



Teacher's Guide

Florida NGSS

SC.4.E.6.3- Recognize that humans need resources found on Earth and that these are either renewable or nonrenewable.

SC.4.E.6.6- Identify resources available in Florida (water, phosphate, oil, limestone, silicon, wind, and solar energy).

SC.4.L.17.1- Compare the seasonal changes in Florida plants and animals to those in other regions of the country.

SC.4.L.17.4- Recognize ways plants and animals, including humans, can impact the environment.

SC.5.N.2.1 - Recognize and explain that science is grounded in empirical observations that are testable; explanation must always be linked with evidence.

SC.5.E.7.5- Recognize that some of the weather-related differences, such as temperature and humidity, are found among different environments, such as swamps, deserts, and mountains.

SC.5.L.15.1- Describe how, when the environment changes, differences between individuals allow some plants and animals to survive and reproduce while others die or move to new locations.

SC.5.L.17.1- Compare and contrast adaptations displayed by animals and plants that enable them to survive in different environments such as life cycle variations, animal behaviors and physical characteristics.

MS.LS2.1- Analyze and interpret data to provide evidence for the effects of resource availability on organisms and populations of organisms in an ecosystem.

MS.LS2.5- Evaluate competing design solutions for maintaining biodiversity and ecosystem services.

MS.ESS3.3- Apply scientific principles to design a method for monitoring and minimizing a human impact on the environment.

MS.ESS3.4- Construct an argument supported by evidence for how increases in human population and per-capita consumption of natural resources impact Earth's systems.

MS.ESS3.5- Ask questions to clarify evidence of the factors that have caused the rise in global temperatures over the past century.

MS.ETS1.1- Define the criteria and constraints of a design problem with sufficient precision to ensure a successful solution, taking into account relevant scientific principles and potential impacts on people and the natural environment that may limit possible solutions.

HS.LS2.1- Use mathematical and/or computational representations to support explanations of factors that affect carrying capacity of ecosystems at different scales.

HS.LS2.2- Use mathematical representations to support and revise explanations based on evidence about factors affecting biodiversity and populations in ecosystems of different scales.

HS.LS2.5- Develop a model to illustrate the role of photosynthesis and cellular respiration in the cycling of carbon among the biosphere, atmosphere, hydrosphere, and geosphere.

HS.LS2.6- Evaluate the claims, evidence, and reasoning that the complex interactions in ecosystems maintain relatively consistent numbers and types of organisms in stable conditions, but changing conditions may result in a new ecosystem.

HS.LS2.7- Design, evaluate, and refine a solution for reducing the impacts of human activities on the environment and biodiversity.

HS.LS2.8- Evaluate evidence for the role of group behavior on individual and species' chances to survive and reproduce.

HS.LS4.5 - Evaluate the evidence supporting claims that changes in environmental conditions may result in (1) increases in the number of individuals of some species, (2) the emergence of new species over time, and (3) the extinction of other species.

Objectives

- Define and describe a watershed. Students can discuss the threats watersheds face.
- Define ecosystem services and identify services provided by different ecosystems.
- Identify and describe aquatic plant and animal species found within Fisheating Creek ecosystems.
- Describe different types of habitats in Fisheating Creek region and understand the biological community they support.
- Explain global warming and the effects it has on Florida habitats.
- Recognize ways to decrease climate change impacts through responsible ecosystem management and protection.
- Understand the purpose and importance of wildlife corridors in Florida.

Link to Feature Film: The content of this lesson coincides with the content from the video [Fisheating Creek: Wild River of the Everglades](#). Use this guide in class before or after viewing the film to enrich the educational experience.



