Area, Quality and Protection of Special Lakeshore Communities - Cobble Beaches

Indicator #8129 (Cobble Beaches)

This indicator report was last updated in 2005.

Overall Assessment

Status:	**Mixed**
Trend:	**Deteriorating**

Lake-by-Lake Assessment

Separate lake assessments were not included in the last update of this report.

Purpose

- To assess the status of cobble beaches, one of the 12 special shoreline communities identified within the nearshore terrestrial area
- To assess the changes in area and quality of Great Lakes cobble beaches
- To infer the success of management activities
- To focus future conservation efforts toward the most ecologically significant cobble beach habitats in the Great Lakes

Ecosystem Objective

The objective is the preservation of the area and quality of Great Lakes cobble beaches, individually and as an ecologically important system, for the maintenance of biodiversity and the protection of rare species. This indicator supports Annex 2 of the Great Lakes Water Quality Agreement.

State of the Ecosystem

Background

Cobble beaches are shaped by wave and ice erosion. They are home to a variety of plant species, several of which are threatened or endangered provincially/statewide, globally, or both making them one of the most biodiverse terrestrial communities along the Great Lakes shoreline. Cobble beaches serve as seasonal spawning and migration areas for fish as well as nesting areas for the piping plover, a species listed in the U.S. as endangered.

Status of Cobble Beaches

Cobble beaches have always been a part of the Great Lakes shoreline. The number and area of these beaches, however, is decreasing due to shoreline development. In fact, cobble shorelines are becoming so scarce that they are considered globally rare.

Lake Superior has the most cobble shoreline of all the Great Lakes with 958 km (595 miles) of cobble beaches (Figure 1); 541 km (336 miles) on the Canadian side and 417 km (259 miles) on the U.S. side. This constitutes 20% of the whole Lake Superior shoreline (11.3% on the Canadian side and 8.7% on the U.S. side).

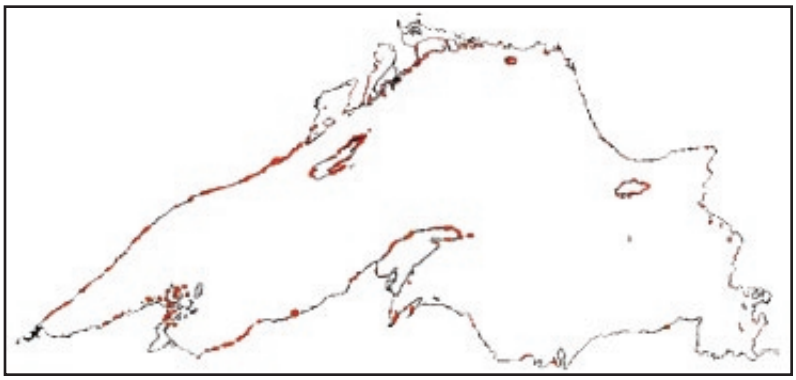

Figure 1. Cobble beaches along Lake Superior's shoreline (red = cobble beach locations).

Source: Lake Superior Binational Program, Lake Superior LaMP 2000, Environment Canada, and Dennis Albert

Lake Huron has the 2nd most cobble shoreline with approximately 483 km (300 miles) of cobble shoreline; 330 km (205 miles) on the Canadian side and 153 km (95 miles) on the U.S. side. Most of the cobble beaches are found along the shoreline of Georgian Bay (Figure 2). This constitutes approximately 9% of the whole Lake Huron shoreline (6.1% on the Canadian side and 2.8% on the U.S. side).

Approximately 164 km (102 miles) of the Lake Michigan shoreline is cobble, representing 6.1% of its shoreline. Most of these beaches are located at the northern end of the lake in the state of Michigan (Figure 3).

Lake Ontario has very little cobble shoreline of about 35 km (22 miles), representing only 3% of its shoreline (Figure 4).

Lake Erie has the smallest amount of cobble shoreline of all the Great Lakes with only 26 km of cobble shore. This small area represents approximately 1.9% of the lake's shoreline (Figure 5).

While the cobble beaches themselves are scarce, they do have a wide variety of vegetation associated with them, and they serve as home to plants that are endemic to the Great Lakes shoreline. Lake Superior's large cobble shoreline provides for several rare plant species (Table 1) some of which include the Lake Huron tansy and redroot. It is also home to the endangered heart-leaved plantain, which is protected under the Ontario Endangered Species Act.

Lake Michigan and Lake Huron's cobble shorelines are home to Houghton's goldenrod and the dwarf lake iris, both of which are endemic to the Great Lakes shoreline (Table 2, Table 3). Some other rare species on the Lake Michigan shoreline include the Lake Huron tansy and beauty sedge (Table 2).

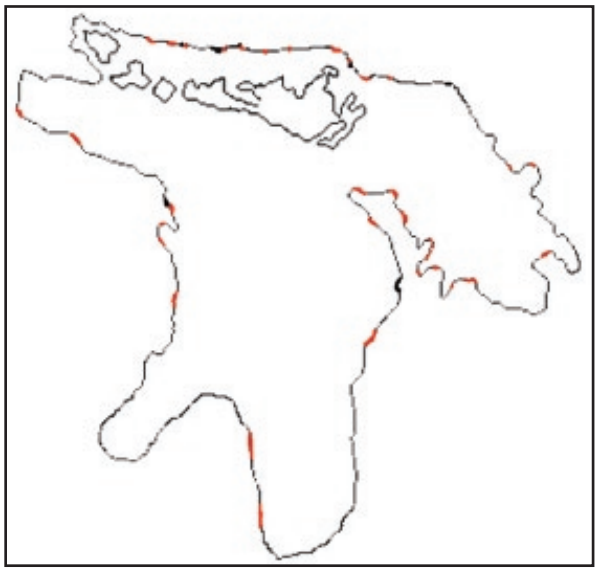

Figure 2. Cobble beaches along Lake Huron's shoreline (red = cobble beach locations).
Source: Environment Canada

