Student Guide to...

The Sunken Forest on Fire Island

Outdoor and Environmental Education Program

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www.nassauboces.org/outdoors
A Student Guide to the Sunken Forest
Text and photos taken from the Sailor’s Haven Teachers Guide and Sunken Forest National Seashore website: http://www.nps.gov/fiis/planyourvisit/sunken-forest.htm

This is a Magical Place!
Imagine entering an eerie woodland with gnarled branches overgrown with thick vines. It’s a place shaped by harsh conditions and salty winds. Such an area might seem to be in a Harry Potter Book or at least in a science fiction movie. In fact, though, you have just entered the Sunken Forest. It’s an enchanting wonderland filled with amazing sights, smells and sounds.

But first...you have to get there!
You will get on the Ferry with your classmates, teachers and BOCES naturalists at the Sayville Terminal. The Ferry ride takes about 30 minutes and upon arrival you will be welcomed by a National Park Service Ranger. Then you will divide into small groups and be on your way!

Visiting the Sunken Forest
As you begin your tour, your naturalist will share lots of information with you. You will be staying on the board-walk for most of your trip and also take the stairs to get to the Atlantic Ocean for more explorations.
The Sunken Forest is on Fire Island. Fire Island is approximately 32 miles long. How Fire Island was formed is not fully understood but it is believed that Fire Island started as a sand spit. More and more sand built up from ocean currents carrying the sand from eastern Long Island, depositing it on the western end of the growing sand spit. The current lighthouse was built in 1858 on the western end of the island. Yet today, it appears to be almost at the center because each year the island grows in a westward direction in length at a rate of over 200 feet /year! It is now about 5 miles from the western end.

If we could slice through Fire Island we could see a cross section of how the terrain changes from the Atlantic Ocean to the mainland:

![Cross section of Fire Island](image)

In addition to ocean currents, wind played a big role in how the dunes were formed. Dunes are very important in maintaining the health and structure of the Island and because they act as a barrier to keep the Atlantic Ocean from washing onto the shores of the mainland.

As seeds from plants were carried to the dunes on the wind and water, extensive networks of roots formed and helped hold the sand together. As the sand piled higher and higher, the first dunes started to grow. In fact, these beach grasses are stimulated to grow by sand building up around them.

At the same time, a new line of dunes formed in front of the old ones, resulting in Fire Island having two dunes lines. The dune line nearest the ocean is called the Primary Dune and the dune closest to the Bay side is called the Secondary Dune. The Sunken Forest was formed between the secondary dune line and the Great South Bay to the north.

The forest formed here because the high secondary dunes protected the forest from the harmful salt spray which would otherwise keep the trees from growing tall. Yet the entire forest is below the height of the secondary dune, which is why it is called the Sunken Forest.
Trees of the Sunken Forest

It took less than 300 years for the Sunken Forest to develop from barren sand to a maritime forest. As plant communities grow, they often create conditions that make it hard for their own kind to survive. Their seeds may have needed full sunlight to grow but now as mature trees they create too much shade. Other plants that need shade to grow become the next plant to succeed. This is called succession.

As you tour the Sunken Forest, you may see lots of American Holly. This plant is not native to Fire Island or Long Island, but it is very successful here. The first holly began growing here in the early 1800’s. There are some trees that are 200 – 300 years old!

Holly, as an evergreen, keeps its leaves year-round. These leaves are very sharp and pointy and have a waxy coating. These are great adaptations that help to defend the plant from the salt spray from the ocean winds and the deer that may want to eat them.

None of the trees in the Sunken Forest will grow higher than the dunes that protect them – so even a 100 year old oak tree may only grow to be 25 feet high. That same oak if it were growing in your back yard, may be 60 – 75 feet tall! Your naturalist may point out other common trees as well as the ones below:

Sassafras: The trunk of this tree often twists and turns as it reaches upward for sunlight. Early settlers made “sassafras tea” by boiling its roots and it smelled a little like root beer! Look at its leaves: it has 3 shapes on the same plant!

Pitch Pine: This is the pine mainly found in the Long Island Pine Barrens and is the only native pine found on Fire Island.

Because all of the trees will grow only as tall as the height of the secondary dune, the branches tend to grow sideways and form a dense canopy overhead. It becomes very dark even with the bright light of summer and only vines can successfully reach the sunlight.

The one vine your naturalist will be sure to point out to you is Poison Ivy!
Poison Ivy seems to be everywhere on Fire Island! It has shiny green leaves in clusters of three and white berries. The leaves turn bright red in the fall, perhaps giving Fire Island its name.

But it seems to only be bad for humans. Since it will grow even in the poorest soils, it helps to anchor the sand and helps to prevent erosion. Its white berries are consumed by many birds and the deer browse on the leaves.

There are many more species of plants in the Sunken Forest. Three hundred years of struggle against the wind and the sea created a fascinating variety of plants to be discovered by a careful observer.