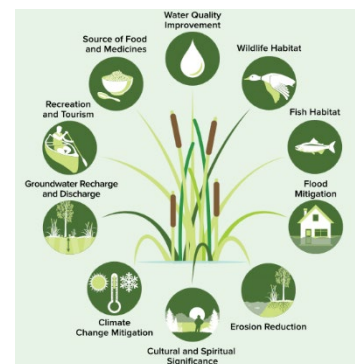
Ecosystem Services

It's important to protect, maintain, and restore our natural environment to utilize the services and resources they provide. *Ecosystem services are the benefits natural ecosystems provide for human well-being* such as food, clean water, climate regulation, pollination of crops, and more. Every ecosystem provides unique services based on the wildlife present and natural processes that occur.

Wetland ecosystems perform a number of ecosystem services for us. Floodplains full of aquatic plants act as water filters to remove nutrients like nitrates and phosphates from the water flowing through them. Roots stabilize the sediment, helping to control erosion during storms. During storms, plants act as a buffer by soaking up water from rain runoff and reducing the intensity of flooding.

Wetlands are also important for combating climate change. The plants store carbon within their tissues and in the sediments they grow in instead of releasing it into the atmosphere as carbon dioxide. Carbon dioxide is one of the main greenhouse gasses that is driving climate change. The storage of carbon within the plant tissues and the sediment is referred to as "sequestration."

Wetlands provide us a multitude of services we rely on, as well as recreational benefits through nature tourism, and fishing, both commercial and recreational.



The Watershed

Today, the Fisheating Creek is the only free flowing river that feeds into Lake Okeechobee, making it an essential component of the Everglades watershed. A *watershed is an area of land*

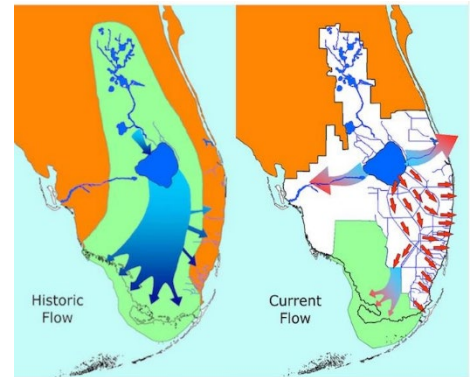
where freshwater flows and drains into a common body of water. Most of this water comes from rainfall that eventually runs into streams and rivers. Some of the water also seeps into the ground where it's stored in aquifers. Groundwater stored in aquifers is a key source of drinking water in Florida.

Topography of the land is a key element that affects where water will naturally drain. The steepness of mountains, hills, and valleys determines runoff pathways. Watersheds are crucial because of the way they store and transport surface water. Stormwater runoff from the land within a watershed can carry nutrients and pollutants into the water system. These often include fertilizers applied to crops, human and animal waste and other pollutants from urban areas.

In addition to cleaning, storing and moving water, watersheds also provide habitats for native wildlife. It is necessary to understand the natural processes that occur within watershed systems because these runoff pathways affect our water supply and natural ecosystems.

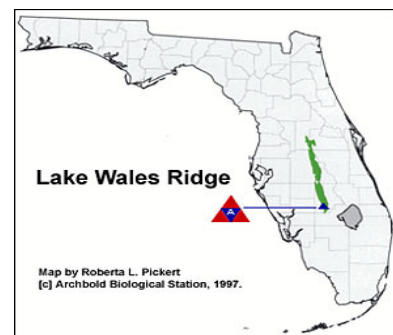
The Everglades Watershed

The Fisheating Creek and Kissimmee River watersheds are both components of the greater Everglades watershed. Lake Kissimmee and Kissimmee River are the headwaters of the Everglades watershed in central Florida. The Kissimmee River flows south into Lake Okeechobee and eventually into the Everglades. Historically, water slowly overflowed the southern rim of Lake Okeechobee, spreading across the Everglades. The water continued flowing south through the sawgrass and coastal mangroves till it reached Florida Bay. As urban development increased, canals were dug to manage flood control and redirect water for agricultural purposes. This drastically changed the flow of water and the surrounding ecosystems.



