

Lesson I: Weedon Island -- Land

keywords: midden, rookeries, erosion, brackish, mangroves

Weedon Island is a nature preserve where humans are the intruders. So when you visit, you should bring along your bug repellent as you might find that the beetles, cicadas, and mosquitoes might be interested



in you. You might also find a harmless praying mantis, a cockroach or two, and many kinds of spiders if

you look closely. One of the most beautiful spiders found there is the golden orb. It can spin an intricate web larger than six feet in diameter! And when you look at the web at the right angle, you can see that the silk is a golden color. Thus, how the golden orb got its name. Finally, as you continue your walk through the preserve, keep your eyes open for squirrels, armadillos, and foxes. You might even encounter a shy bobcat, or raccoon feasting on berries

Weedon Island, located in Pinellas County, Florida, is a unique wetland **habitat**. The existence of all types of **wetlands** is determined by water

the amount that flows into and out of wetlands and the amount of water stored there.

Wetlands support diverse habitats of fish, birds, mammals, microorganisms and vegetation. Diverse habitats benefit fish for spawning, feeding or seeking shelter from predators. The protective plants that emerge from the mud provide a variety of foods and cover for the waterfowl and smaller organisms.

Wetlands support some of the most diverse ecosystems on earth. Inland wetlands may help control floods by storing water and slowly releasing it to downstream areas. Coastal wetlands reduce wave action. In addition to being a wonderful resource, they provide many opportunities for recreational and educational activities.

Our wetlands are in peril. Since the late 1700's over half of the wetlands of the United States have been lost. Wetland losses have resulted in greater flooding and erosion, reduced water quality, and reduced populations of many plants and animals.

What are Mangroves?

Mangroves are trees or shrubs that are native plants of Florida. All kinds of mangroves have a common trait in that they grow in shallow and muddy

salt water or **brackish** waters. They are classified as any tropical tree or shrubs belonging to the genus *Rhizophora*, the species of which are

mostly low trees growing in marshes or tidal shores, noted for interlacing aboveground roots. Mangrove trees thrive in tropical environments where wetlands are abundant. They have green elliptical shaped leaves, long propagating root stems, and grow where water is abundant. They are sensitive to extreme temperature fluctuations. **Salinity**, water temperature, tidal fluctuations, and soil affect their growth and distribution. They are unique in that they can thrive in salty environments because they are able to obtain freshwater from saltwater. The mangroves may either secrete excess salt through their leaves, or completely block absorption of salt through their roots.

Mangroves are important for many reasons. They trap organic materials, important nutrients, and help prevent **erosion**. Mangroves

protect uplands from storms, winds, waves and flooding. Not only do the mangrove trees trap materials and help to prevent erosion, they provide a home for various marine organisms. Some of these organisms include oysters, crabs, and shrimp. Mangroves also supply a safe nursery for fish. Healthy mangrove forests are important to provide food for recreational and commercial fishes.

Without mangroves, the population of many fish and shellfish would be drastically reduced. In addition to providing a home for marine related organisms, beautiful coastal birds rely on the branches to nest. The nesting areas in the branches of the mangrove trees are called **rookeries**.

Mangrove Forests of Weedon Island

Worldwide, there are more than 50 species of mangroves. In the Weedon Island Preserve, there are three species of mangrove trees.



They are most commonly known as the red mangrove, the black mangrove, and the white mangrove. Of the three, the red mangrove, *Rhizophora mangle*, is the most well-known. The red mangrove can be easily identified along the water's edge by its tangled, reddish roots called "prop roots." These roots have earned mangroves the title, "walking trees." The trees appear to be standing or walking along the surface of the water. The seeds of the red mangrove are very distinctive. They are approximately 8 inches in length, and $\frac{1}{4}$ to $\frac{1}{2}$ inches wide. They are green-yellow, cigar shaped, and heavier at

the root end than the leafy end. Upon falling, they plant themselves in the mud below the tree.

