Tropical Hammocks & Freshwater Swamps: An Ecosystem Journey

2023 4H Forest Ecology Clinic

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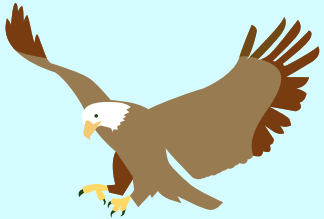
Introduction



We start our journey as birds in the sky, soaring above the ecosystems below us! Before we learn about two very important ecosystems, we need to ask: **what is an ecosystem?**

An ecosystem is defined as "**a geographic area where plants, animals, and other organisms, as well as weather and landscapes, work together to form a bubble of life** ." (National Geographic, 2022)

Biotic Factors:

- Plants
- Animals
- Fungi
- Bacteria

Abiotic Factors:

- Water
- Sunlight
- Soil
- Air

02

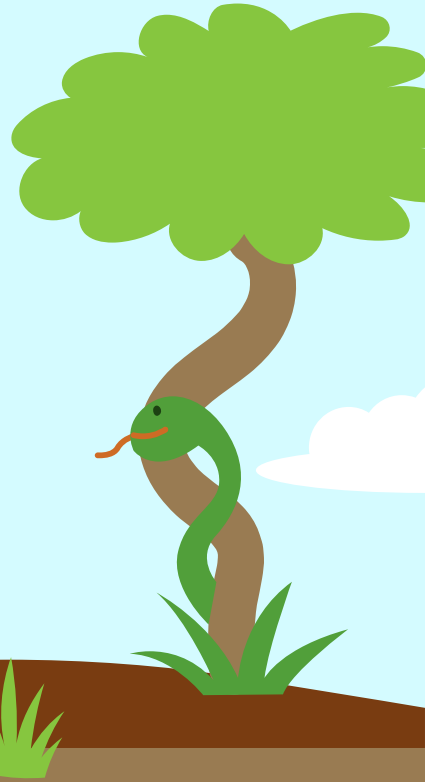
Freshwater Swamps

As we fly above the ocean and across the coastline, there seems to be some changes…

The land starts to dip downwards and big trees with wide bases start to appear along side the rivers and lakes!

Characteristics of Freshwater Swamps

- Freshwater swamps can be found in **low-lying areas** near bodies of water (lakes, rivers, streams, etc.)
- The two major types of freshwater swamps are **river swamps** and **stillwater swamps**
- The soil is a mixture of sand and clays, meaning they are poorly-drained
- **Hydroperiod**, or how long an area remains flooded, determines what kinds of plants will grow in an area
- Fire is rare, but not impossible
- Freshwater swamps are very shady and made up of cypress and hardwood trees, scattered shrubs, and flood-tolerant plants like ferns and moss
- The center of the swamp holds more water, but the edges hold more plant and animal species



River vs. Stillwater Swamps

River Swamps

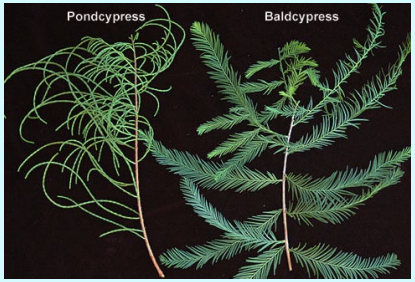
- Fed by streams and rivers that have flooded over
- Noticeable flow
- Water is less acidic
- Shorter hydroperiods
- Bald cypress more common

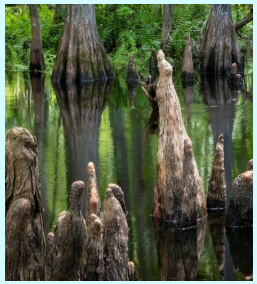
Stillwater Swamps

- Fed by rainwater and groundwater
- Little to no flow
- Water is more acidic and murkier due to chemicals from plants
- Longer hydroperiods
- Pond cypress more common

Common Freshwater Swamp Trees

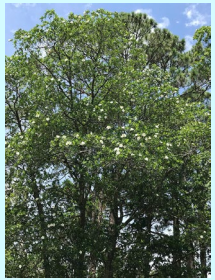
Pond Cypress *(Taxodium ascendens)*





- More common in slow-moving stillwater swamps
- Thicker, fire-resistant bark
- Knees help support the tree in flooded soil
- Fewer knees and less buttressing than bald cypress

Loblolly Bay *(Gordonia lasianthus)*



- Fast growing and short-lived shrub/tree
- Grows in shallow swamps and moist depressions
- Shallow root system that requires water
- Used as an ornamental, for tanning leather, and for cabinets

Common Freshwater Swamp Trees

Swamp Tupelo *(Nyssa sylvatica var. biflora)*



- Grows well in wet, acidic bottomlands
- Lower trunk is swollen or buttressed
- Bluish-blackish fruit ripens in September/October and is a major food source for wildlife in the fall
- Historically used for tool handles, flooring, and as a toothbrush!

