

Tropical Hammock

Intermediate contestants should study the following description to prepare for the Ecosystem Quiz station in the [Florida 4-H Annual Forest Ecology Contest](#)



Tropical hammock ecosystem. Source: Heather Henkel, USGS, [usgs.gov](https://www.usgs.gov)

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General Description

Tropical hammocks are nature's treasure troves along Florida's coasts. They serve as important habitats for many tropical plants whose northernmost range is Florida and a refuge for many species of wildlife. Tropical hammocks formed when sea levels receded millions of years ago and exposed the land. Seeds traveled across the ocean from the tropics to create these dense forests.

The word "hammock" is a term sailors would use to describe tree-covered islands they saw on the horizon. Today, "hammock" refers to a forested area with hardwood trees at a higher elevation than its surroundings. Tropical hammocks are known for their dense canopies of evergreen hardwoods, trees that keep their leaves on year-round. The dense canopies block most of the sunlight from reaching the forest floor, creating shady conditions inside the hammock.

The soils in tropical hammocks are composed of a thick layer of organic matter, or broken down remains of plants and animals, on top of a mineral layer. These soils are well-drained and rarely flood. Combined with the limited sunlight, this spongy layer of organic matter holds moisture and keeps the inside of the hammock cool. The mineral layer underneath the organic matter can be sand, limestone, or even shell mounds left behind by Native Americans.

The species found in tropical hammocks are sensitive to the cold and will die during a freeze event. As such, tropical hammocks are found in extreme south Florida and the Keys where temperatures rarely drop below freezing. They are also found in fragments along the coasts—up to Cape Canaveral on the east coast and up to the mouth of the Manatee River on the west coast.

Environmental Factors

Wind continually shapes tropical hammocks. Seeds carried by the wind from the tropics can establish new tropical hammocks. In addition, salt carried by the wind, also known as salt spray, prunes buds and encourages the trees to grow horizontally, giving them their signature "windswept" look. Eventually, the entire canopy becomes rounded, and wind will blow up and over the hammock. Because of the spongy layer of organic matter at the surface of the soil and rocky mineral layer below it, most plants in a tropical hammock have shallow roots. The rounded shape of the canopy helps the plants resist being blown over from strong winds. During large storms like hurricanes, winds have enough force to blow over trees and bury the hammock with sand, resetting it for a new generation of plants.

Unlike their neighbors in mangrove forests, many of the plants in tropical hammocks cannot tolerate flooding. Because they are elevated, tropical hammocks avoid being flooded during the tide. However, storms that bring in storm surges will flood this ecosystem. The combination of flooding and saltwater in these extreme weather events kills many plants in the hammock.

In tropical hammocks that are underlain by limestone, naturally acidic rainwater can dissolve the limestone and form small depressions called solution holes. Solution holes can

fill with rainwater and form small ponds. Especially in the Keys, these solution holes are often important sources of freshwater for wildlife.

Fire is rare in tropical hammocks. It is very moist inside the deeply shaded forest, so fire is unlikely to carry. During an extreme drought, it is possible for fire started in nearby areas to creep into the hammock. When this happens, many of the plants burn up because they are not resistant to fire. However, many of the trees and shrubs can quickly resprout from their roots afterwards.

Flora and Fauna

Plants

Many of the tropical species that inhabit tropical hammocks are native to the Caribbean and became established in Florida when their seeds traveled across the ocean. These seeds traveled by different means, including by wind, tide, and migratory birds. The majority of the trees that form the dense canopy are broadleaf evergreens such as the gumbo-limbo, pigeon plum, and mastic. Live oak is also a temperate species often found in tropical hammocks.



Gumbo-limbo (*Bursera simaruba*) is also known as the “tourist tree” because of its red bark that peels off in flakes, like a sunburn. Source: Whitney Cranshaw, Colorado State University, Bugwood.org



Strangler fig (*Ficus aurea*) grows roots that strangle its host tree. Source: Gitta Hasing, UF IFAS

Common shrubs in tropical hammocks include wild coffee, marlberry, and snowberry. These shrubs work together with the trees to form the characteristically impenetrable hammock. Because sunlight hardly reaches the forest floor, grasses are not often found in tropical hammocks. To reach the sunlight, temperate vines such as Virginia creeper and poison ivy will climb up the trees and into the canopy.

