The History of Florida Wildlife Corridor Science and Planning Efforts

The concept of a statewide ecological corridor is not new to Florida. The Florida Wildlife Corridor relies on and continues the decades of work by numerous scientists and conservation organizations that determined the need for landscape-scale conservation approaches, and specifically corridors, as a way to address habitat loss and fragmentation across Florida. These decades long efforts brought into play the right combination of people, need, and opportunity, resulting in arguably the most ambitious landscape conservation plan of any U.S. state.

Landscape-scale Conservation

One of the first observations for the need for larger and connected conservation lands occurred in the 1930s, when George Wright and his colleagues determined that most U.S. National Parks were not large enough to provide for all of the habitat needs for wide-ranging species. Since then, the emergence of ecological and conservation sciences have bolstered the need for large-scale land protection efforts. Ensuring that ecosystem connections remain or are restored so as to combat habitat fragmentation has become a tenet for many national and international conservation organizations. This connectivity-based approach extends beyond strict application to wildlife as well, and is invoked as a solution to address water quality, flood control, air quality and other ecosystem services.

Island biogeography, developed by E.O. Wilson and Robert MacArthur in the 1960s and 1970s, had a strong influence on the development of modern conservation science, including the new discipline of Conservation Biology in the 1980s. Island biogeography elaborated the relationship between island size and distance from mainland areas (small islands further from mainland areas have fewer species than large, closer islands). Eventually this evolved into in-depth discussions about how these principles might apply to isolated conservation lands on continents, and the development of guidelines for designing conservation land networks that would protect viable, natural diversity.

In the 1980s, as Conservation Biology was emerging, researchers proposed developing comprehensive, large scale planning to conserve biological diversity. Two of the leading researchers both had connections to Florida, specifically the University of Florida. In 1983, Reed Noss, a conservation biologist from Ohio, published a paper in the journal BioScience, titled “A Regional Landscape Approach to Maintain Diversity”. At the same time, Larry Harris, a professor in the Department of Wildlife and Range Sciences at the University of Florida, was working in the Pacific Northwest on a landscape approach to regional forest management to protect biodiversity while maintaining timber production. In 1984, that strategy was published in Harris’s book, “The Fragmented Forest: Island Biogeography Theory and the Preservation of Biotic Diversity”.

Both works by Noss and Harris advocated a comprehensive regional landscape approach that recognized the need for working at large scales and integrating both protected and

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more intensive land uses to maximize conservation efforts. Their approach combined both the nascent field of Conservation Biology with another emerging discipline, Landscape Ecology. Landscape Ecology is focused on the interactions of land patterns and processes over broad scales, and its findings reinforce the need for well-planned integration of various land uses across landscapes to maximize conservation and other benefits. R.T.T. Forman, a landscape ecologist at Harvard who helped develop the discipline in the United States during the 1980s, coined the phrase the “ethics of isolation” which states:

“In land use decisions and actions, it is unethical to evaluate an area in isolation from its surrounding or from its development over time. Ethics impel us to consider an area in its broadest spatial and temporal perspectives.” (Forman 1987)

Scientific Foundations for Landscape-scale Approaches in Florida

Florida was an obvious candidate for advocating and implementing the comprehensive connectivity strategies proposed by both Noss and Harris. With most of Florida relatively isolated as a peninsula, ecological connectivity is arguably more at a premium and more of an issue here than elsewhere. Protection of such connections would require more careful analysis and planning. In addition, Florida has a combination of unique and highly-diverse ecosystems, highly prized by both residents and Florida’s many visitors. We’ve witnessed explosive growth in human population (from 2 million people in 1940 to almost 20 million people today), and development is rapidly threatening Florida’s ecosystems. Starting in the 1970s, Florida state government began a series of initiatives to attempt to better balance burgeoning development with natural resource conservation by passing legislation to more effectively manage water resources (by creating the Water Management Districts, etc.). In addition, Florida began to fund land conservation efforts, and through landmark growth management legislation intended to reduce the impacts of new growth on the environment. All of these trends helped support further development of Florida’s landscape conservation strategies embodied in proposals and plans to protect wildlife corridors and ecological networks starting in the mid-1980s.