Titi *(Cyrilla racemiflora)*



- Flowers are showy, fragrant, dangling white blossoms, making it a popular ornamental plant
- The vegetative growth is a nutritious food source for white-tailed deer
- Spreading thickets provide shelter for black bear, deer, other mammals, and numerous bird and aquatic species

Other Common Freshwater Swamp Plants

Wax Myrtle

Cinnamon Fern

Spanish Moss

Common Freshwater Swamp Animals

Invertebrates

- Snails
- Crayfish
- Mosquitos

Fish

- Golden topminnows
- American Flagfish
- Mosquitofish

Amphibians

- Southern leopard frogs
- Bullfrogs
- Northern Dwarf sirens
- Two-toed amphiuma

Birds

- Limpkins
- Anhingas
- Great blue herons
- Swallow-tailed kites
- Warblers

Reptiles

- American Alligators
- Mud snakes
- Eastern cottonmouths
- Soft-shelled turtles

Mammals

- River otters
- Beavers
- Cotton mice
- Black Bears
- Florida Panthers

Threats to Freshwater Wetlands

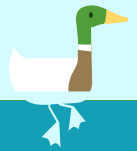
Habitat loss/damage

- Florida has lost nearly 50% of its natural wetlands since 1845
- Wetlands are drained for residential development
- Dikes and canals are built, altering the flow of water

Overharvesting

- Nearly all of Florida's freshwater swamps have been harvested
- The wood is strong, rot-resistant, and water-resistant
- Little old -growth left

Today, many areas of freshwater swamps are protected by different agencies such as water management districts, state parks, and national parks. **Florida's swamps provide benefits such as habitat for diverse plants and animals, flood control, and water filtration/cleaning.**



03

Tropical Hammocks

Resuming our journey as birds, we decide to fly up and out of the freshwater swamp. Within a few minutes, we encounter a new ecosystem standing taller than its surroundings…

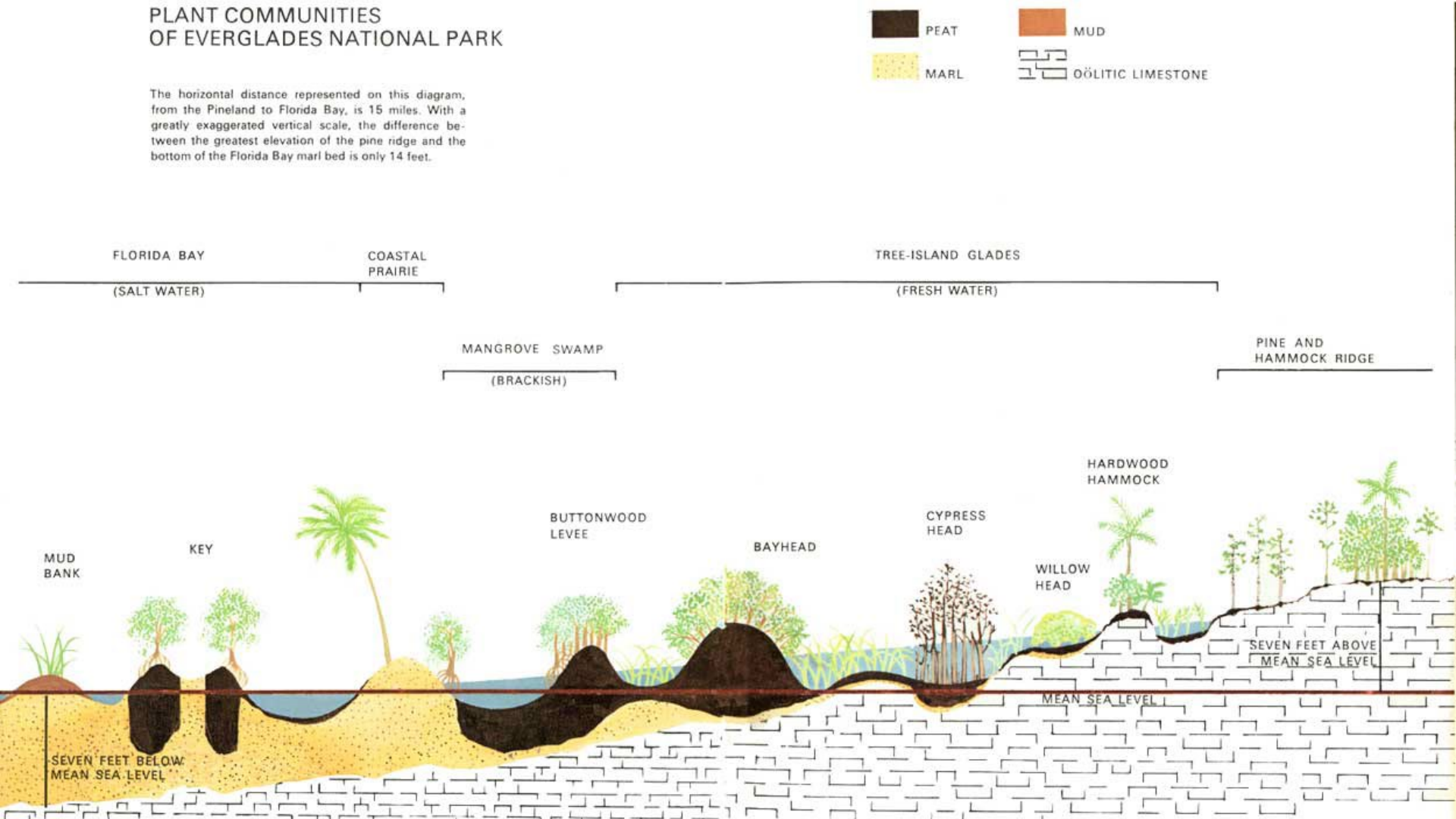
A dense, shady canopy full of windswept, twisted trees comes into view!

