

Threats to Florida's Biodiversity¹

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Look at a map of Florida, and what do you see? A spider web of roadways crisscrossing the state, converging on towns, from a small corner grocery store and gas station to huge metropolitan areas that sprawl for miles. A land that was once considered uninhabitable now has the fourth highest population in the country, and is expanding at a rate of over 600 people per day (ENFO Report).

Background

The land that was uninhabitable because of swamps and marshes is now kept dry through a network of canals. The dense forests have been cleared to make room for developments. Coastal prairie, pine flatwoods, hardwood hammocks, have all been sacrificed in the name of progress.

Part of Florida's heritage still remains. Florida is one of the most species-rich states in the nation. But even this biological diversity is being threatened. The roadways that allow us to maneuver around the state confine wildlife to isolated tracts of land. Our homes remain dry, but the wetlands' wildlife are struggling to survive with a new, unnatural hydrological regime. We cut down forests to build our homes and feed our growing population, while destroying the homes and food of our native wildlife.

Obviously, Florida's native species are suffering. According to the US Fish and Wildlife Service's rankings, there are 70 endangered (not including threatened, etc.) species in Florida, ranking it second in the nation, behind California.

To date efforts to preserve biological diversity have mostly been centered on preserving individual species and tracts of land. By looking at the threats to Florida's biodiversity, we may be able to come up with some additional approaches.

While viewing Florida's landscape, you may notice that natural habitats have not only been lost, but also fragmented into different size patches. Roads serve as barriers, confining many species of wildlife within restricted areas. In these small habitat patches, organisms must carry out life functions within the area, or must attempt to cross into other suitable areas. These options have different outcomes, depending on the specific traits of the species in question, and the size of the patch in which they occur.

For species that are able to remain in a small area for their entire life cycle, a small patch may seem at first to be suitable habitat. However, small, isolated areas can accommodate only a few individuals of any particular species. In this situation, inbreeding becomes a potential problem. Individuals in one patch have few alternatives for breeding partners, as they are unable to mix and mingle with individuals from different areas, as would occur naturally. Inbreeding can be a destructive process, as it leads to the depression of reproductive potential and reduced adaptability to a constantly changing environment.

For far-ranging animals, these barriers cause even more problems. For example, very few of the remaining habitat patches are large enough to provide the spatial needs of a

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Florida panther or a Florida black bear. Florida panthers normally occur in densities of one panther per 50,000 acres. Hence, even in very large tracts of available land, there is still not enough habitat for more than a few individuals per tract. It is instinctive for animals such as a Florida panther to establish territories, and to avoid other panthers' territories, even if this means attempting to cross some of those barriers, the roadways.

A far-ranging species may choose to attempt crossing the roadway for a variety of reasons, such as finding food, suitable cover, or mates. In fact, this has become such a common occurrence that vehicular collisions are an immediate threat to Florida's wildlife. As roadways are widened to accommodate higher speeds and heavy volumes of traffic, the odds of successfully making it across diminish. Automobile collisions have been implicated as a major cause of mortality for several of Florida's large threatened or endangered species, including the Florida panther, Florida black bear, Key deer, bald eagle, and American crocodile.

If one considers collisions with boats, the West Indian manatee is added to that list. Vehicular collisions are not only dangerous for wildlife, but for humans as well. Four hundred thirty one vehicle collisions with animals during 1990 were considered serious enough to be reported to the Florida Department of Highway Safety and Motor Vehicles. Of these collisions, there were four human fatalities, 380 human injuries, and an average estimated property damage of \$3,395 per accident, testifying to a problem for both wildlife and humans alike.

Mobile species are not only dodging cars, but these animals also have a greater risk of encountering other human imposed risks, such as pets, livestock, illegal hunting, traps, and other hazards associated with urban areas. The loss of large carnivorous species is not only a loss to biological diversity, but it also diminishes our regard for the wildness of an area.

