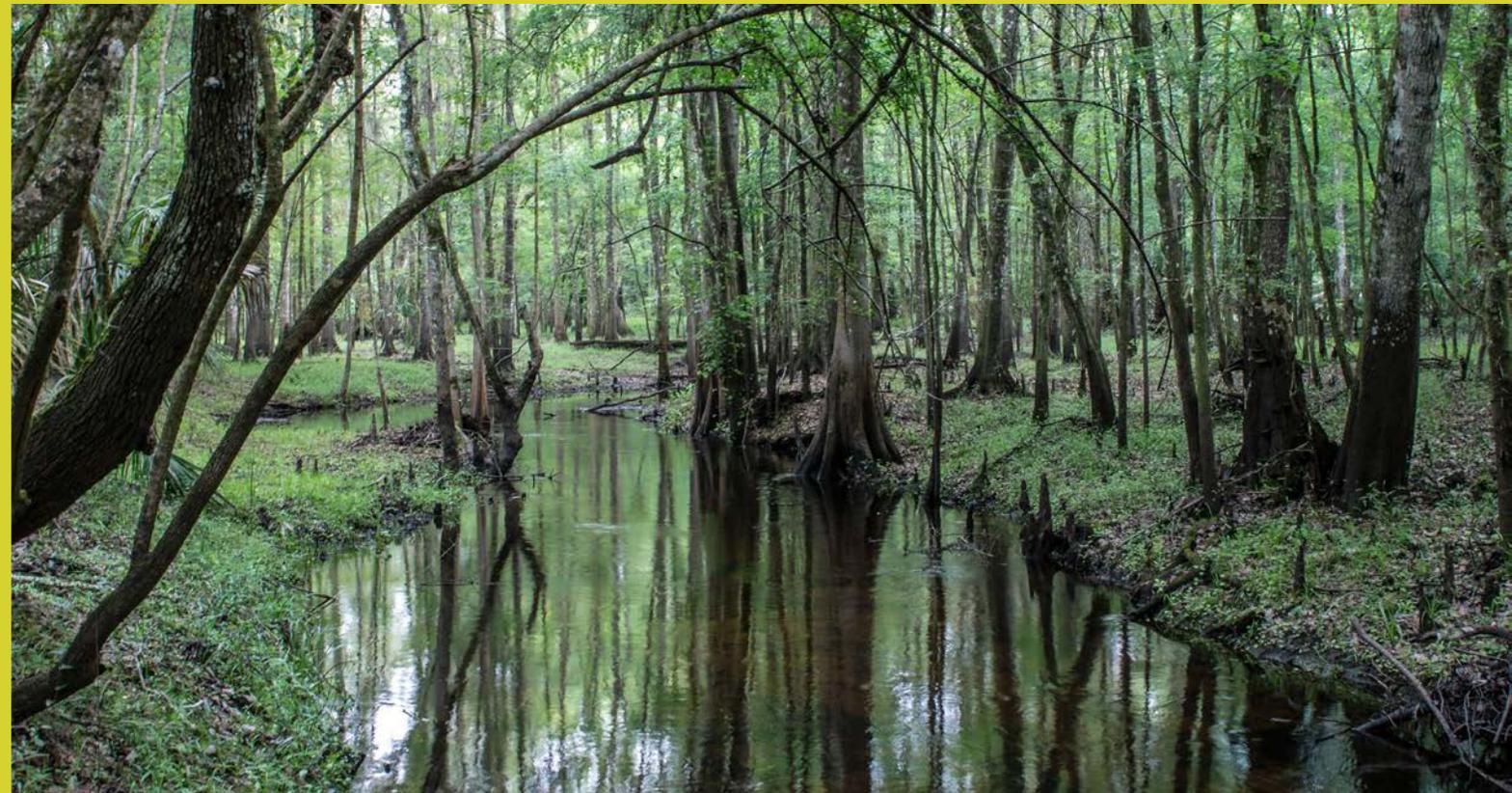




Celebrating Tampa Bay's wildlife and habitats:

Florida Birding and Nature Festival

tampabay.com/nie/nature • floridabirdingandnaturefestival.org



Southwest Florida
Water Management District

WATERMATTERS.ORG • 1-800-423-1476



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NIE
newspaper in education
tampabay.com/nie

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Hillsborough
County
FLORIDA



Pine flatwoods

Joel E. Jackson

Introduction: The natural history of Florida

By Andrew Fairbanks, environmental outreach coordinator, Hillsborough County Conservation and Environmental Lands Management Department

Formed from pieces of present-day Africa and South and North America during the breakup of the supercontinent Pangea, the peninsula we know as Florida has been shaped by three primary agents: water, fire and humans.

Over the millennia, sea level rose and fell with changes in Earth's climate. Shorelines fluctuated by as much as 100 miles, leaving ancient beaches as upland ridges of sandy scrub and the continental shelf offshore. Springs and rivers punctuated an otherwise arid savannah with oases for moisture-loving plants and animals.

Florida is wetter now. Sea-level rise that inundated Paleoindian settlements pushed a thin lens of freshwater up into limestone caverns, forming the Floridan Aquifer. Floodplains and swamps swelled. Lakes, ponds and ephemeral wetlands freckled the landscape, blurring distinctions between land and water.



Beach

Joel E. Jackson

Yet most of Florida's natural terrestrial denizens remain fire-adapted and, in many cases, fire-dependent. Vast prairies of longleaf pine, wiregrass and wildflowers once covered 90 million acres of North America's southeastern plains. Lightning-ignited fires regularly swept through pine flatwoods, interrupted

only by swamps, rivers and coastal waters. Lush new growth resprouted almost immediately in response to the first hints of post-burn moisture.

For more than 14,000 years, humans have worked with and against Florida's natural processes. Paleoindians, Seminoles, Miccosukees and pioneers with Old World roots employed fire to

improve hunting, grazing and farming lands. They adapted freshwater and coastal ecosystems to benefit fishing and transportation and introduced pigs, cattle and other species to uplands. Yet nothing has changed the face of Florida more radically than the explosive urban growth since World War II.

Florida's natural history has registered many significant consequences of man's outsized footprint, intentional or otherwise. The effects of mining, agriculture and urban development are plainly visible at ground level and from orbiting satellites.

Recognizing the historic losses to nature, resources and quality of life, forward-thinking Floridians acted to save what remains of this earthly paradise. The Florida Birding and Nature Festival celebrates these endeavors to protect our natural heritage and restore native ecosystems.

Three Sisters Springs

Southwest Florida Water Management District



Florida's unique ecosystems and natural resources

Florida has a unique and diverse natural landscape. Only two states have more plant diversity than Florida, and 8 percent of Florida's flora and fauna are found nowhere else in the world. Florida is home to many species of animals, including more than 1,000 species of fish, more than 500 species of birds, 142 species of native reptiles and amphibians (plus 42 non-native reptiles), 98 species of mammals and thousands of species of insects and invertebrates.

Florida has 53 distinct natural ecosystems, which are home to many different plant and animal species. In this publication, we will explore three types of ecosystems found in west-central Florida: coastal, freshwater and upland.

Sources: Florida Fish and Wildlife Conservation Commission, Florida Ornithological Society, UF/IFAS Extension

Why are healthy ecosystems important?

By Rob Northrop, extension forester, UF/IFAS Extension, Hillsborough County



Wood stork (*Mycteria Americana*)

Joel E. Jackson

What is an ecosystem?

An ecosystem is a system that includes all living organisms in an area, as well as its physical environment, functioning together as a unit.

An ecosystem is made up of plants, animals, microorganisms, soil, rocks, minerals, water sources and the local atmosphere interacting with one another.

What is a habitat?

A habitat is the place where an organism or a biological population normally lives or occurs.