Characteristics of Tropical Hammocks

- Formed when sea levels receded millions of years ago and exposed the land
- Seeds traveled **across the ocean by wind, tides, and migratory birds from the tropics** to create these dense forests
- The word "hammock" refers to a **forested area with hardwood trees at a higher elevation than its surroundings**
- These dense forests are made up of evergreen hardwoods, trees that do not lose their leave in the fall, making it very **shady and cool** inside
- Soil has a thick layer of organic matter, or broken down remains of living things, on top of a mineral layer of either sand, **limestone**, or shell mounds built by Native Americans
- Species found in tropical hammocks are very sensitive to the cold and will die during a freeze event, meaning they are **limited to south Florida and the Keys**
    - Tropical hammocks contain many unique and **rare** plants and animals
- Fire is rare and unlikely to carry, but can creep in during extreme droughts

PLANT COMMUNITIES OF EVERGLADES NATIONAL PARK

The horizontal distance represented on this diagram, from the Pineland to Florida Bay, is 15 miles. With a greatly exaggerated vertical scale, the difference between the greatest elevation of the pine ridge and the bottom of the Florida Bay marl bed is only 14 feet.



Common Tropical Hammock Trees

Gumbo-limbo *(Bursera simaruba)*

- Tropical, able to adapt to dry and moist habitats
- Considered one of the most wind-tolerant trees in south FL
- Bark is bright red, peels off in flakes, sometimes called the “tourist tree”
- Birds consume the fruits during the summer and fall months

Pigeon plum *(Coccoloba diversifolia)*

- Hurricane resistant species, can tolerate high winds, salt, and drought
- Grows well in sandy, rock, or broken coral soils near tidewater areas
- Fruit is eaten by many animals, namely doves and pigeons
- Wood is strong but brittle

Common Tropical Hammock Trees

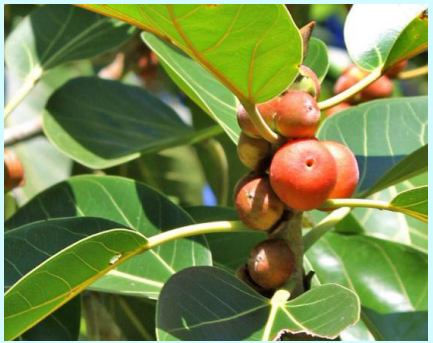
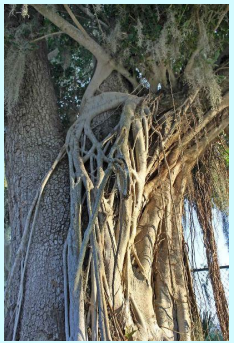
Mastic *(Sideroxylon foetidissimum)*

- Also known as false mastic, jungle plum, and wild olive
- Most common in the Keys and south FL, but can be found on the east coast up to Volusia County
- Small, edible fruits are bitter but enjoyed by some people; the fruit is covered in a sap that glues a person's lips together
- Wood is strong and valuable in the Bahamas and West Indies



Strangler fig *(Ficus aurea)*

- Large and fast-growing tree
- Begins its life as a parasite as its seed sprouts in another tree's branches
- The sprout then sends out air roots, which grow towards the ground while the trunk of the tree surrounds the host
- After the host tree is killed, the strangler fig can support itself and becomes its own tree


Other Common Tropical Hammock Plants

Cabbage Palm

Wild Coffee

Resurrection Fern

Common Tropical Hammock Animals

Invertebrates

- Florida tree snails
- Stock Island tree snails

Amphibians

- Southern leopard frogs
- Eastern narrow-mouthed toads

Birds

- Kirtland's warblers
- Peregrine falcons
- White-eyed vireos

Reptiles

- Green anoles
- Eastern indigo snakes
- Florida Keys mole skinks

Mammals

- Florida panthers
- Florida Keys woodrats
- Key deer

Threats to Tropical Hammocks

Overharvesting

- Tropical hammocks used to contain valuable timber species like mahogany
- These species were extensively logged

Habitat loss/damage

- Due to being located on high and dry areas along the coast, tropical hammocks were converted into farms, resorts, and residential areas
- Remaining areas are very small and fragmented, making it a rare ecosystem

Climate Change

- If the sea level rises, the freshwater resources that are used by plants and animals will be contaminated with salt water

Questions?

For study materials and more information about the contest visit the 4H Forest Ecology website: