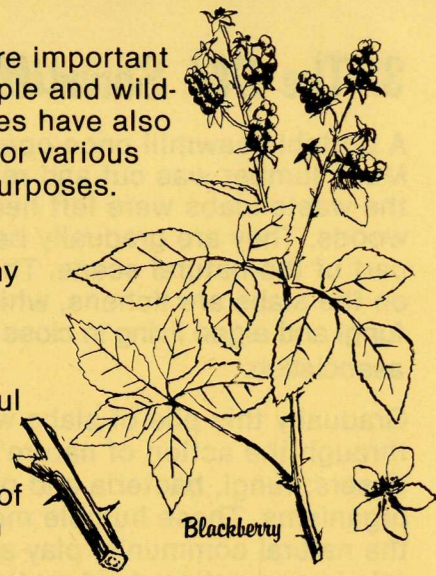


The fruits are important to both people and wildlife. Brambles have also been used for various medicinal purposes.

Throughout history, many different kinds of plants have proved useful to people. Even today, almost half of prescription medicines contain drugs of natural origin. Yet people are destroying natural habitat so quickly that many species are becoming extinct before they can be studied to determine their usefulness and their role in the natural community.



Blackberry

5. The Big Maple

This giant sugar maple must be about two hundred years old. Run your hands over its trunk. Lie down on the ground and look up at its branches. Sit under it for a while. If you feel a sense of awe, then you understand another reason for preserving biological diversity. Every time we lose a species, we lose the opportunity to experience its unique beauty and wonder.

6. Wildlife

Can you see any signs of animal life around this hollow tree? Old beech trees often develop internal rot and the holes become ideal homes for porcupines, squirrels and raccoons. Beech

trees also produce large crops of edible nuts. The outside is spiny and splits into four parts, releasing the triangular nuts inside. These are a favorite food of the many birds and mammals.

While the park provides habitat for about forty different species of mammals, we should also give a moment's thought to the ones that are rare and absent. At one time bears roamed this area, but now they are seldom seen. Wolves once inhabited most of North America, but now they are limited to just a few locations. The park is not large enough to provide habitat for these large, far-ranging mammals. In order to preserve biological diversity, large tracts of wilderness are necessary.



Raccoon

7. Windy Moraine Overlook

From this vantage point, you can see a large part of Sleeping Bear Dunes National Lakeshore. The park includes North and South Manitou Islands as well as considerable mainland acreage. You can see a variety of habitats: sand dunes, lakes, forests and fields. When we attempt to preserve biological diversity, we must preserve all different kinds of habitats.

REVISED 3/93

Portions of the park have been designated as potential wilderness and are managed as wilderness areas. In 1964, Congress passed the Wilderness Act "to assure that an increasing population, accompanied by expanding settlement and growing mechanization, does not occupy and modify all areas within the United States...leaving no lands...in their natural condition...."

Wilderness is important both as a recreational resource and as an area where natural diversity can flourish.

8. Woodpecker Holes



Pileated Woodpecker

Have you ever wondered, "What good is an old, dead tree?" Infested trees are a valuable source of food for woodpeckers. The elongated holes are made by the pileated woodpecker. This crow-sized bird with a red crest lives in mature forests, but it has become scarce in places where logging has destroyed its natural habitat. It usually makes a new nesting hole each year, and other birds often nest in the old holes. About 85 different kinds of North American birds including bluebirds, chickadees, wrens and owls make their nests in old, hollow trees. When these old trees are removed, many different kinds of birds are affected.

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There are many complex interrelationships in the web of life. When we damage one strand, we weaken the entire web.

9. The Pine Plantation

After loggers cleared the native forest, pine trees were planted. You can recognize pine plantations by the even rows of trees of the same age. Unlike natural forests, pine plantations lack variety. Because most of the trees are of the same species and age, they are susceptible to the same diseases and insect infestations. The planting of large tracts of a single plant is known as monoculture. Other examples of monoculture are cornfields and vegetable farms. A natural plant community is healthier because the greater variety of plant life makes for milder effects of insects or disease.

Conclusion

It is just a short way back to the trailhead. We hope you have enjoyed the beauty of the natural surroundings and have gained a better understanding of the importance of biological diversity. If this subject has touched you, perhaps you will work through community groups and environmental organizations to assure the continuation of natural, diverse communities on our planet Earth.

Sleeping Bear Dunes National Lakeshore



P.O. Box 277
Empire, MI 49630
616-326-5134

Windy Moraine Self Guiding Hiking Trail
Biological Diversity - "Variety Is the Spice of Life"
A 2.4 K (1.5 MI. LOOP)

NORTH MANITOU ISLAND

SOUTH MANITOU ISLAND

SLEEPING BEAR DUNES

LITTLE GLEN LAKE



Hiking Safety Tips

- Hike with a companion or notify someone of your route and expected return time.
- Carry drinking water.
- Avoid poison ivy.
- Dress for the weather.
- Be prepared for mosquitoes.
- Be careful of your footing. Trails include uneven ground, exposed roots, etc.
- Rifle season is November 15-30. Other hunting seasons span the period of September 15 through May. Wear hunter orange.

