Conservation Outlook for Florida's Threatened, Endangered, and At-risk Species

The Mission of the U.S. Fish and Wildlife Service:

Working with others to conserve, protect and enhance fish, wildlife, and plants and their habitats for the continuing benefit of the American people.

Conservation Outlook For Florida's Threatened, Endangered, and At-risk Species

U.S. Fish and Wildlife Service
Florida Ecological Services Offices
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A snail kite prepares to eat an apple snail. These raptors use their curved beaks to pull their primary prey, apple snails, from their shells.

Photo: © Kevan and Linda Sunderland

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The green turtle can be found nesting on many Florida beaches and all life history stages are found in Florida. Nesting numbers have been increasing the last few years.

Photo © Blair Witherington

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A singing banded male grasshopper sparrow.

Photo © Christina L. Evans

State Supervisor's Foreword

Florida's beauty and mild climate are enjoyed by 19 million residents—a number growing rapidly as 1,000 people move to Florida every day. Florida also welcomes over 94 million tourists every year. Florida's rich natural heritage and iconic plant and animal life are major reasons why millions of people want to live in and visit the Sunshine State.

The outlook for conserving Florida's plants and animals protected under the Endangered Species Act (ESA), as well as those categorized as "at-risk species", are the focus of this report. The U.S. Fish and Wildlife Service (Service) is jointly responsible for administering the ESA, along with the National Marine Fisheries Service.

The ESA federally protects species under two broad categories: threatened or endangered. By evaluating where each of Florida's 129 threatened and endangered species stand relative to its potential for recovery or extinction, the Service hopes to best inform agencies, decision-makers, and citizens in conservation planning.

For the purposes of this conservation strategy, the Service's Southeast Region has defined "at-risk species" as those species that have either been proposed for listing, are candidates for listing, or have been petitioned for listing. Florida has about 148 of those species.

In the coming decade, the Service will evaluate a record number of fish, wildlife, and plant species for possible listing as threatened or endangered under the ESA. Our goal is to limit the number of at-risk species before they need to be formally listed by conserving them in voluntary and innovative ways.

To do that, we'll need to partner like never before with private landowners and others, as our state manages a growing influx of new residents and environmental stressors such as climate change. We're working with our partners to proactively conserve as many at-risk species as possible in the face of change. Together we can pass down our outdoor traditions to future generations, and help keep ranches, farms, forests, and other lands working for people and wildlife.

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We hope to achieve our goal through vigorous work in five action areas:

Prioritizing Species in Need of Conservation. We are working closely with the states and other partners to evaluate species based on their conservation needs and potential for success.

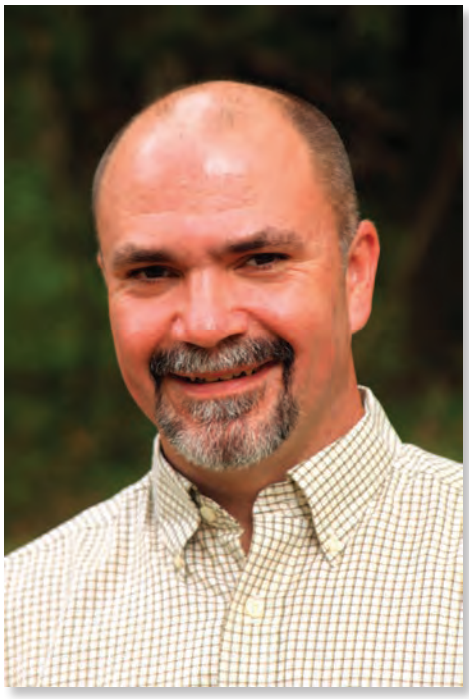
Voluntary Conservation Actions. We are working to improve the tools available to make it easier and beneficial for partners to do more to safeguard declining species.

Partnerships. We are working with a variety of organizations including the Southeastern Association of Fish and Wildlife Agencies and the Southeast Regional Partnership for Planning and Sustainability, as well as individual partners, to support their efforts to conserve at-risk species.

Collecting Data. We are evaluating the Service's data systems to ensure they are integrated and useful to help us make the smartest conservation decisions.

Outreach. We are engaging interested partners to join the effort to conserve at-risk species. It's an ambitious, but necessary plan because Florida holds the greatest biological diversity east of the Mississippi River.

> ***"We're working with public and private partners to proactively conserve as many of these at-risk species as possible over the next decade and hopefully prevent the need to list them under the Endangered Species Act."***



Larry Williams
Florida State Supervisor for Ecological Services
U.S. Fish and Wildlife Service

Introduction

Unfortunately, much of Florida's plant and animal life has become imperiled. Once intact ecosystems are now small fractions of their historic size, and consequently, more species are losing the ability to deal with predators, disease, pollution, invasive species, and habitat decline. This condition is furthered by climate change—including sea level rise, temperature shifts, and precipitation changes.

Many listed species are on a solid path to recovery and eventual delisting. Those successes should be celebrated. Several of those species are highlighted in this report. People are working valiantly to save our highly imperiled species, but they are often limited by resources. A troubling pattern is many of these species are becoming reliant on intensive conservation actions that are both expensive and challenging. Three species illustrating this pattern are the Florida grasshopper sparrow, Florida torreya, and Schaus' swallowtail butterfly.

The Schaus' swallowtail butterfly is endangered due to most of its habitat and host plant (torchwood) being eliminated from South Florida.

Florida grasshopper sparrows are found nowhere else in the world except the dry prairies north of Lake Okeechobee. About 90 percent of their original habitat has been lost. The sparrows have declined to less than 200 birds, so we are working with our partners to develop techniques to breed them in captivity. Florida torreya, an evergreen tree found only in Florida's panhandle, is now dying range wide because of an introduced fungus. Torreya trees formerly matured to 60 feet or more in height, but the fungus now kills them back to their roots, and new sprouts never get above six feet before being killed back again.

This report includes a short section on "Recently Extinct Species." These stories provide helpful lessons on situations to be avoided and the subtlety of incremental steps that can lead to extinction. Environmental laws have improved greatly in recent decades. Some of these species would not have gone extinct if today's protections had been in place. Still, these species demonstrate the need to be attentive to all factors that contribute, directly and indirectly, to species decline.

The Service reviewed all 129 of the federally listed species in Florida and assessed them using 10 key factors contributing to species health [based on the International Union for Conservation of Nature (IUCN) and the Florida natural Area Inventory (FNAI)]. This allowed us to see across the board which species may be closer to recovery and which ones may be facing greater challenges.

Assessing the species in this way could help conservationists and decision-makers better plan future work. For example, the species with high recovery potential could potentially be delisted altogether in the near future if targeted investments are made in their recovery. Several of these species, such as Okaloosa darters, represent long-term conservation endeavors that all Floridians can be proud of.

At the opposite end of the spectrum are those species facing major recovery challenges. These species have a high potential for extinction and urgently need investments if they are going to persist. Often what is needed to move these species towards recovery is clear, but beyond resources. For example, the Perdido Key beach mouse and the Florida leafwing butterfly both need more protected habitat, but the beachfront real estate on Perdido Key and the pine rockland habitat near Miami (where the Florida leafwing lives) are very expensive. Climate change, especially sea level rise, could also significantly impact the habitat of both of these species. Species like these, with small occupied ranges in areas with highly desirable real estate, are probably the most vulnerable to extinction.

> *“We do not inherit the Earth from our Ancestors, we borrow it from our Children”*
>
> *~ Native American proverb*

Between those two extremes, in the middle, are the majority of our listed species. It is for these species that mainstream conservation planning can be most effective. Florida has two excellent conservation planning efforts underway—the Florida Statewide Action Plan and the Cooperative Conservation Blueprint. These two planning efforts focus on overlaying the distribution of all species that are threatened, endangered, or otherwise imperiled, and using their overlapping needs to guide strategic land protection. This comprehensive planning is happening statewide, and it is fundamental to conserving the 129 federally threatened and endangered species and the 148 at-risk species.

