



Sandy Hook Interactive Herbarium
Marine Academy of Science and Technology
Highlands, New Jersey

Introduction to Sandy Hook Plant Specimens: Fisherman's Trail



Photograph Taken By: P.T., Sandy Hook Fisherman's Trail

The following pages are to be placed in order and cut down the vertical line in the center of the page. The booklet should be stapled together and separated for the teacher and student. The first 3 full pages (before being cut and including this one) are strictly for the instructor. The pages following are for the students to use during the lesson and for the teacher to reference and prep the material. Usage of the Sandy Hook Interactive Herbarium Website is key before starting any related lesson plans. Enjoy the Learning Packet!

-P.T.
Creator of Salt Marsh Learning Packet

Lesson Plan Courtesy Of: <http://sandyhookherbarium.org/>

Lesson Plan Aspects

Overview: Students will be able to learn about the different aspects of the Sandy Hook Fisherman's Trail while walking through the site or applying it to the in-school classroom. Students will be able to identify different parts of an ecosystem for further use. Students will be evaluated on what they learned and studied at the closure of the material. Students will have the chance to learn with their peers and work as a group.

Objectives:

- Recognize the habitat of Fisherman's Trail
- Note the specimens specific to the area
- Evaluate human impact on specific areas
- Become more aware of the dune system
- Learn about longshore current

New Jersey Common Core Science Standards:

- MS-LS2-1
- MS-LS2-2
- MS-LS2-3
- MS-LS2-4
- MS-LS2-5
- MS-ESS3-3

Disclaimer: This lesson plan is intended for the middle school level use of grades 6 to 8, or whichever learning level can benefit from the informational activities. This lesson plan can be altered to fit to any classroom with the use of the Sandy Hook Interactive Herbarium website along with the use of the lesson plan on the site located on Sandy Hook, NJ.

Background

The Fisherman's Trail environment on Sandy Hook, New Jersey is a diverse area where many visitors of Sandy Hook gravitate to. It is on the very tip of the area and has a variety of plant specimens to discover. One of the main aspects of this area is the diverse dune system that is growing over the years. The placement of the "tip of the hook" is perfect for gradual growth within the dune system. Also, the long shore current that occurs along the northern end of Sandy Hook is causing a buildup of sand rather than gradual erosion. When our herbarium group goes out into the field, we learn about these different aspects and how they function as an ecosystem. The Fisherman's Trail is an evolving environment that we keep a careful eye on. This booklet will give your students a new look into the functions and systems of the area, and teach them about how to conserve our natural structures.



Photograph Taken By: P.T., Sandy Hook Fisherman's Trail

Carrying Out the Lesson Plan

Materials:

- Pencils or Pens
- Colored Pencils, Crayons, Markers, etc.
- Paper
- Worksheets

Procedure

Please remind students that harming the flora and fauna of Sandy Hook is strictly PROHIBITED. The Sandy Hook Interactive Herbarium has a special permit to carry out its activities with the plants that does not apply to any other sources. Also, this activity is best completed during the warmer months if the instructor chooses to carry out the activity on Sandy Hook, NJ.

1. Distribute worksheets and start at location of Fisherman's Trail.
2. Walk through path and discuss activity with children and explain the process.
3. Allow children to read facts about the different plants and try to identify what the plants are.
4. Have students either work alone or in small groups to see what they can find among the area.
5. To conclude, regroup all together and discuss findings and importance of ecosystems and preserving the environment.

The worksheets provided for the children are very self explanatory. In order for the process to run smoothly, the instructor should preview the information and complete the activity with the children. The activity promotes group work skills and exploration of different material, compared to what is taught in the typical science classroom. Meeting the objectives and goals for this activity (as explained before) is very important for the conclusion of the activity.

Tips and Ideas for the Instructor

Once the lesson is finished for the day, have other ones planned as well. On the Sandy Hook Interactive Herbarium website, there are other plans that can be adaptable to any grade. If the plans are too easy or difficult for the grade level being taught, use them as inspiration to create new plans.

Some common activities on Sandy Hook include seining, beach walks, and tours of the history left behind by older generations. More information about different activities can be found on the Sandy Hook, New Jersey website as well as affiliated websites with the National Park Service.

