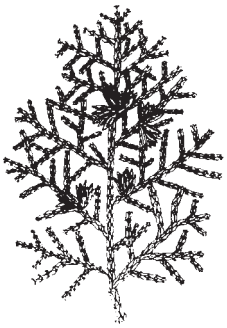
Appendix E

Creeping Juniper Trail Labels

This ½ mile loop trail takes you through a sand dune community. Along the trail you will discover the diversity of plants that thrive in these desert-like conditions and learn how these sand dunes formed.

To help protect this fragile area (and avoid poison ivy), we ask that you stay on the cordwalk and leave your pet and bike elsewhere.

Northern White Cedar "Tree of Life"



You are standing in a small grove of white cedars. Though normally found in moist forests and wetlands in northern Wisconsin, it thrives on these stable dunes because of the cooling effect of Lake Michigan.

White cedar is commonly referred to as arbor vitae. Its name comes from the French "l'arbre de vie" meaning tree of life. Jacque Cartiers, a 15th French Century explorer, is given credit for naming the tree. The story goes that in 1557, native people cured Cartiers and his party of scurvy by feeding them a vitamin C-rich tea brewed from white cedar leaves.

Dune Stabilizers

Sooner or later, grasses will take root in the dunes and begin to hold sand in place. Look for these grasses and their graceful patterns in the sand all around this label.

Marram Grass or Beachgrass is the first plant to take root on the young dunes closest to the water where winds are strongest. Marram grass has extensive, long underground stems which easily sprout through shifting sands. Its fibrous root system helps the plant withstand drought conditions and holds sand in place.

Sand Reed Grass grows where the wind is less intense. It is less tolerant of blowing sand than marram grass and buries easily.

Dune Shrubs

Dwarf Juniper is a low shrub with branches that can spread outward up to 12 feet.

Creeping Juniper sends out long runners that "creep" low to the ground. This juniper is well adapted to shifting sands because its runners will still grow even if partially covered by sand.

Junipers have tiny, bluish berries which are actually tiny pine cones. In winter, white-tailed deer paw through the snow to feast on juniper berries. Birds, mice, and ground squirrels also eat them.

Where did this Sand Come From?

Some 14,000 years ago, a huge lobe of the Wisconsinan glacier gouged out the basin that would become Lake Michigan—the sixth largest fresh water lake in the world. As the ice melted it created a huge glacial lake that at one time covered this park with over 20 feet of water.

Fine silt and clay held within glacial ice settled at the bottom of this glacial lake, while the coarser sand remained at the lake's edge to become beaches. Over thousands of years, dropping lake levels exposed these sand beaches. Strong winds blew this sun-dried sand into these beautiful dunes.

On blustery days, watch how lake winds continue to blow beach sand toward the dunes.

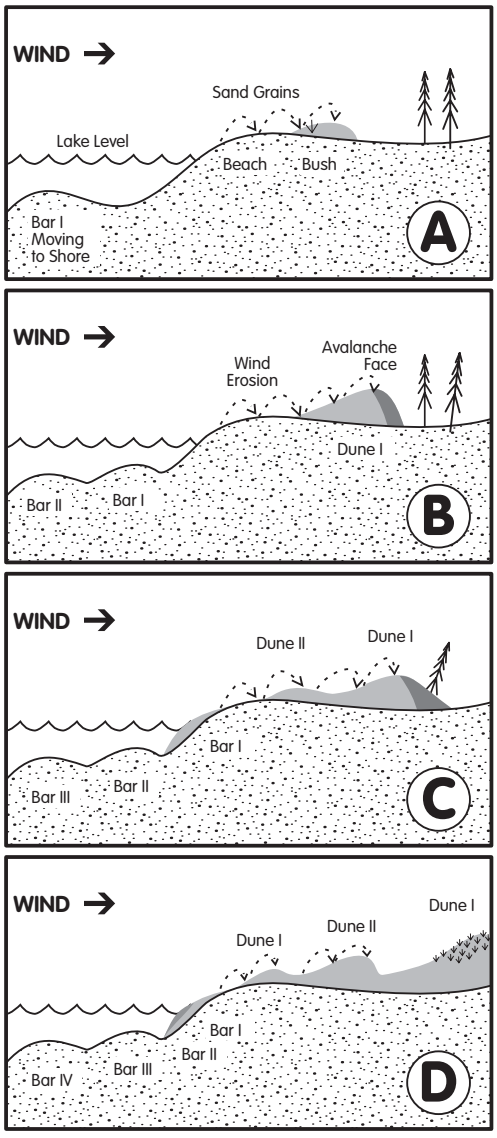
How Dunes Form

Dunes form when dry beach sand blows inland and settles behind an obstacle such as a plant, driftwood, rock or a fence. This action is similar to the way snow piles up behind a snow fence. Over time, an "avalanche face" develops. You can see this "face" from the park road.

Over time, dunes migrate as wind carries sand up and over the edge of the dune and deposits it on the other side. This is how dunes migrate inland.

Younger dunes closest to the water block the wind so that vegetation can take root on the older dunes.

