KETTLES AND KAMES

The distinctive landscape of Indiana's Pokagon State Park is a legacy of the most recent Ice Age. Although the Pleistocene Epoch began about 2.6 million years ago, today one can see only the effects of the most recent continental glacier from the Wisconsin age. The irregularly shaped hills, bogs, and lakes are underlain by an assortment of materials that melted from a rugged disintegrating ice sheet a mere 14,000 years ago.

Kettle lakes

Lake Lonidaw is one of the kettle lakes that formed as the Wisconsin-age glacier retreated. Large blocks of ice broke free from the glacier and were buried under insulating debris. The ice slowly melted, leaving behind a water-filled depression.

Morainal landscape

The steeply rolling hills, bogs, and interconnected lakes of the park bear witness to the massive ice sheets that advanced over and then melted from this part of the Midwest.

Glacial erratics

This former Canadian resident arrived in one of the glacial advances into central Indiana. Many of these transported rocks and boulders, known as "glacial erratics," are in evidence throughout the park.

Photos provided by the Ind. Dept. of Natural Resources and the Indiana Geological & Water Survey.

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Lake James

The Northern Moraine and Lake Region, in which Pokagon State Park is located, is noted for its beautiful scenery and lakes — a landscape created by glaciers. The third largest natural lake in Indiana, Lake James covers 1,140 acres and is 88 feet deep. It is one of the many kettle lakes in the region and was formed by the slow melting of a buried ice block.

THE GEOLOGIC STORY

of Pokagon State Park

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The Ice Age

In northern latitudes, under the influence of a global climate that was, on average, 10°F cooler than at present, more snow fell during winter than melted in summer. The deepening snow turned to ice that eventually began to flow plastically from the center of the greatest accumulation, growing into a great continental ice sheet many thousands of feet thick. In continental North America, an ice center built up around Hudson Bay, Canada, and flowed into the north-central United States. As the ice flowed through the irregular landscape of the Great Lakes region, it separated into lobes with ice tongues forming along the axes of Lake Michigan, Lake Superior, and Lake Erie.

The Moraine

A moraine is a landform that is made up of glacial debris ranging in size from rock dust to boulders. Pokagon's morainal landscape was created from sediment deposited between two glacial lobes, the Saginaw Lobe and the Huron-Erie Lobe. These ice lobes competed for ground space, with large ice masses overriding and burying other stagnant ice masses. This process, along with the glacier's eventual retreat, caused the surface of the ice became more and more rugged. Crevasses enlarged and thin patches of dark glacial sediment warmed and melted depressions in the underlying ice. Some sediments that were being carried along melted from the base of the glacier. Other sediments were carried by meltwater across the ice surface and into the great crevasses; these sediments were left in long gravel ridges called *eskers*, crevasse fills, and irregular sharp-crested hills, known as *kames*, that we see today.

Some unsorted sediments slid and flowed down the rugged ice surface as it melted, accumulating in the natural melt hollows on the ice surface. This material later formed some of Pokagon's hills as the surrounding and underlying ice melted away. Masses of ice buried by thick insulating debris, and they remained long after all other glacial ice melted. Eventually they, too, melted, leaving ice block depressions, or *kettle holes*. Some of these holes filled with water and are known as *kettle lakes*; Lake Lonidaw and Lake James are two of the larger kettle lakes in the park.

Geologically, so little time has elapsed since the melting of the last ice that the topography has not been changed by erosion. At Pokagon, we see a landscape nearly as the ice left it.

