

Habitats

Healthy Land Equals Healthy Water



Southwest Florida
Water Management District

WATERMATTERS.ORG • 1-800-423-1476

Student Guide
For grades 6–8

Dear Teachers and Parents

In order to have a safe and adequate supply of water now and in the future, we must teach our children to be responsible users of Florida's water resources.

This booklet is dedicated to habitats and land resources. Protecting land resources is an effective tool in water management because it helps maintain natural patterns of water storage and movement. Natural areas are important for flood protection, high water quality and recharge of our underground aquifers.

This *Habitats — Healthy Land Equals Healthy Water* booklet outlines the relationship between effective stewardship of the land and our natural water resources. If you would like more information about water resources, contact the Communications Section of the Public Affairs Bureau of the Southwest Florida Water Management District at 1-800-423-1476, ext. 4757, or visit our web site at WaterMatters.org.

Youth Education
Southwest Florida Water Management District

Dear Students

How much do you know about habitats? Try the following quiz to test your habitat knowledge. Then continue with the booklet to learn more about protecting our land resources.
Good luck!

Habitats Quiz

Directions: Circle True or False for each sentence.

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|------|-------|---|
| True | False | 1. A habitat is the place where an animal or plant lives. |
| True | False | 2. A threatened species is a plant or animal that is not likely to become extinct. |
| True | False | 3. Estuaries are some of the most productive habitats on earth. |
| True | False | 4. Lakes are large bodies of salt water that are natural or constructed. |
| True | False | 5. Springs occur where groundwater comes to the surface of the earth. |
| True | False | 6. Florida has a high level of biodiversity. |
| True | False | 7. Wetlands help filter out pollutants. |
| True | False | 8. The Southwest Florida Water Management District's Green Swamp Wilderness Preserve is not open to the public. |
| True | False | 9. Purchasing lands is one way the Southwest Florida Water Management District protects water resources. |
| True | False | 10. Controlled burning is used to reduce animal populations. |

Unit 1

Habitats and Ecosystems

You can probably rattle off your home address in five seconds. But do you know the “address” of the living things around you? Plants and animals also have an address. It’s called their **habitat**. A habitat, like your own home, is the specific place where **living organisms** find the things they need to survive, such as food, shelter, water and space.

Your **ecosystem** is similar to the town or city where you live. An ecosystem is a living **community** of plants and animals and their relationships with the environment around them. Just as you depend on farms, groves, grocery stores and other businesses to supply the things you need, plants and animals depend on their environment to supply the things they need, such as water and food.

One way to meet these needs is to find a home that includes sunlight, food, water and a suitable climate.

Some animals may have different homes at different times of the year, just like some of us do when we go on vacation or visit relatives. But animals don’t change addresses for fun. They move, or **migrate**, at different times of the year to ensure their needs are always met. No matter where they live, animals must adapt to their environments.

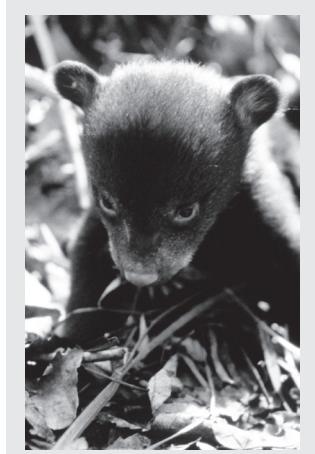
You may have adapted to where you live. Most of the clothes in your closet are probably designed for warm weather, and the things you like to do may center around warm weather or the outdoors. Other living things also adapt to the environment in which they live. How? Plants and animals have certain features that help them get the food and energy they need, protect themselves, and adapt to changes in

their environment. For example, fish have fins to move through water and gills to get oxygen from the water.

Changes to habitats can be natural or caused by humans. People sometimes change the land to make it usable for their needs. They grow food, build homes and businesses, or take water from the ground, lakes and rivers for drinking and other purposes. When these changes occur, plants and animals may lose their habitats and be unable to survive.

Florida has a high level of *biological diversity* or **biodiversity**. This means that our state contains a wide variety of plants and animals. Ten percent of Florida’s plants and animals can only be found in Florida. Some of the reasons for Florida’s diversity are:

- *Its location as a peninsula, which allows both plant and animal species to migrate here*
- *A wet environment*
- *A long geologic past with natural features ranging from 2,000 to 25 million years*



Florida black bear cub

Changes to natural habitats are causing Florida to lose some plant and animal species. A **species** is a group of plants or animals that are genetically similar and reproduce with each other, like humans.

Both natural and human changes to habitats have created problems for some species. They may not have enough space or food to survive. These species are labeled “endangered,” “threatened” or “species of special concern.” An **endangered species** is a plant or animal that is in danger of becoming **extinct** without human protection. A **threatened species** is likely to become endangered in the foreseeable future unless **conservation** actions are taken. A **species of special concern** is a species that does not clearly fit into the endangered or threatened categories, yet warrants special attention. One of the primary causes of extinction is habitat loss, or a loss of “homes.”

Communities

1. An ecosystem is a living community of plants and animals and their relationships with the environment surrounding them. Find examples of things in newspapers, magazines and on the Internet that you and your family need to exist in your community. For example, you might include articles about agriculture and food production, water resources or housing.
2. Factors that determine where organisms live include sunlight, temperature, food supply and weather. Search newspapers, magazines and the Internet for articles, photos or advertisements that influence your own environment.
3. Florida’s water habitats include oceans, lakes, wetlands, rivers, springs and estuaries. Find habitat-related articles in newspapers, magazines and on the Internet and begin a notebook. List the different impacts to habitats and water resources.

Unit 2

Florida's Water Habitats

Florida has five regional agencies responsible for protecting water resources. These agencies are called water management districts. The Southwest Florida Water Management District (SWFWMD) is responsible for an area that includes part or all of the following counties:

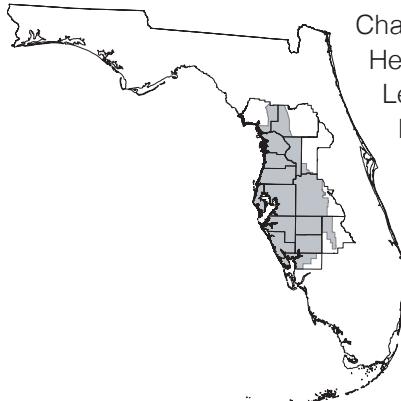
Charlotte, Citrus, DeSoto, Hardee, Hernando, Highlands, Hillsborough, Lake, Levy, Manatee, Marion, Pasco, Pinellas, Polk, Sarasota and Sumter.

There are 14 major rivers, 1,800 lakes that are 10 acres or larger and over a million acres of wetlands within the SWFWMD. Southwest Florida is shaped, defined and, in many ways, dependent on water. The water habitats or "addresses" in southwest Florida include estuaries, lakes, wetlands, rivers and springs.

Undeveloped and agricultural land areas provide groundwater **recharge** by absorbing rainwater, allowing it to seep underground and replenish the **aquifers**. These are spongelike underground layers of limestone or rock that can hold and release water. One of the most effective ways to protect water resources is to protect and properly manage these types of lands. These lands store excess rainwater and filter out pollutants.

The following are water habitats that exist within the SWFWMD:

Estuaries are bodies of water along our coasts that are formed when fresh water from



Species: Manatee

Description: A large aquatic mammal. The average adult is about 10 feet long and weighs about 1,200 pounds. Eats seagrasses. A 1,000 pound manatee could eat from 100 to 150 pounds of seagrass per day. Because it is a mammal, the manatee must surface for air about every three to five minutes.

Habitat: Shallow, slow-moving rivers, estuaries, saltwater bays, canals and coastal areas.

Status: Endangered

Problems: Loss of food source and human recreation. Seagrasses declined by about 80 percent in Tampa Bay but are now increasing due to the efforts of publicly funded programs. Boat propellers are a threat when manatees surface for air. Almost all manatees in Florida have scars from collisions with boats.

rivers and streams flows into and mixes with salt water from the ocean.

In estuaries, the fresh river water is blocked from streaming into the open ocean by either surrounding mainland, peninsulas, barrier islands or surrounding salt marshes. This mixing of fresh and salt water creates a special habitat (or home) that brims with life of all kinds. The estuary gathers and holds an abundance of life-giving nutrients from the land and the ocean, making it one of the most productive habitats on earth. An estuary produces more food per acre than the richest farmland.

Estuaries come in all shapes and sizes and go by many different names, often known as bays, lagoons, harbors, inlets or sounds. (Not all water bodies by those names are estuaries. What makes an estuary is the mixing of fresh and salt water.) Some familiar examples of estuaries include San Francisco Bay, Puget Sound, Chesapeake Bay, Boston Harbor and Tampa Bay. The largest estuary within the SWFWMD is Tampa Bay, with a watershed that covers 2,200 square miles.

An important factor for a healthy estuary is the amount of fresh water that flows into it. This fresh water determines the **salinity**, or amount of salt, in the estuary's water. The SWFWMD studies estuaries to find out how much fresh water they need to survive. If water levels in lakes and rivers drop, less fresh water flows into estuaries. Some animals and plants are sensitive to even small changes.

Estuaries are also affected when a lot of people live in coastal areas. Through building, transportation and agricultural needs, estuaries can be destroyed. More than 13 million people live in Florida's coastal counties. As our population grows, it is important that we protect our estuaries for the benefit of all who enjoy and depend on them.



Species: Florida sandhill crane

Description: Long legged, long necked gray-brown bird with red on the top of its head.

Habitat: Open lands, marshy lake margins. Usually nests in the shallow water of lakes, ponds and open marshes.

Status: Threatened, but improving

Problems: Loss of habitat

Lakes are inland bodies of fresh water, natural or constructed, usually surrounded by land. There are approximately 1,800 lakes 10 acres or larger within the SWFWMD. Polk County has the largest number of lakes within the SWFWMD, ranking fourth in the state.

Lakes can be used for many purposes, such as swimming, boating and fishing. Many plants grow underwater with the help of sunlight that shines through the water. These plants are food for many animals that live in the lake. Lake levels may drop in some areas when too much water is taken out of our underground water supply. This affects the plants and animals that live there because they may not have enough space or food available to them. Lakes also may be affected by **stormwater runoff**, which is extra rainwater that does not soak into the ground. Stormwater runoff can cause an increase in algae and the growth of bacteria.

Wetlands are lands that are wet all, or part, of the year. They lie between dry lands, or uplands, and water or aquatic systems. Wetlands are either fresh water or salt water. Freshwater wetlands include cypress swamps, hydric hammocks, hardwood swamps, marshes and wet prairies. Saltwater wetlands include coastal saltwater marshes and forested wetlands known as mangrove swamps.

Each kind of wetland supports different animals and plants that have adapted to living in or close to water. Swamps are dominated by trees, while marshes are dominated by grasses and plants.

Wetlands filter out pollutants or **contaminants** and store excess water to protect us from floods. They also provide homes for plants and animals and recreational opportunities, and they support the commercial fishing industry by providing a valuable habitat for many kinds of fish. One acre of wetland can hold 300,000 gallons of water!