Dunes generally form and grow in three phases. Due to thousands of years of sand blow outs and human interference, this pattern has been altered along this trail. Look for this pattern in other parts of the park.



Blowing in the Wind

When strong winds howl, dune plants and their roots keep sand in place. Sand blows, like this one, develop when fire, farming or a digging animal disturbs the delicate dune plant cover and exposes sandy soil to gusty winds.

This sandblow will continue to grow outward as winds blow sand from the inside of the blowout up and over its leeward edge. As the blowout deepens, pebbles too heavy to blow with the wind settle on the surface and create a course pavement. This pavement protects the blow from becoming any deeper.

The Impact of People
A former farm field

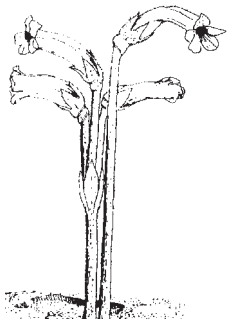
It's hard to imagine anyone eking out a living on this sandy soil, but a few hardy farmers tried. This grassy field was plowed into crops probably as late as the mid-1930s. You can still see the furrows where the plow ran through the field.

The scotch pine windbreak in back of you may have been planted to protect this field from blowing sand.

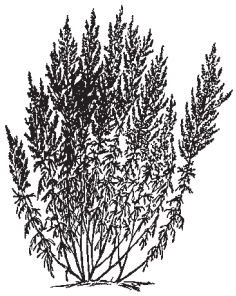
The Impact of People
Scotch pine windbreak

The farmer who planted this scotch pine windbreak thought only about protecting his crops from harsh winds. He didn't think about the value of a sand dune as a natural community. Today, our priorities have reversed. In order to protect and preserve this state natural area, we now remove non-native plants such as scotch pines.

Since becoming a State Natural Area in 1969, park staff have removed thousands of scotch pines to restore the native dune habitat. More will be removed in the future.

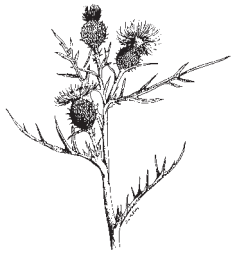


Broomrape



Wormwood

Wheatgrass



Dune Thistle

Parasitic Relationship

Clustered Broomrape is a rare non-green plant that survives only in dry, dune habitats. The plant is "parasitic" meaning it invades the root system of a "host" plant to siphon off nutrients. At Kohler-Andrae, the host plant is wormwood.

Wormwood is a common dune plant which grows on stabilized dunes.

As sand dune habitat diminishes, so do the plants that depend on them. This State Natural Area preserves these plants and Wisconsin's rich plant diversity. Staying on the cordwalk will give these plants a fighting chance.

Largest Dune Tree

The large evergreens you see growing throughout the dunes area are **white pines**. They provide welcome shade on the dunes and help hold sand in place. White pine are more common to northern Wisconsin, but they grow here because Lake Michigan creates cooler, northernlike temperatures that white pine prefer.

Hike the Woodland Dunes Nature Trail to see and learn more about this northwoods giant and other northern trees that grow near Lake Michigan's dunes.

Rare Plants

Thickspike Wheatgrass colonizes and stabilizes dunes. It is found in only four shoreline counties in Wisconsin and grows near this label.

Dune Thistle grows along the Lake Michigan shoreline in only three other Wisconsin counties. It is the rarest plant in the park.

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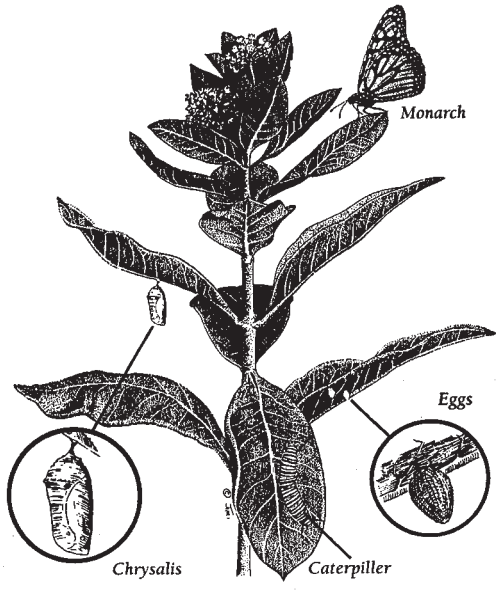

Monarch Butterfly Plant

Next to dune plants, **milkweed** is the most common plant found in this area.

Milkweed is the only food of monarch butterfly caterpillars. After feasting on milkweed for several weeks, these brightly colored yellow- and black-striped creatures pupate into a beautiful monarch butterflies.

In fall, swarms of monarchs fly south toward their wintering grounds in Mexico. Lake Michigan's shoreline is along their flight path and is a good place to spot migrating monarchs.

Thanks for Coming

We hope you have enjoyed hiking Creeping Juniper Trail through this rare sand dune area. This area is protected so that its rare plants can survive. If you would like more information about the dunes, visit the nature center or take a guided hike with a park naturalist during summer months.