Source: Biology Online



Going beyond the text • Using technology and innovation

As you read through this publication, think about the facts, the statistics and the research that was done to compile the information. Technology is a big part of research, whether it is documenting species, knowing the pH balance of a waterway or tracking a species' habitat. Write down all the ways technology is used or can be used to document and protect ecosystems and habitats. Look in the *Tampa Bay Times* for examples of how technology is used by other organizations and services in your community. Research this subject on the Internet, as well. Now that you have learned what you can do to help conserve Florida wildlife, ecosystems and habitats, create a new technology that can be used in these efforts: a computer program, application, database or other type of interactive system. Write a blog post about your innovative idea. Share your idea with your class.

Few people are aware of the critical role natural ecosystems play in their lives.

On the streets of our cities, along the aisles of giant supermarkets or on the floor of an electronics store, the relevance of nature can seem remote. But natural ecosystems perform fundamental life-support services without which our society could not exist.

Some of the benefits of healthy natural ecosystems include:

- Purification of air and water
- Detoxification of wastes
- Generation and preservation of soils
- Cycling and movement of soil nutrients
- Maintenance of biodiversity
- Control of agricultural pests
- Pollination of crops and natural vegetation
- Dispersal of seeds
- Protection of coastal areas from wave erosion
- Moderation of weather extremes and their impacts
- Stabilization of climate

Maintaining the health of our ecosystems is crucial because most of the above benefits of healthy ecosystems cannot be replaced by technology.

Unfortunately, many human activities cause lasting harm to our ecosystems. Although these activities might bring short-term economic gains, these gains are dwarfed by the long-term cost of the loss of ecological benefits. Effective conservation of natural ecosystems and habitats is the cheapest and best way to maintain a healthy, productive and safe environment and society.



River otter

Roger Sheets

What's a healthy ecosystem worth to Tampa Bay?

- 33,500 tons of air pollutants associated with respiratory illness removed from our atmosphere, a value of \$160 million in reduced health costs.
- \$1 billion worth of atmospheric carbon, associated with climate change, sequestered, or "locked up," in plants and soils.
- 865 million cubic feet of rainfall absorbed annually that could have caused flooding and erosion and washed pollutants such as oil, trash and pesticides into our waterways – a value of \$58 million.
- More than \$900 million and 19,000 jobs generated statewide by the Florida state park system annually.

Sources: Florida Department of Environmental Protection, UF/IFAS Extension, University of South Florida, U.S. Environmental Protection Agency

Learn more about Florida's ecosystems:

**Florida Native Plant Society
Native Plant Communities**
fnps.org/natives/native-plant-communities

**Florida Natural Areas Inventory
Natural Communities**
fnai.org/naturalcommunities.cfm

**University of Florida Institute of
Food and Agriculture Sciences
(UF/IFAS)
Ecosystems & Species**
[solutionsforyourlife.ufl.edu/
environment/ecosystems_and_
species.shtml](http://solutionsforyourlife.ufl.edu/environment/ecosystems_and_species.shtml)



Swamp lily (*Crinum Americanum*)

Joel E. Jackson

Careers in land management and natural resources

Are you interested in exploring career paths that have to do with researching, conserving or working with the natural world? Visit tampabay.com/nie/nature/careers to learn more.

Start training for your career at Hillsborough Community College (HCC) in the Environmental Science Technology Program: Learn more at <https://www.hccfl.edu/environmental-sciences.aspx>.



Freshwater marsh

Joel E. Jackson

Exploring Tampa Bay ecosystems: coastal ecosystems

What is a coastal ecosystem?

Coastal ecosystems exist where land areas and large bodies of water meet. Florida, with its 8,000 miles of coastline (more than any other state except Alaska), has many different kinds of coastal ecosystems, including beaches, estuaries, mangrove swamps and salt marshes.



Pinellas County Communications Department

Beaches

Beaches exist at the boundary between the land and the ocean. Sandy beaches are found on high-energy coastlines, where wind and waves create an ever-changing environment. Wind, waves, tides and storms constantly erode sand from, and add sand to, the shoreline.

Beaches and dunes provide habitat for numerous birds and reptiles, nesting grounds for sea turtles and storm protection for upland communities by acting as buffers against flooding, wind and storm surge.



Pinellas County Communications Department

Estuaries

Estuaries are areas where freshwater meets and mixes with salty ocean water. Plants and animals that live in estuaries are adapted to this mix of fresh and salt water. Tampa Bay is the largest open-water estuary in Florida, with more than 100 tributaries flowing into it, including four major rivers: the Hillsborough, Alafia, Manatee and Little Manatee.

Estuaries provide breeding and nesting areas for coastal birds; nursery areas for fish, crustaceans and shellfish; and habitat for a wide variety of fish, mammals and other marine life.

Mangrove swamps

Mangroves are unique types of salt-tolerant trees that live in salty or brackish water. In the continental United States, mangroves are only found on the southern coasts of Florida and Texas. Three species of mangrove live in Florida: red, white and black.

Mangroves are extremely important ecologically. Mangroves filter out pollution, protect the shoreline from erosion and provide essential feeding, nesting and nursery habitat for a variety of fish, shellfish, crustaceans, birds and other wildlife. Destruction of mangrove habitat by shoreline development can increase coastal erosion, change waterfront runoff patterns and impact biodiversity. Florida law protects mangroves, and their removal is regulated by state and local laws.



Pinellas County Communications Department



U.S. Forest Service

Salt marshes

Salt marshes are grassy coastal wetlands that occur in the zone between low and high tides.

Salt marshes are composed of a variety of grasses, sedges and rushes. These plants play an important role in shoreline stabilization by protecting inland areas from storm surge and flooding, and by trapping sediments, eventually creating more land. Salt marsh plants cannot grow where waves are strong, but thrive in more sheltered locations, such as along the Gulf Coast of Florida.

Salt marshes also provide critical wildlife habitat and are nursery areas for many fish, shellfish and crustaceans. In addition, they act as natural filters, absorbing pollutants and preventing them from entering coastal waters.

Swamps vs. marshes

Wetlands are classified as swamps or marshes depending on whether or not they contain trees. Swamps are forested wetlands that contain trees and large shrubs, while marshes primarily contain grasses and other soft-stemmed plants.



Going beyond the text • Exploring coastal ecosystems

Everything in the natural world is connected. An ecosystem is a biological community of interacting organisms and their physical environment. In other words, an ecosystem is a community of living and nonliving things that work together. Think about all of the different parts of the coastal ecosystems on these pages. Research one of the coastal ecosystems. Use the Internet, your school media center and the *Tampa Bay Times*. Make a list of the interacting organisms in that coastal ecosystem. Next, look for articles, photos and advertisements in the *Times* about that coastal ecosystem. Choose some of the most important parts and create a cartoon strip depicting this coastal ecosystem.

Where to find local examples of coastal ecosystems

Chassahowitzka National Wildlife Refuge

1502 SE Kings Bay Dr.
Crystal River, FL 34429
WaterMatters.org/
ChassahowitzkaRiver

The Chassahowitzka National Wildlife Refuge includes more than 31,000 acres of saltwater bays, estuaries and brackish marshes.



Southwest Florida Water Management District

Fort De Soto Park

3500 Pinellas Bayway S.
Tierra Verde, FL 33715
pinellascounty.org/
park/05_ft_desoto.htm

Fort De Soto Park consists of five interconnected keys and contains excellent examples of coastal ecosystems, including beaches and mangroves.

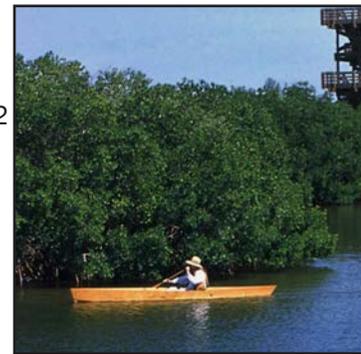


Pinellas County Communications Department

Weedon Island Preserve

1800 Weedon Dr. NE
St. Petersburg, FL 33702
weedonislandpreserve.org

Weedon Island Preserve is a 3,190-acre natural area located on Tampa Bay that includes both coastal and upland ecosystems.