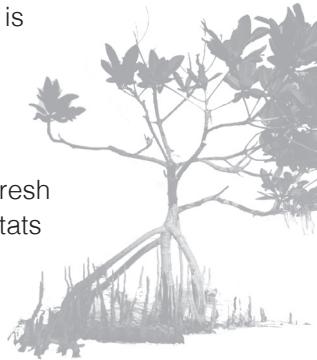
Jeff Palmer

People did not always understand the value of wetlands to our water resources and to other species. Wetlands used to be called "wastelands" and were drained to build homes and businesses or converted to agricultural areas. Approximately 50 percent of Florida's original wetlands have been altered — about 10 million acres.

Rivers are created from excess rainwater that flows off the land. Wetlands are often close to river banks. The SWFWMD has 13 major rivers within its region of responsibility.

Springs occur where groundwater, or water stored in underground aquifers, comes to the surface. Often they are the **headwaters** of a river — where it starts. Springs provide water to downstream rivers and lakes. If too much underground water is removed from the aquifer, the water available in springs is reduced, which may affect habitats downstream.

One important spring group within the SWFWMD is Homosassa. Homosassa Springs is located 75 miles north of Tampa. The spring is 45 feet deep and pumps millions of gallons of water *every hour!* This provides valuable fresh water to many habitats downstream on the Homosassa River.



Species: Alligator
Description: Reptile with elongated, armored, lizardlike body and muscular flat tail. Average adult size ranges from 8.2 feet to 11.2 feet and can reach a weight of more than half a ton. In captivity, alligators can live to be 50 years old, but in the wild they usually live to be 30 to 35 years old.

Habitat: Large shallow lakes, marshes, ponds, swamps, rivers, creeks and canals in fresh and brackish water areas.

Status: Listed by state as a species of special concern and by the federal government as threatened due to the similarity in appearance to the endangered American crocodile.

Problems: The alligator was hunted for its skin until it was given protection as an endangered species. Although it is still protected and considered a threatened species, years of protection have helped alligator populations.

Species: Mangrove
Description: A tree with roots that grow in salt water or brackish water. White, red or black varieties provide shelter and nesting areas for birds, fish and other life. Filters out pollutants before they can enter coastal waters, protects coast from erosion and provides habitat. Leaves of mangroves falling in water provide the base of the estuarine food chain.

Habitat: Saltwater and brackish wetlands

Status: Protected
Problems: Threatened by human development in coastal areas.

Communities

1. Write a paragraph explaining why wetlands are such a valuable natural resource. Search newspapers, magazines or the Internet for an article mentioning another kind of water habitat. Read the article and explain to the class why you think this habitat is important.
2. Find an article that discusses a water or land problem facing people in your community. What is the problem and why does it exist? What people or organizations are involved with the problem? What is being done to solve the problem? Is there anything standing in the way of a solution? Write an editorial stating your opinion on the subject.
3. Look for an article that discusses any of the water habitats present in southwest Florida. Is there a habitat like that near your community? Do members of the community protect it? Is there anything you can do to improve it?

What's Connected to a Habitat?

Most of us live in a neighborhood or community with other families. You see them at the store, during community activities, or you might see your neighbors at school. This "connects" you to the members of your community. In the same way, you also are connected to natural systems, such as the animals or plants that exist around you.

A habitat is like a puzzle, made up of many different pieces that don't make a complete picture until all the pieces are in the right place. What are the pieces in a habitat? Food, water,

shelter and space.

Do you remember what it felt like when you lost a piece of a puzzle? Your puzzle just didn't look the same with a piece missing, and

perhaps you took better care of your next puzzle. You recognized the VALUE OF EVERY PUZZLE PIECE. In the same way, it is important that each of us understands the value of different kinds of habitats and the small puzzle pieces that compose a habitat, such as water, so that we will protect them.



Anhinga

Habitats and Ecosystems

Remember the term "ecosystem" from Unit 1? An ecosystem can be made up of a variety of habitats, and a species' habitat is where they live within their ecosystem. Each plant or animal has a specific role to play in the ecosystem, its **ecological niche**. Think of a "niche" as a character on a TV show. Each character has his/her own personality and behaves differently, right?

The ecological niche of a species, therefore, describes its behavior and includes such things as food requirements, nesting sites, feeding method and other physical, chemical or biological conditions that the species needs to survive in the ecosystem. For example, the anhinga is a wading bird whose ecological niche includes its food (fish), its feeding method of swimming underwater and spearing fish, and its behavior, such as spreading its wings out to maintain its body temperature. Anhingas are found anywhere there are alligators because they use alligator holes to hunt for fish.

Species and their roles in ecosystems share important relationships that keep all the pieces together in the larger ecosystem puzzle. They are *interdependent*. All relationships between plant and animal species are influenced by the movement and availability of water, making water one of the top factors in an ecosystem's health.

Communities

1. Look through the newspaper for reports about natural disasters that alter a natural environment. Start with the weather page. Summarize how people and the environment were affected by these extreme weather conditions.
2. If you were a scientist in charge of restoring habitat for manatees, what ingredients might you include? Remember the essential components of a habitat: food, water, shelter and space. Search newspapers, magazines and the Internet for articles and photographs of manatees to give you ideas.
3. Search newspapers, magazines and the Internet for articles about different types of pollution or environmental problems and arrange them in categories in your notebook. Some categories might be noise, air, water and solid waste. How are the categories connected to each other? How might one type of pollution affect more than one natural resource?

Impacts to Habitats

Many of Florida's diverse aquatic habitats are threatened by natural and human activities. Natural impacts to habitats include hurricanes — storms with winds of at least 74 miles per hour that naturally form over ocean waters. Hurricane winds can damage or alter coastal habitats of people and other species.

Rapid population growth is one human impact. There are more than 4.7 million people living within the Southwest Florida Water Management District (SWFWMD). Also, more than 80 million people visit Florida each year. Many plant and animal species have drastically declined or vanished and water resources have been impacted because of the increased need for water and living space for people.