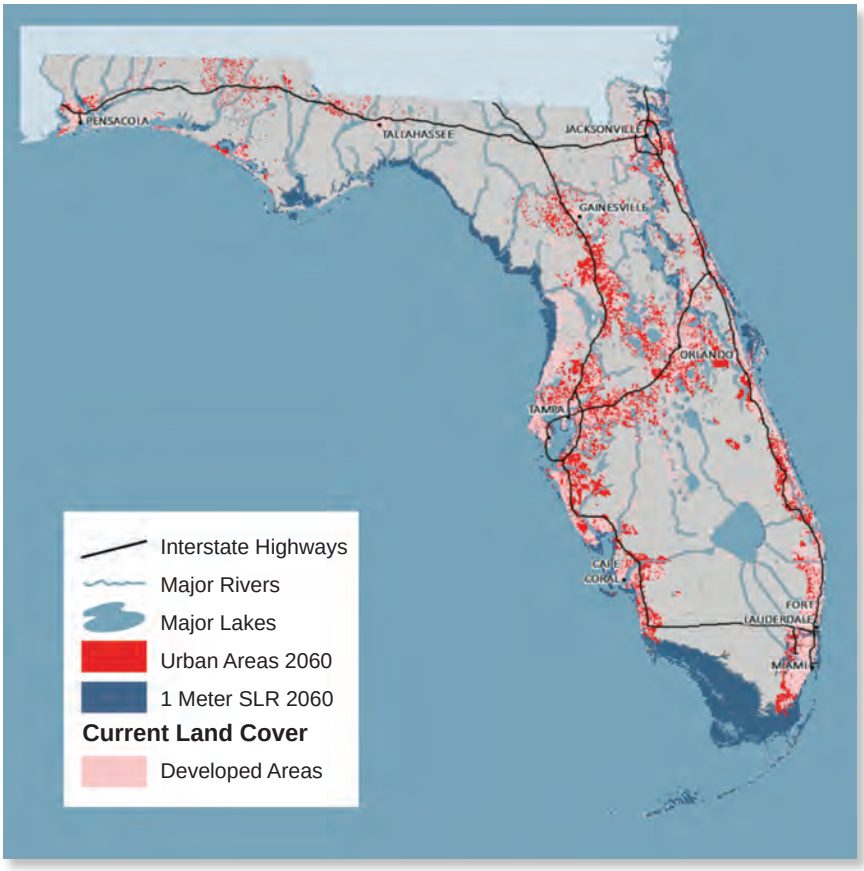
Right: The USFWS helps coordinate interagency controlled burns as a management technique for many Florida habitats.

Photo © Larry Richardson (USFWS)

Threats to Conservation in Florida

Habitat Loss

Florida is the third most populated state in America and conservative growth projections estimate 11 million more people by the year 2060. Human growth infrastructure will have a strong influence on the conservation potential for many species. Residential and commercial development, road construction, dams, and agricultural conversion all fragment and destroy Florida's natural communities.



Urbanization of Florida in red (11,000,000 more people by 2060) with 1 meter of sea level rise projection to 2100 scaled for 2060 in dark blue; by GeoAdaptive, LLC and GeoDesign, LLC). Some of the major growth areas include the Atlantic coast and the I-4 corridor especially north Orlando. This will cause a large amount of conflict with numerous endangered species—especially along the Lake Wales Ridge.

Fire Suppression

Lightning strikes and thunderstorm activity occur more often in Florida than almost anywhere. Without roads, asphalt, and concrete serving as firebreaks, much of Florida likely burned frequently and completely before there development was so widespread. Fire shapes and maintains the Florida landscape. It cycles nutrients and makes them available to plants, triggering many to flower and set seed. Many species of plants and animals decline when fire is suppressed, as soil nutrients decline and vegetative communities change.

Climate Change

Nine inches (0.75 feet) of sea level rise occurred in Florida over the last 70 years, but there is a high probability of this increasing to at least one meter (3.28 feet) by the year 2100 (facing page). Millions of acres of habitat in Florida could be directly flooded by sea level rise, and many more acres may be indirectly affected by ground and surface water changes.

Other aspects of climate change important for our species of concern are events associated with rising temperatures and increased incidence of droughts, changes in precipitation amounts and intensity, and decreased freshwater availability. For instance, specific effects to mussels, their habitat, and their fish hosts could include changes in stream temperature regimes, the timing and levels of precipitation causing more frequent and severe floods and droughts, and alien species introductions. For plants, recent extended droughts and changes in temperatures and precipitation are affecting the timing of first leaf date, flowering, and seed germination processes.

Invasive Species

Many introduced plants and animals are emerging as serious threats to native wildlife. The damage caused by invasive species can include direct impacts from predation, competition for food and space, and habitat destruction. Some invasive plants can dominate and alter community structure. Pythons, feral cats, hogs, tegu lizards, cactus moths, fungal diseases, melaleuca trees, and many other invasive species have become established in Florida. Without any natural predators, they outcompete, voraciously prey upon, and alter the habitat of our native species. Without surveillance and action, many of Florida's wading bird colonies, mammals, and plant communities are at high risk.

Numerous exotic plants and animals have invaded Florida. The Burmese python is one example that will be very difficult to remove, and potentially harms numerous native species.


Forgetting
“ is another kind ”
of extinction
~ Todd McGrain,
the Lost Bird Project

Recently Extinct Species

Gone are the times when extinctions regularly occurred due to overhunting or intentional eradication. Today, extinctions primarily occur due to loss of habitat. There may be secondary, more immediate causes noted, such as predation by feral cats (Pallid beach mouse), or pesticides (Dusky seaside sparrow and Zestos and Rockland grass skippers), but these factors came into play only because there was no alternative place for these last individuals to go where conditions were better or safer.

Here are some species recently lost from the Florida landscape:

Bachman's Warbler—Once common, the Bachman's warbler has not been reported in Florida since 1977 and not seen in the U.S. since 1988—likely caused by habitat loss from land clearing and development in the Southeastern U.S., and destruction of its wintering habitat in Cuba. This species did not breed in Florida, but used a variety of habitats as migration stops.

Pallid Beach Mouse—Once abundant, much of the species' coastal dune habitat is now the city, roads, homes, and condominiums of Daytona Beach. This white sand-colored mouse was vulnerable to habitat fragmentation and loss, as well as the artificial lighting, house mice, and feral cats that are commonly associated with development. The last Pallid beach mouse was observed in 1946.

Dusky Seaside Sparrow—A striking bird with a unique call, this species was threatened by DDT and flooding of its nesting habitat to control mosquitoes, and then draining of habitat to facilitate construction of the Bee Line Highway. By 1979, only males remained in the wild, and they were captured to initiate a captive breeding program. Efforts to preserve the Dusky's unique genes by crossing them with a related sparrow were ultimately unsuccessful, with the last Dusky seaside sparrow dying of old age in captivity in 1987.

Ivory-billed Woodpecker—Considered extinct due to collecting and logging until two were observed in Florida in the 1920s, which sadly and inexplicably were shot as specimens. In 1938, the species was rediscovered again on lumber company lands in Louisiana. Efforts to protect the land for conservation were unsuccessful, and the last bird was gone by 1944. Field surveys, habitat restoration, and land acquisition efforts were recently hastened after possible ivory-billed woodpecker sightings in 2004 to 2008, but definitive evidence has yet to be confirmed.

Zestos Skipper and Rockland Grass Skipper—The Zestos skipper is a butterfly that occurs commonly throughout the Bahamas and eastern Antilles. In the U.S., it was last observed in south Florida on Stock Island within the lower Florida Keys in 2004. Although the Zestos skipper was found locally in the lower Florida Keys until 2004, populations elsewhere in southern Florida had mostly disappeared several decades ago. The Rockland grass skipper, a subspecies of the more wide-ranging Meske's skipper, was known locally from pine rocklands of the lower Florida Keys. It was thought to be eliminated in the 1980s. It was briefly rediscovered on Big Pine Key in 1999, but it disappeared again before recovery actions could be implemented. The exact reasons for the extirpation of the Zestos and Rockland grass skippers are unknown, but was likely a result of habitat loss, fragmentation, and degradation, among other natural and human factors.

Left: The Dusky seaside sparrow whose loss highlights the need for habitat conservation and management.

Photo © USFWS

The downlisting of the wood stork from endangered to threatened demonstrates how the Endangered Species Act can be an effective tool to protect and recover imperiled wildlife from the brink of extinction.

