommended in the Florida Panther recovery plan is to move panthers north of the Caloosahatchee River in south Florida, especially females, to expand their current range. In recent times, all of the panthers documented north of the Caloosahatchee River have been sub-adult males that have likely been pushed out of their primary southwest Florida habitat by more dominant males. Female panthers, on the other hand, tend to stay close to their mother's home range. The increasing number of panther incidents in southwest Florida regarding people, pets and livestock since 2002 are likely a sign that panthers are running into more people because people are encroaching more into panther habitat. Additionally, they are experiencing

competition from other panthers trying to expand their range as it is now accepted that the panther population has increased over the last 15 years.

Unlike highways for human travel, corridors for a wide ranging animal such as the panther optimally need to be several miles wide. "Panthers can't live solely inside narrow corridors," said FWC panther biologist Darrell Land in the book Encounters with Florida's Endangered Wildlife. "They need large landscapes to establish home ranges and those home ranges need to overlap with members of the opposite sex. Corridors are important, but we cannot manage down to the minimums, only leaving enough land to walk through, instead of conserving large tracts of suitable habitat." Former FWC panther team leader Dave Maehr suggested a connectivity improvement to assist panthers in broadening their range in the form of a wildlife overpass created over the wide Caloosahatchee River. "Plant it with palmettos and live oaks," he writes in the book Florida Panther, "link it with existing forest on both sides of the river, and suddenly the envelope would open and ease the pressure within the panther habitat core." Further, Maehr added, a key to expanding panther habitat north of the river is to work closely with private landowners, several of which he thought would be willing participants.

Future Ecological Greenway Development in Florida

On Earth Day 2010, the grand vision to connect, protect and restore natural ecosystems from the Everglades to Georgia was presented as The Florida Wildlife Corridor. Dr. Tom Hoctor and conservationist Carlton Ward Jr. were two of the principal architects.



Map of the Florida Wildlife Corridor Vision, painting by Mike Reagan (www.mapsbymikereagan.com). The Florida Wildlife Corridor, based on underlying FEGN priorities within peninsular Florida, is a vision for connecting natural lands and waters from the Everglades to Georgia. The FWC was designed as an outreach tool for engaging Floridians regarding *the opportunity to protect and connect our remaining wilderness, with benefits including the survival of wide-ranging species such as panthers and bears, protection of the Everglades and St. Johns watersheds and sustainability of human developments. Plans include a public-awareness expedition throughout the length of the Florida Wildlife Corridor in 2011, a suite of publications and a documentary film.*

"As an eighth-generation Floridian with a family ranch, I am very sensitive to the agricultural landowners whose stewardship over the past century has allowed for bears and

panthers to survive on their properties," wrote Carlton Ward Jr. about the proposal. "It will be a failed outcome if popular pressure from the Florida Wildlife Corridor campaign results in land use regulations for these landowners without significant compensation. The landowners who are among the last not to have already sold out should be financially rewarded for their stewardship, not penalized. To address this potential inequity, we need the Florida Wildlife Corridor vision to push for regional or statewide incentive programs, including transfer of development credits, payment for ecosystem services, expanded funding for conservation easements and other solutions. The regulatory climate needs to evolve so that it will be in a landowner's financial best interest to engage in conservation programs within the proposed corridor."

The key to expanding the Florida ecological greenways network is continued cooperation among agencies and landowners, political will, funding for land buying programs such as Florida Forever and local land conservation initiatives as well as creative interactions with private landowners with economically useful compensatory actions for their voluntary participation. A developing aspect in this regard may be to work with and pay private landowners to retain or even enhance particular ecosystem services such as natural water storage of freshwater rather than over drainage of lands, or payment for reforestation or natural landscape enhancements supportive of habitat improvements and ecological greenway function. Provision of a certain level of economic certainty in the form of ecological service payments to private landowners may be an upcoming tool that allows the "farm" not to be subdivided and sold and the statewide system of greenways to further evolve without having to acquire every acre of conservation land. Overall, Florida's emerging network of ecological greenways represents our best hope for sustaining many species of native wildlife and for providing critical ecosystem services and outdoor recreation opportunities for a growing population.

CREDIT NOTES*: The following people helped with development of this article: Doug Alderson, FDEP, Office of Greenways & Trails; Dan Pennington, 1000 Friends of Florida; Jim Wood FDEP, Office of Greenways & Trails; Carlton Ward, Photojournalist and Conservationist; Thomas Hoctor, Ph.D. Director, Center for Landscape Conservation Planning, Department of Landscape Architecture, University of Florida; Nancy Payton, Florida Wildlife Federation; Darrell Land, Imperiled Species Management - Panther Team Leader, FL Fish and Wildlife Conservation Commission; Vernon Compton, The Nature Conservancy; John J. Cox, Adjunct Assistant Professor of Wildlife and Conservation Biology, University of Kentucky.*

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