



shape of the rocks. Because the local bedrock is all dark gray basalt, we can conclude that many of the beach rocks were brought here by glacial ice. The rounding of the cobbles is a result of transport by glacial ice and especially the abrasive action of Lake Superior waves moving them back and forth across the beach.

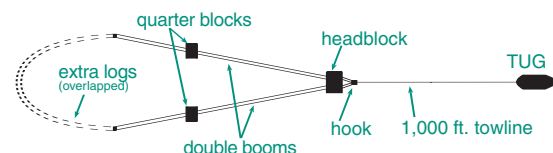
The spur trail leads to a restored wetland ecosystem. For more information, please take a moment to read the interpretive panels located along the spur trail.

To reach the next stop, walk two-thirds of the way along the beach, and watch carefully for a small arrow on a post, marking the continuation of the trail.



## 12 LOG RAFTS

Here you see more evidence of the pulpwood rafting operation. These huge logs were head blocks and quarter blocks, which formed a platform for workers to stand on while changing cable ties when pulling a boom full of pulp.



CONSOLIDATED PULPWOOD RAFT



## 13 TOMBOLO

This low area that you are walking through is part of the tombolo. A tombolo is formed when sediment (usually gravel) is deposited by waves and currents on a shallow section of the lake bottom over thousands of years, ultimately connecting an island (Sugarloaf Point) with the mainland. Tombolos are rare along the Lake Superior shoreline, because there are few offshore islands and not many shallow areas where sediment can accumulate.



## 14 MOUTH OF SUGARLOAF CREEK

This small stream along the western boundary of the Sugarloaf Cove property is one of many that drain the uplands surrounding Lake Superior. The amount of water in the stream varies greatly throughout the year. During spring snowmelt and heavy rainstorms, the stream is swollen with water running off the land into Lake Superior. During dry periods, the stream shrinks to a quiet trickle. The rocky bed is all part of one large lava flow.

The land on the other side is privately owned, so please do not cross the stream.



## 15 PLANTING DEMONSTRATION

Nearly hidden on the forest floor are boom logs, left behind by the paper company and now decaying as new trees grow up around them. This forest is a major demonstration area for restoration of native conifer forests. You will notice a wide variety of fencing and planting techniques. Most of the fencing at Sugarloaf is done to protect young conifer trees from being eaten by white-tailed deer. The primary tree species planted here in 2004 and 2005 are white pine, white spruce and white cedar.



## 16 BEACH TERRACE AND RED PINE DEMONSTRATION

You are now standing on an old beach terrace, about 60 feet above Lake Superior. It marks the temporary water level of Lake Superior at one stage during the melting of the last glacial ice sheet. Notice the rounded beach pebbles at the bottom of the wave-cut slope.

Now look at the red pine plantation. The trees were planted after the paper company closed the rafting operation in 1971. A few feet down the trail, stop and look at the cord of wood that has been built with the trees removed from the pine plantation. A "cord" of wood is defined as being four feet high, four feet wide and eight feet long.



## 17 VISITOR CENTER

The Sugarloaf Cove Nature Center was constructed in 2000. This location was carefully chosen to allow visitors to see Lake Superior from the center while minimizing impacts to the shoreline.

This building, built by Senty Log Homes of Grand Marais, was designed to be energy efficient, with in-floor, off-peak electrical heating, and high R-value windows and doors which were donated by the Andersen Window Company. The decking, donated by Aspen Research, is made from recycled sawdust and vinyl—waste products from window manufacturing.

Thank you for visiting  
Sugarloaf Cove.

## JOIN US!

To become a member, please visit the Nature Center or our web site at [www.sugarloafnorthshore.org](http://www.sugarloafnorthshore.org). Or mail your membership fee to the address below.

A contributing membership is \$25 yearly;  
a supporting membership is \$50;  
and a sustaining membership is \$100.

Sugarloaf: The North Shore Stewardship Association  
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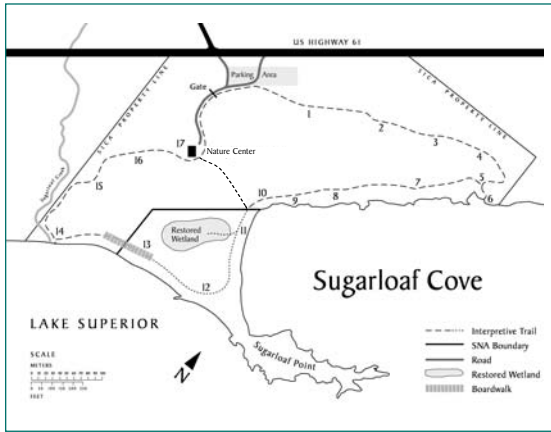
# Sugarloaf Cove TRAIL GUIDE

Sugarloaf Cove is a 34-acre site located on the North Shore of Lake Superior, approximately 4 miles southwest of the town of Schroeder, Minnesota. The site was purchased by the State of Minnesota in 1988 to preserve its unique geological, biological, and cultural resources and make them available for educational purposes. Approximately 7 acres of the site have been designated as a State Scientific and Natural Area (SNA). The remaining 27 acres belongs to Sugarloaf: The North Shore Stewardship Association. Sugarloaf was organized in 1992 to protect the site and provide a public interpretive forum. Sugarloaf is a membership-supported, non-profit organization, and we hope you will become a member!

Please take time to enjoy the self-guided interpretive trail. The trail is approximately one mile long. A leisurely walk on the entire trail, using this guide to help you, will take approximately one hour.