Florida's water habitats have been altered, degraded and broken into smaller pieces. Perhaps the most significant threats come from habitat alteration and degradation. Changes, such as draining wetlands for human use, alter the natural flow of water and may lower underground water levels.

Another alteration is the invasion of non-native species. Exotic species do not occur naturally in an area. They are brought into a new area by accident or to "improve" upon the existing system.

An example of an exotic species that has done damage in Florida is melaleuca. The melaleuca tree was brought from Australia to Florida in the early 1900s. It was believed it would dry up wetlands. (Remember, at that time, people did not understand the value of wetlands.) The tree grows and reproduces rapidly, crowding out natural Florida trees and plants. Melaleuca also soaks up a lot of water, limiting the water available to native trees and plants.

Melaleuca is a problem on some of the SWFWMD lands in southern counties. The SWFWMD addresses the problem by uprooting small trees and either chopping down or cutting open larger trees, which are then treated with a small amount of herbicide. The herbicide is applied directly to the melaleuca tree so

that it will not cause harm to surrounding plants and animals.

Citrus trees are an example of a noninvasive, nonnative species that has been economically beneficial to southwest Florida. Citrus trees were introduced to Florida hundreds of years ago by Spanish explorers. Today, Florida produces more than 70 percent of the United States supply of citrus. Florida is second only to Brazil in global orange juice production.

The degradation, or decline, of habitats is a result of several causes that may include overpumping of underground water. Overusing groundwater supplies may degrade surrounding areas, causing wetlands to dry up and lowering lake levels. Another cause of degradation is pollution from stormwater runoff and industrial discharges.

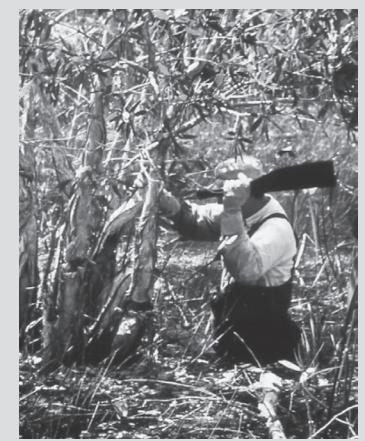
A significant amount of Florida's native habitats have been changed for human uses, such as growing food and providing housing for all the state's residents. About 50 percent of the state's wetlands have been altered.

The breaking up, or fragmenting, of habitats also is a major threat to Florida's natural habitats. Habitats have been separated into smaller pieces by roads, fields, houses and other development. There are lower numbers of some species, such as the black bear, because they don't have enough land area to survive and reproduce, or are killed on roadways when they attempt to travel to other areas.

Today, people recognize the value of wetlands and other lands to water resources and wildlife. Scientists, governmental decision-makers, conservationists, educators, farmers, business people and individuals like you are working together to keep the habitat puzzle intact.



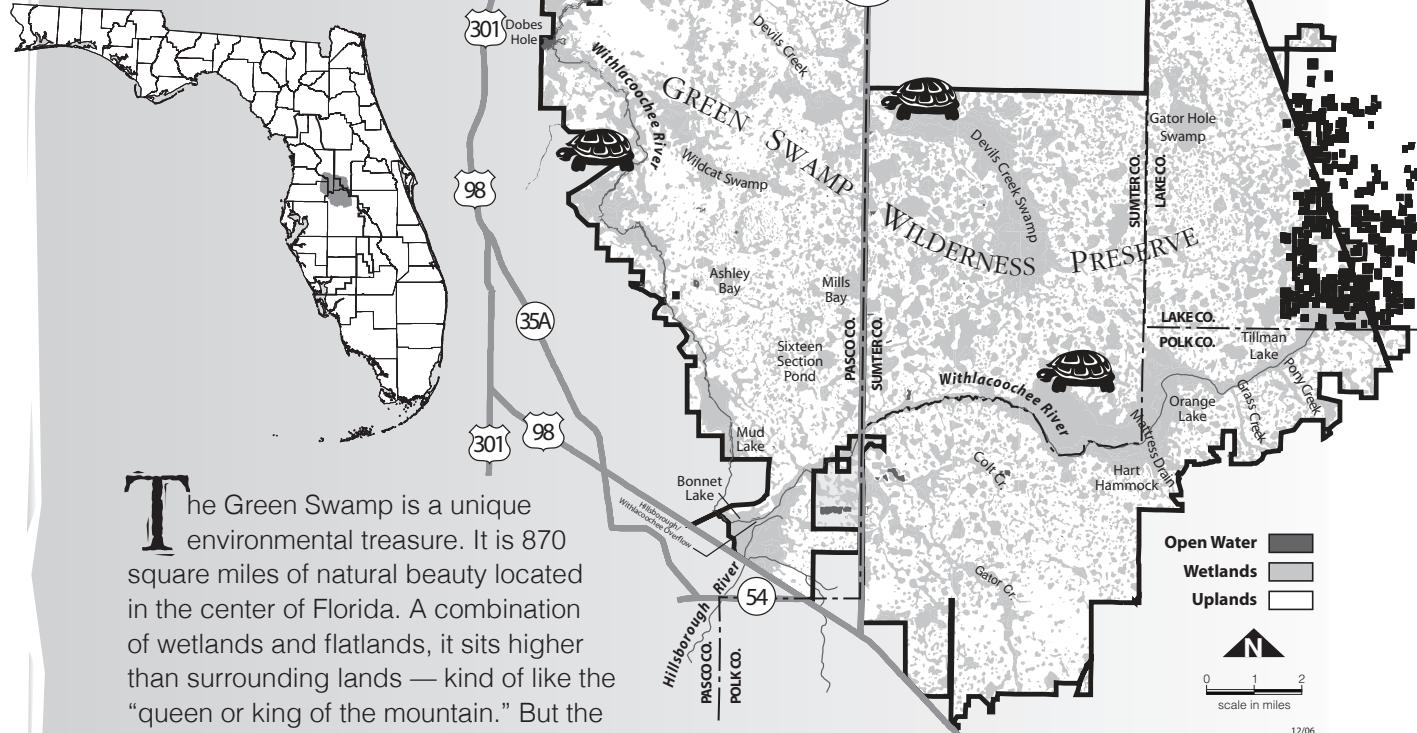
New growth and development leads to habitat and water supply losses and pollution.