Going to school at the Marine Academy of Science and Technology (M.A.S.T) has taught me many different valuable lessons about our environment. We are so lucky to have a national park, like Sandy Hook, for our personal use that is filled with so many different aspects to discover. Visitors of Sandy Hook can utilize the different historical aspects, while enjoying the beach at the same time. Use the beautiful park as a resource to create new lessons and activities for the students.



Lesson Plan Courtesy Of: <http://sandyhookherbarium.org/>

The Dune System

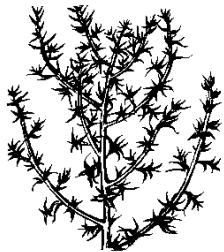
The **Primary Dune System** is mostly known for its grassy look with very small plants. This type of dune system is very limited with its growth and is the young version of a dune. Some plants that grow in the primary dune system include the following:



American Beachgrass



Prickly Pear Cactus



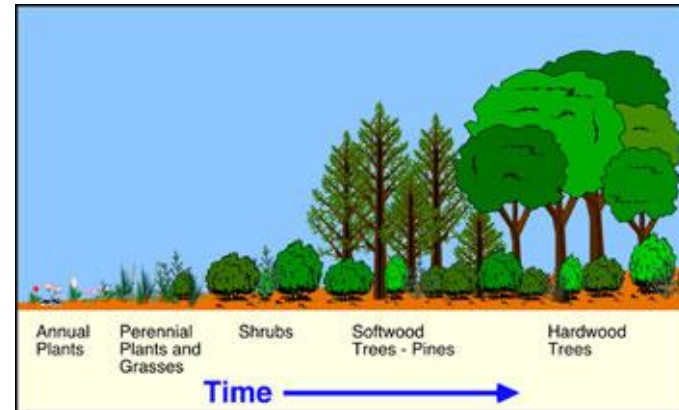
Russian Thistle



Virginia Creeper

When you observe these plants, what do you notice about their structure and ground placement?

The Dune System



(Tony's APES World, Dune Image)

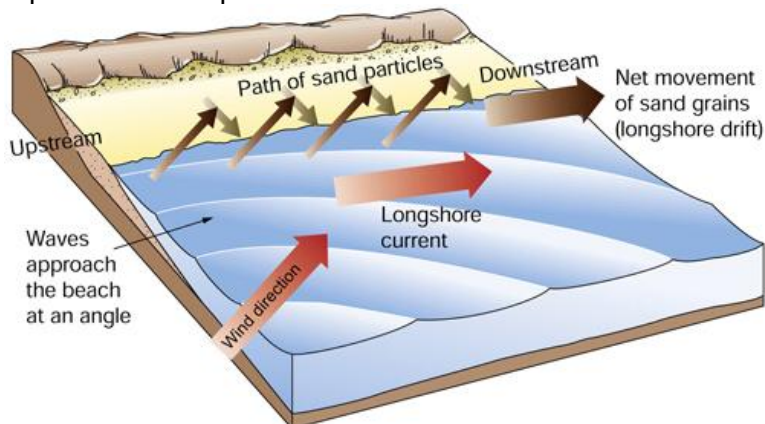
As the years progress the dunes become larger. This allows more time for larger shrubbery to grow and eventually trees. The secondary dune system consists of small shrubs, bushes, and few trees. This system fosters clump like specimens and allows them to grow into a tertiary dune system. In the tertiary dune system, the plant life consists of many tall trees and it is older than all the other dune systems. In order for a dune system to reach its tertiary height, we have to preserve the environment. These plants have specifically adapted to the dune life style, and our actions are not helping. We need to them grow and prosper by keeping away and protecting them.

Human impact has affected the marine world within the dune system. How can we spread awareness to protect the systems and educate the public? Discuss this with a group and bring the class together to brain storm ideas. At the conclusion of the lesson, create a way to get the information out to the public. Be creative and captivating for your possible audience.

Longshore Current-In Conjunction with NOAA

The depth of the water and the natural shape of the seafloor affect wave movement along the coast. As a wave moves toward the beach, different segments of the wave encounter the beach, and it slows following wave movements. As a result, the wave tends to bend and conform to the general shape of the coastline. Also, waves do not typically reach the beach perfectly parallel to the shoreline. Rather, they arrive at a slight angle, called the "angle of wave approach." Once the wave(s) reaches the coastline, it releases energy that generates a current. This type of current that runs parallel is called longshore current.

