



Great Lakes: Shoreline

Description

Shoreline areas of the Great Lakes range from zero to 3 meters in depth. This area includes coastal marshes. Great Lakes are considered to be the Michigan waters of Lake Michigan.

General Condition of Feature

This habitat is considered 55% in good to excellent condition, 15% in fair condition, and 30% in degraded to very degraded condition.

Associated Natural Communities

Great Lakes Marsh
Northern Fen

Associated Species of Greatest Conservation Need

MUSSELS

Specific associations with this landscape feature were not found in the literature

SNAILS

Specific associations with this landscape feature were not found in the literature

INSECTS

Specific associations with this landscape feature were not found in the literature

FISH

lake sturgeon (*Acipenser fulvescens*)

FISH cont.

cisco or lake herring (*Coregonus artedii*)
slimy sculpin (*Cottus cognatus*)
spoonhead sculpin (*Cottus ricei*)
sauger (*Sander canadensis*)

AMPHIBIANS

mudpuppy (*Necturus maculosus maculosus*)
Fowler's toad (*Bufo fowleri*)

REPTILES

Specific associations with this landscape feature were not found in the literature

Associated Threats

MODIFICATION OF NATURAL PROCESSES

- Altered hydrologic regimes: Water level management
- Climate change: Climate change resulting in habitat shifts and altered biotic interactions (low threat)
- Fragmentation: Armoring (i.e. sheet piling) prevents movement between habitats

POLLUTION

- Altered nutrient inflows
- Altered sediment loads: Sediment from streams (too much erosion); Sedimentation covering spawning habitat; Erosion
- Pesticides and herbicides
- Urban, municipal, and industrial pollution: Urban and or industrial pollution

HABITAT CONVERSION

- Dredging and channelization: Dredging of shoreline around major shipping channels alters habitat in shoreline areas; Shoreline dredging for residential dockage
- Riparian modification: Riparian stewardship and development; Armoring (i.e. sheet piling) prevents movement between habitats; Marina development; Dock-Groin-Pier development; Rip-Rapped shorelines; Seawalls; Marinas; Shoreline development for urban and recreational use
- Wetland modification: Wetland filling

BIOLOGICAL INTERACTIONS

- Invasive plants and animals: Invasive species- cover habitat and compete with native species; Especially zebra mussels because they alter bottoms and filter available food; Quagga mussels; Round gobies; Sea lamprey

CONSUMPTIVE BIOLOGICAL RESOURCE USE

- Forestry practices: (low threat)
- Mining practices: (low threat)
- Removal of wildlife: (low threat)

NON-CONSUMPTIVE BIOLOGICAL RESOURCE USE

- Macrophyte removal: Vegetation removal and management

EDUCATION

- Social attitudes

Conservation Actions Needed (Threats addressed)

LAND, WATER & SPECIES MANAGEMENT

- Control and prevent aquatic invasive species introductions and establishments (invasive plants and animals)

**MICHIGAN'S WILDLIFE ACTION PLAN
AQUATIC SYSTEMS: LAKE MICHIGAN BASIN**

- Develop integrated pest management plans (invasive plants and animals)
- Ensure any roads near lakes are not contributing sediment to the system (altered sediment loads)
- Maintain or establish riparian buffers of at least 50 ft., but 500 ft. or wider maximizes conservation benefits, but 500 ft. or wider maximizes conservation benefits (altered sediment loads, riparian modification)
- Protect existing natural wetlands and rehabilitate degraded wetlands (urban, municipal, and industrial pollution, wetland modification)
- Rehabilitate original hydrologic functions (i.e., throughflow, wetlands) (altered hydrologic regimes)
- When removing invasive vegetation, at least 60-80% of native vegetation should be preserved (invasive plants and animals, macrophyte removal)
- Survey erosion sites within watershed and develop strategies to reduce identified problems (altered sediment loads)

LAW & POLICY

- Continued vigilance and cooperation on preventing more aquatic invasive species establishments (invasive plants and animals)
- Enact and enforce shoreline protection regulations (riparian modification)
- Encourage clustered development rather than evenly spaced homes (riparian modification)
- Encourage green space planning (riparian modification)
- Implement and improve storm-water and non-point source best management practices (altered hydrologic regimes, urban, municipal, and industrial pollution)
- Reduce effluent flow (Urban, municipal, and industrial pollution)
- Restrict beach grooming (macrophyte removal, riparian modification)
- Restrict dredging and channelization activities, especially during spawning and migration seasons (dredging and channelization)
- Soften or remove hard shoreline structures (fragmentation, riparian modification)
- Strengthen existing environmental laws and enforcement of permits controlling effluent discharge (urban, municipal, and industrial pollution)
- Use natural materials or soft engineering techniques for any shoreline modification (riparian modification)
- Work with local governments to develop and refine planning and zoning regulations and ordinances that consider natural processes (variety of threats)
- Work with local officials on setback and buffer ordinances (riparian modification)

EDUCATION & AWARENESS

- Educate landowners on the importance of shoreline vegetation (riparian modification, social attitudes)
- Educate legislators, other policy makers, and the public on the value of riparian vegetation, macrophytes, natural processes, and stewardship issues (social attitudes)

Research and Survey Needs

- Aquatic invasive species—control of established species; prevention of new establishments; rapid response protocols
- Classify all Great Lakes shoreline
- Continue interactive governmental decision making from local to international levels
- Continue interagency cooperation on invasive species prevention and control
- Continue to work with GLFC Lake Michigan Technical Advisory Group implementing Lake Michigan aquatic community objectives
- Determine aquatic community interactions (i.e., food webs, changing species community, genetic affects of non-indigenous species on locally adapted species, etc.)
- Determine estimates of *Dreissena* abundance and threats to this genus
- Hydrologic modeling of Great Lakes tributaries
- Survey shoreline and inventory aquatic species and physical features of this landscape feature
- Survey shoreline areas to determine relationships of cumulative shoreline armoring at a landscape scale
- Survey social attitudes and determine effective communication approaches

Monitoring

- Aquatic invasive species
- Dredging and channelization
- Effluent discharges to Lake Michigan and its tributaries
- Lake Michigan tributary water flows
- Riparian modification
- Wetland modification