Figure 3. Cobble beaches along Lake Michigan's shoreline (red = cobble beach locations).
Source: Albert (1994a), Humphrys et al. (1958)

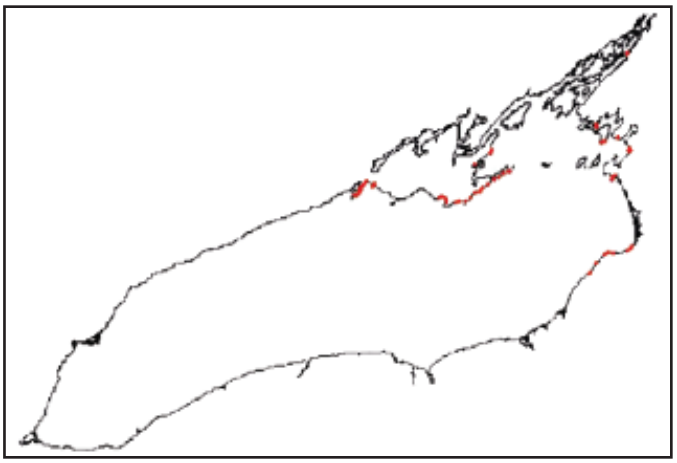

Figure 4. Cobble beaches along Lake Ontario's shoreline (red = cobble beach locations).
Source: International Joint Commission (IJC) and Christian J. Stewart

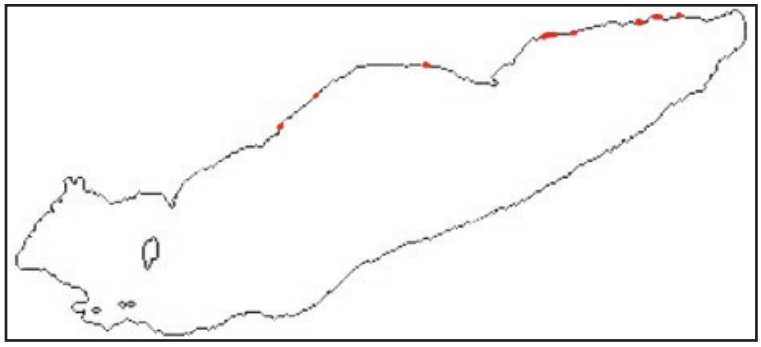

Figure 5. Cobble beaches along Lake Erie's shoreline (red = cobble beach locations).
Source: Environment Canada

Lake Superior	
Common Name	**Scientific Name**
Bulrush sedge	*Carex scirpoidea*
Great northern aster	*Aster modestus*
Northern reedgrass	*Calamagrostis lacustris*
Purple clematis	*Clematis occidentalis*
Northern grass of Parnassus	*Parnassia palustris*
Mountain goldenrod	*Solidago decumbens*
Narrow-leafed reedgrass	*Calamagrostis stricta*
Downy oat-grass	*Trisetum spicatum*
Pale Indian paintbrush	*Castilleja septentrionalis*
Butterwort	*Pinguicula vulgaris*
Pearlwort	*Sagina nodosa*
Calypso orchid	*Calypsa bulbosa*
Lake Huron tansy	*Tanacetum huronense*
Redroot	*Lachnanthes caroliana*
Heart-leaved plantain	*Plantago cordata*

Table 1. Rare plant species on Lake Superior's cobble shoreline.
Source: Lake Superior LaMP (2000)

Not many studies have been conducted on the cobble shorelines of Lake Ontario and Lake Erie because these areas are so small. The report author was unable to find any information about the vegetation that grows there.

Pressures

Cobble beaches are most frequently threatened and lost by shoreline development. Homes built along the shorelines of the Great Lakes cause the number of cobble beaches to become limited. Along with the development of homes also comes increased human activity along the shoreline resulting in damage to rare plants in the surrounding area and ultimately a loss of terrestrial biodiversity on the cobble beaches.

Lake Michigan	
Common Name	**Scientific Name**
Dwarf lake iris	*Iris lacustris*
Houghton's goldenrod	*Solidago houghtonii*
Slender cliff-brake	*Cryptogramma stelleri*
Lake Huron tansy	*Tanacetum huronense*
Beauty sedge	*Carex concinna*
Richardson's sedge	*Carex richardsonii*

Table 2. Rare plant species along Lake Michigan's cobble shoreline.
Source: Dennis Albert

Lake Huron	
Common Name	**Scientific Name**
Dwarf lake iris	*Iris lacustris*
Houghton's goldenrod	*Solidago houghtonii*

Table 3. Rare plant species along Lake Huron's cobble shoreline.
Source: Environment Canada

Comments from the author(s)

Not much research has been conducted on cobble beach communities; therefore, no baseline data have been set. A closer look into the percentage of cobble beaches that already have homes on them or are slated for development would yield a more accurate direction in which the beaches are headed. Also, a look at the percentage of these beaches that are in protected areas would provide valuable information. Projects similar to Dennis Albert's *Bedrock Shoreline Surveys of the Keweenaw Peninsula and Drummond Island in Michigan's Upper Peninsula* (1994) for the Michigan Natural Features Inventory, as well as the International Joint Commission's *Classification of Shore Units Coastal Working Group*: *Lake Ontario and Upper St. Lawrence River* (2002), would be very useful in determining exactly where the remaining cobble beaches are located and what is growing and living within them.

Acknowledgments

Author:

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