Emergency Phone Numbers

Park Rangers - Emergency Dispatcher
616-326-5134 or
Police, Fire, Ambulance 911

Regulations for Hikers

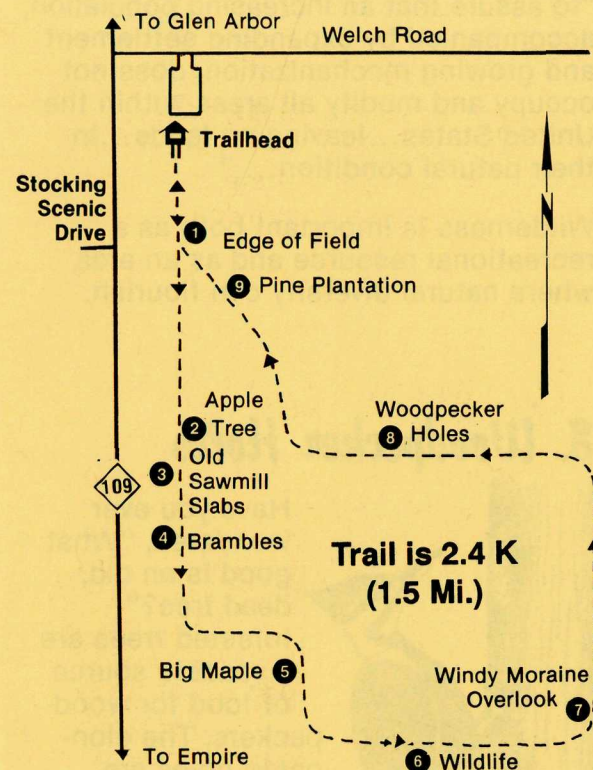
Pets on trails must be kept on a 1.8 - meter (6 foot) maximum hand-held leash. Pets are not permitted at the Dune Climb.

Collecting of plants and other natural, historical and archeological items is not permitted. Exception: certain edible fruits and mushrooms may be collected in limited quantities for personal use.

Bicycles are prohibited on hiking trails.

Protect Your Park

Please stay on designated trails. This will help prevent erosion and damage to vegetation. Off-trail hikers can quickly produce paths that take years to revegetate. If you do venture cross-country, take a compass and topographic map and avoid private property. Take care to avoid disturbing plants and animals: threatened and endangered species occur throughout the area.



Introduction:

Welcome to the Windy Moraine Trail. Numbered posts along the trail correspond to the numbered messages in this brochure.

One of the purposes of our National Parks is to preserve a wide variety of native plants and animals. But on a worldwide basis, species are rapidly becoming extinct primarily because of habitat loss. Points of interest along this trail show why it is important to maintain diversity in nature.

1. The Edge Effect

Where the forest meets the field, we find an especially rich variety of plant and animal life. This is called the "edge effect." The edge zone provides good habitat for robins, bluebirds, deer and rabbits. Both food and cover are available here. A wide variety of different lifeforms is an indication of a healthy natural community.

2. The Apple Tree

The old apple tree on the left suggests that there was once a farm here. Look at the trunk: it is riddled with sapsucker holes. The original habitat for this member of the woodpecker family was forests with clearings, but it has come to favor orchards as well.



Yellow-bellied Sapsucker

Apple trees originated in Europe and Asia and came here with the settlers. Cultivation of apples and cherries is an important industry in Northern Michigan. Occasionally cultivated plants suffer from disease, insects and drought. Scientists then turn to their wild cousins to seek out types that are resistant. Wild plants are a reservoir of genetic diversity, and for this reason it is important to preserve them.

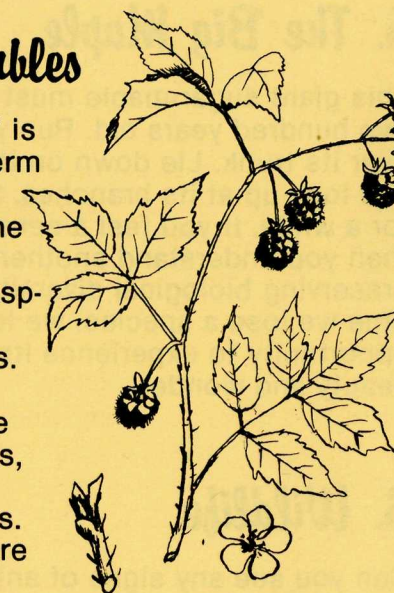
3. The Old Sawmill

A portable sawmill once operated here. Much lumber was cut and removed, but the waste slabs were left here in the woods. They are gradually becoming part of the natural scene. The growth on the slabs are lichens, which contain fungi and algae living in close association.

Gradually this pile of slabs will decay through the action of nature's decomposers: fungi, bacteria and other organisms. These humble members of the natural community play an important role in converting dead matter into topsoil that can nourish a new generation of plant life. Species diversity is important for production of oxygen, purifying water, and preventing floods and soil erosion. All these functions are important in allowing the Earth to support life.

4. Brambles

"Brambles" is a generic term for thorny shrubs in the rose family including raspberries and blackberries. Red raspberries have round stems, with many small thorns. The fruits are red and hollow. Blackberries have an angular stem with large thorns and the fruit is a solid globe.



Red Raspberry