A Tale of Two Rivers: Fisheating Creek vs. Kissimmee River

The Fisheating Creek watershed is separated from the Kissimmee River watershed by the Lake Wales Ridge. The sandy Lake Wales Ridge runs about 100 miles south and north in central Florida. This ridge of elevated land started forming when global sea-levels were much higher, millions of years ago. In ancient times, most of Florida was underwater. As sea-levels began to subside, the Lake Wales Ridge emerged first as a chain of islands. Today the ridge habitat is comprised of ancient dune sand and is dry and desert-like. Many species found on the ridge are found nowhere else in the world, making this habitat, which we call the Florida scrub, unique and biologically important.





To the west of the Lake Wales Ridge is Fisheating Creek. The Fisheating Creek river is a critical component of the greater Everglades watershed because it has been mostly unaltered. Unlike the Kissimmee River, Fisheating Creek's meanders and floodplains remain intact. Because of this, the water passing through this river continues to be naturally filtered, and Fisheating Creek can perform its other ecosystem services just as nature intended.

The Kissimmee River once meandered through central Florida for 103 miles between Lake Kissimmee and Lake Okeechobee. Hurricanes in the 1920s and 1940s caused extensive flooding in southern Florida, resulting in huge losses of life and property. In the 1960s the Kissimmee River was channelized for flood control by dredging a 30 ft deep canal. The canal cut through the natural meanders of the original river channel, changing the flow of water through the river and floodplain.

While the project delivered on the promise of flood protection, it also destroyed much of the surrounding ecosystem. By channelizing the river and draining its wetlands, the river was no longer able to effectively filter out pollutants from urban and agricultural run-off. This resulted in huge losses of aquatic life. This also had detrimental effects on Lake Okeechobee, the River of Grass, Florida Bay, and coastal estuaries on the east and west coasts: the ultimate destination of the Kissimmee's water. The project also resulted in the loss of over 19,500 acres of wetlands and the disappearance of over 90% of water birds.

The negative effects of the project were visible within the first year of construction. In response to the environmental problems being observed throughout the greater Everglades watershed, the United States Congress signed into law the Comprehensive Everglades Restoration Plan (CERP) in 2000. CERP is the largest and most expensive ecosystem restoration plan in the history of our planet.

Included in CERP, was a project to restore portions of the channelized Kissimmee River back to its natural meandering pattern. The plan examined approaches to meet the system's ecological needs while maintaining the same level of flood control as the channelized system. Completed in 2020, 40 square miles of floodplain were restored, as well as 20,000 acres of wetland habitat.

On the other side of the watershed, Fisheating Creek remains unaltered and the river meanders and flows naturally. Since ecosystem processes can take place naturally, the watershed requires exponentially less effort and cost to manage and maintain.

One lesson that can be taken away from this environmental case study is the enormous effort it takes to restore wetlands. This can cost millions or even billions of dollars.

Discussion Questions:

1. What are some of the negative effects that resulted from channelizing the Kissimmee River?
2. Compare and contrast how humans have managed the Kissimmee River versus Fisheating Creek. Which approach would you say is more economically responsible in the long term: conservation or restoration?

The Water World of Fisheating Creek: Aquatic Plants

Alligator Flag



An emergent aquatic plant that grows in swamps and marshes. Grows 3-8 ft tall with broad green leaves. Unexpected movement of the leaves can be a sign that an alligator is swimming below.

Spatterdock



Part of the water lily family. Found in ponds, lakes, and slow-moving streams. Leaves often seem floating on top of the surface displaying bright yellow flowers.

Blue Flag Iris



This species tends to grow in marshes and coastal brackish waters. It is known to grow up to 30 inches tall.

Bald Cypress



These large native trees prefer freshwater swamp habitats. They can grow up 120 feet tall. Unlike most conifers, bald cypress lose their needles each winter and grow them again in the spring.

The Water World of Fisheating Creek: Aquatic Animals

River Otter



These playful members of the weasel family are often found in lakes and wetlands feeding on fish, and crustaceans. While foraging under water, they can hold their breath up to 4 minutes long.