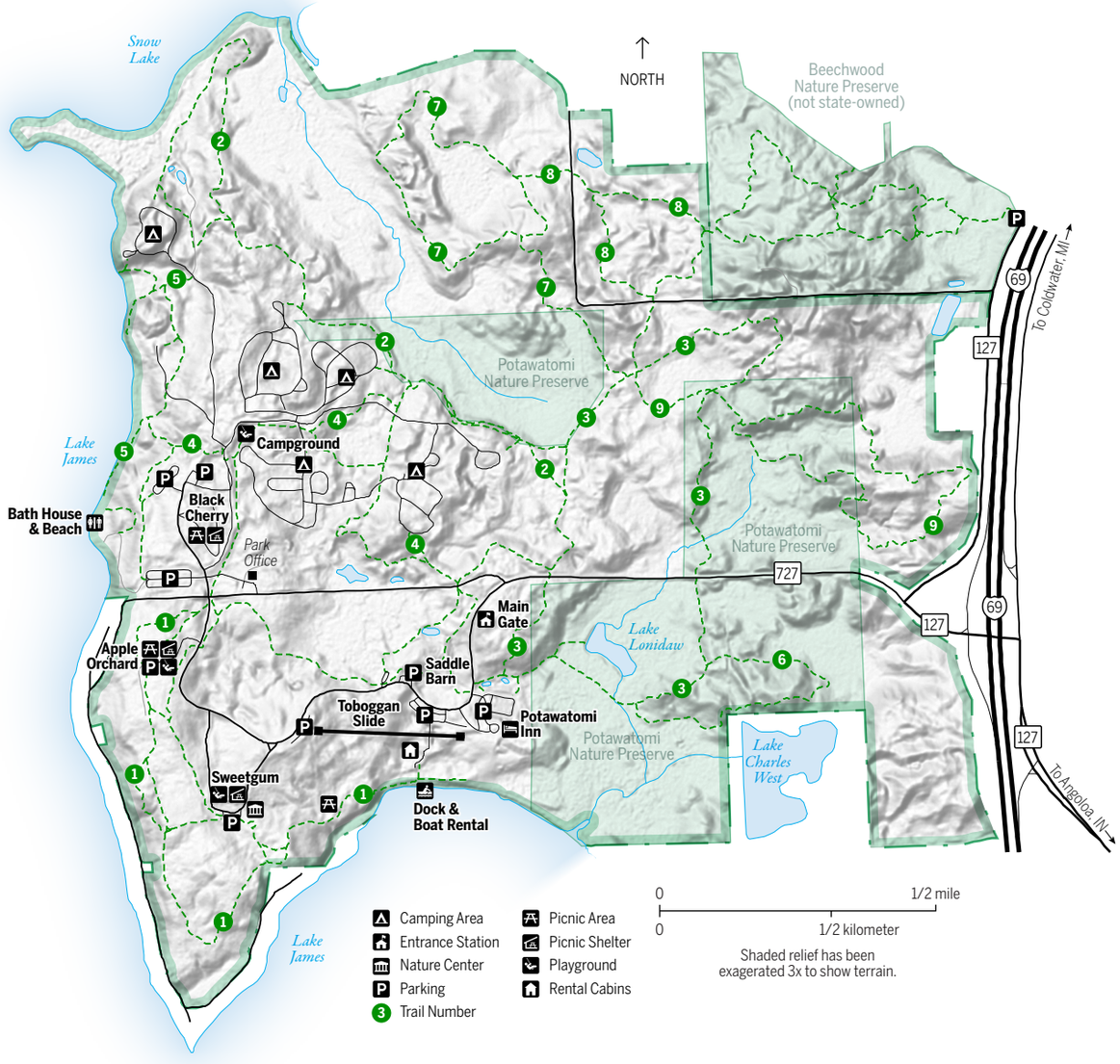
Left Behind

As the glacial ice melted and receded from northern Indiana, it left behind sediment called *till*. Carried within or on the surface of the glacier, till is composed of unsorted sand, silt, and clay. As the glacier melted, water transported and deposited outwash of sorted and stratified sand and gravel. Outwash forms the core of kames, eskers, and other meltwater landforms. Erratics of granite, gneiss, basalt, and other igneous and metamorphic rocks are prevalent throughout Pokagon. These massive boulders were plucked from the bedrock surface in Canada and transported to Indiana by the great mass of glacial ice.

Our Ice Age Legacy

The ice masses took centuries to melt and, even as they wasted away, plant communities colonized and migrated northward over the debris. Pollen found in lake and bog deposits in northern Indiana record the postglacial succession from spruce to pine and, finally, to oak forest, indicating the general warming of the climate. Some bogs in northern Indiana also have yielded the remains of extinct mastodon, wooly mammoth, and giant beaver.

The soil is one of the most beneficial legacies of the Ice Age; Indiana's agricultural wealth can be attributed, in part, to sediments carried by the glaciers. The thick rich soils that grow Indiana's corn and soybeans owe their existence to this glacial debris. The Ice Age also left the midwestern United States with abundant buried sand and gravel beds that supply fresh water or materials for construction, and peat and marl for agriculture. And in the Northern Moraine and Lake Region, including Pokagon, our recent geologic history created the interesting scenery and abundant recreational opportunities we enjoy today.



Maps: Indiana Geological & Water Survey