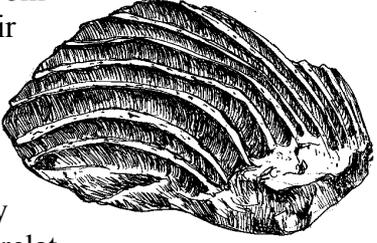
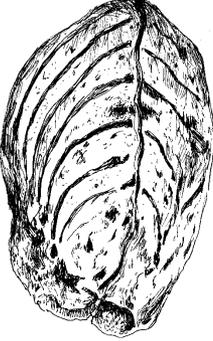


Brachiopod Trail

Welcome to the Brachiopod Trail. As you hike, take a few minutes to learn about the plants and animals of the park and discover how its geology affects all life here. The 1.5 mile interpretive trail will introduce you to some of the treasures of this special area.

The trail begins at the shelter building. It is intended to be accessible for all people, but weather and terrain variations may cause some difficulty for people using mobility aids.

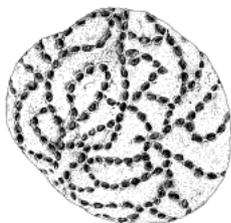
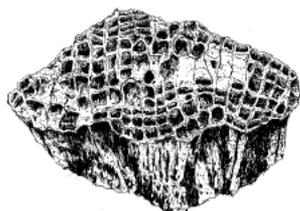
What is a Brachiopod?



It is a two-shelled marine animal that resembles our mussels found in fresh water. During the Ordovician and Silurian periods over 400 million years ago, brachiopods became adapted to life in most marine environments and became particularly numerous in shallow water habitats. In the county, large sections of limestone bluffs and reef deposits are composed largely of their shells. Brachiopods are marine shelled invertebrates that look superficially very much like clams. They are actually quite different from clams in their anatomy, and they are not closely related to mollusks at all. They feed by using a fringe of tentacles known as the *lophophore*. These tentacles sweep microscopic food particles in the water into the creature's mouth.

Station 1:

Look closely at the rocks in this wall. These dolomite limestone rocks provide clues to life long ago. They contain fossils that tell us that an ancient, warm water sea once covered the land. This time period is referred to as the Mid-Silurian Period or the Age of Brachiopods and Corals.



The land on which you are now standing was an ocean floor about 425 million years ago.

Continue along the shoreline path to the rock marker at Station 2.

Station 2:

Carefully walk out onto the rock shelf shore to enjoy the beautiful view. To the south is the sand beach and the fertile fishing grounds of Whitefish Bay. To the north are the rocky cliffs of Cave Point.



Different animals and plants call this rocky area home. Plants must be able to survive cold, wet winds and periods of hot sun. Fish like the sturgeon, lake trout and whitefish seek shelter and spawn among the rocks.

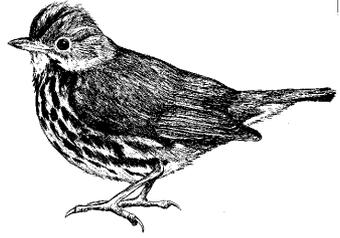
Take time to enjoy nature's beauty. Use your historical imagination to visualize a Woodland Indian spearing a spawning sturgeon from the edge of the rock shelf. Watch for herring gulls and common terns spearing their own meal of fish from this same spot.



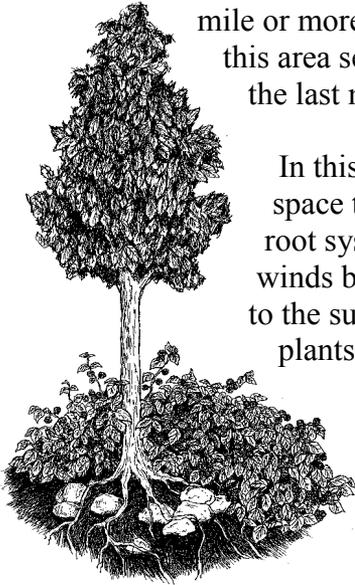
The Brachiopod Trail now turns inland and joins the Black Trail.

Station 3:

The shrubby opening you see here attests to the shallow soil layers of much of the Door Peninsula. Glaciers, a mile or more deep, scraped this area several times in the last million years.



In this rocky environment, trees have limited space to put down roots. They grow until their root systems are unable to support them, then high winds blow them down. Having bedrock so close to the surface makes it difficult for trees and other plants to grow here.



Rest on the Leopold bench and listen for the summer songs of the ovenbird and American redstart or the hammering of the crow-sized pileated woodpecker.