Florida Softshell Turtle



These aquatic turtles are characterized by their pointed snout and webbed feet. They can be found basking along the shore, logs, and floating vegetation. They prefer habitats with muddy and sandy soils and feed on snails, crustaceans, and small fish.

American Alligator



Alligators are prevalent in marshes and wetland habitats swimming at the bottom of rivers or basking in the sun. They are known as opportunistic feeders, meaning they eat what's abundant and easily available such as fish, snakes, and small mammals.

Dragonfly Nymphs



Dragonflies have three life stages: egg, nymph and adult. The nymph is a ferocious aquatic predator.

Florida Apple Snail



Florida is home to one native species of apple snail, as well as a few invasive apple snail species. They can be found in most shallow bodies of freshwater in Florida. The apple snail is an important food source for several native animals, such as the limpkin.

Limpkin



Limpkins are wading birds that feed almost exclusively on apple snails, both the native and introduced species.

Fisheating Creek: The Upland Habitats

Hardwood hammock

Central Florida's hardwood hammock habitats within Fisheating Creek are often a mix of live oak, sweet gum, and cabbage palm. South of Lake Okeechobee is a bit more tropical, and here you'll find trees such as gumbo limbo and pigeon plum. Below the tree canopy, hammocks have a shrubby understory featuring species such as saw palmetto, wax myrtle, and American Beauty Berry. Epiphytes are also common, including resurrection fern and bromeliads.



Pine flatwoods

These woodland habitats tend to have widely spaced longleaf and slash pine trees growing with a low shrub layer below including saw palmetto, wax myrtle, and a variety of grasses.

The density of the soil only allows for minimal water runoff. This leads to water logged soils during the rainy season.

Pine flatwoods attract animals that like tall trees or exhibit scavenging behavior. A few animals you might see include the gopher tortoise, Florida mouse, fox squirrel, and Florida black bear. Amphibians such as the green tree frog and birds such as the swallow-tailed kite may be spotted climbing and nesting in the tall pine trees.



To maintain a healthy and balanced ecosystem, natural burns are necessary. Fire is a dominant factor to the pine flatwoods ecology. Without occasional fires, the pine flatwoods may transition to a hardwood hammock through succession. Ecosystem ***succession is the process of change from one habitat to another.***

Florida Scrub

Florida scrub habitats are characterized by well drained sandy soils and dry, desert-like conditions. A few plant species found in this habitat include saw palmetto, sand pine and prickly pear cactus. Scrub lands are also home to several endemic animals including the Florida scrub jay, short tailed snake, and scrub lizard. The word ***endemic refers to species only found in one specific habitat or region.***

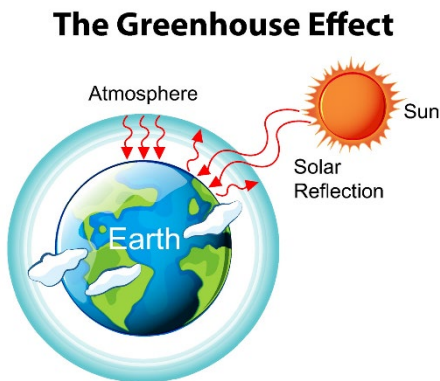
The scrub is one of Florida's oldest habitats. The sandy soils originated from ancient dune sands when ocean levels were much higher. A lot of upland areas that exist today used to be completely under water. The largest contiguous region of Florida scrub habitat is located in the Ocala National Forest.



Like the pine flatwoods, these habitats are fire-maintained communities. This means regular fires help maintain the scrub's plant communities and prevent succession.

