

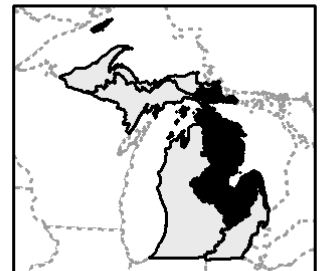
Aquatic Characteristic: Rock Substrates

No Data

0 15 30 60
Kilometers

0 5 10 20
Miles

N



Aquatic Characteristic: Rock Substrates

Description

Rock substrates are predominately composed of a mass of stone of any size, consolidated or unconsolidated, of various mineral compositions often described as bedrock, rock, cobble, and gravel.

General Condition of Feature

No data available.

Associated Species of Greatest Conservation Need

MUSSELS

elktoe (*Alasmidonta marginata*)
slippershell mussel (*Alasmidonta viridis*)
round pigtoe (*Pleurobema coccineum*)
ellipse (*Venustaconcha ellipsiformis*)
rainbow (*Villosa iris*)
purple wartyback (*Cyclonaias tuberculata*)
pimpleback (*Quadrula pustulosa*)
cylindrical papershell (*Anodontoides ferussacianus*)
creek heelsplitter (*Lasmigona compressa*)
snuffbox (*Epioblasma triquetra*)
wavy-rayed lampmussel (*Lampsilis fasciola*)
black sandshell (*Ligumia recta*)
threehorn wartyback (*Obliquaria reflexa*)
hickorynut (*Obovaria olivaria*)
kidneyshell (*Ptychobranhus fasciolaris*)
purple lilliput (*Toxolasma lividus*)

INSECTS

ocellated damer (*Boyeria grafiana*)
rapids clubtail (*Gomphus quadricolor*)
riverine snaketail (*Stylurus amnicola*)
arrowhead spiketail (*Cordulegaster obliqua*)
stygian shadowdragon (*Neurocordulia yamaskanensis*)
a stonefly (*Ostrocerca albidipennis*)
a stonefly (*Arcynopteryx compacta*)
a stonefly (*Helopicus nalatus*)
Hungerford's crawling water beetle (*Brychius hungerfordi*)

FISH

lake sturgeon (*Acipenser fulvescens*)
mooneye (*Hiodon tergisus*)
brassy minnow (*Hybognathus hankinsoni*)
striped shiner (*Luxilus chrysocephalus*)
river chub (*Nocomis micropogon*)
pugnose shiner (*Notropis anogenus*)
lake chubsucker (*Erimyzon sucetta*)
black buffalo (*Ictiobus niger*)
spotted sucker (*Minytrema melanops*)
black redhorse (*Moxostoma duquesnei*)
golden redhorse (*Moxostoma erythrurum*)
brown bullhead (*Ameiurus nebulosus*)
stonecat (*Noturus flavus*)
tadpole madtom (*Noturus gyrinus*)
grass pickerel (*Esox americanus*)
cisco or lake herring (*Coregonus artedii*)
slimy sculpin (*Cottus cognatus*)
deepwater sculpin (*Myoxocephalus thompsonii*)
fantail darter (*Etheostoma flabellare*)
least darter (*Etheostoma microperca*)
channel darter (*Percina copelandi*)
river darter (*Percina shumardi*)
sauger (*Sander canadensis*)

AMPHIBIANS

mudpuppy (*Necturus maculosus maculosus*)

REPTILES

queen snake (*Regina septemvittata*)
wood turtle (*Glyptemys insculpta*)

MAMMALS

water shrew (*Sorex palustris*)

Associated Threats

POLLUTION

- Altered sediment loads: Sedimentation

HABITAT CONVERSION

- Dams: (low threat)
- Dredging and channelization: Dredging; Filling
- Riparian modification: Land use practices (low threat)

Conservation Actions Needed (Threats addressed)

LAND, WATER & SPECIES MANAGEMENT

- Avoid stream relocations (dredging and channelization)
- Encourage use of natural materials or soft engineering techniques for any shoreline modification (dredging and channelization)
- Engineered drainage channels should mimic natural stream channel stability (channel dimension, pattern, and profile) (dredging and channelization)
- Maintain or rehabilitate natural hydrology (altered sediment loads)
- Maintain or rehabilitate vegetated riparian buffers (altered sediment loads)
- Preserve woody riparian vegetation to reduce sedimentation (altered sediment loads)
- Rehabilitate channel diversity (dredging and channelization)

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

- Work with and educate Drain Commissioners on the use of natural channel processes to allow a river to manage sediment and flow and decrease the amount of channelization needed (dredging and channelization)
- Work with road commissions and forest management agencies to fix perched culverts and rehabilitate eroding stream crossings (altered hydrologic regimes, altered sediment loads)
- Work with road commissions and forest management agencies to site and build effective new stream crossings (altered hydrologic regimes, altered sediment loads)

LAW & POLICY

- Continue developing and refining planning and zoning regulations and ordinances (altered sediment loads)
- Enforce the use of sediment barriers and best management practice's during road siting, construction, and maintenance (altered sediment loads)
- Promote green-space planning (altered sediment loads)
- Restrict dredging and channelization activities especially during spawning and migration seasons and near mussel beds (dredging and channelization)
- Strengthen environmental laws (all threats)

EDUCATION & AWARENESS

- Educate riparian landowners of the importance of vegetated riparian buffers and the ecological services they provide (altered sediment loads)

Research and Survey Needs

- Determine amount of sediment loading to the watershed
- Determine life history requirements for SGCN associated with this landscape feature
- Determine the number and condition of erosion sites
- Inventory erosion sites within watersheds and conduct remediation activities at those sites

Monitoring

- Dam operations
- Erosion sites
- Riparian modification
- Road and stream crossings
- Sand and gravel mining