Melaleuca being harvested



The Green Swamp



The Green Swamp is a unique environmental treasure. It is 870 square miles of natural beauty located in the center of Florida. A combination of wetlands and flatlands, it sits higher than surrounding lands — kind of like the “queen or king of the mountain.” But the Green Swamp needs a little help to protect itself, just like a king or queen can't run an entire kingdom alone.

That's why the Southwest Florida Water Management District (SWFWMD) has more than 142,000 acres of the Green Swamp under protection, named the Green Swamp Wilderness Preserve, for the public's benefit. The entire Green Swamp is generally located in southern Sumter and Lake counties, eastern Hernando and Pasco counties and northern Polk County (see inset map above).

You and I — and all sorts of other living things — need the Green Swamp. As you read earlier in this booklet, one acre of wetlands can hold about 300,000 gallons of water. So, one of the main reasons this land is so valuable is its natural ability to help with flood protection if there is major rainfall or storms.

The Green Swamp diverts “extra” water through the Withlacoochee and Hillsborough rivers. The Withlacoochee River receives most of the water that leaves the Green Swamp. The Green Swamp is important to the health of ecosystems and habitats along these rivers.

Other valuable land cover is within the Green Swamp. There are large forested areas that provide habitat to species such as the gopher tortoise. One of the tortoise's favorite habitats is pine flatwoods.

Do you know the best part about the SWFWMD's Green Swamp Wilderness Preserve? You can go there to have fun. Most of the preserve is open to the public for hiking, bicycling, camping, canoeing and fishing. Remember, when you visit, take care of that land so it can continue to provide important homes for animals and plants and continue to protect our water resources.

About the Green Swamp

The Southwest Florida Water Management District (SWFWMD) has more than 142,000 acres of land under protection within the Green Swamp because of its regional significance to water resources. The Green Swamp is a significant wetland area that covers 870 square miles. Four major rivers, the Hillsborough, Peace, Withlacoochee and Ocklawaha, originate in the Green Swamp. It is an important area for groundwater recharge because the aquifers are very close to the surface there. The Green Swamp also provides flood protection and natural treatment of runoff water.

For information about recreational opportunities or directions to the SWFWMD's Green Swamp Wilderness Preserve, visit our online ordering form at

WaterMatters.org/publications
for a free “Recreation Guide to Southwest Florida Water Management District Lands.”

Gopher Tortoise Basics

- Medium-sized turtle with a broad, muscular head and a relatively short tail. Adult averages 9 to 11 inches in length and weighs 8 to 10 pounds.
- Distinguished from other Florida turtles by its lack of webbed feet.
- Hatching of eggs takes place in late summer. Hatchlings are yellow-orange and emerge from their eggs with a shell length of 1.5 to 2 inches.
- A gopher tortoise's life revolves around its burrow, which can be up to 40 feet in length and 18 feet in depth. The tortoise digs its burrow with its shovellike front legs.
- More than 360 species of animals have been found using gopher tortoise burrows in various ways. These include burrowing owls, raccoons, opossums, gopher frogs, spiders, insects, cotton rats, indigo snakes, coachwhips and rattlesnakes. Several species that utilize the burrows have protected species designations.
- Live from 40 to 60 years and possibly as long as 150+ years. No precise estimate is available due to the difficulty of accurately aging tortoises once they have passed 30–40 years of age.
- Generally described as a **herbivore** (an animal that feeds chiefly on plants), the bulk of their diet consists of broad-leaved grasses, wiregrass and wild legumes. Small amounts of animal matter (insects and **carrion**), wild fruits and berries are also consumed occasionally. They actively feed during the warmer parts of the day.
- Apparently have a social structure and communicate with each other using head bobs, occasional sounds and even ramming.



- Gopher tortoise numbers are being reduced considerably throughout their range due to road kills, disease and land development. Some are killed for food, while others are killed when their burrows are filled with gasoline, a practice used to drive rattlesnakes from their tortoise-burrow shelter. Upper respiratory tract disease is threatening gopher tortoises too. This disease is spread when the tortoises are relocated to make way for development.
- Classified as a "threatened" species in Florida.
- Gopher tortoise populations are scattered throughout the coastal plain of the southeastern United States, with most being found in north-central Florida and southern Georgia.

What is a gopher tortoise's habitat?

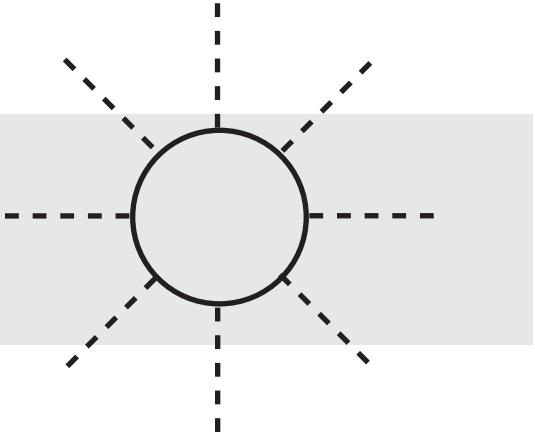
Three conditions are needed for healthy tortoise populations: well-drained sandy soils for digging burrows; sufficient low-plant growth for food; and open, sunny areas for nesting. Habitats may include longleaf pine-turkey oak sandhills and clayhills, live oak and red oak hammocks, sand pine scrub and pine flatwoods.

