

Florida's Ecosystem Management and Wildlife

By:

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Florida is one of the fastest growing states. Rapid population growth and development impact the quality and quantity of the state's natural resources including our fresh water, wildlife and native plant communities.

In order to improve protection of these dwindling resources, the state has implemented a number of programs, three of which are administered by the Florida Department of Environmental Protection. They are 1) a major Ecosystem Management Initiative, 2) a Greenways Program and 3) the largest land acquisition program in the nation, Preservation 2000.

The ecosystem management initiative began in 1993 when the Florida legislature directed the Department to "develop strategies to protect the functions of entire ecosystems". We brought together an assemblage of interests to the table which included business, environmental groups, industry, agriculture, forestry, mining, university faculty, government representatives from local to federal, large landowners and interested citizens. And we reached consensus on the major implementation issues.

The reason we went to such great lengths is that a fundamental assumption from the very start was that this initiative could not succeed without the support and active participation of the people of the state. We didn't want this to be another government program directed from the top. Over 300 people participated. They developed over 500 recommendations which were then distilled into our implementation strategy. The goals of the program are 1) better protection of Florida's environment, 2) development of an environmental ethic among Floridians and 3) a sustainable, healthy environment and economy. This translates into Stewardship. I won't go into further detail now; however, anyone wishing to have additional information can receive written materials about the program.

The Florida Greenways program also received extensive input from diverse interests as it was being developed. The objective of the program is to create a statewide system of Greenways which will connect conservation and recreation areas throughout the state. There will be many types of Greenways including landscape linkages, recreation corridors, conservation corridors, greenbelts and trails. The Office of Greenways and Trails in DEP administers this innovative program.

The third program that has a major impact on the protection of Florida's natural lands is Preservation 2000. This land acquisition program is to provide \$300 million per year for 10 years. The funds are allocated to a number of state agencies and to the five water management districts. This may be the final major opportunity to protect Florida's last natural lands before they are lost to development. River floodplains, springs, barrier islands, coastal dunes and rare plant communities such as tropical hammocks are being acquired for preservation, water management and recreation purposes.

Since DEP is making a major shift to ecosystem management, let's discuss this topic in more detail to see how it relates to transportation related mortality of wildlife. What is an ecosystem? DEP's definition states: "an ecosystem is a community of organisms, including humans, interacting with one another and the environment in which they live". Since this is somewhat abstract, let's consider some real examples.

An endangered plant, the Wiregrass Gentian (*Gentiana pennelliana*), occurs in low pine flatwoods, a fire-dependent plant community. One would expect that this plant's ecosystem would be very small, perhaps smaller than a square meter. Botanists could only find two or three plants at Fort Gadsden State Historic Site when the site was being managed with prescribed fires set during the winter. When prescribed burning at this site was changed to the lightning season, which is the natural fire season, botanists were able to find a couple hundred of the plants. It is clear that human interaction in this plant's ecosystem has a major impact on the species.

The gopher tortoise, *Gopherus polyphemus*, is Florida's most important animal. The ecosystem of a gopher is less than an acre of good quality habitat that is frequently burned. The gopher tortoise is a keystone species whose burrow is a critical shelter or habitat for approximately 350 other vertebrates and invertebrates. The indigo snake, *Drymarchon corais couperi*, an endangered species, is one of the species dependent upon these burrows. An indigo's ecosystem is approximately 100 acres. In the absence of the burrows in the xeric sandhill community, the indigo simply cannot occupy this community during winter months.

The Florida gopher frog, *Rana capito*, is designated a species of special concern by the Game & Fresh Water Fish Commission. It inhabits gopher tortoise burrows in Florida's most xeric plant communities. One could surmise that the frog's ecosystem would be a few meters around the burrow. However, there must be a seasonal pond within a mile that can be reached by the frog during the early summer in order for reproduction to take place. Therefore, the frog's ecosystem extends to and includes the pond.

You may be wondering how all this relates to transportation related mortality of wildlife. All of these species, the wiregrass gentian, gopher tortoise, indigo snake and gopher frog were thriving until the era of modern man. They were not endangered.

Today, lightning caused fires no longer manage Florida's natural landscape. Land managers must use prescribed fire to maintain native plant communities in a healthy condition for the thousands of species of plants and animals that occupy them.

Roads are a major impediment to the use of this critically important land management tool. A road in close proximity to a state park, national forest, wildlife refuge, or Nature Conservancy preserve is a serious handicap for the proper application of prescribed fire. Land managers must keep smoke off the road so as to avoid causing a traffic hazard; however, an unpredictable change in wind direction could result in an accident. The wiregrass gentian is a species that must be burned during the lightning season, when winds are more variable, which increases the probability of causing a smoke problem on a near-by road.

