

## Ecosystems Within the Watershed

**Essential Question:** What ecosystems make up the Hillsborough River Watershed?

**Objective:** Students will be able to identify and describe some of the ecosystems in the Hillsborough River watershed.

**Standard(s):**

SS.6.G.2.1

Explain how major physical characteristics, natural resources, climate, and absolute and relative locations have influenced settlement, interactions, and the economies of ancient civilizations of the world.

SS.6.G.2.3

Analyze the relationship of physical geography to the development of ancient river valley civilizations.

SS.6.G.3.2

Analyze the impact of human populations on the ancient world's ecosystems.

**Materials:**

- Cornell Notes Template – **Watershed Ecosystems**
- **Watershed Ecosystem Factsheets**

**Setup/Prep time:** 5 Minutes

**Lesson Duration:** 20 Minutes

**Directions:**

1. Place students in groups of 2 - 3 students.
2. Pass out a set of **Watershed Ecosystem Factsheets** to each group of students.
3. Have students work together to answer the questions on the Cornell notes.
4. Review answers with class.
5. Have students complete the summary section of their Cornell notes.

**Assessment:** Students will complete Cornell notes to answer guiding questions.

Class Notes / Learning Log / Textbook Notes

Name:

**Watershed Ecosystems**

**Objective:**

Students will be able to identify and describe ecosystems found in the Hillsborough River watershed.

Class:

Period/Block:

**Topic:** An **ecosystem** is a biological environment consisting of all the organisms living in a particular area, as well as all the nonliving, physical components of the environment with which the organisms interact, such as air, soil, water and sunlight.

Describe a **riverine swamp**.

What is the role of water in this ecosystem?

Describe a **hydric hammock**.

What is the role of water in this ecosystem?

Describe a **mesic pine flatwoods**.

What is the role of water in this ecosystem?

Describe a **sandhill / xeric oak hammock**.

What is the role of water in this ecosystem?

**Summary:** *What makes up a watershed?*


Class Notes / Learning Log /

Name: \_\_\_\_\_

Textbook Notes

**Watershed Ecosystems**

**ANSWER**

**Objective:**

Students will be able to identify and describe ecosystems found in the Hillsborough River watershed.

Class: \_\_\_\_\_

**KEY**

Period/Block: \_\_\_\_\_

**Topic:** An **ecosystem** is a biological environment consisting of all the organisms living in a particular area, as well as all the nonliving, physical components of the environment with which the organisms interact, such as air, soil, water and sunlight.\*

Describe a <b>riverine swamp</b> .	Found along rivers, streams and spring runs. They are important in the support of many types of plant and animal life.
What is the role of water in this ecosystem?	This area has flowing water within it.
Describe a <b>hydric hammock</b> .	Found between the flatwoods and the river swamps. Rich organic soil absorbs water like a sponge during the rainy season and slowly releases it during the dry season.
What is the role of water in this ecosystem?	The area may be flooded for only one month a year but the soils are wet most of the year. Water comes from wet season flooding, rainfall, and seepage of groundwater from the uplands.
Describe a <b>mesic pine flatwoods</b> .	Found on relatively flat land that may drain poorly during the rainy season. Made up mostly of pine trees and saw palmetto. Depends on frequent fires to maintain its existence. Most heavily altered by human activity.
What is the role of water in this ecosystem?	May flood in the rainy season but there is very little water available to plants during the dry season.
Describe a <b>sandhill / xeric oak hammock</b> .	Occurs on the tops and slopes of gently rolling hills. Soils are dry and low in nutrients. The dominant plants are turkey oaks, longleaf pines, and live oaks.
What is the role of water in this ecosystem?	This habitat is an important aquifer recharge area. Water sinks rapidly into the porous sand with little runoff or evaporation.

**Summary: What makes up a watershed?**

There are several distinct habitats within a watershed, each providing a key role in the health of the ecosystem. Water plays an important part in each of these habitats. Specific plants and animals can be found in each habitat depending on their needs.

## Riverine Swamps



**Riverine swamps** have flowing water within them. These types of swamp **communities** border rivers, streams and spring runs and consist of the **floodplain** area and the ground surrounding the floodplain. They are found in broad valleys and are thickly populated with trees. Because these swamps have so much water, they are home to a wide variety of vegetation.

Riverine swamps have both a high **productivity** and a high **biological diversity**. This means that they are home to many individuals of different kinds of plants and animals.

Many types of trees are common in riverine swamps. These include bald cypress, cabbage palm, water ash, American elm, and water locust.