Climate Change: Past and Present

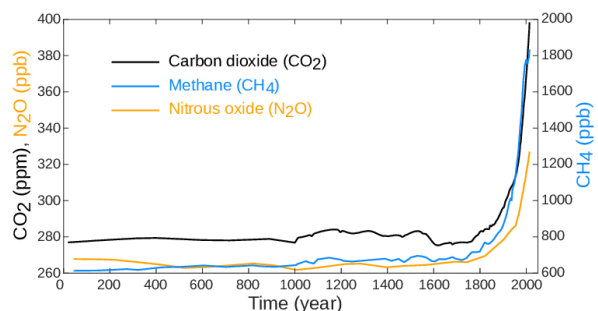
Over the course of time, our planet's climate has gone through gradual cycles of warming and cooling periods. As the climate changes, ecosystems adapt and transform. One example of these ecosystem transformations can be observed in modern Florida scrub habitats. Scrub ecosystems near the Lake Wales Ridge were formed over 100,000 years ago. The sand mounds of the Lake Wales ridge are remnants of ancient sand dunes when sea levels were high and the majority of Florida was underwater. As temperatures dropped again, sea levels did also, leaving behind dunes of sand far removed from the sea.



Today we see changes in global climate as a result of anthropogenic activities. **Anthropogenic activities are the processes carried out by humans that impact the environment** such as burning fossil fuels, mining, and clearing forests for agriculture. These human drivers are changing the climate more rapidly than natural processes through the greenhouse effect. The average global temperature has increased by 0.74°C in the past 100 years. The **greenhouse effect is the process where atmospheric gasses, such as carbon dioxide and methane, absorb and re-emit heat.** Although this process occurs naturally, the greenhouse effect is rapidly increased by human activities. Today,

the atmosphere contains 32% more carbon dioxide than it did prior to the industrial age. It's important to understand how our methods of production and energy consumption shape the environment around us to properly address the current climate issues at hand. We must adapt and change our practices to more sustainable methods to prevent further global warming effects.

This line graph displays the historic change of greenhouse gas levels in the atmosphere. Each gas shows drastic increases after the turn of the 19th century compared to the past.



Discussion Questions:

1. What are some examples of human activities that increase global warming?
2. What are a few changes we can observe in our environment because of climate change?

Creature Features

Animals have specific habitat requirements that they need to survive such as available food and water, sufficient space to roam, and shelter. Some species have especially restrictive requirements in order to thrive, and this limits the types of habitats or region where the organisms can be found. For example, the Florida scrub jay is endemic to a very specific habitat; the Florida scrub.

Florida scrub jays are not particularly strong flyers and prefer to hop around from place to place. As a result, they need shrubby ground vegetation to hide from predators and a sparse canopy in order to spot potential predators from far away.

Another bird in Florida with restrictive habitat requirements is the swallow-tailed kite. For their nesting, these birds need tall trees with sparse crown vegetation in order to have clear openings to land on and take flight from their nests. This makes pine and cypress forests ideal habitats for swallow-tailed kites.

Florida Scrub Jay

Video Adventure: Click on this link to watch our short video on the Florida scrub jay.



The Florida Scrub Jay is one of Florida's only endemic birds, with the scrub being its primary habitat. These birds are highly intelligent, very social and form complex family units. After fledging, offspring stay with their parents for several years to help feed and train their younger siblings and to act as sentinels to watch for incoming predators. They tend to stay in the same area most of their life, never traveling more than a few miles from their original nest.



Because scrub jays have such specific habitat requirements, this has led to population decreases. The primary threats to the scrub jay are habitat degradation, fragmentation and

loss. Fire suppression has also led to habitat loss. If regular burns do not occur, the vegetation becomes too dense to support the scrub jays. Prescribed burning is an essential tool for conserving the Florida scrub jay.

Swallow-tailed kite



Swallow-tailed kites are known for their acrobatic flight and sleek beauty. They tend to hunt by swooping over trees to snatch up prey and often eat while flying. These birds eat insects, frogs, lizards and small birds.

While nesting, both parents take turns incubating the eggs for the first month of development. They usually build their nest in the tallest trees with sparse foliage such as pines and cypress trees.