Longshore currents are affected by the angle and velocity of a wave. When a wave breaks at a steeper angle on a beach, encounters a steeper beach slope, or is very high, longshore currents increase in velocity. The opposite happens when the angle is low, moving towards a horizontal. These currents are very important to shaping Sandy Hook and have a large impact on the shape and human built structures.



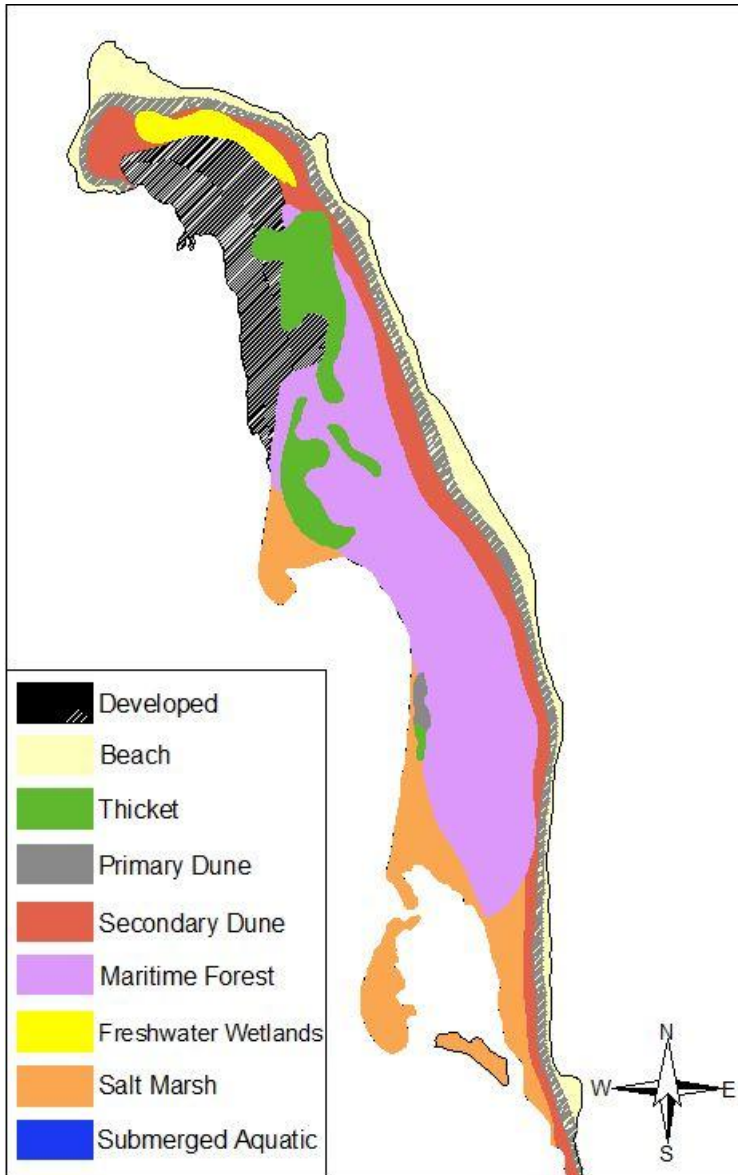
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Longshore Current-Continued

Draw your observations of the wave action and take pictures of what you see. Evaluate the patterns and once the lesson is over, create a larger version to present to the class. Draw and take notes in the space provided.

Zone Map

Refer to the zone map to reference your area. Notice how the current has shaped Sandy Hook throughout the years.



Post-Activity

Have students create a colorful poster either online or in person to represent their findings. Have them focus on the plant life they have found and the idea of longshore current. They can utilize the Herbarium website and outside sources to build upon their knowledge. Make sure they include the following:

- Background of their findings
- Map Interpretation
- Minimum of 4 plant species
 - Images
 - Research
 - Drawing (can be labeled)
 - Are the plants native?
 - Are they edible
 - Are they used for medicinal purposes?
- Explanation of Dune System
- Explanation of Human impact on our environment, and specifically our coastal areas

Add more requirements to fit the in-class environment and tailor to the students' curriculum.

Conclusion

This activity is very flexible and can be conjoined with other activities on the Sandy Hook Interactive Herbarium Website. Organizations like Girl Scouts and Boy Scouts can also adapt this activity towards an award or badge. It is very simple to alter the information and make it your own.