Another threat from a fragmented landscape is the expansion of non-native and native weedy species. A weedy species is one that is already common throughout many types of environments; raccoons are an example. With the loss of large native carnivores, medium-sized animals such as raccoons and opossums face little threat from predators and are able to expand populations. Increasing populations of such species causes problems for other species. For instance, the raccoon is an avid predator of eggs of endangered marine turtles and American crocodiles, alligators and many native forest songbirds.

In ecology, all things are inter-connected: the loss of contiguous habitat leads to the loss of large native carnivores, which leads to population increases in medium-sized mammals such as raccoons, which in turn leads to increased predation on many other native wildlife species. At this point, the foundation of the ecosystem begins to break down from the loss of biological diversity, as the loss of one species sets off chain reactions that reverberate throughout the whole system.

The threat of some non-native species in Florida comes from their ability to displace native species. Many non-native species survive because of their aggressiveness and tolerance of disturbed environments, which provide artificial sources of food and shelter. Non-native species also tend to tolerate or thrive in fragmented landscapes, and as Florida's natural areas become more and more fragmented, it opens up more habitat for the species that prefer those areas.

For example, forest edges (within 100 yards of an opening) are the preferred habitat of the brown-headed cowbird, a native species that is expanding its range, which parasitizes the nests of native songbirds .

When the forest is one contiguous habitat, the area of edge habitat is very small in comparison to the area of interior forest, and the cowbird does not penetrate into the interior portions. When the forest becomes fragmented into many small patches, most habitats are edge habitats. The cowbird has free access to the entire area and all songbird nests within.

In Florida, for every native species that is lost, ten non-native species have become established. While this may be an increase in species richness, it is not an increase in ecological integrity, as non-natives tend not to contribute to the system as a whole.

While Florida's native species are forced to compete with non-native species on small, isolated patches of habitat that are surrounded by roadways full of high speed traffic, they must also cope with the loss of actual acreage. Habitat loss is the most common cause of the decline in wildlife populations. For instance, if ten percent of a forest is cleared, you can expect a percentage of that area's wildlife to disappear. Species are usually adapted only for a particular type of habitat, and when that habitat is destroyed or altered, it may not provide the same quantity or quality of food, water, and shelter. If the alterations are severe, the area may cease to be a viable habitat for species that originally occurred there.

Occasionally, alterations of habitat can occur without actually losing area. If we look at an area the size of Everglades National Park and Big Cypress National Preserve, you may wonder why those areas are unable to support their original array of species. Together they encompass over 2.2 *million* acres of more-or-less contiguous habitat. The alterations in the Everglades area comes from changes in the water cycle. Many species are dependent on the natural water cycle to signal nesting and breeding times and to provide sufficient food supplies. The effects of a human-regulated hydrological regime on wading birds has been devastating, especially on the wood stork, now an endangered species. The decline of the wood stork can be seen as a biological indicator, revealing the decline in the overall health of ecosystem itself. Since wood storks are so visible, and there is such a wealth of information concerning their past populations, their current status can be viewed as being representative of many other native species that are not as easily observed.

According to a Florida Game and Fresh Water Fish Commission study, 44% of all of Florida's vertebrates are known or suspected to be declining in number or distribution. This should be viewed as a warning that current efforts aimed at preserving species are not enough. We often hear about deforestation occurring in Brazil, but do we ever hear that Florida's forest loss rate is more than double that of Brazil?

How can we hope to save Florida's wildlife if we continue to destroy habitat? Conservation and management is possible, but federal, state, regional, and local agencies must work together to implement an ecosystem approach to management, which understands that all things are interconnected. The loss of each piece of the puzzle has implications throughout the ecological landscape.

What you can do:

- Urge your state and federal representatives to support greenways, wildlife movement corridors, and more highway wildlife underpasses.
- Support the nongame program of the Florida Game and Fresh Water Fish Commission.
- Visit national, state, and local parks where resident naturalists describe local ecosystems, and look into volunteer activities at these locations.
- Attend public hearings concerning land and water use decisions. Become informed, then get involved.

- Encourage conscientious driving habits that include obeying the posted speed limits, and keeping alert to avoid hitting wildlife.
- Plant a refuge for wildlife in your own backyard.
- Join conservation organizations active in your region.