Communities

1. Search newspapers, magazines and the Internet for an article about how a human changed or plans to change an area. Do you think there will be any impacts to water resources or to plants and animals? What might they be? Is there a way to lessen the negative impacts? Are there positive results of the change? What are they? Discuss with your class whether the positive outcomes outweigh the negative impacts and why.
2. Humans change habitats to make room for housing and provide food for the nation's people. Can you think of ways that humans might be able to change land areas while protecting the habitat for water resources, plants and animals? Discuss this idea with classmates. Combine your ideas into a classroom poster.
3. Search newspapers, magazines and the Internet for articles about Florida's increasing population. Why is this population good and why might it be bad? Summarize your thoughts.

Wetlands Concept Map

A concept map allows you to diagram information. Place the word "wetlands" in the circle at right. Then add eight facts you learned about wetlands to the lines surrounding the circle. Compare your concept map with others.



Unit 5 Managing Habitats

Many people and organizations are concerned about the loss of aquatic habitats and are working to protect them. These include state, local and regional government agencies, private organizations, businesses, citizen and agricultural groups and individuals.



Prescribed burn

Government Protection

In 1970, a law was passed in the United States called the National Environmental Policy Act (NEPA). This act established the right of residents in this country to a healthy environment and the government's responsibility to protect the environment. Because of this law and others like it, there are many government organizations working hard to protect natural resources. These include federal, state, regional and local agencies.

In Florida, the Department of Environmental Protection (DEP) works with agencies throughout the state to protect habitats. The Southwest Florida Water Management District (SWFWMD) is responsible for protecting water resources and their associated habitats in your area. A variety of techniques are used to reach this goal. One of these techniques is land **acquisition**, or the purchase of lands.

The SWFWMD purchases land for the purposes of flood protection, water quality protection and improvement, water supply, protection of recharge areas, protection of wetland systems (such as headwater swamps

and floodplains), and restoration and management of uplands. Other government agencies also purchase lands for the benefit of our natural resources.

Effective management of these lands is necessary for protecting natural ecosystems. Lands also may be changed back to their natural state or improved so that natural functions such as water flow are working.

The SWFWMD restores lands through its Surface Water Improvement and Management Program — a state initiative started in 1987 to improve the quality of surface water bodies — and through its Land Resources Department. Both departments use restoration activities, such as changes in the land design for better water flow, reintroduction of native plants and animal species and removal of exotic species.

Besides restoration, agencies carry out important management activities, such as prescribed fire. Some plant and animal communities depend on fire for the health of their ecosystem. Fire cleans away excessive brush, recycles nutrients to the soil and stimulates some plants to produce fresh growth for **wildlife** food. Natural, lightning-caused fires can burn until rain puts them out or they reach a natural barrier like a river. Because of population growth and development, humans have had to intervene to stop these natural fires. So, the SWFWMD prescribes fire for certain sections of land to maintain good wildlife habitat and to prevent wildfires from destroying homes. The SWFWMD is exploring other ways of protecting the land too. Land protection options might involve the SWFWMD buying certain rights to private land, called a *conservation easement*. This allows a landowner to hold title to lands while restricting the use of the land, such as prohibiting development. Landowners may also donate their land. Often, conservation organizations, such as The Nature Conservancy, purchase lands and work with the SWFWMD to maximize the water resource benefits.

Private Organizations and Businesses

Businesses, citizen groups, other organizations and farmers help protect our habitats in many ways. They might purchase lands and keep them in a natural state, look for ways their businesses can limit impacts to the environment, or educate others about their lands. For example, farmers and ranchers use efficient water conservation systems to

save water, and their undeveloped lands allow rainwater to seep down and replenish the aquifers.

Private landowners are usually good stewards of the land because it's in their best economic interest. Farmers and ranchers like to say they were the first environmentalists. And their help is critical to the success of *ecosystem management*, an approach to solving environmental problems



David Heller

that looks at how the entire natural system works.

This is important because there are thousands of acres of critical habitat that are *not* under government management, and there's not enough money to buy or manage all the important lands. The SWFWMD encourages private landowners to pursue cooperative efforts with the government to protect critical habitats and to establish greenway corridors (linear open spaces connecting recreational, cultural and natural areas).

Individuals

Perhaps one of the most important parts of good habitat management is the involvement of individuals in habitat protection. Many people may not be aware of the importance of natural resources to their everyday needs. Water is a resource that we need **EVERY DAY** for our health, well-being and for recreation. Individuals need to know about problems with habitats so they may make educated choices every day. **EVERYONE** must share in the responsibility for managing our ecosystem. The next unit will address something called "stewardship." Stewardship can be defined as a sense of ownership in, and responsibility for, Florida's lands and associated natural resources.

Public ownership is one way to preserve and restore Florida's remaining natural areas, while providing passive recreation for the public.

Communities

1. Many government agencies, private organizations and businesses are working hard to protect aquatic habitats. See how many of these groups or agencies you can find in a newspaper or magazine. What are they doing to protect water resources and the state's natural ecosystems?
2. Restoration of Florida's natural areas is important to protect water resources. See if you can find an article about something that was restored. What was the item? Why is it valuable or worth restoring? Is it essential to human health? What might have happened if it was not restored?
3. One of the most important parts of habitat management is the everyday involvement of individuals. Make a list of the many different uses of water. Mark the ways you use water. List ways you can conserve and protect water resources when you are using water in different ways. Share your ideas with your class.