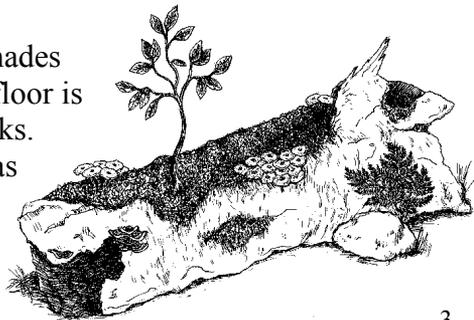
Station 4:

These round boulders traveled hundreds of miles to this spot. How did they get here? Look closely to see the crystals, indicating that these are igneous rocks formed from magma. Called granite, the rocks originated far north of here and were carried along by the last glacier more than 10,000 years ago. The bulldozer-like action of the moving glacier created the boulders' rounded shapes.

Cross the blacktopped road and continue on the Black Trail.

Station 5:

Look up! A canopy of trees shades you. Look down! The forest floor is covered with "bumps" and rocks. These small hills of soil form as fallen trees decompose. This soil helps other trees grow and survive.



Station 5 continued

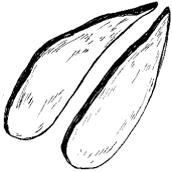
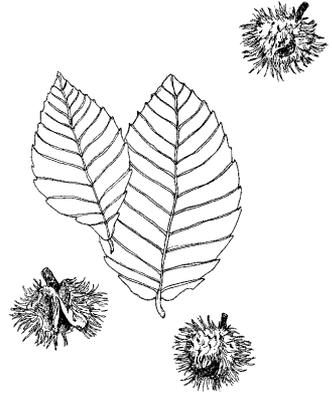
The trees still have a tough time surviving with the limited soil; it takes a long time to create enough soil to cover all these rocks. Tree roots cannot penetrate the rock, so they spread along the surface, allowing you to see the “knees” of the trees.

Station 6:

Feel the rough bark of this sugar maple. This sugar maple took root more than 75 years ago. Think of the struggle it had growing up on this rocky ground!

Does the bark of the tree to the left of the marker remind you of elephant skin? The American beech is known for its distinctive steel-gray bark. By the time this tree has matured, it may reach 50-75 feet in height.

Check the ground below for beech nuts; their spiny outer covering opens after the nut falls to the ground.

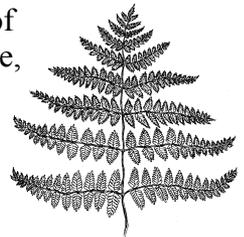


Deer and squirrels eat the sweet sugary bark and buds of young maple seedlings. Squirrels, wild turkeys and deer enjoy feeding on these beech nuts. Watch for signs of these animals in this quiet part of the forest.

Turn left at the next trail intersection.

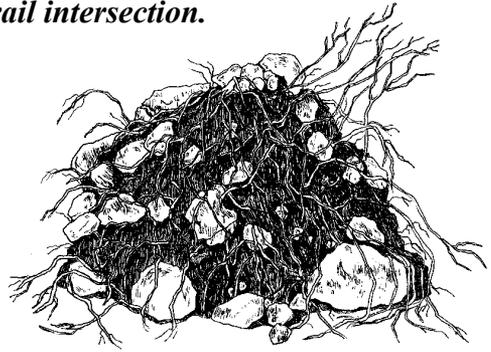
Station 7:

Here in the forest, each site is unique, with its own set of conditions including climate, slope and soil type. So, each forest community is home to different life forms that thrive on the site. American beech, sugar maple and even black cherry form the tallest trees in this forest. Under this canopy grows a shrub layer of young seedlings and saplings of the beech and maple, shrubs and other shade-loving trees. The forest floor is covered with ferns, sarsaparilla, trillium, and other herbaceous plants. They are all important parts of this special forest community.



Continue straight at the next trail intersection.

As you hike to the next station, watch for fallen trees. Here where the soil is shallow, tree roots have difficulty anchoring. One strong wind storm can bring a tree crashing down, pulling its roots out of the ground. As fallen trees de-



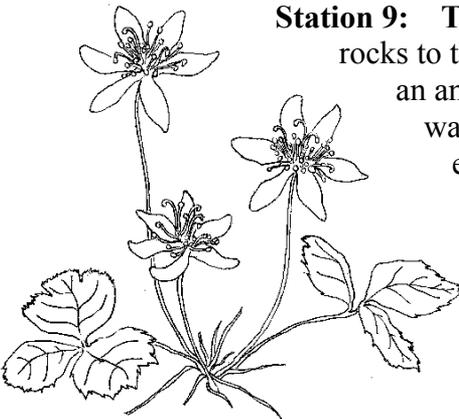
compose, their tipped-up root balls and trunks form mounds on the forest floor. Can you find some newer and older tip-ups? Look carefully at the root ball, can you see the rocks caught up in the roots?

