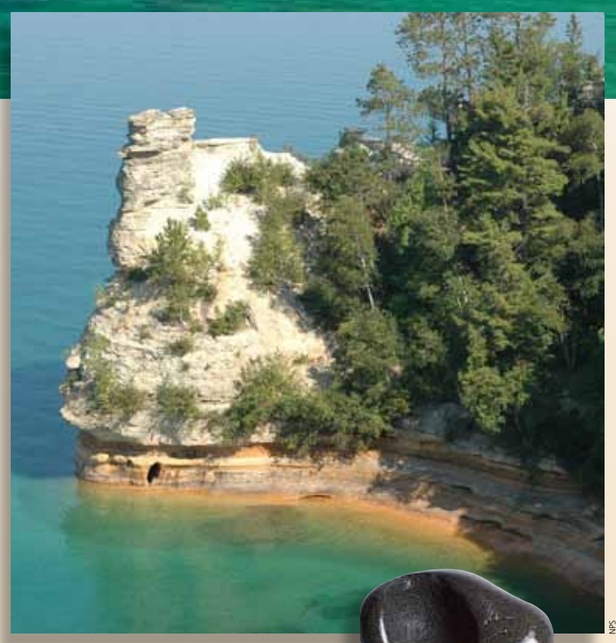
Pictured Rocks

Pictured Rocks National Lakeshore
Michigan

National Park Service
U.S. Department of the Interior

Cliffs along the trail east of Miners Castle.



Miners Castle *(above)*.

Basalt *(at right)*; horn coral *(middle)*; red jasper *(lower)*.

NPS

Stories in Sand

Sandstone cliffs. Ochre, tan, brown, sandwiched with layers of white and green—tower 50 to 200 feet above the water. Lake Superior. So vast, so blue—glistens against a cloud-streaked sky. Deep forests. Emerald, black, gold—open onto small lakes and waterfalls. The image is reminiscent of a master's painting: a palette of nature's colors, shapes, and textures creates the scene that is Pictured Rocks National Lakeshore.

This place of beauty was authorized as the country's first national lakeshore in 1966 to preserve the shoreline, cliffs, beaches, and dunes, and to provide an extraordinary place for recreation and discovery. Little more than 6 miles across at its widest point, Pictured Rocks National Lakeshore hugs Lake Superior's shore for nearly 40 miles. The park consists of two zones: the Lakeshore Zone, federal land managed by the National Park Service, and the Inland Buffer Zone, a mixture of federal, state, and private ownership. Together these nearly 73,000 acres protect a portion of Lake Superior's shoreline and watershed.

Icy Architects Massive glaciers inched back and forth across this land for a million years, scouring and molding, while the land yielded and took on a new shape. Moving ice ground the volcanic and sedimentary rock of previous eras into rubble and slowly enlarged river valleys into the wide basins that would become the Great Lakes. The last glacier began its retreat about 10,000 years ago. Over time, meltwater from this wasting glacier formed powerful rivers and scattered rubble onto outwash plains and into crevasses. The water scooped out basins and channels that harbor the wetlands found in the park today. Eventually, as the weight of the glacier lessened, the land rose and exposed bedrock to lake erosion. It was this onslaught by the lake—centuries of crushing ice and battering waves—that carved the bedrock into young cliffs. Relentlessly the water continues to pound and sculpt the cliffs today, eroding them inland while enlarging the lake.

Solid or liquid, the force of the water profoundly altered the landscape and created the largest freshwater lake system in the world. It is hard to imagine that power, until you examine the evidence. You will soon recognize the clues. Look at the water-sculpted arches and profiles of the cliffs. Observe the inland lakes formed when glacial outwash buried enormous blocks of ice. The ice melted over time, forming depressions that filled with water and became kettle lakes. Examine the stones along Twelvemile Beach—horn coral from an ancient sea, polished granite and quartz rounded like eggs, and disk-shaped fragments of the Jacobsville sandstone.

Colorful Cliffs The name pictured rocks comes from the streaks of mineral stain that decorate the face of the sculpted cliffs. The ramparts of the cliffs are composed of 500-million-year-old Cambrian sandstone of the Munising Formation. The Munising Formation makes up much of the angled slopes and formations, like Miners Castle. Closest to lake level is the Jacobsville Formation, a late-Precambrian mottled red sandstone that is the oldest exposed rock in the park. Covering all is the 400 million-year-old Ordovician Au Train Formation, a harder limy sandstone that serves as a capstone and protects the underlying sandstone from rapid erosion. Streaks on the cliffs occur when groundwater oozes out of cracks. The dripping water contains iron, manganese, limonite, copper, and other minerals that leave behind a colorful stain as water trickles down the cliff face.