Pinellas County Communications Department

What to look for



Pinellas County Communications Department

Red mangrove

(Rhizophora mangle):

Red mangroves are the most recognizable mangrove trees due to their arching prop roots. Cool fact: They give live birth! Pollinated flowers yield propagules, which fall off the parent and float on the tide until they stick in the shoreline and grow.



John Snowden

Yellow-crowned night-heron

(Nyctanassa violacea):

This small (21-28 inches) heron is a crab-eating specialist. Look for it in cypress swamps and mangroves. Listen to its calls at audubon.org/field-guide/bird/yellow-crowned-night-heron.



Joel E. Jackson

Sea oats

(Uniola paniculata):

Sea oats are a perennial grass found on beach fronts and barrier islands. They are a protected plant in Florida because they play an important role in preventing beach erosion and stabilizing dunes.



Donna Bollenbach

Railroadvine

(Ipomoea pes-caprae subsp. brasiliensis):

Railroadvine is a perennial vine that grows on beach dunes. It is well adapted to survive in the harsh beach environment.



Bibzie Priori

Black skimmer

(Rynchops niger):

Black skimmers fly low with their long lower bill in the water to snap shut on unwary fish. They nest directly on the beach in shallow hollows called "scrapes." Listen to their calls at audubon.org/field-guide/bird/black-skimmer.



Dave Parkinson, Tampa's Lowry Park Zoo

Brown pelican

(Pelecanus occidentalis):

Look for groups of brown pelicans flying low over coastal waters and plunging into the water in pursuit of fish. Listen to their calls at audubon.org/field-guide/bird/brown-pelican.



Katie Johnson, Florida Fish and Wildlife Conservation Commission

Loggerhead sea turtle

(Caretta caretta):

The loggerhead turtle has a reddish-brown shell and can reach 3 feet in length. Loggerheads typically nest on Florida beaches from April through September.



Amanda Nalley, Florida Fish and Wildlife Conservation Commission

Bottlenose dolphin

(Tursiops truncatus):

Bottlenose dolphins, typically 6 to 12 feet long, are blue-gray on top with lighter sides and bellies. It is against federal law to feed or harass wild dolphins. Listen to their calls at animals.nationalgeographic.com/animals/mammals/bottlenose-dolphin.



Tampa's Lowry Park Zoo

Florida manatee

(Trichechus manatus latirostris):

The Florida manatee is a keystone species whose behavior can alert researchers to environmental and habitat changes in Florida's waterways. During the winter months, manatees gather in warm waters such as springs or power plant discharge basins.

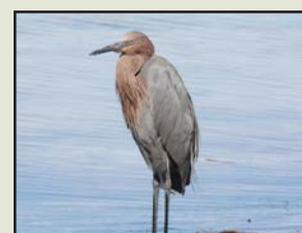


Dave Parkinson, Tampa's Lowry Park Zoo

Cownose ray

(Rhinoptera bonasus):

This ray is gray-brown on top and white below, and has pointed pectoral fins ("wings"). Its snout has two lobes on the front, giving it its name. Look for it in shallow coastal waters.



Pinellas County Communications Department

Reddish egret

(Egretta rufescens):

Reddish egrets are endemic to Tampa Bay and very rare. This wading bird nests in mangrove swamps and feeds in protected coastal areas. Reddish egrets can be dark or white. Listen to its calls at audubon.org/field-guide/bird/reddish-egret.



Gregory Breese, U.S. Fish and Wildlife Service

Red knot

(Calidris canutus):

Each year, red knots migrate from the Arctic to the tip of South America – one of the longest migrations on Earth. Look for it along Florida's coasts in the winter. Listen to its calls at audubon.org/field-guide/bird/red-knot.

Exploring Tampa Bay ecosystems: freshwater ecosystems

What is a freshwater ecosystem?

Freshwater wetlands are transitional areas between dry uplands and freshwater aquatic systems such as lakes or rivers.

To be considered a wetland, an area must be covered by a shallow layer of water for at least part of the year. Some wetlands are always covered with water, while others, called ephemeral wetlands, are flooded on a temporary or seasonal basis.

Freshwater ecosystems commonly found in the Tampa Bay area include cypress swamps and freshwater marshes, as well as springs, rivers, ponds and lakes.

Cypress swamps

Cypress swamps are made up of closely spaced cypress trees. Cypress trees are extremely flood tolerant and often grow in standing water. Cypress trees are notable for their very wide base – up to 6 feet across – and for their “knees,” brown stump-like roots that stick out of the ground around the trees. Cypress swamps are typically flooded for at least half of the year.



Southwest Florida Water Management District

Cypress swamps provide habitat for species that include the American alligator and river otter, as well as many species of birds and amphibians. Epiphytes, or air plants, such as bromeliads and orchids, commonly grow in cypress swamps.

Freshwater marshes

Freshwater marshes are pond-like areas filled with grasses, sedges, rushes and other soft-stemmed plants. Water levels in freshwater marshes can vary from a few inches to several feet, and some marshes may periodically dry out. Marshes provide valuable habitat for many species of birds and other animals. They also benefit urban areas by mitigating flood damage and filtering excess nutrients from surface runoff.



Southwest Florida Water Management District

Freshwater marsh ecosystems are often put at risk by human development. Historically, they have been drained for development, excavated for water storage and degraded by urban and agricultural runoff. Their destruction eliminates important natural habitat and causes flooding and pollution downstream.

Where to find local examples of freshwater ecosystems



Joel E. Jackson

Circle B Bar Reserve

4399 Winter Lake Road (State Road 540)
Lakeland, FL 33803
WaterMatters.org/CircleB

Circle B Bar Reserve is a 1,267-acre site that features a variety of freshwater habitats, including freshwater marshes and swamps.



Hillsborough County

Lettuce Lake Regional Park

6920 E Fletcher Ave.
Tampa, FL 33637
hillsboroughcounty.org/Facilities/Facility/Details/7937

Lettuce Lake Regional Park is a 240-acre site bordered by the Hillsborough River on two sides. More than half of the park consists of freshwater ecosystems.

Native, exotic and invasive species

- **Native** species are those found in Florida before European colonization began in the 16th century.
- **Exotic or nonnative** species are those that have been introduced outside of their native area by humans, either intentionally or accidentally.
- **Invasive** species are those that are able to spread into and dominate an area due to a lack of natural predators and disease.

Invasive species cause ecological damage and harm native ecosystems by displacing or even causing the extinction of native species. They also can have negative economic effects and even be harmful to human health and safety. There are almost 1,400 nonnative plant species and more than 500 fish and wildlife nonnative species in Florida.

Invasive species in the Tampa Bay region include:

- Air potato vine (*Dioscorea bulbifera*)
- Brazilian pepper tree (*Schinus terebinthifolius*)
- Cuban treefrog (*Osteopilus septentrionalis*)
- Lionfish (*Pterois volitans* and *P. miles*)
- Skunkvine (*Paederia foetida*)

What you can do?

- Learn to identify invasive species found in your area.
- Remove invasive plants on your property and use native plants whenever possible.
- Don't bring animals, plants or agricultural products such as fruits, vegetables or soil into the country illegally.
- Never release nonnative pets into the wild.
- Participate in exotic invasive removal work days at local parks and preserves.

Sources: Florida Fish and Wildlife Conservation Commission, Florida Native Plant Society, University of Florida/IFAS Extension, U.S. Fish and Wildlife Service, U.S. National Arboretum



Going beyond the text • Invasive species

A significant part of environmental management work includes invasive species control. Use the following resource to research invasive species that affect Florida ecosystems and investigate what local agencies are doing to combat them: floridainvasives.org.

Look for articles in the *Tampa Bay Times* that focus on local ecosystems and invasive and threatened species. Pay special attention to the information about the effects of human activities and invasive species on ecosystems. Keep track in your journal of the articles you find. Choose one of the topics you have read about to do further research. Write a feature-style newspaper article about what you have discovered. Share this article and what you have learned with your class.

What to look for



Christopher Foster, Hillsborough County

Lithia Springs Regional Park

3932 Lithia Springs Road
Lithia, FL 33547

hillsboroughcounty.org/facilities/facility/details/Lithia-Springs-Regional-Park-7938

Lithia Springs Regional Park, located on the Alafia River, offers 160 acres of river cypress swamps, hardwood hammocks and a natural spring.



Southwest Florida
Water Management District

Bald cypress (*Taxodium distichum*):

Look for this distinctive tree in freshwater swamps, floodplains and sloughs. What are commonly known as cypress “knees” are actually a special kind of root known as a pneumatophore.



Southwest Florida
Water Management District

Swamp lily (*Crinum americanum*):

This perennial wildflower grows in swamps and other freshwater wetlands.



Roger Sheets

Pickerelweed (*Pontederia cordata*):

This perennial wildflower grows along the edges of marshes, swamps and slow-moving streams. Ducks love to eat it.



Southwest Florida Water Management District

Potts Preserve

2988 N Hooty Point
Inverness, FL 34453
WaterMatters.org/Potts

The Potts Preserve’s wetlands play a role in both the Tsala Apopka Chain of Lakes and the Withlacoochee River systems.



Dave Parkinson, Tampa’s Lowry Park Zoo

Roseate spoonbill (*Platalea ajaja*):

Look for roseate spoonbills in many types of both salt and freshwater wetlands. Spoonbills feed in shallow waters, walking forward slowly while sifting the muddy bottom with their wide, flat bills. Listen to their calls at audubon.org/field-guide/bird/roseate-spoonbill.



John Snowden

Sandhill crane (*Grus canadensis*):

These large (sandhill cranes can reach a height of 3 to 4 feet, with a wingspan of 5 to 6 feet) omnivorous cranes are gray, heron-like birds with a patch of bald, red skin on top of their head. Listen to their calls at audubon.org/field-guide/bird/sandhill-crane.



Roger Sheets

Wood stork (*Mycteria americana*):

The wood stork is North America’s only native stork. It is a very large, heavy-billed bird that breeds in colonies and typically nests in cypress swamps. Listen to its calls at audubon.org/field-guide/bird/wood-stork.



Southwest Florida Water Management District

Two Mile Prairie

7160 N Lecanto Hwy.
Hernando, FL 34442
WaterMatters.org/TwoMile

Two Mile Prairie is a 2,900-acre site along the southern bank of the Withlacoochee River. It features upland and wetland ecosystems, including scrub and cypress swamp.



Dave Parkinson, Tampa’s Lowry Park Zoo

American alligator (*Alligator mississippiensis*):

This reptile resides in freshwater wetlands throughout Florida. Adults can reach 15 feet in length and can weigh up to 1,000 pounds.



Bibzie Priori

Florida red-bellied turtle (*Pseudemys nelsoni*):

Also known as the Florida red-bellied cooter, this turtle lives in freshwater lakes, ponds, streams and marshes and can actually have a red, orange or yellow belly.



Dave Parkinson, Tampa’s Lowry Park Zoo

River otter (*Lontra canadensis*):

River otters live in burrows on the banks of freshwater rivers, creeks, lakes, ponds and swamps. Mostly nocturnal, they are social animals, powerful swimmers and exceptional fishers.

Sources: Audubon Society, Florida Department of Environmental Protection, Florida Fish and Wildlife Conservation Commission, Florida Native Plant Society, National Geographic, Southwest Florida Water Management District, UF/IFAS Extension, U.S. Department of Agriculture, U.S. Environmental Protection Agency, U.S. Fish and Wildlife Service

Florida's natural areas



Pine flatwoods

Joel E. Jackson

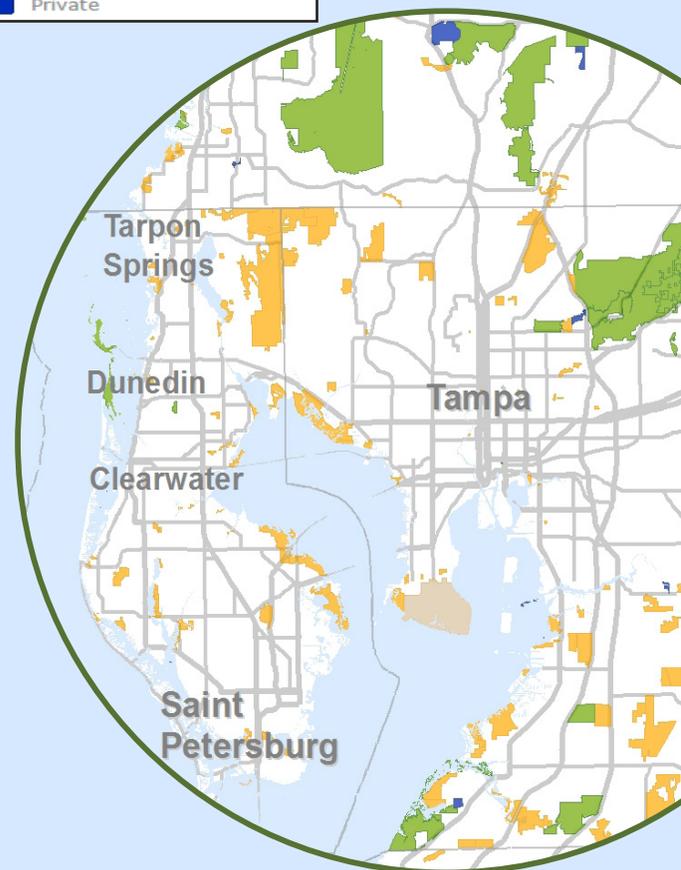
Florida's natural areas are managed by federal, state and local agencies, as well as private landowners, who work together to protect, preserve and restore Florida's natural resources and wildlife.

Natural areas include national and state parks and forests, wildlife management areas, and county and local parks and preserves, as well as privately owned conservation easements.

The Florida Natural Areas Inventory serves as the primary source for information on Florida's natural communities and conservation lands. In addition, it maintains a comprehensive database of Florida's rare plants and animals. Visit fnai.org to view an interactive map of Florida's natural areas.

Florida Forever

Florida Forever, which began in 1990 as Preservation 2000, is Florida's conservation and recreation lands acquisition program. Since 2001, the state has purchased and protected more than 718,126 acres of land through Florida Forever. For more information about Florida Forever, visit dep.state.fl.us/lands/fl_forever.htm.



Sources: Florida Natural Area Inventory (inset), Florida Wildlife Corridor

Find a park or preserve

The Tampa Bay area has numerous parks, preserves and other natural areas offering spectacular wildlife viewing opportunities and outdoor recreational activities:

Citrus County Parks & Recreation
citrusbocc.com/commserv/parksrec/parks-recreation.htm
352-527-7540

Florida Fish and Wildlife Conservation Commission Wildlife Management Areas
myfwc.com/viewing/recreation
850-488-4676

Florida Forest Service
FloridaForestService.com
863-940-6700

Florida State Parks
floridastateparks.org
850-245-2157

Hernando County Parks & Recreation
hernandocounty.us/Parks_Rec
352-754-4027

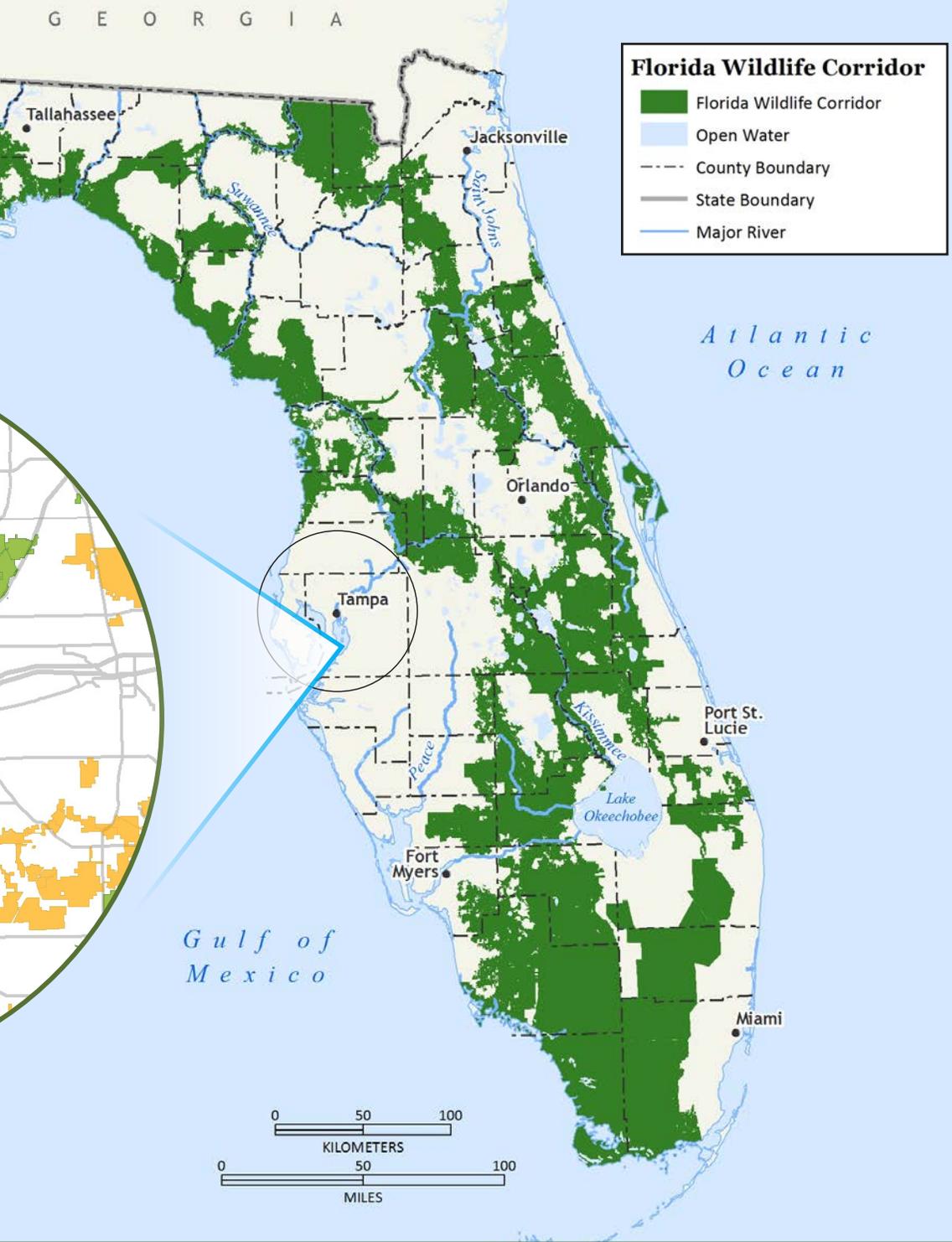
Hillsborough County Conservation and Environmental Lands Management
hillsboroughcounty.org/index.aspx?NID=99
813-672-7876

Manatee County Parks and Natural Resources
mymanatee.org/home/government/departments/parks-and-recreation
941-742-5923

National Park Service
nps.gov
404-507-5600

Pasco County Parks, Recreation, and Natural Resources
pascocountyfl.net/Index.aspx?NID=252
813-929-2760

Pinellas County Parks and Conservation Resources
pinellascounty.org/resident/recreation.htm & pinellascounty.org/park/default.htm
727-582-2100



Park or preserve?

By Andrew Fairbanks, environmental outreach coordinator, Hillsborough County Conservation and Environmental Lands Management Department

Many parks feature natural attractions, so what makes a nature preserve different? The answer lies in why the site was established. While parks are designed for human users, the primary beneficiary of a nature preserve is Mother Nature.



Lettuce Lake Park Joel E. Jackson

Parks generally have restrooms, manicured pathways and other amenities. Many parks also have playgrounds, full-service campgrounds and onsite staff. Development is kept to a minimum on nature preserves because they are intended for the protection of natural areas and the wildlife that inhabit them. Generally, you can expect to find the following: a fence with a walk-through entrance, unmarked fire lanes and/or marked hiking trails, signage indicating "nature preserve" and a kiosk with site information. Parks and nature preserves each have their own charms. If you're new to natural Florida, a park is a great place to get your feet wet. When you're ready to dive into the deep end, check out a nature preserve.

Southwest Florida Water Management District Conservation Lands

One of the main ways the Southwest Florida Water Management District carries out its mission of balancing water needs and protecting the environment is by obtaining conservation lands around lakes, rivers, wetlands and estuaries. These lands serve as natural buffers that filter out pollution from runoff before it reaches the nearest body of water. The District also buys lands to preserve and restore native Florida ecosystems that provide water resources benefits and water storage.



As a result, plants and animals that live on these lands are also protected, and the public can enjoy recreational activities such as hiking, bicycling, hunting, horseback riding, fishing, camping, nature study, paddling and picnicking. Every year about 2.5 million people visit lands obtained by the District and its partners.

Did you know that many state and county parks, as well as state forest areas, are owned by the District? The District, in partnership with state and local governments, protects water resources while our partners develop parks with facilities, such as picnic pavilions, nature trails, environmental education centers, restrooms and camping areas, and provide on-site staff.

To learn more about the recreational opportunities available on District lands and to order or download a free recreation guide, visit WaterMatters.org/Recreation.



Beach Joel E. Jackson Mangrove swamp Joel E. Jackson Scrub Joel E. Jackson

Polk County Parks and Recreation
polk-county.net/boccsite/Departments/Parks-and-Recreation
 863-534-4340 or 800-780-5346

Sarasota County Parks, Recreation and Natural Resources
scgov.net/prnr
 941-861-5000

Southwest Florida Water Management District Recreation
WaterMatters.org/recreation
 352-796-7211

City of St. Petersburg Parks and Recreation
stpeteparksrec.org
 727-893-7441

City of Tampa Parks and Recreation
tampagov.net/parks-and-recreation
 813-274-8615

U.S. Fish and Wildlife Service National Wildlife Refuges
fws.gov/refuges
 800-344-WILD (9453)

U.S. Forest Service
fs.fed.us
 404-347-4095

Exploring Tampa Bay ecosystems: upland ecosystems

What is an upland ecosystem?

Topography in Florida is a study in subtlety. Just a few feet can make the difference between uplands and wetlands. Upland ecosystems are elevated, non-wetland habitats such as hardwood forests, pine flatwoods, scrub and dry prairie. They are often punctuated and bordered by freshwater wetland habitats.

Uplands in Florida historically have experienced frequent wildfires, and fire plays a critical role in the health of their native plant and animal species. Regular fires reduce the density of the canopy and clear excess undergrowth, allowing sunlight to reach exposed soil and maintaining habitat for species such as the Florida scrub-jay, Florida mouse, scrub lizard and sand skink. The fresh vegetation that grows after a fire provides nutrient-rich food for wildlife such as gopher tortoises and white-tailed deer. Land managers now use prescribed burns and other techniques to restore and maintain these natural areas.



Southwest Florida Water Management District



Ken Bradshaw, Hillsborough County

Pine flatwoods

Pine flatwoods, consisting of open pine woodlands on flat, sandy terrain, are the most widespread terrestrial ecosystem in Florida, covering approximately half of the state's land area.

Pine flatwoods ecosystems provide habitat for a variety of animals, including threatened or endangered wildlife such as the Florida black bear, gopher tortoise and red-cockaded woodpecker.

Scrub

Florida's dry, sandy scrub habitats are found along ridges that are the remnants of ancient coastlines. Scrub soil is very porous, meaning that rain drains through it very quickly, and low in nutrients, so scrub plants are very tolerant of drought and low nutrient levels. Scrub is often dominated by shrubs, low palmettos and dwarf oak trees.

Florida scrub provides habitat for a surprising amount of wildlife species, including the Florida scrub-jay and gopher tortoise.