Larry Harris and Reed Noss authored a series of articles and book chapters discussing the importance of ecological connectivity, wildlife corridors, and the protection of functionally connected networks of conservation lands. This included detailing the strategic value of protecting specific tracts of land in Florida that would result in larger, connected conservation networks. In 1985, Harris advocated the protection of five connecting tracts of land across Florida: Pinhook Swamp to connect Osceola National Forest and Okefenokee National Wildlife Refuge in Northeast Florida (and Georgia); the Yellow River ravines between Eglin Air Force Base and Blackwater River State Forest in the western panhandle; strategic tracts to connect St. Marks National Wildlife Refuge and Apalachicola National Forest near Tallahassee; the Wekiva River corridor between Ocala National Forest and Wekiwa Springs State Park in Central Florida; and the Loxahatchee River-Jonathan Dickinson State Park-Dupuis Wildlife Management Area ecological network in southeast Florida. In 1986, Noss and Harris wrote about protecting a regional ecological network in North Florida including Okefenokee National Wildlife Refuge,
Osceola National Forest, the Suwannee River, and various conservation lands along the Gulf of Mexico along Florida’s Big Bend coast. In 1985, in a magazine article, and again in 1987, in the Natural Areas Journal, Noss proposed the first statewide ecological network. This proposed network was expanded in a map in the book Saving Nature’s Legacy: Protecting and Restoring Biodiversity in 1994.

At the same time as the need for wildlife corridors began to be expressed, Florida was struggling to protect two endangered wide-ranging species: the Florida panther and Florida black bear. By the 1980s, the Florida panther was considered to be near extinction, with estimates of a population no bigger than a couple dozen individuals relegated to the remaining wilds of extreme Southwest and South Florida. Florida black bear were not as rare, but a once statewide population had been reduced to seven isolated populations across the state with either limited or no functional connectivity between
these populations. Research on both species was initiated in the 1980s by what is now the Florida Fish and Wildlife Conservation Commission. One of the conclusions of that research is that protecting and restoring functional connectivity across regional landscapes was a key strategy for ensuring the viability of both species. For the panther, this meant there was a need to significantly increase protection in southwest Florida to ensure a base of habitat that would not be developed in the speculation-based real estate market of the region. By the late 1980s essential protected lands included the Big Cypress National Preserve, Florida Panther National Wildlife Refuge, and Fakahatchee Strand State Park. In addition, biologists studying the panther also stressed finding ways to prevent conversion of upland habitats on surrounding private lands to the north of these protected lands, which were also essential for protecting a potentially viable population and for possible expansion of the population into its former range further north, which extended far beyond just Florida.

Dave Maehr, a former student of Larry Harris and the same biologist who first argued the importance of the private lands to the Florida panther, was also active in finding landscape-level conservation opportunities for two isolated subpopulations of the Florida black bear elsewhere in the state. David Maehr led research on the bear population status at Chassahowitzka, a complex of conservation lands in Citrus and Hernando counties isolated between the Gulf of Mexico and coastal development along U.S. Highway 19. In Highlands and Glades counties, Maehr developed a cooperative approach with landowners presiding over a remnant bear population scattered among a handful of cattle ranches. In both studies, Maehr and colleagues were able to identify key habitat corridors that could, if protected, allow functional connectivity – that is, the movement and successful exchange of genes between populations – for the populations of interest and nearest neighboring bear populations elsewhere in Florida. Maehr’s revelations of Florida black bear’s use of habitat corridors in Central Florida ultimately helped inspired the statewide “Florida Wildlife Corridor” campaign.