Photo © Peter Brannon

Florida Wildlife Success Stories

Wood Stork

The U.S. breeding population of the wood stork has increased markedly since it was listed in 1984. The three-year averages during the past 10 years ranges from 7,086 to 10,147—all above the 6,000 nesting pair reclassification benchmark. The recent downlisting from endangered to threatened recognizes the wood stork's ongoing recovery and the positive impact that collaborative conservation efforts over the last three decades are having on the status of the breeding population. With continued population growth, breeding range expansion and the minimization or removal of threats, the species could approach the biological milestones where it could be considered for delisting. The Service continues to work with conservation partners such as the Natural Resources Conservation Service through its Wetlands Reserve Program, to protect and restore wetlands to continue the recovery of the wood stork. The Wetlands Reserve Program alone has restored more than 200,000 acres of wetlands in Florida.

American Crocodile

In pre-Columbian days, the coastal tip of South Florida was crawling with thousands of American crocodiles. By the time they were listed as endangered in 1975, hunting for sport and skins, as well as over-collection for zoos and museums had reduced their numbers to as few as 200. With the entire population, including only 10–20 breeding females, living in one small area of northeastern Florida Bay, American crocodiles were in stark danger of becoming little more than a memory. But only eight years after gaining ESA protection, populations had grown to about 1,000, and crocodiles had already returned to much of their historic range, from Biscayne Bay and Key Largo to Florida's southwestern coast. In 2005 the crocodiles' numbers grew to over 2,000. Two years later the species was downlisted to threatened.

Brown Pelican

Two distinct populations of brown pelicans exist: The California brown pelican—ranging from California to Chile, and the eastern brown Pelican—ranging into the Atlantic and Gulf coasts, the Caribbean, and the Central and South American coasts. Both populations were dramatically impacted by habitat destruction, food shortages and DDT. Driven to extinction in Louisiana, brown pelicans have made a dramatic comeback. The brown pelican was fully delisted in 2009.

West Indian Manatee

Manatees were first listed as an endangered species in 1967 and subsequently grandfathered into the ESA's list of threatened and endangered species in 1975. At the time of listing, there was no population estimate for the West Indian manatee throughout its range. However, researchers believed that there were only about 750 manatees in Florida. In 2015, researchers provided a more recent minimum population count for the manatees in Florida that includes 6,063 animals.

American Alligator

Following listing in 1967 under a law that preceded the Endangered Species Act of 1973, American alligator populations rebounded, and the species recovered. American alligator populations reached all-time lows in the 1950s, primarily due to hunting and habitat loss. However, in 1987, the alligator was pronounced fully recovered, making it one of the first endangered species success stories. Today, millions of alligators are found throughout the Southeast, from the Carolinas to Texas and north to Arkansas. It remains protected due to similarity of appearance to the threatened American crocodile.

Green Sea Turtle

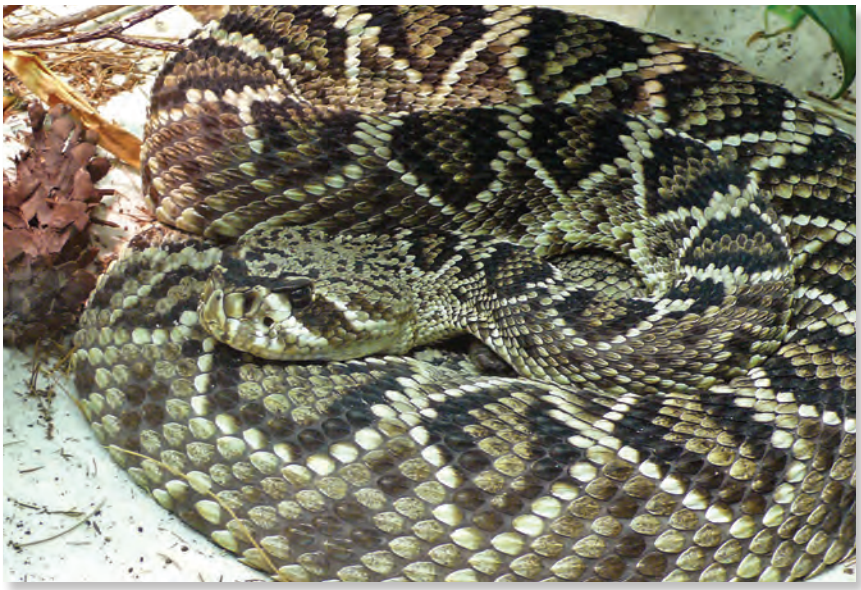
The Atlantic green sea turtle is threatened by egg collection, hunting, vandalism, disturbance while nesting, beach development, habitat loss and sea level rise. Its population has increased in the U.S. since being listed as endangered in 1978. It grew by a whopping 2,206 percent in Florida between 1989 and 2011 (464 to 10,701). In 1990, fewer than 50 green turtles were documented nesting at the Archie Carr National Wildlife Refuge on Florida's east coast. This 20–mile stretch of beach hosted nearly 13,000 green sea turtle nests in 2013, making this one of the greatest conservation success stories of our time.

At-risk Species Examples

The following plants and animals are a subset of the 148 at-risk species in Florida and represent the wide range of issues causing these to be at risk. Continuing the strong conservation culture in Florida will be critical for protecting the at-risk species and keeping them off the endangered species list.

Gopher Tortoise

Gopher tortoises are found in parts of all of Florida's 67 counties. However, their current range in South Florida is limited because of unsuitable habitat and increased urbanization. The primary threats are habitat destruction, fragmentation, and degradation, particularly resulting from urbanization and development, agriculture, and phosphate/heavy metals mining.



Eastern Diamondback Rattlesnake

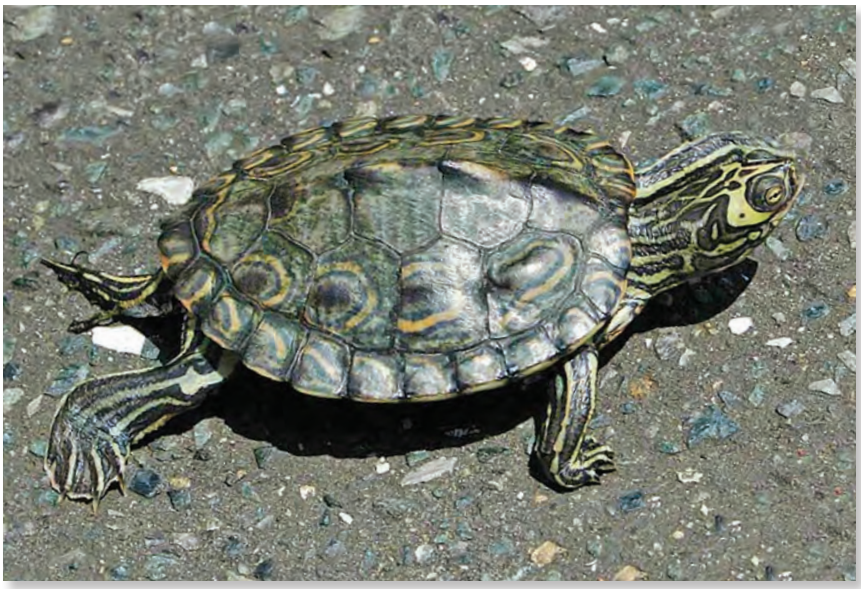
This snake historically ranged on the coastal plain from North Carolina south throughout Florida and westward to the eastern most parishes of Louisiana. The decline of the eastern diamondback rattlesnake is associated with the loss, alteration, and degradation of preferred dry habitats due to commercial and residential development, agriculture, and mining. Additional threats include road mortality and general persecution by humans. Localized commercial collection for regional rattlesnake roundups has been a conservation issue in the past, and continues to be so in several Alabama and Georgia towns.

The gopher tortoise is a federal at-risk species and in Florida listed as threatened. Both the tortoise and its burrow are protected under state law. Gopher tortoises must be relocated before any land clearing or development takes place.

Photo © Blair Witherington

Florida Pine Snake

This snake occurs throughout the Atlantic and Gulf coastal plains, from Southeastern South Carolina to South Florida, and west to Mobile Bay, Alabama. In Florida, this species historically occurred throughout the state, except for the Everglades and the Florida Keys. The major threats are loss and degradation of habitat.



Barbour's Map Turtle

Historically known only from the Apalachicola River drainage (including Chattahoochee, Flint, and Chipola rivers) of Alabama, Georgia, and Florida. Recent observations have extended the range to include the Ochlocknee and Choctawhatchee river systems. Principal threats include the combined effects of human take (food, pet trade, wanton killing), riverine habitat alteration (impoundment, channel dredging, snag removal, siltation), and pollution.