Unit 6

Stewardship of Natural Resources

One of the most important goals of Florida's habitat protection efforts is to ensure Floridians have a sense of shared responsibility, or **stewardship**, for our natural resources. What does this mean? It means that each of us needs to accept our connection to a larger community of living things that make their homes in southwest Florida. We are interdependent with the natural world around us.

Each of us has a responsibility to the environment. We must all share in the costs for habitat and water resources protection. We must work to protect our natural resources for our long-term health and survival. Helping individuals take action and make wise choices

every day will prevent problems that would otherwise require difficult and costly solutions. It is much more complicated and expensive to look for new water sources than it is for each of us to protect water and use it wisely every day.

In order to be a good member of your community, you should become informed, get involved and act responsibly. You can gain a better understanding of the environment and environmental issues by reading the newspaper, books and magazines; going to nature centers; and volunteering to work with local conservation and environmental organizations. Once you have this new knowledge, you need to use it!

On the next page are some helpful habitat hints. Share them with your family, friends and neighbors so that each of you will learn how to be a good member of your environmental community.

Sierra Club

"When we try to pick out anything by itself, we find it hitched to everything else in the Universe."

— naturalist John Muir

Communities

1. John Muir worked hard for the protection of the environment. He founded the Sierra Club, a national conservation organization. Find an article that demonstrates his philosophy that everything in the world is interconnected. How does one decision or change result in other changes?
2. The Southwest Florida Water Management District wants you, your family and your school to be good members of the environmental community. Brainstorm with your class and make a list of ideas to help preserve water habitats. Make a class project out of one of the ideas. Write us and let us know what you did.
3. Make a list of ideas with your family of things you can do indoors and outdoors to conserve water resources and natural habitats. Make a family project out of one of your ideas — but don't forget to do something every day to help protect your water resources.

Habitat Hints

What can you do to help protect habitats? Understand the connections between you and the environment and act! Try some of the hints listed below. Habitats need *us* for their survival and we need them to protect our freshwater resources.

1. Keep it natural! If your family owns a large piece of land, ask them if you can leave it natural to provide wildlife habitat and groundwater recharge.
2. Plant it! Use water-conserving plants outside your home that provide food and nesting space for native wildlife.
3. If it's dead, leave it! Dead or dying trees provide valuable habitat to many animals.
4. Protect the shore! If you live near a water body, leave the shoreline natural to control erosion and decrease the need for chemicals that may harm water quality and the resident species.
5. Give up some time! Find out about local parks or groups that need volunteers to help protect natural lands and wildlife.
6. Put it in the trash! Don't throw garbage where it doesn't belong.
It eventually gets into water bodies or attracts wildlife to dangerous roads.
7. Conserve resources! Taking care to use natural resources, such as water, *responsibly* and *carefully* will protect them and improve habitats.
8. Share it! Don't keep all your new knowledge to yourself — share it with your friends, family and neighbors.
9. Make a pact! Get together with your friends and commit to doing something **EVERY DAY** to protect our water resources.
10. Protect natural areas! Take only pictures and leave only footprints when you visit a natural park.

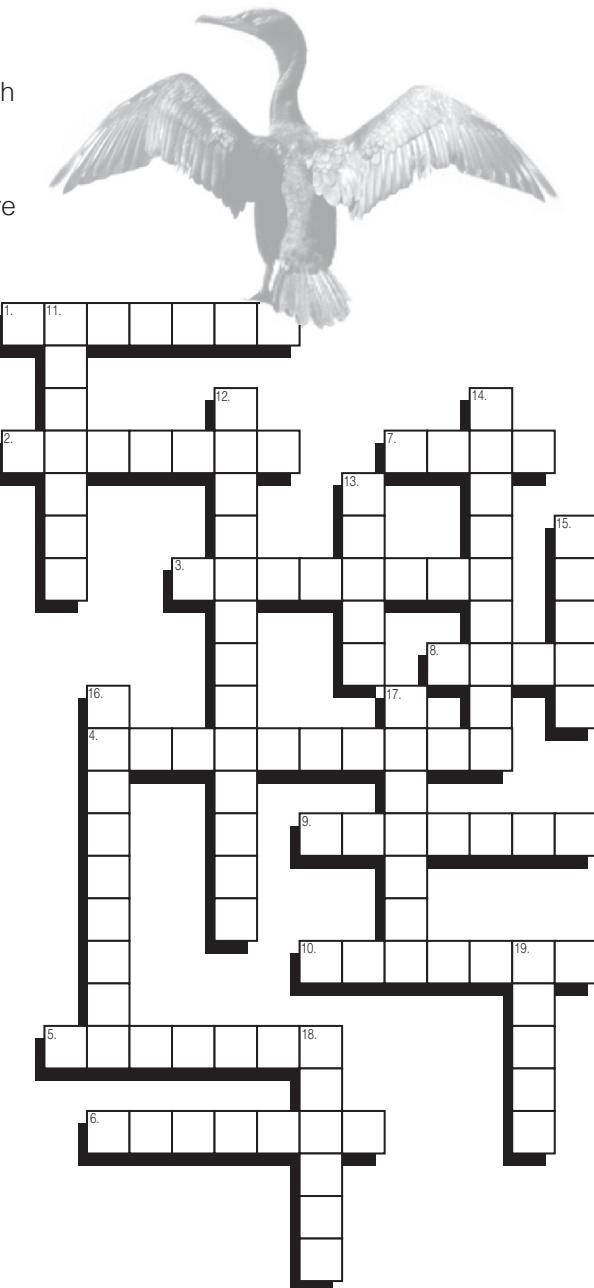
For additional reading materials, go to your local library or bookstore or call any of the organizations from the resources list on the following page. You can also order free publications from the Southwest Florida Water Management District online at WaterMatters.org/publications/.