Station 8:

Be careful! Behind this railing is a depression formed over an enlarged joint (fissure) in the bedrock.

The fissure expands when water drains into the opening and causes erosion. As water drains into and travels along joints and fissures in the bedrock, it carries with it run-off from roads, farms, lawns, and parking lots. These contaminants can cause pollution of drinking water, lakes, and rivers.

The trail now crosses the blacktop road.

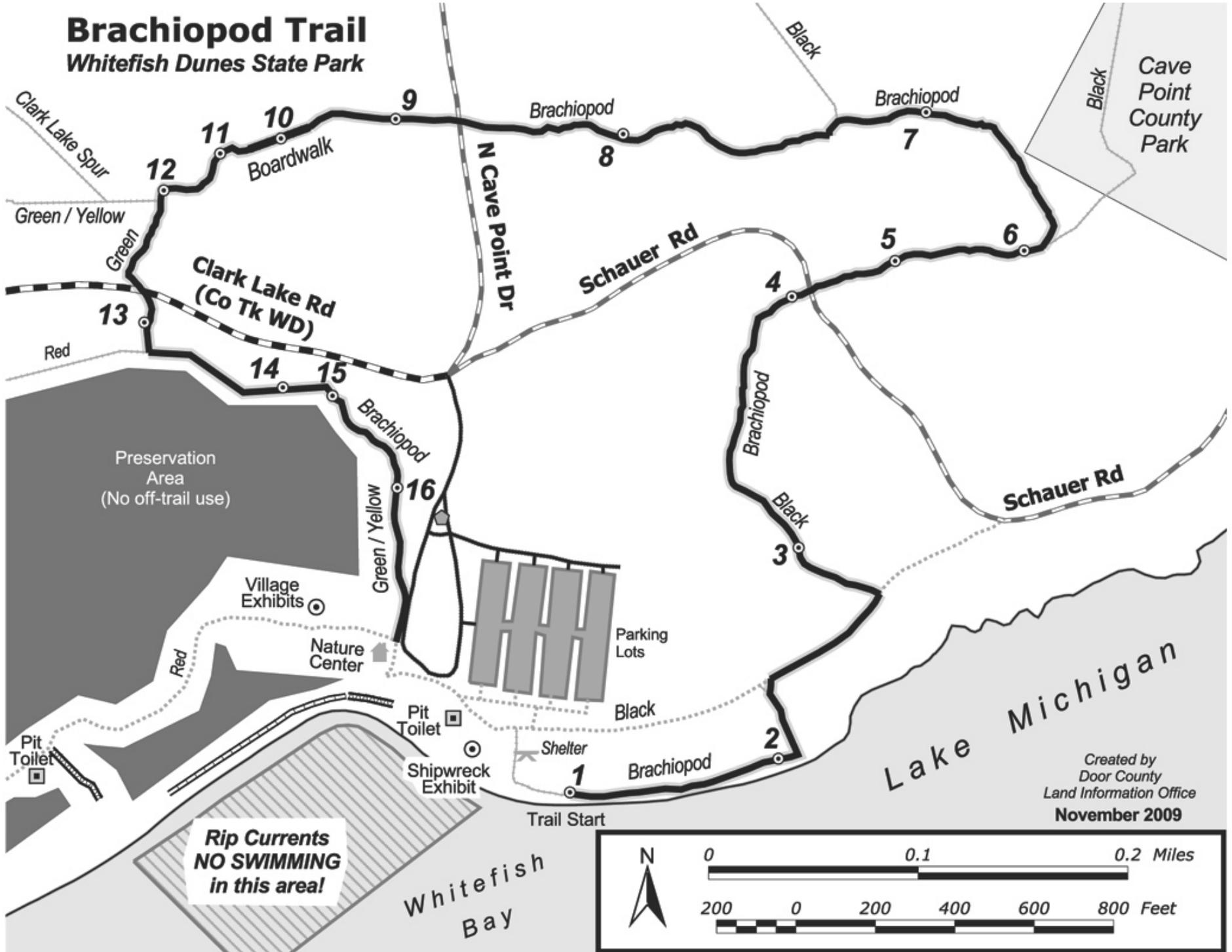


Station 9: This ridge defined by piles of rocks to the right and left, is evidence of an ancient shoreline. This shoreline was created when the glacier melted, causing the water level to rise in Lake Michigan. Lake levels have historically fluctuated up to 60 feet, resulting in ridges like this one.