Where to find local examples of upland ecosystems



Bill Carlisle, Hillsborough County

Balm Boyette Scrub Preserve

13998 Balm-Boyette Road

Lithia, FL 33547

hillsboroughcounty.org/facilities/facility/details/Balm-Boyette-Scrub-Preserve-7891

Balm Boyette Scrub Preserve features 5,000 acres of upland and freshwater ecosystems, including scrub, pine flatwoods and freshwater marshes.



Donna Bollenbach

Brooker Creek Preserve

3940 Keystone Road

Tarpon Springs, FL 34688

brookercreekpreserve.org

Brooker Creek Preserve is an 8,700-acre natural area consisting primarily of forested wetlands and pine flatwoods.



Donna Bollenbach

Duette Preserve

2649 Rawls Road

Duette, FL 34219

mymanatee.org/home/government/departments/parks-and-recreation/natural-resources/preserves/duette-preserve.html

Duette Preserve offers more than 21,000 acres of pine flatwoods, hardwood swamps, scrub, depression marsh and dry prairie ecosystems.



Going beyond the text • Conservation initiatives

According to the Florida Fish and Wildlife Conservation Commission, the best way to help imperiled species survive is to participate in beach and park or roadside cleanups in your area, volunteer your time to educate others and contribute to organizations who administer management, educational and research programs. Visit tampabay.com/me/nature/volunteer for more information. Look in the *Tampa Bay Times* for articles about conservation and how you can help make your community environmentally sound. Using ads in the newspaper as models, create an ad or public service announcement to promote a conservation initiative. Think about the dynamics of the ads you see in the *Times* (images, words, placement of items, colors). Think about ways to draw people's attention to your ad and message. Next, design an ad for the print edition of the newspaper and for the website. How is the ad in the print edition going to be different than the Web version of the ad? Write a fully developed paragraph showing the differences in the ads and what your main point of the ads is. Share your ad and the information in your paragraph with your class.

What to look for



Bill Carlisle, Hillsborough County

Golden Aster Scrub Preserve

12181 East Bay Road
Gibsonton, FL 33534
hillsboroughcounty.org/facilities/facility/details/Golden-Aster-Scrub-Preserve-7913

Golden Aster Scrub Preserve is a 1,236-acre sanctuary that provides a large expanse of diverse natural habitat, including pine flatwoods, scrub and freshwater wetlands.



Southwest Florida Water Management District

Starkey Wilderness Preserve

10500 Wilderness Park Blvd.
New Port Richey, FL 34655
WatterMatters.org/Starkey

The Starkey Wilderness Preserve is comprised of 18,000 acres of conservation lands that features pine flatwoods, cypress domes, freshwater marshes, stream and lake swamps, sandhill and scrub habitats.



Randy Browning, U.S. Fish and Wildlife Service



Bibzie Piori

Longleaf pine (*Pinus palustris*):

This long-lived native evergreen is highly tolerant of fire. It can grow as high as 120 feet with a canopy of 30-50 feet.



Florida Department of Environmental Protection

Florida goldenaster (*Chrysopsis floridana*):

This endangered endemic perennial wildflower lives in scrub habitats.



Hillsborough County

Burrowing owl (*Athene cunicularia*):

These owls dig burrows that are up to 10 feet long. Although it hunts mostly at dusk and at night, this owl is also active in the daytime. Listen to its calls at audubon.org/field-guide/bird/burrowing-owl.



Dave Parkinson, Tampa's Lowry Park Zoo

Gopher tortoise (*Gopherus polyphemus*):

This long-lived reptile lives in upland habitats, digging deep burrows for shelter and foraging on low-growing plants. The gopher tortoise is referred to as a 'keystone species' because its burrow provides refuge for more than 350 other species.



Dave Parkinson, Tampa's Lowry Park Zoo

Eastern indigo snake (*Drymarchon couperi*):

This shiny, blue-black, nonvenomous snake can grow to more than 8 feet in length. Indigo snakes are listed as a threatened species, and it is illegal to handle, harass, kill, capture, keep or sell them. They also are known as the blue gopher snake due to their habit of living in gopher tortoise burrows.



Southwest Florida Water Management District

Gopher frog (*Rana capito aesopus*):

The nocturnal gopher frog lives in dry, sandy habitats and often makes its home in gopher tortoise burrows. It is listed as a species of special concern in Florida. Listen to its call at tampabay.wateratlas.usf.edu/fln/audio.aspx.



State Archives of Florida

Prickly-pear cactus (*Opuntia humifusa*):

This perennial evergreen thrives in hot, dry, sandy scrub conditions.



Bibzie Piori

Florida scrub-jay (*Aphelocoma coerulescens*):

This endangered bird lives only in Florida scrub. Scrub-jays breed in cooperative flocks, with older offspring helping to feed young and defend territory. Listen to its calls at audubon.org/field-guide/bird/florida-scrub-jay.

Longleaf pine flatwoods

Mature longleaf pine trees can reach heights of more than 100 feet, but they take a long time to do so. These slow-growing trees live for more than 300 years. They may take up to 150 years to reach their full size.

Longleaf pine forests once covered an estimated 90 million acres in the southeastern United States. Now, only about 4 million acres remain, due primarily to logging of their famously strong, long, straight timber.

When logged lands were reforested, they were often planted with faster-growing slash pine rather than longleaf pine, further reducing the longleaf population.

Longleaf pine ecosystems provide habitat to a wide variety

of plants and animals, including the endangered red-cockaded woodpecker, the gopher tortoise, the Eastern indigo snake and many native plants. According to the U.S. Forest Service, 29 species that depend on longleaf forest are federally listed as threatened or endangered.

Efforts are underway to conserve and restore the longleaf pine ecosystem. America's Longleaf Restoration Initiative plans to increase longleaf pine forests to 8 million acres across nine states. Learn more at americaslongleaf.org.

Explore an interactive map of Florida longleaf pine ecosystems at fnai.org/webmaps/LongleafMap.

Sources: The Longleaf Alliance, National Wildlife Federation, U.S. Forest Service

FLORIDA'S NATIVE WILDLIFE



The Florida Aquarium

Rescued heron finds a home at The Florida Aquarium

The great blue heron (*Ardea herodias*) is the largest species of heron in the Americas. They can be found throughout most of North America and live year-round in Florida. They often can be seen standing completely still near bodies of water, waiting to ambush fish and other small terrestrial animals with their lightning-fast, spear-like beak. Harming great blue herons in any state is illegal and punishable by law.

This heron arrived at The Florida Aquarium in urgent need of medical treatment for a lingering wing injury.

An examination and X-ray revealed that the heron had a completely fractured distal right radius and ulna (the area of the arm just above the elbow). Since the injury was old and the bone had already healed, the veterinary staff determined that the best option for her overall health and comfort was to amputate the wing.

The X-ray also revealed embedded lead shot from a gunshot at some point in her life. The veterinary staff decided not to remove the pellets, because they are not expected to cause any harm or discomfort and would be an extremely invasive procedure. The heron now has a permanent home on The Florida Aquarium's Wetlands Trail.

The Florida Aquarium actively participates in conservation initiatives in Florida and beyond to rescue and rehabilitate injured wildlife, including those that are threatened and endangered. As part of the Association of Zoos and Aquariums, the Aquarium collaborates with a network of other AZA institutions to help animals in need who face both human-made and natural threats.

Injured wildlife: What to do and who to call

To report a sick or injured wild animal, call the Florida Fish and Wildlife Conservation Commission's toll-free Wildlife Alert hotline at 888-404-FWCC (888-404-3922).

To learn how to rescue a hooked bird, visit myfwc.com/education/wildlife/unhook.

See something? Say something.

To report a possible wildlife or environmental law violation, contact the FWC's Wildlife Alert hotline. If your information results in an arrest, you may be eligible for a reward of up to \$1,000. You can remain anonymous.

Toll-free: 888-404-FWCC (888-404-3922)

Cellphone: *FWC or #FWC

Text: Tip@MyFWC.com

Online: myfwc.com/wildlifealert



(Clockwise from lower left): checkered white butterfly (*Pontia protodice*) / Bill Carlisle, Hillsborough County; osprey (*Pandion haliaetus*) / M. Weimer, U.S. Fish and Wildlife Service; Florida panther (*Puma concolor coryi*) / Mark Lotz, Florida Fish and Wildlife Conservation Commission; Florida black bear (*Ursus americanus floridanus*) / Gary Tucker, U.S. Fish and Wildlife Service; American alligator (*Alligator mississippiensis*) / Bill Carlisle, Hillsborough County.

Florida is home to more than 700 species of terrestrial animals, more than 200 species of freshwater fish and more than 1,000 species of marine fish.

Source: Florida Fish and Wildlife Conservation Commission

Tips for successful wildlife viewing

- Research what species you are likely to spot before you go, and bring a field guide to help identify what you see.
- The best time for wildlife viewing is at dawn or dusk, when many animals and birds are most active.
- Find a comfortable spot and stay still. Move slowly and quietly if you must move.
- Dress in natural colors; avoid bright colors.

Sources: Florida Fish and Wildlife Conservation Commission, The Wilderness Society

Florida Wildlife Corridor

without contact with human habitations or cars, to access new habitats and to maintain a healthy territory size. They also help to protect the health of the species by promoting genetic biodiversity: Individual animals have access to mates that are not related to them, resulting in a healthier gene pool.

The Florida Wildlife Corridor encompasses 15.8 million acres: 9.5 million acres that are protected from development and 6.3 million acres that do not yet have conservation status. The corridor provides habitat for 42 federally listed endangered species, 24 threatened species and 15 candidate species. At the state level, there are an additional 176 species listed as endangered, 56 as threatened and 29 as species of special concern.

Sources: Florida Wildlife Corridor, National Wildlife Federation



Gopher tortoise

Joel E. Jackson

DOs and DON'Ts of responsible wildlife viewing

Take nothing but pictures. Leave nothing but footprints. Kill nothing but time.

Florida's natural areas offer an amazing abundance of birds, marine animals and other wildlife. Catching a glimpse of a wild animal in its native habitat is exciting and rewarding. But it's critical to view wildlife in a responsible way to avoid harm to both people and animals. Irresponsible human behavior can disturb wildlife, destroy habitats and result in injury to animals and people.

DO plan ahead. Share your plan and expected return time with family or friends, and check in when you return. If the trail has a log book, sign in and out.

DON'T harm Mother Nature. Stay on designated roads, trails and paths to avoid trampling sensitive plants or critters. Don't kill snakes or bugs (swatting mosquitos is okay, though).

DO keep your distance. If an animal stops what it is doing or moves away, you are too close. Try using binoculars or a camera with a zoom lens to get a closer look.

DON'T touch. Never attempt to touch or handle wildlife or to remove baby animals from their natural environment. Young animals that appear abandoned usually aren't.

DON'T feed wild animals. Fed animals may lose their fear of humans and become aggressive or linger too close to human habitations looking for handouts.

DO leave pets at home or keep them leashed. Pets can frighten and harm wildlife, and wild animals can injure and spread diseases to pets.

DON'T chase or harass wildlife. It is against Florida law for you or your pets to chase, harass or harm wildlife.

DO pack out what you pack in. Human garbage is one of the greatest threats to wildlife. If you see illegal dumping, report it to law enforcement.

DO notice signs – both natural and man-made. Weather in Florida can change in an instant. Keep an eye on the sky, listen for thunder and feel changes in the wind and temperature. Officially posted signs tell you what to expect and which way to go. Pay attention to how far you've gone and how far it is to get back.

DO report illegal activities. If you see something suspicious, take photos with time and location data and contact law enforcement.

Sources: Florida Fish and Wildlife Conservation Commission, National Oceanic and Atmospheric Administration



Florida Wildlife Corridor expeditions

In 2012, bear biologist Joe Guthrie, conservationist Mallory Lykes Dimmitt, photojournalist Carlton Ward Jr. and filmmaker Elam Stoltzfus trekked the corridor from the Everglades to Okefenokee National Wildlife Refuge. The 100-day trek covered more than 1,000 miles.

In 2015, the team launched a second 1000-mile expedition, traversing the corridor from Central Florida to the Gulf Coast and all the way to the Gulf Islands National Seashore in the panhandle.

For more information, visit floridawildlifecorridor.org.



Going beyond the text • Research activity

Florida ecosystems and habitats are a vital part of our world. There are many concepts that you can explore in relationship to these topics. When you think about decision making, you need to look at the topic from the following perspectives: social/cultural, economic, ethical/moral, recreational, health and environmental. Choose one of the concepts discussed in this publication. Create an argument based on that concept. With a partner or in a small group, read about the topic and record relevant evidence. Conduct additional research using reliable sources, such as the *Tampa Bay Times*; the Southwest Florida Water Management District (WaterMatters.org); The Florida Aquarium (flaquarium.org); VISIT FLORIDA (visitflorida.com); Hillsborough County Conservation and Environmental Lands Management Department (hillsboroughcounty.org); Tampa's Lowry Park Zoo (lowryparkzoo.org); the Florida Department of Environmental Protection (dep.state.fl.us); and the U.S. Geologic Survey (usgs.gov). Create an Environmental Decision-Making graphic chart using examples from the texts. Write a report focused on this topic and your argument. Create a visual graphic to summarize your points. Share your report and graphic representation with your class.



Native and migratory birds

Roseate spoonbill

Joel E. Jackson

Birding sounds like fun! How do I get started?

Birdwatching, or birding, is an easy, fun, healthy and inexpensive hobby that gets you out in nature. Here's how to get started:

- 1 Get a field guide** – A field guide is a pamphlet or book that helps you identify what birds you are seeing. You can borrow one from your local library, download a digital guide or app or purchase a print guide. Beginners will find it easier to use a guide that includes just birds found in your region. Beginning birders in Tampa Bay can start with the Southwest Florida Water Management District's "Field Guide," which can be downloaded for free at WaterMatters.org/recreation/species/birds.pdf.
- 2 Get some optics** – You will want something to help you spot far away birds, but there's no need for beginning birders to purchase expensive binoculars right off the bat. See if you can borrow a pair from a friend, or use a camera with a zoom lens or a small spotting scope. Some larger parks also offer loaner binoculars at their visitor centers.
- 3 Get out there** – Let the experts help, and start with a guided bird walk. Many local parks and Audubon chapters offer regular, free, guided bird walks. When you venture out on your own, remember to walk slowly and quietly so as not to startle the birds and other wildlife.
- 4 You've got it** – That's it. You're officially a birder. Enjoy!



Wood stork

Joel E. Jackson

Sources: Audubon Society, *Bird Watcher's Digest*, Florida Fish and Wildlife Conservation Commission, The Nature Conservancy

The state of Florida has more than 500 different bird species, and many of them can be spotted in the Tampa Bay area.

In addition to the many native birds who live here all year, Florida hosts hundreds of species of migratory birds annually. Florida is part of the Atlantic Flyway, which stretches along the Atlantic coast of North America from Canada to Florida. A flyway is a pathway used by migratory birds and insects.

The term migration describes the seasonal or periodic movement of populations of animals. Birds migrate to seek resources such as food and nesting locations. In the Northern Hemisphere, some birds migrate northward in the spring to take advantage of budding plants and newly abundant insect populations. As the availability of insects and other food decreases in the fall, the birds move south again. Some birds spend the winter here in Florida, while others just stop here on their way to Central or South America.

More than 350 species of North American birds migrate, and more than 180 migratory species can be spotted in central Florida at the peak of migration in the fall.

Sources: Audubon Society, Cornell Lab of Ornithology – All About Birds, National Wildlife Federation, *Tampa Bay Times*, U.S. Fish and Wildlife Service

Great Florida Birding and Wildlife Trail

The Great Florida Birding and Wildlife Trail (GFBWT) is a network of 515 birding and wildlife viewing sites throughout the state. There are dozens of trail sites in the greater Tampa Bay area to explore. Visit FloridaBirdingTrail.com to find a site near you.