Across clues:

1. An endangered mammal that lives in estuaries
2. This happens to soil when it has no plants or trees to hold it
3. Type of tree that grows in saltwater wetlands
4. A species that is decreasing rapidly and facing extinction
5. Caring for the environment means making good _____
6. Border between freshwater and saltwater systems
7. Water needs natural land areas to _____ into the ground
8. A body of fresh water
9. Habitats that are near or in water
10. Land that is wet all or most of the year

Down clues:

11. Another word for an animal's habitat
12. Another name for pollution
13. A type of wetland with grasslike plants
14. What people used to call a wetland
15. A natural resource essential to all living organisms
16. Water soaking into the ground will help _____ the aquifer
17. A long period of little or no rain
18. Where groundwater comes to the surface
19. A species' role in their ecosystem



Resources List

For more information about land and water resources protection, contact the Communications Section of the Public Affairs Bureau of the Southwest Florida Water Management District at 1-800-423-1476 (FL only) or (352) 796-7211, ext. 4757, or visit our website at WaterMatters.org, or contact any of the agencies or organizations listed below.

Charlotte Harbor National Estuary Program

1926 Victoria Avenue
Fort Myers, FL 33901-3414
(239) 338-2556
Website: chnep.org

Florida Department of Environmental Protection

Tampa Office
13051 North Telecom Parkway
Temple Terrace, FL 33637
(813) 632-7600
Website: dep.state.fl.us/southwest

Florida Farm Bureau

Post Office Box 147030
Gainesville, FL 32614-7030
(352) 378-8100
Website: floridafarmbureau.org

Florida Fish and Wildlife Conservation Commission

Southwest Region
3900 Drane Field Road
Lakeland, FL 33811-1299
(863) 648-3200
Website: myfwc.com

Hillsborough County Extension

5339 South County Road 579
Seffner, FL 33584-3334
(813) 744-5519
Website: hillsborough.extension.ufl.edu

The Nature Conservancy

Florida Field Office
222 South Westmonte Drive, Suite 300
Altamonte Springs, FL 32714
(407) 682-3664
Website: nature.org

Sarasota Bay National Estuary Program

111 South Orange Avenue, Suite 200 W.
Sarasota, FL 34236
(941) 955-8085
Website: sarasotabay.org

Tampa Bay National Estuary Program

100 8th Avenue Southeast
MS I-1/NEP
St. Petersburg, FL 33701
(727) 893-2765
Website: tbep.org

Tampa Bay Watch

3000 Pinellas Bayway South
Tierra Verde, FL 33715
(727) 867-8166
Website: tampabaywatch.org

Habitat Vocabulary

acquisition: gaining possession of something

aquifer: a spongelike underground layer of limestone or rocks that can hold and release water

biodiversity: wide variety of plants and animals within a specific geographic region

carrion: dead and decaying flesh

community: a group of plants and animals living and interacting with one another in a specific region under relatively similar environmental conditions

conservation: careful use of a resource; limited waste

contaminants: impurities that make something unusable or unhealthy

ecological niche: the specific role a plant or animal plays in its ecosystem

ecosystem: a living community of plants and animals and their relationship with the environment around them

endangered species: plant or animal species that is in danger of extinction without human protection

estuary: a partially enclosed body of water formed where fresh water from rivers and streams flows into the ocean, mixing with the salty seawater

extinct: no longer existing

habitat: the specific place where living organisms find the things they need to survive, such as food, shelter, water and space

headwater: the water from which a river originates

herbivore: animal that feeds chiefly on plants

lakes: inland bodies of fresh water, natural or constructed, usually surrounded by land

living organism: a living plant or animal system

migrate: to change habitat or location periodically, as in response to seasonal changes

recharge: the addition of water

rivers: created from excess rainwater that flows off the land

salinity: amount of salt

species: a group of plants or animals that are genetically similar and reproduce with each other

species of special concern: one that does not clearly fit into the endangered or threatened categories, yet warrants special attention

springs: occur where groundwater, or water stored in underground aquifers, comes to the surface

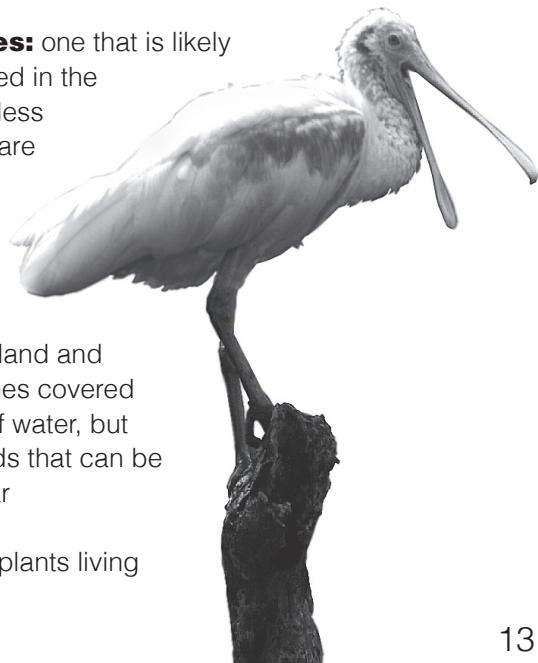
stewardship: sense of shared responsibility; management

stormwater runoff: extra rainwater that does not soak into the ground

threatened species: one that is likely to become endangered in the foreseeable future unless conservation actions are taken

wetlands: lands that are wet all, or part, of the year (or an area between dry land and open water); sometimes covered with a shallow layer of water, but there are also wetlands that can be dry for part of the year

wildlife: animals or plants living in a natural state





Southwest Florida
Water Management District

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