Small-flowered Meadow Beauty

This is a low-growing plant found in eight counties in the Florida panhandle, three counties in southern Alabama and one county in Georgia. The majority of populations are found in areas between depression ponds and the adjacent longleaf pine savannas. Urban development, timbering, and inadequate fire management are the main pressures reducing or eliminating individual populations. To help accomplish the long-term preservation of this species, known sites should be frequently monitored in the field to acquire a greater understanding of population dynamics, particularly in relation to fire.

West Florida Cow-lily

A water lily limited to freshwater inundated habitats and, thus sensitive to changes in hydrology and water quality. It ranges from the western panhandle of Florida to southern Alabama, and possibly to southeastern Mississippi. This species is poorly known. Therefore, known sites should be surveyed and monitored to acquire a greater understanding of population trends.

The Miami blue butterfly, due to habitat destruction from development, is now found only in a few places in the Florida Keys and Marquesas.

Photo © Holly Salvato

Reticulated Flatwoods Salamander

This salamander is found in the pine flatwoods of the coastal plain in Alabama, Florida, Georgia, and South Carolina. The species depends on seasonally-flooded ponds and depressions to reproduce.

Range: The reticulated flatwoods salamander is found in pine flatwoods and ephemeral ponds in southern Alabama, Florida, Georgia, and South Carolina. It is considered to be no longer found in Alabama.

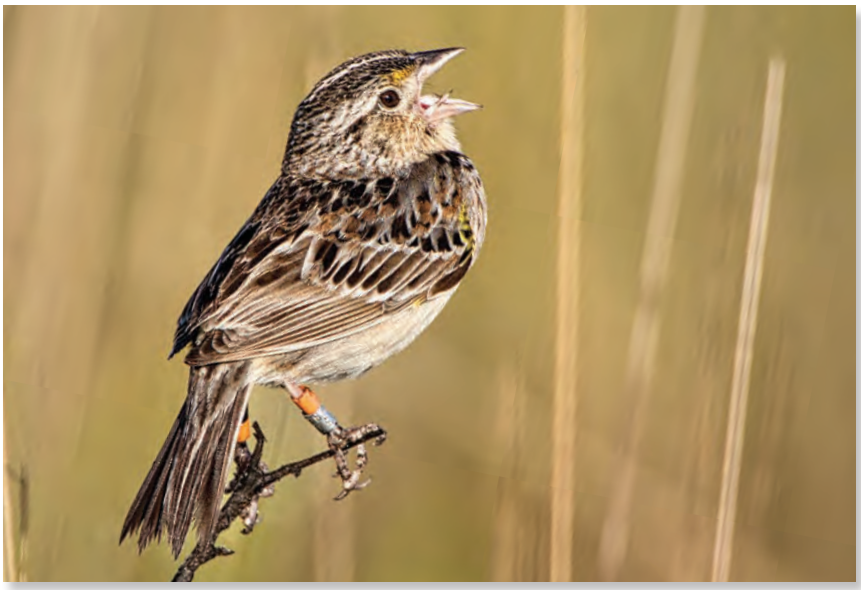
Status: Recent data strongly indicate the salamander is declining rapidly in both populations and range. Without immediate action to stabilize the remaining populations and an action plan for recovering lost populations, the species is vulnerable to extinction in the near future.

Threats: Threats include degradation, alteration and destruction of habitat due primarily to altered hydrology, agricultural practices and climate change.

What is needed?

- Immediate and comprehensive status surveys
- Greater frequency and intensity of prescribed fire during the growing season
- Vegetation management (habitat restoration)
- Restoration of hydrological function
- Enhanced breeding opportunities to increase populations and/or reintroduction into areas where they have become extirpated

Florida Grasshopper Sparrow



This non-migratory sparrow lives only in the dry prairie region of South Central Florida.

Range: Only one core population remains in Osceola County, Florida.

Status: There are probably less than 150 Florida grasshopper sparrows. Nearly 90 percent of their habitat has been lost to development or agriculture. This bird may become extinct within the next three to five years.

Threats: Threats include severe loss of habitat, fire suppression, altered hydrology, and encroachment of trees into the prairie landscape, all of which have further degraded the quality of the little remaining habitat.

What is needed?

- Land acquisition or placement of high priority dry-prairie habitat into conservation easements
- Restoration and enhancement of habitat through tree removal, and saw palmetto density reduction
- Research to develop an optimal fire regime and implementation of this regime in sparrow habitat
- Development and implementation of captive breeding and translocation techniques

Florida Panther

The Florida panther is the last species of cougar or mountain lion still breeding in the eastern United States.

Range: Historically occurring throughout the Southeastern U.S., the Florida panther is now restricted to less than five percent of its historic range. The only breeding population is in Southwest Florida.

Status: The number of Florida panthers has increased since 1995 when eight female pumas from Texas were released in Florida. The current estimate is approximately 100–180 panthers.

Threats: Threats include habitat loss, degradation, and fragmentation; reduced genetic diversity; potential for disease outbreaks; and vehicular collisions.

What is needed?

- Maintaining, restoring, and expanding the panther population and its habitat in South Florida
- Expansion of the breeding population north of the Caloosahatchee River into Central Florida and beyond
- Land acquisition and conservation easement programs and strategically located underpasses to establish safe wildlife corridors

Ochlockonee Moccasinshell

A small freshwater mussel endemic to the Ochlockonee River basin. This once fairly common species now only occurs in low numbers in a very short stretch of the lower river.

Range: This freshwater mussel is found only in the Ochlockonee River basin in Florida and Georgia.

Status: Until it was rediscovered recently in the lower river, the Ochlockonee moccasinshell had not been seen alive for nearly 20 years. The species once occurred throughout most of the Ochlockonee River main channel in Florida and Georgia, but now precariously persists in only an eight-mile stretch of the lower river where it occurs in very low numbers.

Threats: Threats include degradation of stream habitats from excessive sedimentation and pollution, channel destabilization from land clearing, and reduced flows as a result of water withdrawal and extended drought.

What is needed?

- Protection and restoration of wide, forested buffers along stream corridors
- Practices that reduce pesticide runoff
- Protection of groundwater resources to maintain stream flow levels
- Surveys in remote areas of the river

Lower Keys Marsh Rabbit

This species occurs only in the Florida Keys, and is the smallest and darkest of all marsh rabbits. It has been wiped out from most of its historic range (Big Pine Key to Key West).

Range: This species occurs in small, fragmented patches of grassy marshes, prairies, and coastal beach berm communities of the lower Florida Keys.

Status: Persistence of the species relies on dispersal, which has been sternly challenged by urbanization and habitat fragmentation. The Lower Keys marsh rabbit is vulnerable to sea level rise and loss of small, isolated populations.

Threats: Threats include habitat loss, alteration, and fragmentation; predation by cats; and road mortalities.

What is needed?

- Translocation of marsh rabbits to suitable historic habitat on other Keys
- Control or eliminate free-roaming cat populations
- Research focused on habitat use, habitat management, climate change modeling, and genetics

Perdido Key Beach Mouse

Protecting beach mouse habitat, the coastal dunes, protects inland areas from storm surge and other damage from tropical storms and hurricanes.

Range: This species is found only in natural, unspoiled, coastal dune habitat on tiny Perdido Key—an island east of Pensacola, spanning the Florida/Alabama state line.

Status: Perdido Key beach mice continue to persist despite nearing extinction in 2004–2005 after severe hurricane damage. Development pressure is high and with continued habitat loss and fragmentation, they could be one storm away from extinction.

Threats: Major threats include habitat loss and fragmentation, road mortalities, and predation by cats.

What is needed?

- Land acquisition and protection
- Provide and maintain corridors that allow mice to disperse and seek refuge from storm surge
- Control or eliminate free-roaming cat population

Florida Leafwing

This butterfly is completely restricted to the subtropical, pine rockland habitat that contains its only host plant, pineland croton. For protection from predators, the Florida leafwing looks like a dead leaf when at rest with its wings closed.

Range: Over 90 percent of the Florida leafwing's historic range has been lost. This once common species now exists solely in the Long Pine Key region of Everglades National Park.

Status: Due to its limited and isolated distribution, the Florida leafwing is extremely vulnerable to extinction via a wide range of natural or man-made threats, including a hurricane or wildfire.

Threats: Threats include habitat loss, degradation, and fragmentation; lack of adequate fire management; mosquito control pesticides; and poaching.

What is needed?

- Restoration and enhancement of pine rockland habitat, including implementation of adequate fire regimes
- Research focused on leafwing population viability and host plant ecology and distribution

Florida Torreya

© Vivian Negron-Ortiz

Prior to the 1950s, this cone-bearing tree was estimated to be the seventh most abundant tree species within Apalachicola Bluff regions. At present, it has lost at least 99.6 percent of its total population size.

Range: Florida torreya is found in the slope forests that cover hammocks, steep, deeply-shaded limestone slopes, and wooded ravines along the east side of the Apalachicola River in Florida and adjacent Lake Seminole in Georgia.

Status: Population size was estimated between 325,000 and 600,000 trees prior to a catastrophic loss of reproductive age trees in the 1950s. Losses during the 1950s and 1960s are thought to have been a result of fungal disease, or a combination of environmental stress and native pathogens. Currently, there are fewer than 1,000 individuals characterized by small individuals that fail to achieve reproductive maturity.

Threats: Threats include a new species of canker-causing fungus, environmental stress, and deer browse.

What is needed?

- Habitat management to optimize conditions for tree growth and survival; control of deer populations; monitoring and surveys every three to five years to document population status
- Research into the biology of *Fusarium torreyae* and host range study for this disease
- Establishment of seed orchards to augment the size and genetic diversity of natural populations
- Expansion and support of seed storage at very low temperature

Miccosukee Gooseberry

Miccosukee gooseberry is a very rare perennial species found in areas dominated by a mixed hardwood forest. The Florida population is steadily declining.

Range: This species is restricted to two small, separated populations. One is in Florida on private lands along the north shoreline of Lake Miccosukee; the other occurs in two public locations in McCormick County, South Carolina.

Status: Plants appear abundant in both locations. However, recent surveys of the Florida population revealed a dramatic decline in plant numbers.

Threats: The small size of the Florida population, along with low genetic variation and low (or no) seedling recruitment, suggest the possible loss of this recovery unit. The South Carolina population is threatened by several nonnative plants and feral hog habitat disturbance.

What is needed?

- Identify the most critical life history stages of population growth and their causes of demographic variation
- Long-term seed germination and recruitment studies
- Viability of dry-stored seeds; surveys/inventories on potentially new sites, between northern Florida and South Carolina
- Habitat management
- Invasive species management and control

Florida Semaphore Cactus

© Vivian Negron-Ortiz

Florida semaphore cactus is one of the only two plant species only found in the Florida Keys. The species is threatened by sea level rise, all of the living individuals are males, and an introduced species of moth infests the plants, causing mortality.

Range: Florida semaphore cactus is found on four islands in the Florida Keys, with only two small naturally occurring populations and a few outplanted populations of limited success. They grow in low buttonwood transition areas between rockland hammocks and mangrove swamps.

Status: Only two natural, wild populations exist, one of which is comprised of a few, declining mature plants; the other is relatively stable. Most individuals are males with a few that seldom set seeds; the females are likely extinct.

Threats: Major threats include sea level rise, hurricanes and storm surge, predation by exotic moth, root rot, collecting and poaching, and lack of genetic variation and sexual reproduction.

What is needed?

- Reintroduction and monitoring activities
- Control the exotic cactus moth
- Root rot pathogen studies; propagate the species vegetatively for conservation efforts both inside and outside of original growing areas
- Habitat management studies

The federally listed as threatened Florida scrub-jay is a habitat specialist only found in scrub. The scrub habitat is one of the most endangered ecosystem types in Florida and as a result, Florida scrub-jay populations have declined dramatically.

Photo © Blair Witherington

Okaloosa Darter

© Bill Tate USFWS

A small cryptic fish occurring almost entirely on Eglin Air Force Base. Eglin natural resource managers are actively working with partners to recover the species.

Range: The Okaloosa darter is limited to six small coastal watersheds in the Florida Panhandle.

Status: Reclassified from endangered to threatened in 2011, the Okaloosa darter is a conservation success story.

Threats: Major threats include urbanization, introduced species, habitat loss caused by erosion and sedimentation, and habitat fragmentation caused by fish passage barriers and impoundments.

What is needed?

- Habitat restoration efforts including erosion control, stream restoration, and removal of fish passage barriers have improved habitat throughout the species' range
- Research and scientific partnerships have advanced our understanding of the species' behavior, population size, and life history thus improving the efficiency and effectiveness of recovery efforts

Etonia Rosemary

It was thought that this species was found at two locations, Etoniah Creek State Forest and Dunns Creek State Park. However, genetic testing revealed that the population at Dunns Creek is a different mint species.

Range: The Etonia Rosemary is found only in Putnam County, Florida. It currently exists at 13 locations on publicly managed lands and six on private land, which are all located within Etoniah Creek State Forest.

Status: Listed as endangered in 1993, Etonia Rosemary is found in deep white-sand within scrub dominated by sand pine and shrubby oaks.

Threats: Threats include habitat loss and fire suppression resulting in closure of overstory vegetation, which is an important limiting factor to this plant.

What is needed?

- Prescribed fire
- Lighting management
- Scrub management
- Treatment studies

Florida Golden Aster

© Cordell

The Florida golden aster has been successfully bred and reintroduced into five conservation areas and has responded well to restoration within the historic range. The Service is evaluating the potential to downlist this species from endangered to threatened.

Range: Another Florida native, the Florida golden aster is currently found in Hardee, Hillsborough, Manatee, and Pinellas Counties. It grows in open, sunny areas and occurs in sand pine-evergreen oak scrub vegetation on excessively drained fine white sand. Historically, it also occurred in the coastal dune habitats in Pinellas and Manatee Counties.

Status: Listed as endangered in 1986 due to its restricted distribution to a small area of ancient dunes in southern Hillsborough and Pinellas Counties; at that time, all but two known populations were on private property. There are now 12 conservation sites in Hillsborough, Manatee, and Pinellas Counties that have self-sustaining populations; six of these sites in Hillsborough County have populations of more than 1,000 plants.

Threats: The primary threat is the direct loss of habitat due to residential and commercial development. Other threats include mowing, dumping, excessive grazing and off-road vehicle use.

What is needed?

- Development of management plans for publicly managed lands need to receive highest priority and should include guidelines to control mowing, overgrazing, excessive habitat degradation from off-road vehicle use and dumping
- In many situations, soil disturbance and removal of overstory vegetation will promote germination and establishment of the species
- Securing habitat and reintroductions on conservation lands should continue

Florida Scrub-Jay

© Vince Lamb

The Florida scrub-jay is a cooperative breeder with most offspring staying with their parents to help them raise young for at least one year. They are non-migratory and territorial. They're the only bird species that occurs only in Florida.

Range: Florida scrub-jays once occupied 39 counties in Central Florida, but are now only found in 31. Their native habitat is scrub and scrubby flatwoods plant communities which occur on relict dunes and sand ridges in Central Florida.

Status: The Florida scrub-jay was listed as threatened in 1987. Several large populations occur on publicly managed conservation lands including Ocala National Forest, Lake Wales Ridge NWR, Lake Wales Ridge State Forest, and Merritt Island NWR.

Threats: The primary threat is the widespread conversion of oak scrub vegetation resulting in extensive habitat loss along with fragmentation and degradation of existing patches of scrub habitat. Florida scrub-jays prefer landscapes with low-cut trees (less than six feet) and open sandy areas which would naturally occur in this fire-dependent plant community.

What is needed?

- Infrequent fire is one of the greatest threats to this species persistence, making restoration and prescribed fire one of the most important management components of recovery
- Outreach to land managers, both public and private, addressing these habitat management needs, along with stressing the importance of creating and maintaining optimal scrub habitat conditions either through prescribed fire or mechanical manipulation

Scrub Buckwheat

Scrub buckwheat only occurs in scrub and high pineland plant communities along the ancient dune ridges of Central Florida.

Range: Scrub buckwheat occurs along the Lake Wales and Mount Dora Ridges and is found in edge habitats between scrub and high pineland from Marion to Highlands Counties.

Status: Scrub buckwheat was listed as a threatened in1993 due to extensive habitat loss and degradation. Only about 15 percent of the Florida scrub vegetation remains as the rest has been converted to citrus groves, pasture, and residential areas. Many of the remaining larger tracts have been acquired by private conservation entities and local, state, and federal agencies for conservation purposes. Several new populations have been documented since Scrub buckwheat was listed. Of the 48 known populations, 27 (roughly 50 percent) occur on public conservation lands, including Lake Wales Ridge NWR, Lake Wales Ridge State Forest, and Ocala National Forest.