You will now be approaching an open wetland area.

Brachiopod Trail

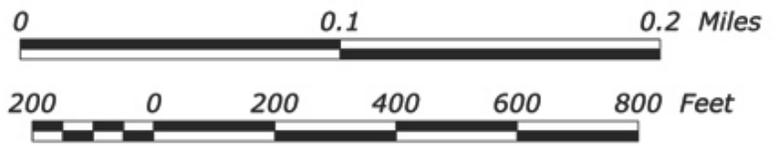
Whitefish Dunes State Park



Preservation Area
(No off-trail use)

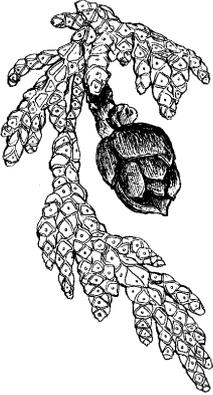
**Rip Currents
NO SWIMMING
in this area!**

Created by
Door County
Land Information Office
November 2009



Move quietly, and you may hear or see some of the many varieties of wildlife that inhabit the wetland. Wetlands provide food and shelter for wildlife, help prevent floods by storing water, and keep our water resources clean and healthy.

Station 10:



Somewhere in the middle of this wetland, the bedrock drops farther below the surface, forming the basin of nearby Clark Lake.

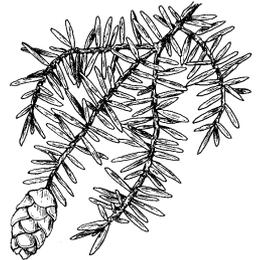
During times of high lake levels, Cave Point and the surrounding area were under water. A deep bay formed, separated from the large lake to the east by the ancient shoreline you crossed at Station 9.

As the lake levels declined over time, water currents and wind caused sand bars and dunes to form in the bay's opening, separating the bay from the larger lake. The area between the two lakes consists of deep sand, with the dolostone bedrock many feet below the surface.

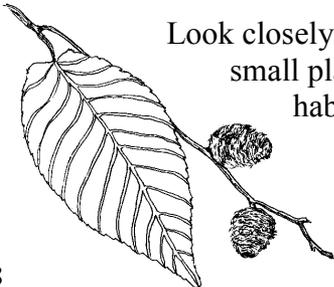
Station 11:

What happened to this tree?

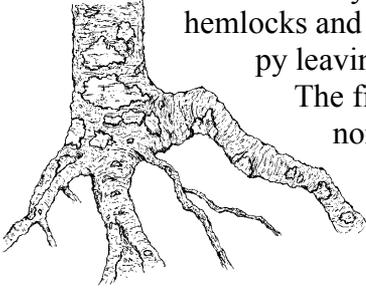
Some time ago, a wind storm blew it over and roots grew where the trunk touched the ground. The tree continued to live. This northern white cedar is very adaptable and can grow in many different habitats. It grows along the rocky shore and in this sandy soil.



Look closely at the tree-tip mounds. Many interesting small plants find these islands of soil an ideal habitat.



Station 12:



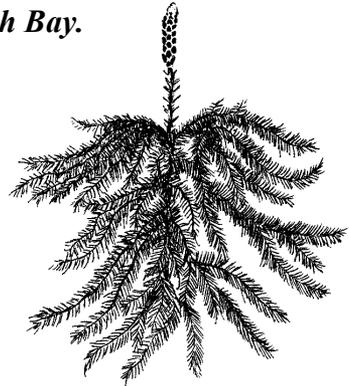
Feel the shady coolness of the forest. Here, eastern hemlocks and yellow birch dominate, their thick canopy leaving little light for anything growing below. The filtered sunlight does allow for interesting northern plants like the starflower and Canada mayflower in the spring and the ghostly Indian pipe in mid-summer.

Look closely at the bases of the trees around you. Notice anything? Most of the trees have grown on little hills formed by decomposing trees. Some even have their roots exposed, creating “legs.” Like the trees at Station 5, these tree roots are limited -- not by rocks, but by moisture. Like people, roots need air to live and grow. So, in forests where the ground is saturated with water most of the year, roots find air by growing on hills.

The trail turns left, and then crosses County Highway WD. For a side trip, turn off to land-locked Clark Lake which once was part of a larger, deeper Whitefish Bay.

Station 13:

Take a look around you on the forest floor. These plants that look like tiny pine trees are club mosses. Since club mosses are plants, they have roots, stems, and leaves. They will get no taller than what you see. Underground stems called rhizomes spread them like a carpet across the forest floor.