**Florida Conservation Land Protection Efforts**

In 1990, Florida began a visionary land and water conservation program named Preservation 2000 (P2000). From 1990 through 2008 (through P2000 and its successor program, Florida Forever), Florida spent approximately $300 million a year to protect the state’s most important natural and rural lands for native biodiversity and ecosystem services. At the start of this almost twenty year effort, the Florida Chapter of The Nature Conservancy, Florida Audubon Society and the Florida Department of Natural Resources conducted a mapping charrette to help guide land acquisitions in the new P2000 program. The mapping charrette included conservation experts and scientists from across the state and targeted many of the wildlife corridors identified by Noss and Harris in the 1980s. The charrette results provided a solid foundation to guide the early years of conservation land buying efforts, and helped to solidify the protection of ecological connectivity as a primary goal of Florida’s conservation land strategy by the mid 1990s.
Results of 1991 mapping workshop (charrette) coordinated by Florida Chapter of The Nature Conservancy, Florida Audubon Society and the Florida Department of Natural Resources. The charrette identified conservation priority areas with some emphasis on ecological connectivity. Natural resource and biodiversity conservation experts from state, federal, regional agencies, universities, and NGOs participated to identify the priorities for the Preservation 2000 state land acquisition program that began in 1990.

Another development further strengthened the ecological connectivity approach rising from Florida’s statewide conservation planning. In 1991, the non-profit group 1000 Friends of Florida and the national land trust non-profit Conservation Fund worked together to foster a new program called Florida Greenways, which was led by Dr. Mark Benedict, who would go on later to co-author the book, Green Infrastructure: Linking Landscapes and Communities with Edward McMahon in 2006. Florida Greenways envisioned a statewide network of both recreational trails as well as ecological greenways. Based on these efforts, Governor Lawton Chiles created the Florida Greenways Commission in 1993. The Commission was asked to plan and support a statewide system of greenways linking natural areas and open spaces to benefit Floridians now and for generations to come. In its 1994 report, the Greenways Commission recommended that Florida state government develop a statewide greenways system that included two networks: a system of trails for multiple recreational and transportation uses including hiking, biking, horse riding, and paddling, and an ecological greenways network to functionally connect conservation lands from the Everglades in South Florida all the way north and northwest to the tip of the Florida panhandle.
The Florida Ecological Greenways Network

The recommendations of the Florida Greenways Commission led to the creation of the Office of Greenways and Trails (OGT) in the Florida Department of Environmental Protection. The Office of Greenways and Trails was also tasked with working with the University of Florida (UF), a network of technical advisors, and stakeholders across the state, to develop the Florida Greenways Plan. In 1995, OGT hired a research team at the University of Florida, including the GeoPlan Center in the Department of Urban and Regional Planning, the Department of Landscape Architecture, and the Department of Wildlife Ecology and Conservation with primary UF research personnel including Peggy Carr, Paul Zwick, Tom Hctor, Mark Benedict, and Dave Lambert. The research team was asked to apply Geographic Information Systems (GIS) to identify opportunities to develop both a statewide trail network and to protect large, intact landscapes integrated into a functionally connected network of conservation lands across Florida. The University of Florida worked with OGT and the Florida Greenways Coordinating Council, the successor to the Florida Greenways Commission, from 1995 through 1997 to identify the best statewide trail and ecological greenway opportunities and develop a statewide Greenways Plan to be presented to the Florida Legislature and Governor. The Florida Greenways program became part of state law in 1997, and the ecological network portion of the plan was named the Florida Ecological Greenways Network (FEGN).

Since 1997, the FEGN has been updated several times, with the latest update completed in 2013. These updates were funded both by the OGT and also most recently by the Florida Fish and Wildlife Conservation Commission. Dr. Tom Hctor, who also studied under Larry Harris, received his Ph.D. in Wildlife Ecology and Conservation from the University of Florida in 2003, and led these efforts. Hctor has also worked extensively on Florida panther, Florida black bear and other habitat fragmentation sensitive species regarding identification of habitat and corridor conservation priorities across the state. This work dovetailed well with improving the FEGN and its priorities over time, while Hctor and conservation organizations including the Florida Chapter of The Nature Conservancy (primarily through the work of Dr. Richard Hilsenbeck) and the Conservation Trust for Florida worked to protect the lands needed to complete the most important corridors in the FEGN. The FEGN has also become the foundation of landscape-scale conservation priorities both within the Florida Forever program’s Conservation Needs Assessment developed and conducted by the Florida Natural Areas Inventory and within the Critical Lands and Waters Identification Project, which is a collection of statewide GIS data layers identifying various biodiversity and ecosystem services conservation priorities developed and maintained by the Florida Natural Areas Inventory, University of Florida Center for Landscape Conservation Planning, and the Florida Fish and Wildlife Conservation Commission.