Thank you for visiting

**SugarloafCove**



## 1 PINE PLANTATION

You are standing in a plantation of red pine trees. The red pine (*Pinus resinosa*), also called the Norway pine, is the state tree of Minnesota. Older red pines, with their thick bark, are tolerant of fire and can grow to be over 100 feet. Notice that these trees are all about the same size and they have been planted in rows. When Sugarloaf Cove was used as a pulpwood rafting operation, from 1943 to 1971, thousands of logs were stockpiled in this area, which was known as the Upper Landing. After the paper company closed its pulpwood operation in 1971, a forester remained at the site until 1978 and established two red pine plantations.



## 2 SIDE LOGS

The logs on the ground in front of you were part of the chute that carried pulpwood from the Upper Landing to the lake. These logs formed the sides of the chute; the thick metal cables were attached to notches in the logs to keep them in place. The rafting operation ended in 1971 so these logs have been lying here on the forest floor for at least 35 years. They are slowly decaying and becoming part of the soil. Notice the trees and shrubs that are growing on and around the logs. This area was entirely cleared of vegetation when the paper company used the site, so these plants have grown since that time.



## 3 ALDER THICKET

You are now in the midst of a thicket of alder (*Alnus incana* and *Alnus viridis*). Alder is a type of shrub that grows rapidly on disturbed, moist ground. It is an important early shrub in forest succession, adding nutrients like nitrogen to poor soils. Sugarloaf managers are trying to restore this area to an upland white cedar forest. White cedar grows particularly well in lower, damp areas along the shore. In 2006, this area underwent a controlled burn in order to thin the thick alder and prepare the soil for planting white cedars. The caged areas you see contain young cedars and other native trees, planted after the fire.



## 4 WEATHERING BEDROCK

Bedrock is what geologists call the solid rock that underlies the land that we live on. Bedrock is often completely hidden by soil and plants, but here along the North Shore of Lake Superior, the soil is thin in many areas because of Ice Age glaciation and much of the 1,100 million year old bedrock is visible. If you look closely at the ground you are standing on, you will see that what appears to be gravel is actually made up of pieces of crumbling bedrock. Water trapped in cracks in the bedrock freezes in the winter and thaws in the spring, breaking the rock apart – a process called physical weathering.



## 5 SCENIC OVERLOOK

Across the cove you can see Sugarloaf Point. The forest on the point has not been disturbed for many years, and it contains a mixture of trees, shrubs, and other plants found only in north central and northeastern Minnesota. At the very end of the Point is a high knob of rock. The shape of this knob is similar to that of a typical loaf of bulk brown sugar that was sold in the 1800s, when English place-names were given to features on the North Shore.



## 6 ROCKY CLIFFS

Optional stop #6 is on the lakeshore at the bottom of the hill. Follow the trail to the left of the bench. At the shoreline, you are standing on bedrock that is 1,100 million years old.

This rock is called basalt, a name that indicates the texture and the chemical composition of the rock. Basalt forms as a result of volcanic eruptions, similar to the ones occurring in Hawaii and Iceland today, and it is the most common type of lava flow.

When Consolidated Papers was using this cove to transport pulpwood across the lake, great booms (big floating logs chained end-to-end) were stretched across the mouth of the cove to contain the floating logs until they could be towed to Wisconsin. Can you find the iron rings that were used to attach the booms on this side of the cove?



## 7 LOG CHUTE

Although little physical evidence remains, it was in this area that the paper company constructed a chute to move logs from the Upper Landing to the cove. The chute was 80 feet long and about 10 feet wide. Once in the water, the floating logs were held inside the cove by storage booms until a large enough quantity was collected to fill a “raft”, which was made up of several thousand logs that covered as much as 40 acres. Tugboats pulled the rafts 62 miles across Lake Superior to Ashland, Wisconsin, a trip that took between 72 and 120 hours. Typically, 6-8 trips were made to Ashland each summer.



## 8 NURSE LOG

Stop here to examine the nurse log on the left side of the trail. A nurse log is a dead tree that has fallen to the ground and is slowly decaying. As the tree decays, it forms a fertile garden where many plants—including mosses, flowers, and other trees—can sprout and grow. Look closely and you should be able to identify some of the plants growing on the nurse log. Please allow the decay to occur naturally; do not pull the nurse log apart.



## 9 ROCKY SHORELINE

At this point you can leave the trail and head for the rocky ledges along the shore. When you reach the rocks, turn to your left and walk carefully along the outcrop, looking for

evidence that these rocks are large, basaltic lava flows. See if you can find a flow contact, which is where one lava flow covered another lava flow. When basaltic magma is erupted, it flows relatively easily and spreads out in a layer. The next pulse of lava flows over the older surface, resulting in layers of individual flows, stacked on top of each other, much like a stack of pancakes. Like cooking pancake batter, the gas bubbles in the magma rise to the top of each flow. This results in a flow top that has many gas bubbles and a flow base that is much more massive and solid. You can recognize the flow contact because the massive base of one flow rests on the vesicular (bubbly) top of the older flow.



## 10 CONSOLIDATED PAPERS BUILDING SITE

Historic photos and maps indicate that Consolidated Papers, Inc. maintained at least fourteen different buildings at Sugarloaf Cove to support their pulpwood rafting operation. Many of these buildings were located here at the base of the hill, including an office, warehouse, and garage. The last building was removed in 1999; it was moved to Grand Marais. The root cellar in the hillside, which used to help feed dozens of people on the site for the summer, is the only major structure remaining and is used today for tool storage and protection of seedlings.



## 11 COBBLE BEACH

There is no official trail on the beach. Feel free to wander along, look at the rocks, and enjoying the lake. You are now within the boundary of the Scientific and Natural Area (SNA), so please be sure to walk gently. Take only pictures with you and leave only footprints behind. Please do not remove rocks, pebbles, or driftwood. Camping and campfires are not allowed on the beach.

Part of the beach at Sugarloaf Cove is covered by well-rounded rocks of varied color and texture. This is often called a “Cobble Beach” due to the size and