The forest soil is created by many means. Fallen trees and branches are broken down by organisms like plants, animals and fungi. Since fungi can't make their own food, they digest the dead material around them. Beneath each fungus is a large underground network of tiny webs called a mycelium. As the mycelium grows, it gathers nutrients from the material around it, speeding the decay process. Eventually, the “left over” material becomes soil.

Turn left at the next intersection.

Station 14:

The hill beside you is a dune. When most people come to see the dunes, they head toward the beach. However, many dunes can be found in the forested areas of the park.

The steep slope that you see here indicates that you are facing a dune back slope. The front slope is long and gradual like a ramp or bike jump. Dry, loose sand takes on a maximum angle of 30 to 35 degrees before it slides downhill. Imagine being a tree and trying to grow on such a slope.

The cool, shady north slope of these dunes offers perfect habitat for the wood and oak ferns.



Station 15:

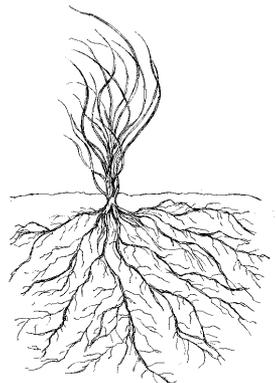
Large trees can't support themselves in this sandy soil over long periods of time, so when they die or are blown over, it creates an opening in the forest. Sun and sand-loving thimbleberry takes advantage of these openings to grow into a thick, shrubby layer. Birds and small mammals find shelter and food in this layer.

As you hike along, watch for chipmunks or woodchucks enjoying the berries. The American redstarts nest in the thick brush.

Station 16:

Sand grows into dunes with the help of plants. Grasses filter the wind, causing sand to deposit and dunes to form.

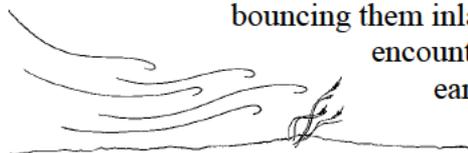
Then, specialized pioneer plants like the mar-ram grass, sand reed grass, and thick-spiked wheat grass grow fibrous root systems. These roots act like a net, holding the sand grains in place.



Dune Formation

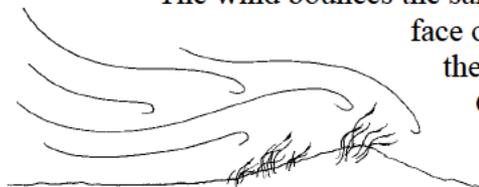
Although the beach appears calm and unchanging, in reality, it is always a work in progress. It is constantly being constructed and reshaped by strong forces of nature.

Wind sweeps across the beach, picking up sand grains and bouncing them inland. As the wind slows down or encounters a plant, the sand drops to the earth and, in time, a pile forms.



Gradually, the pile forms into a low dune.

The wind bounces the sand grains up the gently sloping face of the dune, slowly dropping them as it travels up the slope.



Once cresting the top, the wind moves down the back slope, increasingly picking up sand grains as it goes downward.

This cycle of bouncing and dropping creates the sand dunes.

If you've ever felt the sting of sand pelting your skin on a windy day at the beach, it's because you've been caught in the middle of this sculpting process.



Over time, plants take hold on the shifting sand. The youngest dunes are closest to the water's edge. Hike the Red Trail to explore the 1,000 year-old dunes.

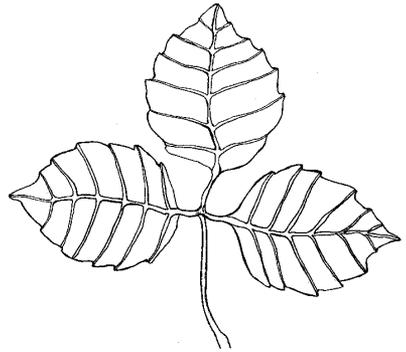




Along the dunes, you may be lucky enough to spot a rare plant, the dune (or pitchers') thistle. The dune thistle is a threatened species in both Wisconsin and the nation. It grows only on sand dunes next to the fresh water of the Great Lakes. You can protect these extraordinary plants by staying on designated trails in the park.

Leaves of three -- let it be!

The poison ivy that covers the dunes will keep you itching for days, but it plays a vital role in keeping the dunes in place.



Thank you for taking time to explore the Brachiopod Trail. We hope you enjoyed your hike. To learn more about the interesting plants and animals seen along this trail or about the park's history and geology, stop at the Visitor Center.

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