Find a guided bird walk near you

Check the website of your favorite local park or visit fl.audubon.org/about-us/find-chapter to find your local Audubon Society chapter. Most Audubon walks are free and open to the public.



Yellow-crowned night-heron Joel E. Jackson

Resources for beginning birders:

Birdwatching Basics: This introduction to birding, produced by the Florida Fish and Wildlife Conservation Commission, can be downloaded at floridabirdingtrail.com/wp-content/uploads/2016/02/birdwatching-basics-2010.pdf.

Wings Over Florida Jr. Birder Program: This program is intended to introduce elementary school students to bird watching. Download the teacher and student guides at floridabirdingtrail.com/junior-birder-program.

Florida Bird Sounds: Listen to the calls of common Florida birds, compiled by the Florida Museum of Natural History, at flmnh.ufl.edu/birds/florida-bird-sounds.

OUR PARTNERS



Florida Aquarium • flaquarium.org

The Florida Aquarium actively participates in and promotes conservation of the natural environment as part of their mission of conservation. Their efforts include scientific research, animal rescue, rehabilitation and release programs and public education on Florida's critical conservation issues through exhibits and programs at the Aquarium.



Hillsborough Community College • hccfl.edu

Hillsborough Community College delivers teaching and learning opportunities that empower students to achieve their educational goals and become contributing members of the local community and a global society.



Hillsborough County Conservation and Environmental Lands Management Department • hillsboroughcounty.org

The Conservation and Environmental Lands Management Division manages more than 61,000 acres of environmentally sensitive wildlife habitat and corridors acquired through the Jan K. Platt Environmental Lands Acquisition and Protection Program (ELAPP).

Hillsborough County Economic Development Department, Tourism Program

The Tourism Development team supports Hillsborough County's multi-billion dollar tourism industry through administrative support to the Tourist Development Council and strategic partnerships. Additionally, the team supports local historic preservation, heritage and ecotourism and related economic development.



Southwest Florida Water Management District • WaterMatters.org

The mission of the Southwest Florida Water Management District is to manage water and related natural resources to ensure their continued availability while maximizing the benefits to the public. Obtaining conservation land helps the District meet this mission.



Tampa's Lowry Park Zoo • lowryparkzoo.org

Tampa's Lowry Park Zoo cares for the most diverse collection of Florida wildlife anywhere and has won numerous awards for its animal preservation. At the Manatee Hospital, the Zoo's veterinary and animal-care staff treat sick, injured and orphaned manatees and return them to the wild after full recovery. Tampa's Lowry Park Zoo is a place of discovery that inspires generations to cherish and preserve wildlife.



VISIT FLORIDA • visitflorida.com • visittampabay.com • visitspeteclearwater.com

VISIT FLORIDA administers the Cultural, Heritage, Rural and Nature Marketing Grant program to publicize the tourism advantages of Florida's cultural, heritage, rural and nature tourism products and the Cultural, Heritage, Rural and Nature Tourism Education Grant program to support educational efforts of the tourism advantages of Florida's cultural, heritage, rural and nature tourism products.

Newspaper in Education

The Tampa Bay Times Newspaper in Education program (NIE) is a cooperative effort between schools and the Times Publishing Co. to encourage the use of newspapers in print and electronic form as educational resources – a “living textbook.” Our educational resources fall into the category of informational text, a type of nonfiction text. The primary purpose of informational text is to convey information about the natural or social world.

Since the mid-1970s, NIE has provided schools with class sets of the daily newspaper plus award-winning original curriculum supplements, teacher guides, lesson plans, educator workshops and many more resources at no cost to schools, teachers or families. Each year, more than 5 million newspapers and electronic licenses are provided to Tampa Bay teachers and students free of charge thanks to our generous individual, corporate and foundation sponsors. NIE teaching materials cover a variety of subjects and are correlated to the Florida Standards.

For more information about NIE, visit tampabay.com/nie, call 800-333-7505, ext. 8138 or email ordernie@tampabay.com. Follow us on Twitter at [Twitter.com/TBTimesNIE](https://twitter.com/TBTimesNIE).

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Credits

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Florida Standards

This publication and its activities incorporate the following Florida Standards for high school students.

Science: SC.912.CS-CC.1.1; SC.912.CS-CC.1.2; SC.912.CS-CC.1.4; SC.912.CS-CC.1.5; SC.912.CS-CC.1.7; SC.912.CS-CP.3.2; SC.912.CS-CS.3.1; SC.912.CS-PC.2.3; SC.912.CS-PC.2.4; SC.912.E.6.4; SC.912.L.17.10; SC.912.L.17.11; SC.912.L.17.12; SC.912.L.17.13; SC.912.L.17.14; SC.912.L.17.15; SC.912.L.17.16; SC.912.L.17.17; SC.912.L.17.20; SC.912.L.17.8; SC.912.N.1.3 **Language Arts:** LAFS.912.L.1.1; LAFS.912.L.1.2; LAFS.912.L.2.3; LAFS.912.L.3.4; LAFS.912.L.3.5; LAFS.912.L.3.6; LAFS.912.RH.1.1; LAFS.912.RH.1.2; LAFS.912.RH.1.3; LAFS.912.RH.2.4; LAFS.912.RH.2.5; LAFS.912.RH.2.6; LAFS.912.RH.3.7; LAFS.912.RH.3.8; LAFS.912.RH.3.9; LAFS.912.RI.1.1; LAFS.912.RI.1.2; LAFS.912.RI.2.4; LAFS.912.RI.2.5; LAFS.912.RI.2.6; LAFS.912.RI.3.7; LAFS.912.RST.1.1; LAFS.912.RST.1.2; LAFS.912.RST.3.7; LAFS.912.SL.1.1; LAFS.912.SL.1.2; LAFS.912.SL.1.3; LAFS.912.SL.2.4; LAFS.912.SL.2.5; LAFS.912.SL.2.6; LAFS.912.W.1.1; LAFS.912.W.1.2; LAFS.912.W.1.3; LAFS.912.W.2.4; LAFS.912.W.2.5; LAFS.912.W.2.6; LAFS.912.W.3.7; LAFS.912.W.3.8; LAFS.912.W.3.9; LAFS.912.W.4.10



tampabay.com/nie

newspaper in education

October 13-16, 2016

More than 40 programs and a vendor fair
at Hillsborough Community College

South Shore campus

551 24th St NE, Ruskin, FL 33570

floridabirdingandnaturefestival.org



FLORIDA BIRDING & NATURE FESTIVAL



Celebrating wildlife corridors and the Migratory Bird Treaty Centennial

The mission of the Florida Birding and Nature Festival is to promote appreciation and conservation of Florida's birds and their habitats through responsible nature-based tourism and public awareness.

- **More than 25 guided tours** by land and sea to birding and wildlife hotspots in six counties throughout the Tampa Bay area
- **FREE children's activities** (with registered adult) all day, Saturday, Oct. 15th
- **Dinner events at historic Firehouse Cultural Center** (101 1st Ave. NE, Ruskin, FL 33570)

THURSDAY, OCT. 13: KICK-OFF –

Join former Florida Governor Bob Martinez and local conservation visionaries to celebrate the history of Florida Forever and the state's largest local-government environmental lands program.



FRIDAY, OCT. 14: KEYNOTE –

David Johnson, director of the Global Owl Project (GLOW), a long-term, worldwide initiative to advance foundational aspects of science and conservation for owls.



SATURDAY, OCT. 15: KEYNOTE –

National Geographic Explorer and conservation photographer Carlton Ward Jr., will speak on the Florida Wildlife Corridor Project and the two expeditions he led to raise awareness about wildlife corridors.



Wood stork Joel E. Jackson



Pine Lilly Andrew Fairbanks



Roseate spoonbill Joel E. Jackson



Brown pelican Joel E. Jackson



Cockroach Bay Donna Bollenbach



Yellow-crowned night-heron
Joel E. Jackson