



Hepatica
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A WEALTH OF HABITATS OFFER YOU HIKING, BIKING, BIRDING, WILDFLOWERS, AND WATER RECREATION



Mallard pair
© MICHAEL KORE



Yellow perch
© ENGELSTON UNDERWATER PHOTOGRAPHY



Marram grass
© VISUALS UNLIMITED



Eastern box turtle
© UNIVERSITY OF MASSACHUSETTS



American bittern
© TERRY SOHE, SOUTH FLORIDA BIRDS



Lupine
© MICHAEL KORE



American goldfinch
© MAX ALLEN



Beaver
© LEONARD BLUE ENTERPRISES



Pitcher plants
© JAN FLISKE

LAKE Indiana Dunes National Park is a National Park Service area. It has 15 miles of beach along Lake Michigan's southern shore between Gary and Michigan City in Indiana. Michigan is third largest of the five Great Lakes, whose origin lies in many episodes of glaciation by ice sheets up to 2.5 miles thick during 1.6 million years or more.

Water and beaches offer far more things to do than we can describe here. You could even travel the 35-mile Lake Michigan Water Trail (see *map on the other side*) and camp at the designated sites as you progress.

BEACH A beach is a transition between lake and land. Lapped by lake water, the lower beach hosts no plants big enough to see, but scavengers, from tiny carrion flies to gulls and shorebirds, feed on remains of fish, birds, and insects that wash ashore. Raccoons and skunks join in the feeding at night after bathers and sun worshippers have retired farther inland.

Plants, like sea rocket, bugseed, cocklebur, pigweed, and seaside spurge, do take hold higher up the beach, where only summer storms hit. These plants may begin the formation of a dune.

DUNES Marram grass on the upper beach is the real dune stabilizer. Safe from the elements, except for the heavy winter storms, the marram grass along with cottonwood seedlings and sand reed grass anchor the sand. It is easy to underestimate the key role these plants play in building the dunes and shaping the landscape around you.

Marram grass puts out seeds, but dual-purpose underground stems, or rhizomes, explain its tenacity. Rhizomes spread networks of new roots across dunes, further anchoring mounds of windblown sand captured by the grass blades.

PONDS BETWEEN DUNES When winds blow out a dune, a bowl can form and later be protected from wind. Then, organic matter from dead plants and animals can build up, enabling trees to grow.

If the bowl reaches down to the water table, a shallow pond may form and harbor wood ducks. Pond shorelines shrink in dry weather to form many smaller pools where toads lay vast masses of eggs in early spring. These interdunal pond habitats magnify the diversity of life in the dune environment.

MARSH Marshes form in many ways, from shallow backwaters of creeks or rivers, from former lakes or ponds, or from shallow lagoons created when a lake level drops quickly. Cattails and grasses advance toward the center of the marsh while water lilies, arrowhead, and spatterdock cover the open water. Red-winged blackbirds nestle in the reeds.

Marshes in the park host a rich mix of life, with more species and greater numbers than found in most habitats.

OAK SAVANNA Oak savannas look like prairies dotted with trees—black or white oak—and shrubs like chokecherry, shadbush, witch hazel, and sumac. Midsummer flowers include lupine, birdsfoot violet, aster, and blazing star. Dense forests that cover older dunes host spring-blooming flowers before tree leaves block the sunlight.

Trees take over a marsh that's filling in, forming a swamp forest of red maple, yellow birch, sourgum, and pin oak. Trees can take over older dunes so much that they become known as hardwood dunes, with oak, hickory, and white ash.

PRAIRIE The national park, at the uppermost and easternmost limits of tallgrass prairie habitat, features quality remnants of this ever diminishing mixture of plants that once covered 140 million acres of North America. Tallgrass means tall: big bluestem, little bluestem, indian grass, and switchgrass can grow to eight or nine feet tall.

Below ground is even more impressive: this prairie's roots reach down 15 to 25 feet, to survive fire and drought. Today, controlled burning uses fire to restore prairie that trees have invaded because fire has been suppressed for so many years.

RIVER How about a nice, mostly level, shaded lowland-forest trail along the Little Calumet River's south bank? The Heron Rookery Trail makes a great place to find wildflower displays in spring. Watch for rue anemone, trillium, spring beauties, bloodroot, and Dutchman's breeches.

The Little Calumet River Trail near Bailly Homestead also explores the river but in forests of hickory, oak, basswood, sassafras, and beech. It has a boardwalk that takes you through a swamp forest, too.

BOG You can visit Pinhook Bog only on a ranger-led walk, but try to do so. It's a fascinating, vibrant, otherworld with its own humid microclimate. What's more, everything—trees, boardwalk, and you—rests atop its floating mass of sphagnum moss. A huge chunk of glacier ice created the bog, which holds water because clay lines its bottom.

Cowles Bog is not a true bog but a fen—it has an underground water source. The National Park Service is restoring part of it to its natural condition. You can walk the Cowles Bog trails (see *map on the other side*) on your own.

PEOPLE, PRESERVATION, PROTECTION The National Park Service was only a month old when its first director Stephen T. Mather tried to save the Indiana Dunes from development in 1916. World War I derailed his attempt. The dunes and related glacial land forms were known to be treasures ever since an 1899 scientific article about them established the botanist Henry Cowles as the founder of plant ecology. Professor Cowles and others formed the Prairie Club of Chicago in 1908, wrestling with the region's booming industry of steel mills and power plants over whether to preserve Indiana Dunes.

Indiana Dunes State Park, created in 1926, did not end the bid for a national park. A proposal for a Port of Indiana sparked dunes resident Dorothy Buell and 19 other women to form the Save the Dunes Council to expand the state park. Within a year the council had 2,000 members

nationwide. Park opponents dismissed the education-oriented women's council as a "tea club" of "harmless birdwatchers." But the council soon turned to political action and organizing. By 1963 a steel industry attorney called the council "a threat to industrial development" in the dunes.

In 1963 President John F. Kennedy proposed creating both a national lakeshore and a port for industry. Illinois Sen. Paul H. Douglas worked so tirelessly in Congress and in public to preserve the dunes that people called him "the third senator from Indiana."

In late 1966 Congress created Indiana Dunes National Lakeshore, whose 8,330 acres would eventually be expanded to over 15,000 acres today. The deal to protect the dunes also included creating the Port of Indiana. In 2019 the park was redesignated as Indiana Dunes National Park.



Car camping in the old days
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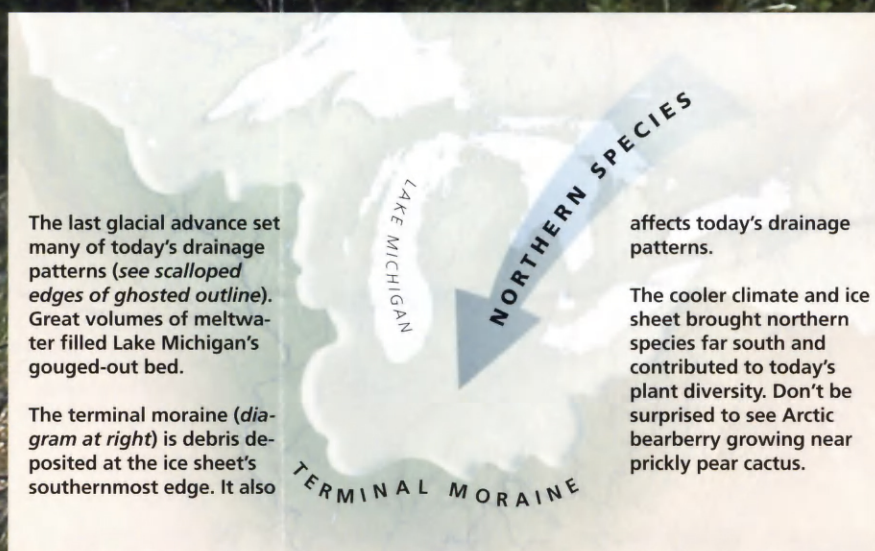
Working to preserve the dunes inspired many new enthusiasts for nature to get a feel for the area's diverse environments, whether its forests (far left) or the dunes themselves (left).

Great blue heron
© GORAN

GOUGING GLACIERS' LIQUID RETREATS + PULSING WINDS AND WATERS = RIPPLED SHORELINES

Imagine great glaciers—ice sheets up to two and a half *miles* thick—covering most of Canada and reaching down into Indiana and Illinois. In the most recent ice age, the Pleistocene Epoch, from 1.8 million years ago to 10,000 years ago, huge ice sheets advanced and retreated over northern North America at least four times.

Lake Michigan originally took form 11,000 years ago when the mile-thick Wisconsin glacier, the last to cover this region, began to melt. When this massive ice slowly melted, it left behind Lake Michigan and four other Great Lakes. Like ice sheets before it, this slow-flowing mass scraped and pulverized mountains and bedrock into boulders and masses of rocky rubble and sand—more sand than you can imagine. As it melted, lake levels fluctuated and ultimately became lower. This made as many as seven succes-



sive shorelines on Lake Michigan. Winds shaped the sands as dunes, with wetlands developing between the dunes. Older dunes built at higher lake levels stand farther from today's lakeshore than younger dunes. Many older dunes are cloaked in trees and some bear stable oak forest. The most recent and still active, still moving dunes are closest to the lake. They may be bare or be dotted with beach grasses that can stabilize them until they support shrubs and trees.

Because lake levels still fluctuate, this story goes on. The highest of all the Indiana dunes, 200-foot-tall Hoosier Slide, was mined for sand and hauled off by full railroad cars before national park advocates could save it.

It can be difficult, even for trained eyes, to tell tree-covered older dunes from glacial



moraines (left). Moraines may look like old dunes, like ripples on the landscape. In a Google Earth image (right) some near-shore lake bottom may still show former shorelines. If the land has not been disturbed, the former shorelines may show as tightly packed contour lines on topographic maps.

Henry Cowles' training as a scientist allowed him to walk through both time and space together at Indiana Dunes. Cowles walked inland from the lake and saw centuries of plant succession. He saw how plants take root in disturbed environments until their flourishing eventually creates conditions enabling other species to replace them. The mix of landscapes and the diversity of species that Cowles observed here remains remarkable today.