There are very few understory plants due to high water levels during the rainy season.

Riverine swamps are ideal for waterfowl and water-adapted reptiles and mammals. Many species of wading birds probe the shallow edges of riverine swamps searching for prey. White ibis are common, as are great blue heron, common egret and limpkin species. A sharp eye may even spot little green herons perched on cypress knees waiting to catch unsuspecting mosquitofish.

Wildlife will often use riverine swamps as travel lanes to move between habitats while avoiding areas populated by humans.

## Hydric Hammocks



**Hydric hammocks** are special because each one can be categorized as either a riverine or still-water swamp depending on its water flow. Hydric hammocks are the driest of the swamp wetlands. They are usually flooded for only a short period of time each rainy season. In fact, it is sometimes difficult to tell that these areas are indeed wetlands since they are dry much of the time. However, if you look closely, you can spot watermarks and lichen lines on the trees caused by high water.

Hydric hammocks are usually located between wetter riverine or still-water swamps and the edge of flatwoods or other upland forests.

Hydric hammocks are home to a variety of trees including sweet bay, cabbage palm and several species of oak and maple. In central Florida, laurel

oaks are the most common trees in hydric hammock communities.

Because hydric hammocks are both wet and dry, they are used by a variety of both wetland and upland animals, including wild turkey, red-shouldered hawk, black bear, opossum, bobcat and raccoon.

## Mesic Pine Flatwoods



**Mesic pine flatwoods** are characterized by low, flat to gently sloping **topography**. The soil usually consists of one to three feet of fine, acidic sand caused by the high acid content of pine needles covering the soil. Water **percolates** quickly down through the sand after rains. If there is a **hardpan subsoil** beneath the sand, it affects the percolation of water. The water moves through the sand until it hits this hardpan layer and goes no further. Mesic flatwood soils can become saturated with water during the summer rainy season.

During the winter dry season, high **evapotranspiration** draws most of the water out of the upper **soil horizons** above the hardpan, drying them out. As a result, during the dry season, **groundwater** is not available for plants whose roots are unable to penetrate the hardpan to reach the water table.

Typical plants include: longleaf pine, south Florida slash pine, gallberry, saw palmetto, St. Johns-wort, dwarf huckleberry, fetterbush, dwarf wax myrtle, stagger bush, blueberry, gopher apple, tar flower, bog buttons, blackroot, false foxglove, white-topped aster, yellow-eyed grass, and cutthroat grass.

The mesic pine flatwoods provide essential forested habitat for a variety of wildlife species. Typical animals of mesic flatwoods include: oak toad, little grass frog, narrow-mouth toad, black racer, red rat snake, southeastern kestrel, brown-headed nuthatch, pine warbler, Bachman's sparrow, Eastern towhees, quail, cotton rat, cotton mouse, raccoon, gray fox, bobcat, and white-tailed deer. The largest mammals include the Florida panther and the Florida black bear.

## Sandhill/Xeric Oak Hammocks



**Xeric Sandhill** ecosystems are found on high elevation spots within the **watershed**. These sandhills were once coastal sand dunes. These dunes were formed on ancient beaches during the ice age. They are made up of deep yellow sands which are dry and low in **nutrients**.

After a rain, water sinks rapidly into the soil with little runoff or **evaporation**. This makes this system an important **aquifer recharge** area. Covering these sandhills at Nature's Classroom are xeric oak hammock communities.

The dominant plants in this community are the sand live oaks. The branches of these evergreen oaks tower above the ground creating a shady canopy. These cool shady hammocks became ideal home sites for the cracker families who lived on the property that is now Nature's Classroom. The root

system of the sand live oak spreads out like a giant net from the trunk of the tree. This net catches water when it falls as rain or runs down the grooves in the bark.

Only a few types of plants can grow in the shade of the sand live oaks. Stinging nettle, bear grass, sensitive plant and wiregrass are able to grow in small patches of light. In addition, carpet moss grows well on the trunks of the live oaks and a variety lichens grow on the trees and ground.

The xeric hammock provides the perfect habitat for a number of animals. Typical animals include the barking tree frog, spadefoot toad, gopher tortoise, worm lizard, fence lizard, five-lined racerunner, black racer, red rat snake, hognose snake, screech-owl, turkey, blue jay, eastern mole, gray squirrel, and eastern flying squirrel. Oak toads, yellow rat snakes, hognose snakes and indigo snakes sometimes make their homes in this dry community. Gopher tortoise burrows provide homes for over 300 species of animals.