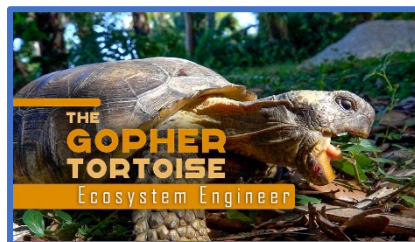


Florida's population of swallow-tailed kites make an annual migration between the southern U.S. and Brazil. Due to this extensive migration, roosting sites are crucial for these birds. These spots are where they fill up on food and energy in preparation for their 5,000-mile flight across the Gulf of Mexico.

Since they spend most of their time in flight, kites require large areas of continuous forests to thrive. Unfortunately, their preferred habitats are disappearing because of development. Wetland ecosystems, such as cypress swamps, have diminished as a result of dredging, logging, and agriculture. Historically, kites once nested in 21 states. This has dropped to 7.

Ecosystem Engineer: The gopher tortoise

Video Adventure: [Click on this link](#) to watch our short video on the gopher tortoise.



Ecosystem engineers are species that modify their environment in a significant manner, creating new habitats and modifying existing ones to suit their needs. These species highlight

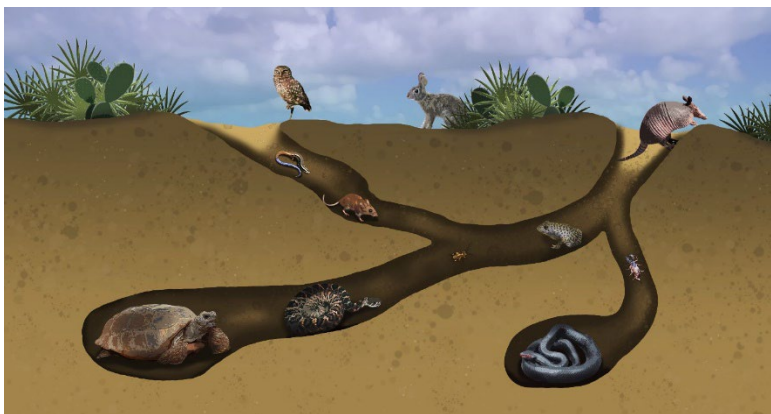
the importance of protecting every animal in an ecosystem since each one has a role to play. An ecosystem is a delicate interconnected system. If an ecosystem engineer disappears from an ecosystem, it creates a ripple effect that impacts many other animals, and even the ecosystem's ability to fulfill its functions. Ecosystem engineers are critical in helping maintain biodiversity.

One example of an ecosystem engineer is the American alligator. Alligators create large nest mounds in sawgrass prairies which often become hammock islands. They also create trails through wetlands, and excavate depressions in the marsh to survive winter dry seasons. These both create habitats for fish and aquatic invertebrates and sources of water and food for other animals like wading birds during the dry season.

Another example of an ecosystem engineer is the pileated woodpecker. It uses its beak to peck out cavities for nesting. Many other species of animals rely on abandoned woodpecker holes for their own nesting, like the eastern screech owl and the grey squirrel. Also, the holes created by woodpeckers accelerate the rate of wood decomposition and nutrient cycling within forests because the wood is more easily colonized by fungi.

Another important ecosystem engineer in Florida is the gopher tortoise. These terrestrial reptiles have shovel-like forearms covered in scales, useful for digging their massive burrows. They can grow up to 15 inches long and live to 60 years old in the wild.

Gopher tortoises prefer well drained, sandy soils, usually in pine flatwood, dry prairie, and coastal dune habitats. They feed on low-growing plants such as grass, gopher apples, and other lowland vegetation. Gopher tortoises are known as opportunistic grazers, meaning they eat whatever plants are available in the local area. They may occasionally drink water from puddles, but they get most of their water content from the plants they eat.



The life of a gopher tortoise revolves around its burrow, spending about 80% of its time here. To avoid predators and hot temperatures, gopher tortoise's dig branching burrows up to 40 feet long.