**Animals of the Sunken Forest**

With such a large number of ecosystems, Fire Island is home to a great number and variety of animals. Animal lovers and naturalists alike would agree that this area is like a zoo!

The most common mammal is the White-tailed Deer. Over many years there has been a loss of the habitat for deer on the mainland. But deer are excellent swimmers, and they crossed the Great South Bay and began to live well on Fire Island. As you walk the boardwalk, be on the lookout for them and their well-marked trails from the forest to the swale (the low valley between the primary and secondary dunes).

Another common mammal of the forest and swale is the Eastern Cottontail Rabbit. This shy creature can often be seen grazing on low growing shrubs and grasses. These two mammals are joined by other small animals, including the Red Fox, Grey Squirrel, Raccoon and the occasional Brown Bat.

Fire Island contains many species of turtles but only the Box Turtle can be found in the dunes, in the swale and the Sunken Forest. Others, like the Snapping Turtle, Painted Turtle, Eastern Mud Turtle, Spotted Turtle, and the Diamond-back Terrapin, live in specific habitats like the bogs and marshes contained in and around the Sunken Forest.
There are three species of snakes on record but only the Black Racer Snake is commonly seen. The Black Racer eats bird eggs, but has been known to raid the nests of turtles too.

There are also three species of frogs on record but only the Fowler’s Toad is common enough to be seen in all areas of the Sunken Forest in the late evening and early morning hours.

There are over 330 different species of birds sighted on Fire Island. That is over 1/3 of all the birds species found in North America! Probably, the most commonly seen bird in the forest is the Catbird. With its distinctively black cap, bright eyes and characteristic call, this bird can be found almost any time of the day. Another common bird that you may hear before you actually see it is the Eastern Towhee. The Towhees call sound like someone is saying “drink your tea-e-e-e.” Keep your eyes open for others as well and of course you will see many marine birds such as gulls, terns, egrets, herons and ducks.

So why is it called Fire Island? You be the Judge!
There are many different opinions....

- According to one thought, the name could be due to spelling errors!
  - The Five Islands name was patented by William Nicholls in 1688. That’s only one letter away from Fire!
  - The island may have been named after Fire Island Inlet, which appeared on a deed in 1789. The number of inlet islands has varied over time, and it is likely that “five” or the Dutch word “vier,” meaning four, was misspelled on early maps as “fire.”

- Under another hypothesis, Fire Island Beach appeared on nautical charts in the 1850s, and folklore suggests the name arose from pirates who built beach fires at night to lure cargo ships to shore.

- Some say poison ivy gave Fire Island its name, either for its red leaves in autumn or its fiery itch.

What do YOU think?
Vocabulary for the Sunken Forest

**Barrier Island:** an island off the mainland, which protects the mainland shore from ocean storms.

**Bay:** a sheltered body of water partially surrounded by land. Ocean bays are a mix of fresh and saltwater and are calmer than the ocean.

**Blowout:** a place where a primary dune has lost its plants due to disturbance, where storms winds blow sand away and destroy the dune.

**Breach:** when a thin piece of land is broken apart by ocean water, usually in a storm.

**Canopy:** the upper layer of tree branches that form the “roof” covering of a forest.

**Currents:** a large moving body of water flowing in a specific direction.

**Ecosystem:** an community of plants and animals which are adapted to live in specific environmental conditions.

**Estuary:** the lower course of a river in which the river’s current meets the sea tide.

**Freshwater bog:** a wet area, often in a forest, which has fresh water coming up from underground or collecting from precipitation, characterized by spongy soil (peat).

**Inlet:** area where the ocean connects to the bay, often created by storms breaking through the land.

**Intertidal zone:** the area between land and sea, often an ocean beach or salt marsh. It is between high tides and low tides with a constant movement of water.

**Invasive species:** an introduced plant or animal that grows quickly and competes for the habitat of local species and usually crowds them out.

**Maritime forest:** a forest growing on a seacoast or an ocean island, whose trees are adapted to high winds, salt spray, and other oceanic influences.

**Marsh:** a low wetland area that is periodically flooded and characterized by grasses.

**Primary dune:** a pile of sand and living plants that is formed by beach grass and wind that protects the island from wind and storms.

**Salt spray pruning:** the natural shaping of tree tops into a wide, flat canopy by salt spray blowing across the tops of the primary dunes.

**Secondary dune:** a dune formed inland, away from the beach and the primary dune.

**Succession:** a natural process by which one ecosystem is replaced with another over time, such as a thicket becoming a forest.

**Surf zone:** place where the ocean waves meet the beach.

**Swale:** any ground that is lower than the land surrounding it (often, this is a moist area).

**Thicket:** dense growth of bushes or trees.

**Tide:** alternate rising and falling of ocean surface twice a day caused by the gravitational pulls of the sun and moon occurring unequally on different parts of the earth.

**Understory:** shrubs, saplings, and vines that grow on the forest floor beneath taller trees.

**Wrack line:** debris such as driftwood and dead marine plants and animals deposited at the high tideline.
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