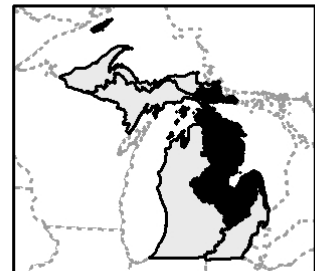


## Aquatic Characteristic: Soft Substrates

No Data

0 15 30 60  
Kilometers

0 5 10 20  
Miles



## Aquatic Characteristic: Soft Substrates

### Description

Soft substrates are predominately composed of particles less than 2 mm often described as sand, silt, mud, or organic matter.

### General Condition of Feature

No data available.

### Associated Species of Greatest Conservation Need

#### MUSSELS

slippershell mussel (*Alasmidonta viridis*)  
scaleshell (*Leptodea leptodon*)  
round pigtoe (*Pleurobema coccineum*)  
rainbow (*Villosa iris*)  
purple wartyback (*Cyclonaias tuberculata*)  
pimpleback (*Quadrula pustulosa*)  
cylindrical papershell (*Anodontooides ferussacianus*)  
creek heelsplitter (*Lasmigona compressa*)  
wavy-rayed lampmussel (*Lampsilis fasciola*)  
eastern pondmussel (*Ligumia nasuta*)  
black sandshell (*Ligumia recta*)  
threehorn wartyback (*Obliquaria reflexa*)  
hickorynut (*Obovaria olivaria*)  
kidneyshell (*Ptychobranthus fasciolaris*)

#### SNAILS

spindle lymnaea (*Acella haldemani*)  
aquatic snail (*Planorbella smithi*)

#### INSECTS

riverine snaketail (*Stylurus amnicola*)  
Laura's snaketail (*Stylurus laurae*)  
russet-tipped clubtail (*Stylurus plagiatus*)  
arrowhead spiketail (*Cordulegaster obliqua*)  
Hine's emerald dragonfly (*Somatochlora hineana*)

#### FISH

lake sturgeon (*Acipenser fulvescens*)  
brassy minnow (*Hybognathus hankinsoni*)  
pugnose shiner (*Notropis anogenus*)  
finescale dace (*Phoxinus neogaeus*)  
black buffalo (*Ictiobus niger*)  
spotted sucker (*Minytrema melanops*)  
brown bullhead (*Ameiurus nebulosus*)  
tadpole madtom (*Noturus gyrinus*)  
grass pickerel (*Esox americanus*)  
cisco or lake herring (*Coregonus artedii*)  
pirate perch (*Aphredoderus sayanus*)  
deepwater sculpin (*Myoxocephalus thompsonii*)  
least darter (*Etheostoma microperca*)  
channel darter (*Percina copelandi*)

#### AMPHIBIANS

Blanchard's cricket frog (*Acris crepitans blanchardi*)  
pickerel frog (*Rana palustris*)

#### REPTILES

spotted turtle (*Clemmys guttata*)  
Blanding's turtle (*Emydoidea blandingii*)  
wood turtle (*Glyptemys insculpta*)  
eastern box turtle (*Terrapene carolina carolina*)

### Associated Threats

#### POLLUTION

- Urban, municipal, and industrial pollution: Contaminants

#### HABITAT CONVERSION

- Dredging and channelization: Channelization; Dredging; Filling
- Riparian modification: Land use practices

### Conservation Actions Needed (Threats addressed)

#### LAND, WATER & SPECIES MANAGEMENT

- Allow seasonal flooding (riparian modification)
- Avoid stream relocations (dredging and channelization)
- Continue clean-ups of contaminated sites and encourage the use of innovative methods (Urban, municipal, and industrial pollution)
- Continue to use the most current information and innovative methods in cleaning up chemical spills (Urban, municipal, and industrial pollution)
- Encourage use of natural materials or soft engineering techniques for any shoreline modification (riparian modification)
- Engineered drainage channels should mimic natural stream channel stability (channel dimension, pattern, and profile) (dredging and channelization)
- Ensure best management practices are used (riparian modification)
- Maintain or rehabilitate natural, vegetated riparian areas (Urban, municipal, and industrial pollution)
- Preserve woody riparian vegetation to reduce sedimentation (dredging and channelization)
- Protect existing natural wetlands and rehabilitate degraded wetland and floodplains (Urban, municipal, and industrial pollution)
- Reduce effluent flow (Urban, municipal, and industrial pollution)
- Rehabilitate channel diversity (dredging and channelization)

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

- Remove hard stream structures (riparian modification)
- Restrict dredging and channelization activities (dredging and channelization)

*LAW & POLICY*

- Continue developing and refining planning and zoning regulations and ordinances (riparian modification)
- Continue developing, refining, and implementing storm water and non-point source best management practices (Urban, municipal, and industrial pollution)
- Promote green-space planning (riparian modification)
- Strengthen air pollution laws (Urban, municipal, and industrial pollution)
- Strengthen water pollution laws (Urban, municipal, and industrial pollution)

*EDUCATION & AWARENESS*

- Continue working with and educating Drain Commissioners (riparian modification)
- Educate the public about the importance of vegetated riparian buffers (riparian modification)

Research and Survey Needs

- Determine and implement methods to handle runoff
- Determine the number and location of sand mining operations in the basin
- Determine unknown life history requirements for SGCN associated with soft substrates
- Model hydrologic flows in each watershed
- Determine effects of sand mining operations on aquatic systems

Monitoring

- Dredging and channelization
- Riparian modification
- Sand mining operations
- Sedimentation
- Storm water flows