Threats: Habitat loss, degradation, and fragmentation coupled with fire suppression results in increased plant competition and canopy closure restricts the available light and is likely a limiting factor for this plant.

What is needed?

- Ongoing research, surveys, and monitoring
- Land acquisition, restoration, and management need to continue

Wood Stork

Wood storks are an iconic wading bird associated with Everglades restoration. They are a wetland-dependent bird and an indicator of the health of freshwater and coastal wetland habitats of Florida and of the coastal plains of the Southeastern U.S.

Range: The wood stork occurs in Florida, Georgia, South Carolina, North Carolina, Alabama, and Mississippi.

Status: The U.S. breeding population of wood storks was listed as Endangered in 1984 throughout its range in Florida, Georgia, South Carolina, and Alabama because of the dramatic population decline and loss of habitat. Specifically, the loss of wetland function of the south Florida ecosystems impacted the primary area where wood storks nest. On June 30, 2014, the wood stork was downlisted from endangered to threatened.

Threats: Loss, fragmentation, and modification of wetland habitats continue as the main threats to wood stork recovery.

What is needed?

- Ongoing protection and restoration of wetlands
- Focused management of public lands and wetland ecosystems

Recommendations

Regional Strategies—Strategically define areas for sensitive species and human services that optimize conservation benefits. This can be accomplished through county- or region-wide conservation plans or guidance.

Outreach and Incentives—Develop creative incentives and land stewardship outreach programs to protect habitat and promote water conservation that will ultimately benefit Floridians and the environment. Programs should stress the importance and many (including economic) benefits of creating and maintaining optimal habitat conditions.

The Key deer is an example of a species that have a stable population in their remaining habitat. However, future threats such as urbanization, continued habitat fragmentation, and sea level rise make the future very uncertain.

Land Acquisition and Conservation Easements—Several Florida species cannot persist on what habitat remains. Land acquisition and easements, followed by restoration and management, are needed to provide and maintain corridors, and offer the space needed for populations to grow to a sustainable level.

Habitat Restoration, Enhancement and Fire Regimes—Efforts to reverse habitat loss and degradation, such as: restoring water function, widening river buffers, invasive tree removal, erosion control, and removal of fish passage barriers, are needed for nearly all habitat types, particularly wetlands, streams and dry prairie. Developing optimal fire regimes and plans for species and habitat types is needed as is the ability and funding to keep up with fire frequency needs.

Climate Change and Sea Level Rise—Much of the Florida Keys is likely to be underwater or at least support very different plant communities by 2060. Priorities, options and adaptation plans should be explored.

Invasive Species Management and Control—Encourage county and agency officials to take action to eliminate many exotic and invasive species such as free-ranging cats throughout Florida. Continue outreach, research, surveillance, and eradication of other non-native invasive species including large constrictor snakes, tegu lizards, cactus moths, feral hogs, and many non-native plant species.

Surveys, Monitoring and Adaptive Management—Fundamental studies of many species are still needed to identify critical life history stages and determine causes of their decline. These efforts are essential to determining the best management practices needed to increase the species' abundance and distribution.

Conclusion

The Service will continue working with its many partners to conserve all of the species listed here. In prioritizing its work, the Service will continue making first priority the prevention of additional species listings. Conservation that is proactive, voluntary and prevents the need for listing is always best for species and for people. The Service's second priority is recovering those species officially listed as threatened or endangered.

Early conservation—before a species requires listing under the ESA—maximizes management options for landowners, minimizes the costs, and reduces the potential for restrictive land use policies by addressing the needs of the species before regulatory requirements for listed species come into play.

Voluntary conservation agreement tools available include habitat conservation plans, safe harbor agreements, candidate conservation agreements and conservation banks.

Florida has two excellent conservation planning efforts underway—the Florida Statewide Action Plan and the Cooperative Conservation Blueprint. These two planning efforts focus on overlaying the distribution of all species that are threatened, endangered, or otherwise imperiled, and using their overlapping needs to guide strategic land protection. This comprehensive planning is happening statewide, and it is foundational to conserving the 129 federally threatened and endangered species. In Florida the Service is fortunate to have citizens and partners who are committed and innovative when it comes to conservation. With ample resources, Florida's conservation community can keep all of these species in existence for future generations.

With continued support and through our collective action, we hope that our children will someday witness many of these imperiled species fully recovered and no longer needing the protection of the ESA.

The bald eagle has been a success story in Florida and the U.S. Due to the removal of various threats, population numbers are up and they were removed from the endangered species list in 2007.

Threatened and Endangered Species in Florida

T = Threatened; **E** = Endangered

Animals — 70 listings

Common Name	Scientific Name	Status
Purple bankclimber (mussel)	*Elliptoideus sloatianus*	T
Florida bonneted bat	*Eumops floridanus*	E
Gray bat	*Myotis grisescens*	E
Indiana bat	*Myotis sodalis*	E
Choctaw bean	*Villosa choctawensis*	E
Bartram's hairstreak butterfly	*Strymon acis bartrami*	E
Florida leafwing butterfly	*Anaea troglodyta floridalis*	E
Miami blue butterfly	*Cyclargus (=Hemiargus)*	E
Schaus' swallowtail butterfly	*Heraclides aristodemus ponceanus*	T
Audubon's crested caracara	*Polyborus plancus audubonii*	T
Elkhorn coral	*Acropora palmata*	T
Staghorn coral	*Acropora cervicornis*	T
American crocodile	*Crocodylus acutus*	T
Okaloosa Darter	*Etheostoma okaloosae*	T
Key Deer	*Odocoileus virginianus clavium*	E
Round ebonyshell	*Fusconaia rotulata*	E
Southern kidneyshell	*Ptychobranchus jonesi*	E
Snail kite	*Rostrhamus sociabilis plumbeus*	E
Red knot	*Calidris canutus rufa*	T
West Indian manatee	*Trichechus manatus*	E
Gulf moccasinshell	*Medionidus penicillatus*	E
Ochlockonee Moccasinshell	*Medionidus simpsonianus*	E
Anastasia Island beach mouse	*Peromyscus polionotus phasma*	E
Choctawhatchee beach mouse	*Peromyscus polionotus allophrys*	E
Key Largo cotton mouse	*Peromyscus gossypinus allapaticola*	E
Perdido Key beach mouse	*Peromyscus polionotus trissyllepsis*	E
Southeastern beach mouse	*Peromyscus polionotus niveiventris*	E
Peromyscus polionotus peninsularis	*St. Andrew beach mouse*	E
Florida panther	*Puma (=Felis) concolor coryi*	E
Fuzzy pigtoe	*Pleurobema strodeanum*	T
Narrow pigtoe	*Fusconaia escambia*	T
Oval pigtoe	*Pleurobema pyriforme*	E
Tapered pigtoe	*Fusconaia burkei*	T

Common Name	Scientific Name	Status
Piping plover	*Charadrius melodus*	T
Ochlockonee pocketbook	*Lampsilis subangulata*	E
Lower Keys marsh rabbit	*Sylvilagus palustris hefneri*	E
Lower Keys rice rat	*Oryzomys palustris natator*	E
Frosted flatwoods salamander	*Ambystoma cingulatum*	T
Reticulated flatwoods salamander	*Ambystoma bishopi*	E
Southern sandshell	*Hamiota australis*	T
Smalltooth sawfish	*Pristis pectinata*	E
Florida scrub-jay	*Aphelocoma coerulescens*	T
Green sea turtle	*Chelonia mydas*	E
Hawksbill sea turtle, hawksbill	*Eretmochelys imbricata*	E
Kemp's ridley sea turtle	*Lepidochelys kempii*	E
Leatherback sea turtle	*Dermochelys coriacea*	E
Loggerhead sea turtle	*Caretta caretta*	T
Squirrel chimney cave shrimp	*Palaemonetes cummingi*	T
Bluetail mole skink	*Eumeces egregius lividus*	T
Sand skink	*Neoseps reynoldsi*	T
Chipola slabshell	*Elliptio chipolaensis*	T
Stock Island tree snail	*Orthalicus reses*	T
Atlantic salt marsh snake	*Nerodia clarkii taeniata*	T
Eastern indigo snake	*Drymarchon corais couperi*	T
Cape Sable seaside sparrow	*Ammodramus maritimus mirabilis*	E
Florida grasshopper sparrow	*Ammodramus savannarum floridanus*	E
Wood stork	*Mycteria americana*	T
Atlantic Sturgeon (Gulf subspecies)	*Acipenser oxyrinchus*	T
Shortnose sturgeon	*Acipenser brevirostrum*	E
Roseate tern	*Sterna dougallii dougallii*	T
Fat threeridge (mussel)	*Amblema neislerii*	E
Florida salt marsh vole	*Microtus pennsylvanicus dukecampbelli*	E
Kirtland's Warbler	*Setophaga kirtlandii*	E
Bachman's Warbler	*Vermivora bachmanii*	E
Finback whale	*Balaenoptera physalus*	E
Humpback whale	*Megaptera novaeangliae*	E
North Atlantic right whale	*Eubalaena glacialis*	E
Red Wolf	*Canis rufus*	E
Red-cockaded woodpecker	*Picoides borealis*	E
Key Largo woodrat	*Neotoma floridana smalli*	E

Plants — 59 listings

Common Name	Scientific Name	Status
Florida golden aster	*Chrysopsis floridana*	E
Britton's beargrass	*Nolina brittoniana*	E
Harper's beauty	*Harperocallis flava*	E
Brooksville bellflower	*Campanula robinsiae*	E
White birds-in-a-nest	*Macbridea alba*	T
Scurb blazingstar	*Liatris ohlingerae*	E
Florida bonamia	*Bonamia grandiflora*	T
Florida brickell-bush	*Brickellia mosieri*	E
Scrub buckwheat	*Eriogonum longifolium var. gnaphalifolium*	T
Godfrey's butterwort	*Pinguicula ionantha*	T
Florida semaphore cactus	*Consolea corallicola*	E
Key tree cactus	*Pilosocereus robinii*	E
Fringed campion	*Silene polypetala*	E
American chaffseed	*Schwalbea americana*	E
Florida perforate cladonia	*Cladonia perforate*	E
Carter's small-flowered flax	*Linum carteri carteri*	E
Pygmy fringe-tree	*Chionanthus pygmaeus*	E
Miccosukee gooseberry	*Ribes echinellum*	T
Okeechobee gourd	*Cucurbita okeechobeensis ssp. okeechobeensis*	E
Avon Park Harebells	*Crotalaria avonensis*	E
Highlands scrub hypericum	*Hypericum cumulicola*	E
Beach jacquemontia	*Jacquemontia reclinata*	E
Crenulate lead-plant	*Amorpha crenulata*	E
Scrub lupine	*Lupinus aridorum*	E
Cooley's meadowrue	*Thalictrum cooleyi*	E
Small's milkpea	*Galactia smallii*	E
Garrett's mint	*Dicerandra christmanii*	E
Lakela's mint	*Dicerandra immaculata*	E
Longspurred mint	*Dicerandra cornutissima*	E
Scrub mint	*Dicerandra frutescens*	E
Carter's mustard	*Warea carteri*	E
Beautiful pawpaw	*Deeringothamnus pulchellus*	E
Four-petal pawpaw	*Asimina tetramera*	E
Rugel's pawpaw	*Deeringothamnus rugelii*	E
Pigeon wings	*Clitoria fragrans*	T
Gentian pinkroot	*Spigelia gentianoides*	E

Common Name	Scientific Name	Status
Scrub plum	*Prunus geniculata*	E
Lewton's polygala	*Polygala lewtonii*	E
Tiny polygala	*Polygala smallii*	T
Aboriginal prickly-apple	*Harrisia aboriginum*	E
Fragrant prickly-apple	*Cereus eriophorus var. fragrans*	E
Chapman rhododendron	*Rhododendron chapmanii*	E
Apalachicola rosemary	*Conradina glabra*	E
Etonia rosemary	*Conradina etonia*	E
Short-leaved rosemary	*Conradina brevifolia*	E
Sandlace	*Polygonella myriophylla*	E
Johnson's Seagrass	*Halophila johnsonii*	T
Florida skullcap	*Scutellaria floridana*	T
Snakeroot	*Eryngium cuneifolium*	E
Deltoid spurge	*Chamaesyce deltoidea ssp. deltoidea*	E
Garber's spurge	*Chamaesyce garberi*	T
Telephus spurge	*Euphorbia telephioides*	T
Cape Sable thoroughwort	*Chromolaena frustrata*	E
Florida Torreya	*Torreya taxifolia*	E
Wide-leaf Warea	*Warea amplexifolia*	E
Cooley's water-willow	*Justicia cooleyi*	E
Papery whitlow-wort	*Paronychia chartacea*	T
Wireweed	*Polygonella basiramia*	E
Florida ziziphus	*Ziziphus celat*	E

At-risk Species in Florida

The Service defines at-risk as species proposed by the Service, candidates (in the queue to be listed), or petitioned (means a citizen or citizen group has requested that the Service considers the species) for listing under the Endangered Species Act.

Common Name	Scientific Name	Taxon
Hall's Pocket moss	*Fissidens hallii*	Non-vascular Plant
Georgia Blind salamander	*Haideotriton wallacei*	Amphibian
Boykin's Lobelia	*Lobelia boykinii*	Vascular Plant
Ciliate-leaf Tickseed	*Coreopsis integrifolia*	Vascular Plant
Elliott's Croton	*Croton elliottii*	Vascular Plant
Georgia Bully	*Sideroxylon thornei*	Vascular Plant
Purpledisk honeycombhead	*alduina atropurpurea*	Vascular Plant
Spathulate Seedbox	*Ludwigia spathulata*	Vascular Plant
Black-capped petrel	*Pterodroma hasitata*	Bird
Chamberlain's Dwarf salamander	*Eurycea chamberlaini*	Amphibian
Black rail	*Laterallus jamaicensis*	Bird
MacGillivray's Seaside sparrow	*Ammodramus maritimus macgillivraii*	Bird
Delicate spike	*Elliptio arctata*	Mussel
Escambia Map turtle	*Graptemys ernsti*	Reptile
Eared Coneflower	*Rudbeckia auriculata*	Vascular Plant
Gopher tortoise	*Gopherus polyphemus*	Reptile
Bog Spicebush	*Lindera subcoriacea*	Vascular Plant
Hairy-Peduncled beaked-rush	*Rhynchospora crinipes*	Vascular Plant
Red Knot	*Calidris canutus ssp. rufa*	Bird
Gulf Hammock Dwarf siren	*Pseudobranchus striatus lustricolus*	Amphibian
Striped newt	*Notophthalmus perstriatus*	Amphibian
Florida Cave amphipod	*Crangonyx grandimanus*	Amphipod
Hobb's Cave amphipod	*Crangonyx hobbsi*	Amphipod
Florida Sandhill crane	*Grus canadensis pratensis*	Bird
Duke's skipper	*Euphyes dukesi calhouni*	Butterfly
Little Oecetis Longhorn caddisfly	*Oecetis parva*	Caddisfly
Alachua Light Fleeing Cave crayfish	*Procambarus lucifugus alachua*	Crayfish
Bigcheek Cave crayfish	*Procambarus delicatus*	Crayfish
Black Creek crayfish	*Procambarus pictus*	Crayfish
Coastal Lowland Cave crayfish	*Procambarus leitheuseri*	Crayfish
Florida Cave crayfish	*Procambarus lucifugus*	Crayfish
Orange Lake Cave crayfish	*Procambarus franzi*	Crayfish
Orlando Cave crayfish	*Procambarus acherontis*	Crayfish