Gopher tortoise habitat steadily deteriorates in the absence of frequent fires to the point that the species cannot exist there. The loss of gopher tortoises results in the loss of indigo snakes and gopher frogs. Some corporations that manage thousands of acres of commercial forests in Florida, no longer prescribe burn their lands because of liability concerns. They are gambling that their trees will reach merchantable size and will be harvested before a wildfire destroys the stand. Prescribed fire is the major deterrent to wildfire because prescribed fires eliminate the hazardous fuels that permit wildfires to occur. If smoke from their prescribed fire causes a traffic accident, subsequent law suits could seriously impact the company. Of course, the gopher tortoise, indigo snake and gopher frog inhabiting those lands are not part of the company's economic equation.

Highways that cross the ecosystem of the indigo and gopher frog can eliminate these species from the area. Vehicles are the major modern predator of the wide ranging indigo. You can predict the likelihood of a gopher frog being able to reach the seasonal pond if this slow moving amphibian must cross a road to get there.

Wakulla Springs, located in Wakulla County a few miles south of Tallahassee, is one of Florida's most significant natural features. It is a first magnitude spring that creates the Wakulla River. Wakulla Springs State Park is one of the premiere wildlife areas in Florida and attracts 170,000 visitors a year. Most visitors ride the glass bottom boats or river boats to view the clear waters and abundant wildlife.

Cave divers are exploring and mapping the cave system that conducts vast quantities of clear water to Wakulla Springs. They have determined that the Wakulla Springs ecosystem extends several miles to the northwest of the state park. Their maps also demonstrate that the cave system lies beneath U.S. 319, S.R. 267 and S.R. 61. Numerous sinkholes along the five mile long cave system are direct and indirect connections between surface waters and the caves.

It was once a common practice to direct highway stormwater into sinkholes for convenient and inexpensive disposal. At the request of the Department of Environmental Protection, the Department of Transportation is blocking direct flow of stormwater into sinkholes adjacent to the above highways.

An existing culvert, located on a curve on S.R. 267 directs stormwater to Indian Spring located at the YMCA's Indian Spring Youth Camp. Water flowing from Indian Spring, combined with the stormwater, flows directly to Wakulla Springs State Park where it mixes with the spring waters in the park. An accident occurring on this curve could have resulted in a chemical spill that could contaminate the waters of Indian, Sally Ward and Wakulla Springs. FDOT has retrofitted the system so as to retain stormwater and permit removal of contamination before it could reach the springs.

U.S. 319 will be widened to four lanes in the near future. We have asked FDOT to give special attention to designing the portion passing over the cave system to insure that neither construction nor stormwater pose any additional threats to the system. Through planning and retrofitting, FDOT will reduce the risks of contamination of waters that nourish this significant wildlife area.

Paynes Prairie State Preserve, at the edge of the city of Gainesville, is another of Florida's outstanding wildlife areas. English naturalist, William Bartram visited Paynes Prairie (Alachua Savannah) in 1774 and documented the presence of sandhill cranes, waterfowl, wolves and herds of Spanish cattle being tended by the Seminoles. Today, over a thousand greater sandhill cranes spend the winter on Paynes Prairie and the Florida sandhill crane continues to nest there.

In 1926, U.S. 441 was constructed across the prairie basin and in 1963 Interstate 75 was also constructed across the basin. Fifty thousand vehicles a day cross the prairie on these two highways. The state of Florida purchased Paynes Prairie in 1970 and established the state preserve. DEP's Florida Park Service has been restoring and managing the basin as a wet prairie and marsh which was its condition when Bartram described it in 1774. As you know, water levels in wetlands must fluctuate from flood to drought in order to remain healthy and productive. Due to the presence of these major highways, water levels can not be raised to the elevation required to kill back hardwoods that are encroaching onto the prairie basin. Prescribed fire must be used to kill the hardwoods; however, there is great risk of smoke causing an accident on these congested highways. Many acres of productive marsh have been lost and more will be lost because of these two limitations on management.

In 1988, annual road kill surveys were begun in Florida state parks. Paynes Prairie has the distinction of having more recorded road kills than any of the 68 parks where surveys are conducted. It is common for over 1,000 dead birds, mammals and reptiles to be recorded annually. Few observations are recorded on I-75 because of the danger

involved in surveying this very congested, high speed highway. It is unlikely that any mammal, reptile, or amphibian is able to cross this wildlife killing zone.

Paynes Prairie is a worst case scenario of the impacts of highways on a major wildlife area. The loss of wildlife habitat caused by limitations on management practices and the direct loss of wildlife on the roads will steadily increase. The mitigation of these losses will require a major interagency commitment. The FDOT and DEP must develop innovative solutions or the state of Florida will permanently lose the significant wildlife resources at Paynes Prairie.

In conclusion, highways impact the ecosystems of plant and animal species, spring systems, and other water basins and the land manager's ability to manage these systems. Florida's continuing growth will result in more roads and more and more vehicles on those roads. The state of Florida has expended and is continuing to spend millions of dollars to acquire natural lands for their protection. Those lands must be managed with fire or the values for which they were acquired will deteriorate until they are completely lost. We must recognize that roads cause very serious restrictions for public and private land managers as they apply prescribed fire. This poses a major ecosystem management challenge for the Florida Department of Transportation, the managers of natural lands, and the people of Florida.