The Florida Wildlife Corridor: Reaching the Public to Make Connectivity a Reality

The Florida Wildlife Corridor campaign was founded by Dr. Tom Hctor, Director of the Center for Landscape and Conservation Planning at the University of Florida and Carlton Ward Jr, a conservation photographer and eighth-generation Floridian. Ward was
photographing Florida’s ranchlands and their role in habitat conservation when he met Joe Guthrie (a student of Dave Maehr) and learned about the landscape movements of black bears and their reliance on private ranches in Central Florida.

Ward began to focus on the Florida black bear as an emblem for habitat conservation and was introduced to Hoctor’s work with the Florida Ecological Greenways Network (FEGN). Working to locate a missing black bear, Maehr and ranch owner Mason Smoak had died tragically in a plane crash in 2008. Maehr’s Masters students Wade Ulrey and Joe Guthrie organized a Highlands-Glades black bear conservation workshop at the Archbold Biological Station in an attempt to continue the legacy of his research and conservation work in Central Florida. Hoctor was giving a presentation about FEGN Critical Linkages, bears, and panthers during the bear workshop, when Ward ask whether we could group all the FEGN Critical Linkages together and call them “Florida Wildlife Corridor” as a means to communicate the vision to wider audiences.

Richard Hilsenbeck, Director of Conservation Projects for the Florida Chapter of The Nature Conservancy, joined Hoctor and Ward to co-found the Florida Wildlife Corridor initiative, leading to a stakeholder conference with Charles Pattison (1000 Friends of Florida), Dan Smith (University of Central Florida), Charles Lee (Audubon of Florida), Hilary Swain (Archbold Biological Station), Laurie McDonald and Elizabeth Flemming (Defenders of Wildlife), Manley Fuller and Preston Robertson (Florida Wildlife Federation), and Mary Oakley (Florida Fish & Wildlife Conservation Commission).

With consensus from the team, Hoctor organized the FEGN into a GIS map that combined priority 1 and 2 landscape linkages. That vision became the basis of the Florida Wildlife Corridor, which was commissioned as a watercolor painting by map artist Mike Reagan. The initial painting debuted on Earth Day 2010.

In 2012, Ward, Guthrie, conservationist Mallory Lykes Dimmitt and filmmaker Elam Stoltzfus completed the first Florida Wildlife Corridor Expedition, a 1000-mile, 100-day trek and public awareness campaign from Everglades National Park to Okefenokee National Wildlife Refuge. In 2014, with guidance from several stakeholder meetings, Hoctor revised the Florida Wildlife Corridor map to represent FEGN priorities for the entire state (not just peninsular Florida as published in 2012). The team then commissioned a new painting of the statewide Corridor. In 2015, Ward, Guthrie and Dimmitt completed the second Expedition, this time trekking 1000-miles through the Corridor from the Everglades Headwaters near Orlando to Gulf Islands National Seashore near Pensacola. Dimmitt co-founded a non-profit organization that advocates for the protection of the Florida Wildlife Corridor organization and serves as its first executive director.

The Florida Ecological Greenways Network (FEGN) provides the scientific foundation for the Florida Wildlife Corridor, with the highest priorities in the FEGN serving as the guide for the Florida Wildlife Corridor vision. The FEGN was an outcome of earlier efforts to elucidate the importance of protecting wildlife corridors and a network of conservation lands spearheaded by Larry Harris and Reed Noss at the University of
Florida in the 1980s, and therefore the Florida Wildlife Corridor is directly and significantly indebted to the hard work of all of Florida’s wildlife corridor, wide-ranging species research, and landscape conservation pioneers and advocates. The Florida Wildlife Corridor combines all of the FEGN Critical Linkages and supporting high priorities from the Everglades to the Okefenokee, and then from Okefenokee and the Big Bend coast west to the Perdido River at the border with Alabama, to highlight the importance of protecting a functional network of public and private conservation lands throughout Florida to protect our native biodiversity, essential ecosystem services, and the rural natural and cultural heritage that is so unique to Florida.

