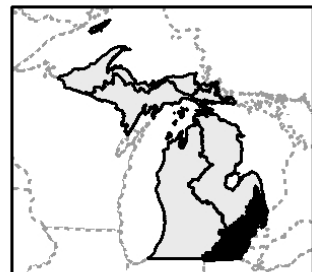


## Aquatic Characteristic: Clear Water

No Data



0 10 20 40 Kilometers

0 5 10 20 Miles



## Aquatic Characteristic: Clear Water

### Description

Clear water is water that has little particulate matter suspended in the water column and allows large quantities of light to aquatic plants and animals.

### General Condition of Feature

No data available.

### Associated Species of Greatest Conservation Need

#### MUSSELS

elktoe (*Alasmidonta marginata*)  
slippershell mussel (*Alasmidonta viridis*)  
scaleshell (*Leptodea leptodon*)  
rainbow (*Villosa iris*)  
cylindrical papershell (*Anodontooides ferussacianus*)  
snuffbox (*Epioblasma triquetra*)

#### INSECTS

rapids clubtail (*Gomphus quadricolor*)  
smoky rubyspot (*Hetaerina titia*)

#### FISH

lake sturgeon (*Acipenser fulvescens*)  
mooneye (*Hiodon tergisus*)  
redside dace (*Clinostomus elongatus*)  
striped shiner (*Luxilus chrysocephalus*)  
silver chub (*Macrhybopsis storeriana*)

#### FISH cont.

river chub (*Nocomis micropogon*)  
pugnose shiner (*Notropis anogenus*)  
silver shiner (*Notropis photogenis*)  
southern redbelly dace (*Phoxinus erythrogaster*)  
western creek chubsucker (*Erimyzon claviformis*)  
lake chubsucker (*Erimyzon sucetta*)  
black redhorse (*Moxostoma duquesnei*)  
brown bullhead (*Ameiurus nebulosus*)  
stonecat (*Noturus flavus*)  
cisco or lake herring (*Coregonus artedii*)  
eastern sand darter (*Ammocrypta pellucida*)  
least darter (*Etheostoma microperca*)

#### AMPHIBIANS

pickerel frog (*Rana palustris*)

### Associated Threats

#### MODIFICATION OF NATURAL PROCESSES

- Altered hydrologic regimes: Increased flashiness increases erosion and thus turbidity due to development and runoff changes; Altered flow regime due to development and farming

#### POLLUTION

- Altered nutrient inflows: Surface runoff, nutrients; Eutrophication
- Altered sediment loads: Inadequate runoff controls on construction sites; Erosion; Increased flashiness increases erosion and thus turbidity due to development and runoff changes; Sedimentation; Sediment resulted from urban, agriculture, road construction, and bank erosion
- Pesticides and herbicides: Plant harvesting; Herbicide use
- Urban, municipal, and industrial pollution

#### HABITAT CONVERSION

- Dams
- Dredging and channelization: Dredging
- Riparian modification: Hardened shoreline; Wave reverberation
- Wetland modification

#### BIOLOGICAL INTERACTIONS

- Disease, pathogens, and parasites
- Invasive plants and animals

#### NON-CONSUMPTIVE BIOLOGICAL RESOURCE USE

- Macrophyte removal: Removal of macrophytes through chemical treatments and mechanical removal can lead to increased turbidity in lakes
- Non-consumptive recreation: Recreational boating - wave energy

#### EDUCATION

- Lack of scientific knowledge
- Social Attitudes: Poor understanding by society for the need for clean water for aquatic organisms

### Conservation Actions Needed (Threats addressed)

#### LAND, WATER & SPECIES MANAGEMENT

- Allow seasonal flooding (altered hydrologic regimes)
- When removing aquatic invasive vegetation, at least 60-80% of native vegetation should be preserved (invasive plants and animals, macrophyte removal)
- Control aquatic invasive plant species (invasive plants and animals)

## **MICHIGAN'S WILDLIFE ACTION PLAN**

### **AQUATIC SYSTEMS: LAKE ERIE BASIN**

- Maintain and rehabilitate riparian corridors (riparian modification)
- Prevent establishment of new aquatic invasive species (invasive plants and animals)
- Protect and rehabilitate degraded wetlands, floodplains, and riparian areas (riparian modification, wetland modification)
- Rehabilitate original hydrologic functions i.e., reconnect meanders and floodplains (altered hydrologic regimes)
- Vegetation management needs to be done in conjunction with a vegetation management plan (invasive plants and animals, macrophyte removal)

#### *LAW & POLICY*

- Encourage green-space planning and clustered development (riparian modification)
- Remaining dams should be operated as run-of-the-river (altered hydrologic regimes, dams)
- Remove dams to rehabilitate riparian and stream habitats and natural hydrologic conditions (altered hydrologic regimes, dams)
- Restrict beach grooming (riparian modification)
- Shoreline and riparian modification should be completed with natural materials and soft engineering (riparian modification)
- Use Best management practices (variety of threats)
- Use sediment barriers and Best management practices during construction (altered sediment loads)
- Work with and educate Drain Commissioners to use natural stream processes (variety of threats)
- Work with farmers and the Natural Resources Conservation Service to decrease pesticide and herbicide use (pesticides and herbicides)
- Work with local officials on planning and zoning regulations and ordinances (variety of threats)
- Work with local officials on setback and buffer ordinances (riparian modification)
- Work with road commissions to site and maintain road crossings (altered hydrologic regimes, altered sediment loads)

#### *EDUCATION & AWARENES*

- Educate legislators, local planning boards, other policy makers, and the public on the importance of natural processes, invasive species, hydrologic cycles and stewardship (social attitudes)
- Educate landowners on the value of riparian areas (riparian modification, social attitudes)
- Work with watershed councils and conservation groups on habitat restoration (riparian modification)

#### Research and Survey Needs

- Explore alternatives to pesticides and herbicides
- Develop early detection and rapid response protocols for aquatic invasive species
- Determine erosion sites and condition
- Determine life history requirements for SGCN associated with clear water habitats
- Determine the condition of clear water habitats in the basin
- Map, in GIS, this landscape feature

#### Monitoring

- Aquatic invasive specie
- Beach grooming
- Effluent flows: municipal waste water treatment plants, septic systems, industrial
- Erosion site
- Pesticide and herbicide use
- Riparian modification
- Road crossings