Common Name	Scientific Name	Taxon
Pallid Cave crayfish	*Procambarus pallidus*	Crayfish
Putnam County Cave crayfish	*Procambarus morrisi*	Crayfish
Santa Fe Cave crayfish	*Procambarus erythrops*	Crayfish
Silver Glen Springs crayfish	*Procambarus attiguus*	Crayfish
Spider cave crayfish	*Troglocambarus maclanei*	Crayfish
Withlocoochee light-fleeing cave crayfish	*Procambarus lucifugus lucifugus*	Crayfish
Woodville karst cave crayfish	*Procambarus orcinus*	Crayfish
Purple skimmer	*Libellula jesseana*	Dragonfly
Southern lance	*Elliptio ahenea*	Mussel
St. John's elephantear	*Elliptio monroensis*	Mussel
Cedar Key mole skink	*Eumeces egregius insularis*	Reptile
Florida scrub lizard	*Sceloporus woodi*	Reptile
Short-tailed snake	*Stilosoma extenuatum*	Reptile
Blue Spring hydrobe	*Aphaostracon asthenes*	Snail
Clifton Spring hydrobe	*Aphaostracon theiocrenetum*	Snail
Dense hydrobe	*Aphaostracon pycnus*	Snail
Enterprise siltsnail	*Floridobia monroensis*	Snail
Freemouth hydrobe	*Aphaostracon chalarogyrus*	Snail
Ichetucknee siltsnail	*Floridobia mica*	Snail
Ponderous siltsnail	*Floridobia ponderosa*	Snail
Pygmy siltsnail	*Floridobia parva*	Snail
Wekiwa hydrobe	*Aphaostracon monas*	Snail
Wekiwa siltsnail	*Floridobia wekiwae*	Snail
Curtiss' loosestrife	*Lythrum curtissii*	Vascular plant
Florida willow	*Salix floridana*	Vascular plant
Godfrey's privet	*Forestiera godfreyi*	Vascular plant
Hartwrightia	*Hartwrightia floridana*	Vascular plant
Narrowleaf naiad	*Najas filifolia*	Vascular plant
Ocala vetch	*Vicia ocalensis*	Vascular plant
Thorne's beaked-rush	*Rhynchospora thornei*	Vascular plant
Yellow anisetree	*Illicium parviflorum*	Vascular plant
One-toed amphiuma	*Amphiuma pholeter*	Amphibian
Logan's agarodes caddisfly	*Agarodes logani*	Caddisfly
Morse's little plain brown sedge	*Lepidostoma morsei*	Caddisfly
Sykora's hydroptila caddisfly	*Hydroptila sykorae*	Caddisfly
Three-toothed long-horned caddisfly	*Triaenodes tridonta*	Caddisfly
Big Blue Springs cave crayfish	*Procambarus horsti*	Crayfish
Coastal flatwoods crayfish	*Procambarus apalachicolae*	Crayfish

Common Name	Scientific Name	Taxon
Cypress crayfish	*Cambarellus blacki*	Crayfish
Dougherty Plain Cave crayfish	*Cambarus cryptodyte*	Crayfish
Panama City crayfish	*Procambarus econfinae*	Crayfish
Wingtail crayfish	*Procambarus latipleurum*	Crayfish
Calvert's emerald	*Somatochlora calverti*	Dragonfly
Say's spiketail	*Cordulegaster sayi*	Dragonfly
Southern snaketail	*Ophiogomphus australis*	Dragonfly
Westfall's clubtail	*Gomphus westfalli*	Dragonfly
Yellow-sided clubtail	*Stylurus potulentus*	Dragonfly
Bluestripe shiner	*Cyprinella callitaenia*	Fish
Saltmarsh top minnow	*Fundulus jenkinsi*	Fish
Broadstripe shiner*	*Pteronotropis euryzonus*	Fish
Halloween darter*	*Percina crypta*	Fish
Apalachicola floater	*Anodonta heardi*	Mussel
Brother spike	*Elliptio fraterna*	Mussel
Inflated spike	*Iliptio purpurella*	Mussel
Rayed creekshell	*Anodontoides radiatus*	Mussel
Southern elktoe	*Alasmidonta triangulata*	Mussel
Suwannee moccasinshell	*Medionidus walkeri*	Mussel
Apalachicola Common kingsnake	*Lampropeltis getula meansi*	Reptile
Barbour's Map turtle	*Graptemys barbouri*	Reptile
Florida Red-bellied Turtle—FL Panhandle	*Pseudemys nelsoni pop. 1*	Reptile
[Unnamed] meadowbeauty	*Rhexia parviflora*	Vascular Plant
[Unnamed] spider-lily	*Hymenocallis henryae*	Vascular Plant
Bear gum	*Nyssa ursina*	Vascular Plant
Blackbract pipewort	*Eriocaulon nigrobracteatum*	Vascular Plant
Florida Pondweed	*Potamogeton floridanus*	Vascular Plant
Gulf Sweet Pitcherplant	*Sarracenia rubra ssp. gulfensis*	Vascular Plant
Karst Pond xyris	*Xyris longisepala*	Vascular Plant
Panhandle Lily	*Lilium iridollae*	Vascular Plant
Panhandle meadowbeauty	*Rhexia salicifolia*	Vascular Plant
Smooth-barked St. John's-wort	*Hypericum lissophloeus*	Vascular Plant
Variableleaf Indian plantain	*Arnoglossum diversifolium*	Vascular Plant
West Florida Cow-lily	*Nuphar lutea ssp. ulvacea*	Vascular Plant
West's Flax	*Linum westii*	Vascular Plant
Raven's Seedbox	*Ludwigia ravenii*	Vascular Plant
Northern Long-Eared bat	*Myotis septentrionalis*	Mammal
Highlands Tiger beetle	*Cicindela highlandensis*	Beetle

Common Name	Scientific Name	Taxon
Sawgrass skipper	*Euphyes pilatka klotsi*	Butterfly
Miami Cave crayfish	*Procambarus milleri*	Crayfish
Insular hispid cotton rat	*Sigmodon hispidus insulicola*	Mammal
Pine Island rice rat	*Oryzomys palustris planirostris*	Mammal
Sanibel Island rice rat	*Oryzomys palustris sanibeli*	Mammal
Sherman's short-tailed shrew	*Blarina brevicauda shermani*	Mammal
Eastern ribbonsnake—lower FL Keys	*Thamnophis sauritus pop. 1*	Reptile
Florida Keys mole skink	*Eumeces egregius egregius*	Reptile
Keys ringneck snake	*Diadophis punctatus acricus*	Reptile
Rimrock crowned snake	*Tantilla oolitica*	Reptile
Big Cypress epidendrum	*Epidendrum strobiliferum*	Vascular Plant
Big Pine partridge pea	*Chamaecrista lineata var. keyensis*	Vascular Plant
Blodgett's silverbush	*Argythamnia blodgettii*	Vascular Plant
Cape Sable orchid	*Oncidium undulatum*	Vascular Plant
Carter's small-flowered flax	*Linum carteri var. carteri*	Vascular Plant
Clam-shell orchid	*Encyclia cochleata var. triandra*	Vascular Plant
Edison's ascyrum	*Hypericum edisonianum*	Vascular Plant
Everglades bully	*Sideroxylon reclinatum ssp. austrofloridens*	Vascular Plant
Florida brickell-bush	*Brickellia mosieri*	Vascular Plant
Florida Bristle fern	*Trichomanes punctatum ssp.floridanum*	Vascular Plant
Florida pineland crabgrass	*Digitaria pauciflora*	Vascular Plant
Florida prairie-clover	*Dalea carthagenensis var. floridana*	Vascular Plant
Lowland loosestrife	*Lythrum flagellare*	Vascular Plant
Meadow joint-vetch	*Aeschynomene pratensis*	Vascular Plant
Narowleaf Carolina scalystem	*Elytraria caroliniensis var. angustifolia*	Vascular Plant
Pineland sandmat	*Chamaesyce deltoidea ssp. pinetorum*	Vascular Plant
Sand flax	*Linum arenicola*	Vascular Plant
Wedge Spurge	*Chamaesyce deltoidea ssp. serpyllum*	Vascular Plant
Gopher frog	*Lithobates capito*	Amphibian
Golden-winged Warbler	*Vermivora chrysoptera*	Bird
American eel	*Anguilla rostrata*	Fish
Blueback herring	*Alosa aestivalis*	Fish
Alligator Snapping turtle	*Macrochelys temminckii*	Reptile
Spotted turtle	*Clemmys guttata*	Reptile
Southern Hognose snake	*Heterodon simus*	Reptile
Florida pine snake	*Pituophis melanoleucus mugitus*	Reptile
Eastern Diamondback rattlesnake	*Crotalus adamanteus*	Reptile
Godfry's Stitchwort	*Minuartia godfreyi*	Vascular Plant

Conservation Outlook For Florida's Threatened, Endangered, and At-risk Species

U.S. Fish and Wildlife Service
Florida Ecological Services Offices
1339 20th Street
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A snail kite prepares to eat an apple snail. These raptors use their curved beaks to pull their primary prey, apple snails, from their shells.

Photo: © Kevan and Linda Sunderland