Their burrows not only protect the tortoises, but also provide shelter to over 350 other local species. If the gopher tortoise went extinct, there

would be measurable changes to the ecosystem. Other native animals that utilize their burrows would gradually lose shelter options which would likely result in population declines. In other words, if the gopher tortoise disappears, so would other animals that rely on them. Species that rely on the gopher tortoises' burrows are referred to as gopher "commensal burrowers." Think of them as decent roommates that don't pay any rent. **Commensalism is the relationship between two organisms in which one benefits and the other is neither benefited or harmed.**

The gopher tortoise's conservation status is listed as vulnerable. The primary threat to tortoise populations is habitat loss as urbanization continues to increase. Dry habitats suitable for the tortoise are also the ideal locations of development projects which leads to the destruction and fragmentation of these ecosystems. Habitat degradation from fire suppression is also a factor in depleting tortoise populations. It is crucial to implement and enforce proper land management practices to ensure the protection of gopher tortoises and other local species that rely on their burrows.

Discussion Questions:

1. Can you think of another animal in Florida that would be considered an ecosystem engineer? In what ways does it alter its environment, and what other species rely on it?
2. Can you think of any other examples of commensalism, other than the gopher tortoise, that we would see in Florida ecosystems?

Invasive Species Feature: The Feral Pig

Although feral pigs have been in Florida for about 500 years, they are considered an invasive species. An ***invasive species is an organism that is not native to the area it inhabits and which causes significant damage to that ecosystem.*** This raises the question: How did the pigs get here? In the 16th century, Spanish explorer Hernando De Soto landed on Florida's shores. Aboard his ships were domesticated pigs. Some eventually escaped, and within a few generations they became wild. These feral hogs reproduced and spread throughout much of North America, causing enormous amounts of damage to crops and natural ecosystems.

Invasive species are a problem because they offset natural balances in the ecosystem. Invasive species can cause great economic and environmental harm to a new area. For a species to be considered invasive, it must adapt to a new area very easily, reproduce quickly, and cause harm to the native plants and wildlife in the area. When an organism takes over an area, it may not have any natural predators so populations continue to increase. This organism may also prey on other, native species.



Feral pigs forage and eat about 3-5% of their body weight every day. Their diet usually consists of 90% plant matter and 10% animal matter including invertebrates, reptiles and rodents. Their diet also coincides with the local white tail deer, which means wild pigs are competing with them for food sources. Feral pigs can also greatly alter their environment when they uproot and overturn soil looking for food.

Discussion Questions:

1. How did feral pigs end up in Florida? Why do you think they were brought here?
2. Name a few characteristics a species must show to be considered an invasive species?

The Plight of the Panther

The Florida panther is an endangered subspecies of puma. Once spanning throughout the southeastern United States, the habitat of the panther has diminished to less than 5% of its historical range. The decreases in habitat and population sizes are a result of urban development and habitat fragmentation. In the 1980's, less than 25 panthers were left in the wild, most with severe genetic problems.



Historically, the Florida panther and the North American cougar, another puma subspecies, once had intersecting ranges and would naturally interbreed. Agricultural and urban development have fragmented the panthers' historical range, dividing the North American cougars and Florida panthers into two isolated populations. This resulted in Florida populations declining to the point where interbreeding threatened possible extinction. Thanks to the intervention of Florida Fish and Wildlife Conservation Commission's Panther Recovery Program, today their population has increased to about 160 individuals.

Florida Panthers are strict carnivores, with a diet that includes feral hogs, white tailed deer, and armadillos. These predators are usually active at dawn and dusk.

Panthers prefer upland habitats with dry soils and plenty of tree cover. Unfortunately, urban development and persecution have pushed them into areas such as Big Cypress National Preserve. Today you'll find panthers in wetland areas with thick vegetation such as cypress swamps. Since they're habitat has changed, we often refer to them as "swamp cats" when they are actually not big fans of water.

Growing 6-7 ft in length, they require larger areas of undeveloped land for hunting to survive. The territorial range of male panthers is about 200 square miles. If these animals are packed into one region, males will often fight to the death over territory. Today most of the panther's natural habitat has been fragmented and intersected by roads and highways. As a result, automobile strikes are the number one cause of panther fatalities today. The need for large areas to roam is why wildlife corridors are necessary to maintain panther populations.



Discussion Questions

1. What are a few habitat requirements/preferences for the Florida Panther?
2. Describe how human development has affected the Florida panther's population.

The Florida Wildlife Corridor

Wildlife corridors are areas of continuous green space that allow wildlife to safely roam or migrate. There are a number of animals that specifically require large areas of continuous unfragmented habitat to roam. A few examples native to Florida include panthers, West Indian manatees, and Florida black bear. Protected lands help ensure these critical pathways continue. We must continue to support Everglades restoration initiatives and wildlife corridor efforts to increase the Florida panther population and many other native organisms.

The Florida Wildlife Corridor is a statewide network of connected lands and waters that support local wildlife. The corridor spans across 17.7 million acres of the state through rivers, parks, and state forests. Half of the corridor consists of working land for agriculture and cattle. Humans benefit from wildlife corridors through ranching and fishing to support our economy. The corridor is also crucial for mitigating climate change. Aquatic vegetation sequesters and stores carbon within its tissues and its sediment that would otherwise be emitted into the atmosphere as carbon dioxide. We also rely on the water reservoirs within the corridors for our drinking water supply. This is why wildlife corridors are not only important to wildlife but to humans as well to maintain a habitable climate and economic resources.

As human populations and development continue to increase in Florida, ecosystems continue to be fragmented. New highways, shopping centers and housing developments are springing up every day. Fragmenting the corridor threatens the ability for wildlife to safely travel. It's not enough to preserve patches of land in different areas. We must connect them. In 2021, the Florida Wildlife Corridor Act was passed to enhance the connections of Florida's natural land.

Name _____

Date _____

Vocabulary

Term	Answer	Definition
Anthropogenic activities		A the process where atmospheric gasses, such as carbon dioxide and methane, absorb and re-emit heat
Wildlife Corridors		B an area of land where freshwater flows and drains into a common body of water.
Greenhouse effect		C the benefits natural ecosystems provide for human well-being
Succession		D species that modify their environment in a significant manner, creating new habitats and modifying existing ones to suit their needs.
Watershed		E processes carried out by humans that impact the environment such as burning fossil fuels, mining, and agricultural land changes.
Ecosystem services		F an organism that is not native to the area it inhabits and which causes significant damage to that ecosystem
Commensalism		G the process of change from one habitat to another
Invasive species		H areas of continuous green space that allow wildlife to safely roam or migrate
Ecosystem engineers		I a relationship between two organisms in which one benefits and the other is neither benefited or harmed

Name _____

Date _____

Quiz

Multiple Choice

1. Which of the following is not part of the Florida Panther's diet? Circle all that apply.
 - a) White tailed deer
 - b) Feral hogs
 - c) Pond apples
 - d) Florida manatees
2. Which of the following is characteristic of the Florida scrub habitat? Circle all that apply.
 - a) It needs regular fires to prevent succession
 - b) It is home to many endemic species of plants and animals
 - c) The sandy substrate is ancient Sahara dust
 - d) It is typically hot and dry
3. The relationship between the Florida mouse and gopher tortoise due to the burrows is an example of which symbiotic relationship?
 - a) Parasitism
 - b) Mutualism
 - c) Commensalism
 - d) Decomposition

True & False

4. All species of apple snails found in Florida are native to Florida wetlands.
 - a) True
 - b) False
5. Fisheating Creek and Kissimmee River are both components of the Everglades Watershed.
 - a) True
 - b) False
6. In modern times, the greenhouse has been largely due to recent human activities such as burning fossil fuels.
 - a) True
 - b) False

Short Answers: Write 2 - 4 sentences for each of the following questions.

7. Name an ecosystem engineer in Florida and describe how it alters its surrounding environment.

8. List and describe 3 ecosystem services provided by wetlands.

9. Name a species (other than the Florida panther) that relies on the Florida Wildlife Corridor and why.

10. How has human development and other anthropogenic activities affected the Florida Panther's population?