The most recent version of the Florida Ecological Greenways Network (FEGN), developed in 2013 by Tom Hecto and Michael Spontak with assistance from a Technical Advisory Group and working in cooperation with the Conservation Trust for Florida with a State Wildlife Grant from the Florida Fish and Wildlife Conservation Commission. This new FEGN version was approved by the Florida Greenways and Trails Coordinating Council in December 2013 and serves as the data foundation for conservation programs including Florida Forever, the Rural and Family Lands Protection Act, the Forest Legacy Program, and the Florida Fish and Wildlife Conservation Commission’s Cooperative Conservation Blueprint. It is also one of the core data layers in the Critical Lands and Waters Identification Project (CLIP), which is used by the U.S. Fish and Wildlife Service’s Peninsular Florida Landscape Conservation Cooperative and many other conservation and land use planning efforts across the state.

The Florida Wildlife Corridor is also interested in efforts to consider additional ecological connections across the boundaries of Florida into Georgia, Alabama and potentially beyond. The intent is to engage the public and policy makers to make clear that there is still an opportunity to protect a functionally connected network of public and private conservation lands across the state, the importance of protecting such a network, and the initiatives and programs such as Florida Forever needed to implement effective protection. Work on projecting Florida’s future including the Florida 2060 human population and development projection project by 1000 Friends of Florida and the University of Florida makes it clear that though there is still the opportunity to protect the Florida Wildlife Corridor today, this opportunity could disappear quickly without appropriate and sufficient conservation and growth management policies, programs, and decisions. This includes the need for significant public policy and investment as well as private conservation efforts by NGOs, foundations, and private individuals such as M.C. Davis, who led efforts to protect tens of thousands of acres essential to the Florida Wildlife Corridor.

Today, the Florida Wildlife Corridor benefits from our partnership with many organizations and people to help in outreach, education, and implementation efforts to protect the FEGN and associated conservation hubs and corridors. The Florida Wildlife Corridor is also built upon decades of work by numerous conservation organizations and programs, including the 1000 Friends of Florida and Conservation Fund’s Florida Greenways Program, the P2000 mapping charrette, the Florida Greenways Commission, the Hillsborough River Greenways Task Force, the Florida Greenways Coordinating Council, the Florida Department of Environmental Protection’s Office of Greenways and Trails, the University of Florida’s greenways research team, The Nature Conservancy’s extensive work helping to protect large connected landscapes and wildlife corridors across the state, the Conservation Trust for Florida’s Ocala to Osceola (O2O) Ecological Greenway project and other Florida wildlife corridor projects, the multi-partner Kissimmee River restoration, the Florida Fish and Wildlife Conservation Commission’s panther and bear research, University of Kentucky’s and Archbold Biological Station’s black bear research, the World Wildlife Fund’s Florida Ranchlands Environmental Services Project (FRESP) around Lake Okeechobee, the U.S. Dept. of Agriculture’s landscape-scale wetlands restoration projects in the Fisheating Creek and other south-central and southwest Florida watersheds, the Florida Forever land conservation program and the Florida Natural Areas Inventory’s Florida Forever Conservation Needs Assessment, the Rural and Family Lands Protection Act, the Florida Fish and Wildlife Conservation Commission’s Cooperative Conservation Blueprint project, the USFWS Everglades Headwaters National Wildlife Refuge, the USFWS Peninsular Florida Landscape Conservation Cooperative, the Amendment 1 campaign, and countless hours of work by many others that have given us the opportunity to raise awareness about the importance of functionally connecting what remains of the increasingly fragmented Florida landscape. The Florida Wildlife Corridor is also the product of a line of academic achievement and relationships starting with Dr. Larry Harris and his mentorship of Reed Noss, Dave Maehr, Tom Hoctor, Dan Smith, and by extension, Joe Guthrie, who was a Master student of Dave Maehr at the University of Kentucky.

The Florida Wildlife Corridor Statewide Vision Map.