Epiphytes are important and abundant in tropical hammocks. Epiphytes are plants that live on another plant, called the host plant, but do not harm their host. They collect all their nutrients and water from the air. Many species of ferns, orchids, and bromeliads are epiphytes found in tropical hammocks. The strangler fig is a unique plant that lives life as both an epiphyte and a tree. It starts out as an epiphyte and grows on the bark of its host tree, but it will start to grow roots towards the ground. Once those roots reach the ground and become established, the fig grows more roots to strangle its host tree and kill it. At this point, the strangler fig can support itself and becomes its own tree.

Animals

Tropical hammocks are home to an abundance of wildlife, including many endangered species. The deeply shaded hammock is an important refuge for wildlife from predators and from the heat of the day. In addition, the fruits that the trees and shrubs produce are a primary source of food for these animals.

Tropical hammocks host several endangered mammals, including the Florida panther, the Florida bonneted bat, and the Key Largo woodrat. This ecosystem is also a critical habitat for the endangered Key deer—a subspecies of the white-tailed deer that is endemic to the Florida Keys, meaning that it is not found anywhere else in the world. In addition to food and cover, the solution holes in tropical hammocks are one of the only sources of freshwater for the deer.

Reptiles make use of tropical hammocks as well. Green anoles can be found climbing the trees while eastern indigo snakes and the Florida Keys mole skink can be found crawling along the ground. Amphibians such as the eastern narrow-mouthed toad and the southern leopard frog also favor the moist conditions on the forest floor.

Tropical hammocks are important rest stops for migratory birds where they can stop and eat while they regain the strength to continue with the rest of their journey. Examples of migratory birds that stop in tropical hammocks include the Chuck-will's-widow, Kirtland's warbler, and peregrine falcon. For Florida residents, hammocks also provide nesting habitat for birds such as the black-whiskered vireo, great crested flycatcher, and white-eyed vireo.



The shells of Florida tree snails (*Liguus fasciatus*) come in a wide variety of colors and were once collected. Source: FWC, myfwc.com



The Key deer (*Odocoileus virginianus clavium*) is an endangered species that only lives in the Florida Keys.

Source: Gary Tucker, USFWS, Digitalmedia.fws.gov

The moist conditions within tropical hammocks are perfect for many invertebrates such as the Florida tree snail and the Stock Island tree snail. These snails eat algae, fungi, and lichen off smooth-barked trees. These animals, along with other invertebrates, are an important source of food for many other wildlife species within the hammock.

Human Impacts

Since the 1800s, humans have negatively impacted on tropical hammocks in a variety of ways. Tropical hammocks contained valuable timber like mahogany and were extensively logged. In addition, being located on high and dry areas along the coast made tropical hammocks desirable places to build farms, resorts, and residential areas. This destroyed large acreages of tropical hammock and reduced much of the remaining areas to small fragments.

Today, the majority of tropical hammocks outside the Florida Keys are protected in parks and preserves. Groups such as the National Park Service, the US Fish and Wildlife Service, and the Florida Park Service help protect this ecosystem by removing invasive species. Although significant portions of tropical hammocks in the Keys are protected, they are still threatened by development as people compete for space on the islands. In addition, sea level rise caused by climate change threatens tropical hammocks in the future. If sea level rises, the freshwater resources that the plants and animals rely on in this ecosystem will be contaminated with saltwater that they cannot use. It is important to protect this unique ecosystem and the many rare plants and animals that live there from further harm.

Places to see examples of tropical hammocks:

- Everglades National Park
- Gumbo Limbo Nature Center
- Hugh Taylor Birch State Park
- National Key Deer Refuge

Links to learn more:

- Florida Natural Areas Inventory: <https://www.fnai.org/species-communities/natcom-accounts> (See Rockland Hammock, Maritime Hammock, and Shell Mound)
- UF IFAS Extension: <https://edis.ifas.ufl.edu/pdf/UW/UW20600.pdf>
- Florida Museum of Natural History: <https://www.floridamuseum.ufl.edu/southflorida/habitats/ hardwood-hammocks/>