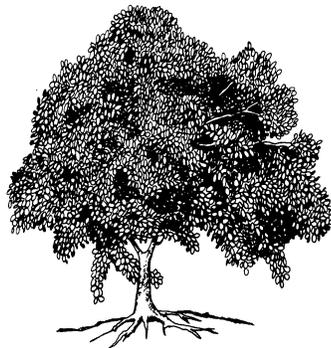
The black mangrove, (right) *Avicennia germinans*, is usually found on a higher elevation than the red mangrove. It can be found further inland than the red mangrove. The black mangrove does not have the “walking” roots, but it has **pneumatophores**. These are narrow, finger like projections that protrude from the soil near the tree’s trunk. **Pneumatophores** act as aerating organs. That means, the pneumatophores help the mangrove

to exchange oxygen and carbon



dioxide with the atmosphere.

Laguncularia racemosa, (left) the white mangrove, is found at higher elevations than the red or black mangrove. It does not have any visible aerial root systems. The easiest way to identify it, is by the leaves. They are elliptical, light yellow-green and have two glands at the base of the leaf blade where the stem starts.



Other Vegetation at Weedon Island

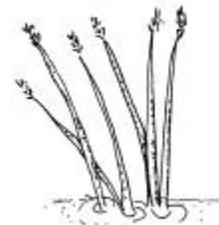
Other Vegetation at Weedon Island.

Mangroves are the most notable vegetation at Weedon Island. But many more beautiful plants are also found there.

Over the lifetime of Weedon Island, there have been many



introduced species of plants and animals. These are called exotics. When a plant or animal is moved beyond its normal range, not native to the local area, it is called an **exotic**. When a plant or animal lives in its natural range and



habitat, it can grow and reproduce without outside aid. It is in balance with its surroundings. This is called a **native** plant or animal.

Most animals that live in native plant habitats are less common in exotic plant habitats. Exotic plants can compete and replace native plants, and therefore reduce fish and wildlife populations.

Many of the plants in Florida today originated on other continents like Africa, South America and Asia. The volunteers and rangers at Weedon Island have been working for many years to control the plants and animals that are exotic to the island. Plants and animals such as the Brazilian pepper, Schefflera and Australian pine are all being removed from the area in the effort to reformat the area to its original state.

Viewing the Inhabitants of Weedon Island

In a place that is more for the birds, fish, snakes, raccoons, dolphins, bobcats, deer and otters than humans, touring Weedon Island might be difficult. Florida's Park Service and the Rangers have solved that dilemma. With the newly built boardwalks and self-guided canoe trail, viewing the inhabitants of Weedon Island is simple for all. In the shallow waters along the way, a sightseer might find pink spoonbills strutting through the waters, blue herons and ospreys startled by the

noise, and even smaller herons and ibises watching from the trees. Further into the mangrove trees, millions of oysters and clams cling to the mangrove roots, and small crabs scurry up and down the trees. In the open waters, snook, mullet, and horseshoe crabs can be found swimming.

In the beautiful flowers that add beauty to the refuge, many different butterflies can be found sipping nectar.



WHAT CAN YOU DO?

To help stop the spread of exotic plants, there are several things you can do:

After boating, make sure all plants are removed from the boat, motor, and trailer. Small pieces of plant stuck on a motor can live for weeks and may be moved to another lake or river. Often, this is how exotic plants spread in Florida waters.

Leave nature in its place. Don't pick things and take them home.

Never empty your home or school aquarium into a lake, river or wetland.

Many aquarium plants sold in pet stores are exotic.

Decrease the amount of pesticide that enters the wetlands! Use a general all-purpose spray: 2½ tablespoons liquid soap with 2½ tablespoons cooking oil in a gallon of water.

Plant the native way! Landscape with native and drought tolerant plants.

They conserve water, require fewer chemicals, and cost less to maintain.

One-fourth of the plants, one-half of the fish, two-thirds of the birds, and three-fourths of the amphibians listed as threatened or **endangered** in the United States are associated with wetlands.

Fun Facts

Wetlands act as a nursery for many organisms. They also provide a nesting habitat, wintering habitat and feeding grounds for many fish, birds and other wildlife.

Wetlands contribute to drinking water supplies.

Wetlands are important in providing protection from flood and storm damage. They store and slow flood waters, lower wave heights and reduce soil erosion.

Construction and city growth has destroyed many millions of acres of wetlands. There are ONLY 99 million acres of wetlands remaining in the lower 48 states. California has lost more than 90 percent of its wetlands! Can you imagine how many wetlands existed when the settlers arrived?

Activity III-1A. Building a Wetland

Modified and adapted from the Water Sourcebook produced by the Georgia Water Wise Council in conjunction with the Environmental Protection Agency. For more information, call (770) 426-8936

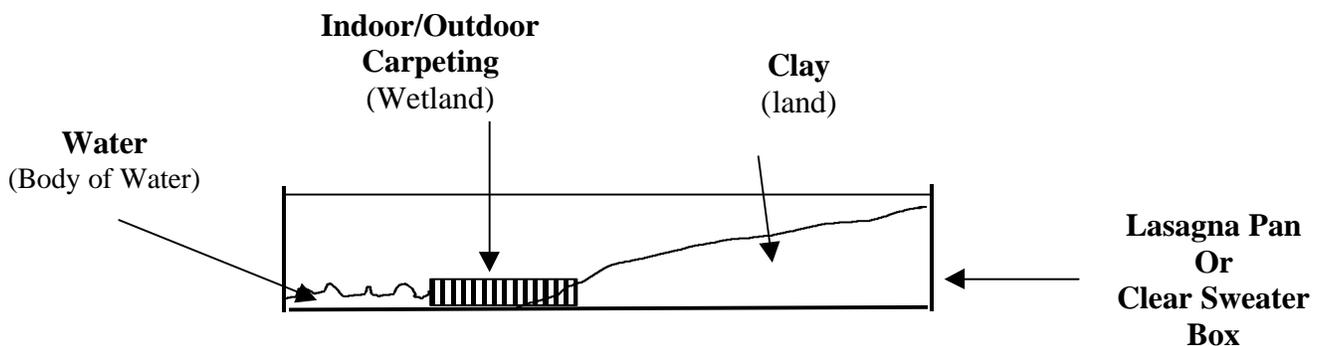
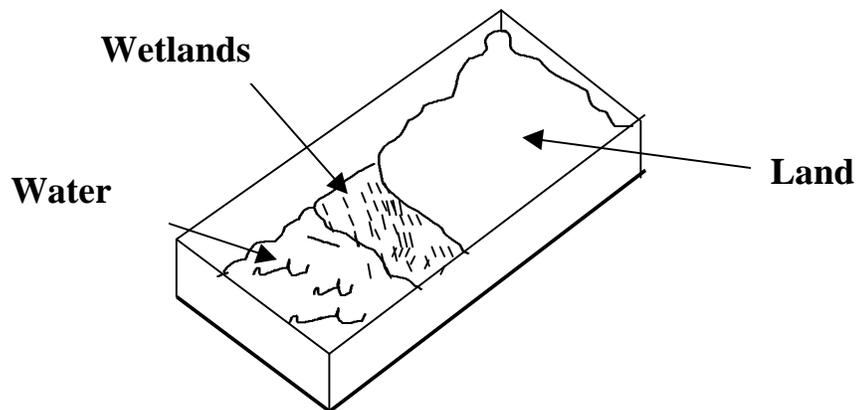
Background: Wetlands are valued as an environment for a variety of plant and animals to live in, but also they provide water resources and other benefits to cities. Some of these include:

1. Wetlands reduce flooding by slowing floodwaters.
2. Wetlands help to filter **sediment** and pollution from runoff before it reaches rivers and streams.
3. Wetlands slow the rate of soil erosion.

Objective: The function of wetlands will be explored through stimulating thought about the role wetlands play in the world.

Materials:

- Glass lasagna pan (or clear plastic sweater box)
- Modeling clay
- Turkey baster
- Strip of indoor-outdoor carpet, 3 inches wide by the width of the pan
- Clear water
- Muddy water



Activity:

1. Spread a layer of clay in half of the lasagna pan or sweater box to represent land. Leave the other half of the pan empty to represent a lake or other body of water. Shape the clay so that it gradually slopes down, as in the activity diagram. Smooth the clay along the sides to seal the edges. Cut a piece of indoor-outdoor carpeting that will completely fill the width of the pan along the edge of the clay. This represents the wetland. Do NOT place the carpet into the model yet.
2. Demonstrate to the class: use the turkey baster to pour clear water slowly over the clay. This represents rainfall. As the students to observe what happens. *The water runs over the clay and into the pan or box.*
3. Use the baster to drain the water from the model back into its original container. Show the students the strip of carpeting and ask them to imagine that it represents a wetland. Place the strip in model, and ask the students to predict what will happen when you pour water onto the clay again.
4. Explain that wetlands are important because they are shallow basins. Using the model, explain how this helps reduce flooding. These basins collect water, and slow its rate of flow over the ground. Pour the same amount of water onto the model again. Let the students describe what happens. *(The water will drain more slowly because it is hindered by a wetland.)*
5. Drain out the clear water. Leaving the carpeting in place, pour some of the muddy water onto the clay. Ask the students to compare the water that flows through the wetland into a body of water with the water left in the jar. *(The water that passed through the wetland is clearer.)* This demonstration shows the ability of wetlands to reduce soil erosion and filter stormwater pollutants.
6. Remove the carpeting and again pour the muddy water over the model. Show what would happen if wetlands were not there to act as a water filter. *(All of the pollutants would flow directly into the water body.)*

Discussion Questions

- What will happen if Florida, or any other areas rich in wetlands, continue to destroy their wetlands in order to accommodate more people?
- Are wetlands valuable in areas where recurring flooding costs homeowners, business owners and insurance companies millions of dollars?
- What role do wetlands play in the health of the **ecosystem**?

Background material for Teachers to use with the Discussion Questions

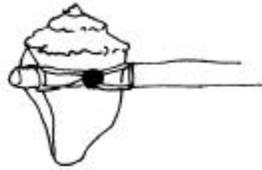
- If wetlands continue to be developed, there will be greater risk of flooding, more water pollution and erosion, etc.
- Researchers at the University of Florida have found that when wetlands make up as little as 10 percent of the landscape, flooding is reduced by 60 percent. When wetlands cover 20 percent of an area, flooding is reduced by 90 percent.
- Sediment and other pollution that reaches rivers and streams adversely affect populations of fish and other **aquatic** animals. This in turn affects animals in the ecosystem such as bald eagles that depend upon fish for food. Wetlands help to keep water clean.

Activity III-1B. Shells for Tools and cooking Utensils

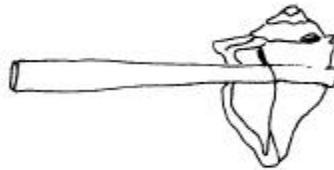
Ladle, dipper or spoon



Cutting tool with handle through two holes



Hammer



Lightning whelk

Cutting tool with handle through one hole and a notch in the rim



Awl or gouge



In the illustration above, there are many tools made from shells. The shells that the Timucuan Indians used were whelk shells. In the following activity, we are promoting preservation as well as illustrating how the Timucuan Indians survived on the land and used its resources wisely.

Objective: Students will learn how valuable natural resources are and how they can be used for many different purposes. Adults are necessary to complete this activity safely!

Materials:

Small shells
Drill and bits
Small dowels

Hemp twine
Plenty of adult supervision
Exacto Knife

Methods:

1. Take the students on a short walking field trip to a local beach or shell quarry. Identify many kinds of shells.
2. Collect a representative shell, that is not broken.
3. Back in the classroom, wash and dry the shells. Sort the shells according to size.
4. Decide which tool will be made and then fashion the shell to look like the diagram. To insert a handle, the shell will need to be drilled and the hemp twine used to secure the handle to the shell.
5. For the other tools, the exacto knife should be adequate to carefully cut and grind away the pieces.

Activity III-1C. Native or Exotic?

Plants that have been living in Florida's lakes, rivers, and wetlands for hundreds of years are called NATIVE. Plants that are not native to Florida are called EXOTIC. Exotic plants were brought to Florida from other continents like Africa, South America and Asia.



Exotic plants and animals are a problem in almost every part of the country. Below are some common native and exotic plants found in Florida's lakes, rivers and wetlands. Ask the students to determine which are native or exotic.

1	2	3
4	5	6
7	8	10
9		

1. Eelgrass 2. Brazilian Pepper 3. Fanwort
 4. Water lettuce 5. Melaleuca 6. Hydrilla
 7. Pickerelweed
 8. Australian Pine 9. Water Hyacinth 10. Bulrush

Teacher's Answer Key to Native or Exotic:

Native Plants: 1, 3, 4, 8

Exotic Plants: 2, 5, 6, 7, 9, 10

Additional project:

Have each student expand his or her knowledge of exotic plants and animals. Have the students search the internet, newspapers, libraries and any other sources to learn about other exotics found across the nation.

STUDENT INFORMATION SHEET III-1 Weedon Island – Land

Weedon Island is a nature preserve near St. Petersburg, in Pinellas County, Florida. Comprising approximately fifteen hundred acres, the preserve is quite flat; the shellfish mounds left by the Timucuan Indians have the highest elevation. Eleven distinct habitat communities are found in Weedon Island Preserve.

Weedon Island is mostly for the birds, snakes, raccoons, dolphins, deer, otters, bugs, and

other inhabitants. The impact that a natural reserve has on the marine environment can be summarized in

one
word:



preservation.

What kind of environment are you in?

Visualize Location I

A cypress swamp where day becomes night under the trees' thick canopy of branches and leaves. Cypress knees poke out from under murky, standing water, and the humming of insects completes the swamp's eerie atmosphere.

Visualize Location II

A coastal marsh where there are many species of seagrasses waving softly in the breeze, shorebirds are flying overhead, blue herons are stalking small fish and where tides affect whether the land is wet or dry over the course of the day.

Cypress swamps and coastal marshes are both **WETLANDS**. All wetlands have common characteristics, but they vary drastically in appearance, plant and animal habitat and other characteristics. There are five primary wetland types:

1. Coastal marshes
2. Mangrove swamps
3. Freshwater marshes and wet prairies
4. Cypress swamps
5. **Hardwood** swamps

To learn more about the wetlands in general and the state of Florida, contact the Southwest Florida Water Management District at 1-800-423-1476 x4757, or 352-796-7211.

Over the lifetime of Weedon Island, there have been many introduced species of plants and animals. These are called **exotics**. When a plant lives in its natural range and habitat, it can grow and reproduce without outside aid. It is in balance with its surroundings, this is called a **native** plant or animal. Many of the plants in Florida today originated on

other continents like Africa, South America and Asia. Plants from other countries also influence the animals that live in a habitat. Most animals that live in native plant habitats are less common in exotic plant habitats. So exotic plants can reduce fish and wildlife populations and replace native vegetation.



ASK YOURSELF?

In addition to harming fish and other **vertebrates**, what are some other ways that exotic plants affect swimmers and boaters?

Answer: *They can smother lakes and rivers making boat navigation difficult and swimming unpleasant!*

Fun Facts

Wetlands act as a nursery for many organisms, a nesting habitat, wintering habitat and feeding ground for many fish, birds and other wildlife.

Wetlands contribute to drinking water supplies.

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If you find any interesting facts, or have any questions that you would like to share with the staff at Project Oceanography, please feel free to call us at: 1-800-51-OCEAN or e-mail us at: pjocean@marine.usf.edu We will answer you either via e-mail or on the air during a broadcast. Visit our website at <http://www.marine.usf.edu/pjocean/index.html>