Living with Lake and Land

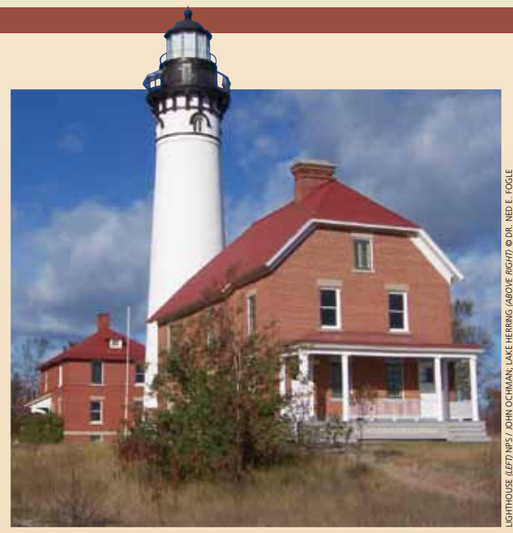
The bounty of the lake and land has attracted people since the glaciers retreated northward. Archaic and Woodland Indians made summer camps along the coast between what is now Munising and Grand Marais. Later, Anishinaabek Indians hunted and fished here, as their descendants still do, while en route to their summer fishing areas at the Sault rapids of the Saint Marys River between Lakes Superior and Huron.

Anishinaabek birchbark storage basket.

NPS

Schoolcraft and Other Adventurers In the 1600s and 1700s French and English explorers and voyageurs searched here for furs and minerals. They left little behind except place names, like Grand Marais and Miners River. In the 1800s American and European settlers arrived to make fortunes in mining and logging. In 1820 Henry Rowe Schoolcraft, adventurer, Indian agent and wilderness scholar, said, "We had been told of the variety in the colour and form of these rocks, but were wholly unprepared to encounter the surprising groups of overhanging precipices, towering walls, caverns, waterfalls . . . . mingled in the most wonderful disorder."

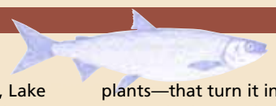
The demand for timber attracted lumber barons who bought vast forests of white pine, beech, and maple. By the 1890s boomtowns supported sawmills. Grand Marais, bustling with a population of 2,000, produced millions of board feet of lumber annually. Business on the lake flourished too. Wooden-hulled freighters and sidewheelers moved lumber and pig iron to distant markets. To help ships navigate the treacherous reefs, the U.S. Life Saving Service and the U.S. Lighthouse Service (later to become the U.S. Coast Guard) built light stations and lifeboat rescue stations along the lakeshore. By the early 1900s most of the forests were gone, and the fortune-seekers moved on.



Today, powered by the sun and not kerosene, the 1874 Au Sable Light Station still warns mariners of the dangerous Au Sable reef.

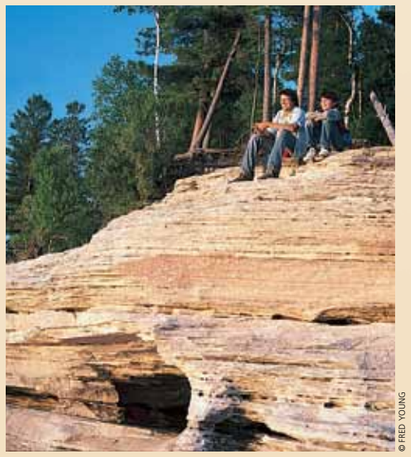
LIGHTHOUSE *(LEFT)* NPS / JOHN OCHMAN; LAKE HERRING *(ABOVE RIGHT)* © DR. NED E. FOGLE

Life of the Lake



Measured by surface area, Lake Superior is the largest freshwater lake in the world. It is 350 miles long, 160 miles across at its widest, and about 1,300 feet at its deepest spot, which is about 35 miles north of Pictured Rocks National Lakeshore. This natural vessel holds so much liquid that, if drained, the water would fill a swimming pool the size of the lower 48 states to a depth of nearly five feet.

Like all things on Earth, Lake Superior is part of an interdependent ecosystem. Picture a giant web with energy flowing from point to point. The spark igniting the web comes from sunshine. Solar energy flows into phytoplankton—microscopic plants—that turn it into food eaten by zooplankton—tiny animals, like water fleas. These are eaten by forage fish, sculpins and lake herrings, which are eaten by predator fish, like lake trout. These, in turn, are eaten by bald eagles and other birds, by small mammals, like otter and mink, and by humans. Humans are an important link in this energy flow because of the residence time of Lake Superior's water. It takes over 190 years to completely replace the lake's volume of water with an equal amount of new water. That means—what you consume, produce, and throw away—will affect Lake Superior's food web for a *long* time.



Hikers take a break at Mosquito Beach.

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