



## Great Lakes: Shoreline

### Description

Shoreline areas of the Great Lakes range from zero to 3 meters in depth. This area includes coastal marshes. For the Lake Erie basin this is the Michigan waters of Lake Erie and the connecting waterways of the St. Clair and Detroit rivers and Lake St. Clair.

### General Condition of Feature

This habitat is considered 20% in good to excellent condition, 30% in fair condition, and 50% in degraded to very degraded condition.

### Associated Natural Communities

Great Lakes Marsh

### Associated Species of Greatest Conservation Need

#### MUSSELS

- northern riffleshell (*Epioblasma torulosa rangiana*)
- eastern pondmussel (*Ligumia nasuta*)
- black sandshell (*Ligumia recta*)

#### FISH

- lake sturgeon (*Acipenser fulvescens*)
- mooneye (*Hiodon tergisus*)
- brassy minnow (*Hybognathus hankinsoni*)
- silver chub (*Macrhybopsis storeriana*)
- black buffalo (*Ictiobus niger*)
- spotted sucker (*Minytrema melanops*)
- stonecat (*Noturus flavus*)
- tadpole madtom (*Noturus gyrinus*)
- brindled madtom (*Noturus miurus*)

#### FISH cont.

- grass pickerel (*Esox americanus*)
- cisco or lake herring (*Coregonus artedii*)
- slimy sculpin (*Cottus cognatus*)
- eastern sand darter (*Ammocrypta pellucida*)
- channel darter (*Percina copelandi*)
- river darter (*Percina shumardi*)
- sauger (*Sander canadensis*)

#### AMPHIBIANS

- mudpuppy (*Necturus maculosus maculosus*)

#### REPTILES

- eastern fox snake (*Elaphe gloydi*)

### Associated Threats

#### MODIFICATION OF NATURAL PROCESSES

- Altered hydrologic regimes: Decreased variation in water levels; lower water levels
- Climate change: Global warming
- Fragmentation: Dredging- alters habitat, increases boat traffic, fragments habitat

#### POLLUTION

- Altered nutrient inflows: Water quality – Dissolved oxygen issues (low threat)
- Altered sediment loads: Water quality – turbidity, sediment starvation- diminished natural sedimentation because of upstream dams (low threat)

#### HABITAT CONVERSION

- Dredging and channelization: Dredging - alters habitat, increases boat traffic, fragments habitat; navigational dredging - new channel; Aquatic navigation expansion - bigger ships, system of locks, etc
- Riparian modification: Alteration of shoreline - seawall construction, fill, shoreline development; hardening of shoreline; and recreational boating wakes

#### BIOLOGICAL INTERACTIONS

- Invasive plants and animals: Especially *Phragmites*, zebra mussels, round gobies – these species present a tremendous threat to native mussels and native fish; Sea lamprey

#### NON-CONSUMPTIVE BIOLOGICAL RESOURCE USE

- Macrophyte removal: Mowing emergent vegetation, weed control (low threat)
- Recreational vehicles: ATV, jet ski (low threat on Lake Erie, high threat on Lake St. Clair)

#### EDUCATION

- Lack of scientific knowledge: Lack of information on habitat types and extent, and aquatic organism communities
- Social attitudes: Lack of education to understand importance of natural shoreline

### Conservation Actions Needed (Threats addressed)

#### LAND & WATER PROTECTION

- Expanding conservation easement programs (altered hydrologic regimes, dredging and channelization, riparian modification)

*LAND, WATER & SPECIES MANAGEMENT*

- Continued vigilance and cooperation on preventing invasive species establishments (invasive plants and animals, social attitudes)
- Improve access to spawning and nursery habitats in rivers and coastal wetlands (fragmentation, species in general)
- Rehabilitate natural hydrological processes along the Lake Erie shoreline including softening shorelines (altered hydrologic regimes, dredging and channelization, macrophyte removal, social attitudes)
- Rehabilitate submerged macrophyte communities in estuaries and embayments (macrophyte removal)

*LAW & POLICY*

- Removal of exotic vegetation needs to preserve 60-80% of native vegetation (invasive plants and animals)
- Work with local officials to develop planning and zoning guidelines that consider natural processes and softened shorelines (altered natural flow, altered sediment loads, macrophyte removal, riparian modification)

*EDUCATION & AWARENESS*

- Expand the education programs for the general public regarding natural processes, invasive species, hydrologic cycles, and stewardship issues (altered hydrologic regimes, altered nutrient inflows, invasive plants and animals, fragmentation, macrophyte removal, riparian modification, social attitudes)

Research and Survey Needs

- Determine effective prevention, control, and survey techniques for aquatic invasive species
- Classify all Lake Erie, Lake St. Clair, and Detroit and St. Clair rivers shoreline
- Continue interactive governmental decision making from local to international levels
- Determine aquatic community interactions (i.e., food webs, changing species community, genetic affects of non-indigenous species on locally adapted species, etc.)
- Model hydrology of Lake Erie and Lake St. Clair tributaries
- Survey shoreline and inventory aquatic species and physical features of this landscape feature
- Survey shoreline areas to determine relationship between cumulative shoreline armoring at a landscape scale
- Survey social attitudes and determine effective communication approaches
- Determine unknown species life history and habitat requirements
- Continue interagency cooperation on invasive species prevention, control, and rapid response

Monitoring

- Effluent discharges to Lake Erie and its tributaries: wastewater treatment plants, septic systems, industrial
- Lake Erie and Lake St. Clair tributary water flows and levels
- Riparian modification