



## Area, Quality and Protection of Special Lakeshore Communities - Sand Dunes

Indicator #8129

### Overall Assessment

Status: **Not Assessed**

Trend: **Undetermined**

Rationale: **Inadequate data exists to determine overall status and trend at this time. Comprehensive dune mapping needs are necessary.**

Note: This is a progress report towards implementing this indicator.

### Lake-by-Lake Assessment

#### Lake Superior

Status: Not Assessed

Trend: Undetermined

#### Lake Michigan

Status: Good

Trend: Deteriorating

Rationale: Dune habitat is being impacted by both biological and anthropogenic forces. Invasive species have spread, destabilizing the system, and increasing human development footprints divide, impact and damage the both the connectedness and quality of the dynamic Lake Michigan dune ecosystem.

#### Lake Huron

Status: Not Assessed

Trend: Undetermined

#### Lake Erie

Status: Mixed

Trend: Improving

Rationale: Currently no formal study of dunes on Presque Isle is underway. There has been ongoing informal management and monitoring the past 8 -10 years. Local and regional experts provide input into management strategies. Improvements are made as time and resources allow.

#### Lake Ontario

Status: Mixed

Trend: Improving

Rationale: U.S. dune management has been in place for 30 years, with strict regulatory structure. Canada is bringing natural resource needs into dune management. U.S. has 17-miles of dunes (10.5 private & 6.5 public). Canada has a few natural dunes in protected areas.

### Purpose

- To assess the extent and quality of Great Lakes sand dunes, one of the 12 special lakeshore communities identified within the nearshore terrestrial area

**Ecosystem Objective**

Maintain total area, extent and quality of Great Lakes sand dunes, ensuring adequate representation of sand dune types across their historical range.

**State of the Ecosystem**

A working definition for “sand dunes” was developed for this report as hills, mounds or ridges of wind deposited sand with a variety of plant communities. Great Lakes sand dunes can be divided into 4 distinct and general zones, which are based upon these plant communities: beach, foredune, trough/swale or interdunal pond, and backdune forest.

Sand dunes continue to be lost and degraded, yet the ability to track and determine the extent and rate of this loss in terms of both area and quality in a standardized way is not yet feasible.

Great Lakes sand dunes comprise the world’s largest collection of freshwater dunes. They are home to endemic, rare, endangered, and threatened species and house globally significant shorebird habitats. Sand dunes can be found along the coasts of all the Great Lakes. The states bordering Lake Michigan, however, have the greatest number of sand dunes with a total of 111,291 hectares, followed by the Province of Ontario (Canada) with 8,910 hectares. Of the individual states, Indiana has 6,070 hectares, New York has 4,850 hectares, and Wisconsin has 425 hectares (2005); the area of dunes in Illinois and Michigan are not known. This information is not complete. No comprehensive map of Great Lakes sand dunes exists.

Degree of protection varies considerably among jurisdictions making it difficult to assess the overall loss or status of the Great Lakes sand dunes. Although information about the quality of individual sand dunes is often locally available, this information has not been collected across the entire basin. Nevertheless, conversations with local managers and environmentalists indicate a continued loss of sand dunes to development, sand mining, recreational trampling, and non-indigenous invasive species. The [Lake] Ontario Dunes Coalition, Michigan Dune Alliance, and the Save the Dunes Council in Indiana are making some progress in both protecting and restoring sand dunes in their respective regions.

**Pressures**

Threats to sand dunes are numerous. Non-indigenous invasive species such as baby’s breath (*Gypsophila paniculata*) and spotted knapweed (*Centaurea maculosa*) tend to spread rapidly if not controlled. Habitat destruction, however, is the greatest threat overall. In addition to sand mining, shoreline condominium and second home development level the dunes. Recreational use by pedestrians and off road vehicle use destroys vegetation, thereby causing dune erosion. The Lake Ontario sand dunes are threatened by sand starvation. In New York (Lake Ontario) sand loss into sheltered ponds and wetlands has been progressive over the last 100 years. Some of this has been due to erosion accelerated by inappropriate use, but recently inlet dynamics has been shown to be a significant cause.

**Management Implications**

Many actions have been taken to protect Great Lakes sand dunes. For example, in Eastern Lake Ontario in the U.S. boardwalks and dune walkovers have been constructed to provide public access to beaches without compromising dune ecology. Native beach grasses have been planted to retard erosion. On the Eastern shores of Lake Michigan, invasive plants have been systematically removed by dune stewards. Michigan has legislation in place to control or reduce sand mining impacts. The U.S. side of Eastern Lake Ontario has developed an educational based stewardship

program (20+ years) as a result of the [Lake] Ontario Dune Coalition. The Eastern Lake Ontario Dune Stewards patrol the public dune areas promoting environmentally sound use of the resource areas while collecting visitor usage data.

In order to protect sand dunes there is a need for improved communication between government agencies and stakeholders with regard to sand dune management. Public education would help alleviate stress to dunes cause by recreational trampling. Stronger legislation could limit some damaging activities. Local government creativity in managing dune areas through creative zoning would improve the protection of sensitive and irreplaceable areas.

**Comments from the Author(s)**

A group of sand dune managers, educators, private landowners, and scientists attended a conference in 2006 to exchange information and form a network for future information exchange on Great Lakes sand dune ecosystem ecology, management, research and education efforts. Attendees from six U.S. states and the Province of Ontario Canada included 75 scientists, public and private land managers, and professional as well as volunteer educators. Attendees came from federal, state/provincial, county and local government agencies, non-profit conservation groups, and private landowner associations. National and State Parks were represented, regulatory and natural resource management agencies, cottage owners, soil and water conservation professionals, interpretive center educators, and two state-level collaboratives for dune conservation and management. Fourteen speakers shared expertise on the areas of research, management and public education over the course of a conference. In addition, 27 attendees presented their work in posters on display throughout the conference. This group could work actively to collect available data about Great Lakes sand dunes and begin collaborative actions to protect them.

Since the Great Lakes Dune Conference the conference committee continued holding conference calls to develop the following products:

1. The pre-conference website has been converted to a post-conference website and now includes posters and PowerPoint presentations that have been made available by presenters (<http://www.nysgdunes.org/confhomepage.htm>).
2. A Listserv (gldunes) hosted by GLIN (Great Lakes Information Network) co-managed by Michigan Sea Grant and New York Sea Grant was created to address the need for communication both across disciplines and geographically.
3. A Great Lakes Dune session was held at the International Association for Great Lakes Research (IAGLR) at Penn State, PA in May-June 2007.

Functional relationships exist between coastal wetlands and freshwater sand dunes. It is difficult for sand dune managers, educators, private land owners, and scientists to exist in their functional capacity without interacting with the coastal wetlands. Not only can professional partnerships be built (across disciplines) with parties interested in sand dune issues, but also those interests in coastal wetlands.

**Assessing Data Quality**

Insert “x” under the statement that best corresponds with each data characteristic

Data Characteristics	Strongly Agree	Agree	Neutral or Unknown	Disagree	Strongly Disagree	Not Applicable
1. Data are documented, validated, or quality-assured by a recognized agency or organization			X			
2. Data are traceable to original sources			X			

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3. The source of the data is a known, reliable and respected generator of data			X			
4. Geographic coverage and scale of data are appropriate to the Great Lakes basin			X			
5. Data obtained from sources within the U.S. are comparable to those from Canada			X			
6. Uncertainty and variability in the data are documented and within acceptable limits for this indicator report			X			
Clarifying Notes: In some cases data may be available and reliable locally, but not system-wide.						

## Acknowledgments

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