

Aquatic Characteristic: Rock Substrates



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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

This habitat is considered 25% in good to excellent condition, 15% in fair condition, and 60% in degraded to very degraded condition.

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*)
creek heelsplitter (*Lasmigona compressa*)
snuffbox (*Epioblasma triquetra*)
wavy-rayed lampmussel (*Lampsilis fasciola*)
black sandshell (*Ligumia recta*)
fawnsfoot (*Truncilla donaciformis*)

INSECTS

ocellated damer (*Boyeria grafiana*)
splendid clubtail (*Gomphus lineatifrons*)
rapids clubtail (*Gomphus quadricolor*)
pygmy snaketail (*Ophigomphus howei*)
riverine snaketail (*Stylurus amnicola*)
tiger spiketail (*Cordulegaster erronea*)
arrowhead spiketail (*Cordulegaster obliqua*)
a stonefly (*Ostrocerca albidipennis*)
a stonefly (*Arcynopteryx compacta*)
a stonefly (*Helopicus nalatus*)
Hungerford's crawling water beetle (*Brychius hungerfordi*)

FISH

lake sturgeon (*Acipenser fulvescens*)
brassy minnow (*Hybognathus hankinsoni*)
striped shiner (*Luxilus chrysocephalus*)

FISH cont.

river chub (*Nocomis micropogon*)
pugnose shiner (*Notropis anogenus*)
bigmouth shiner (*Notropis dorsalis*)
western creek chubsucker (*Erimyzon claviformis*)
lake chubsucker (*Erimyzon sucetta*)
black buffalo (*Ictiobus niger*)
spotted sucker (*Minytrema melanops*)
river redhorse (*Moxostoma carinatum*)
black redhorse (*Moxostoma duquesnei*)
golden redhorse (*Moxostoma erythrurum*)
brown bullhead (*Ameiurus nebulosus*)
stonecat (*Noturus flavus*)
tadpole madtom (*Noturus gyrinus*)
cisco or lake herring (*Coregonus artedii*)
slimy sculpin (*Cottus cognatus*)
deepwater sculpin (*Myoxocephalus thompsonii*)
fantail darter (*Etheostoma flabellare*)
least darter (*Etheostoma microperca*)
banded darter (*Etheostoma zonale*)
sauger (*Sander canadensis*)

AMPHIBIANS

mudpuppy (*Necturus maculosus maculosus*)

REPTILES

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

MAMMALS

water shrew (*Sorex palustris*)

Associated Threats

MODIFICATION OF NATURAL PROCESSES

- Altered hydrologic regimes: Altered flow regime; Ditch run-off during storm or snowmelt events
- Climate change: (low threat)
- Fragmentation

POLLUTION

- Altered nutrient inflows
- Altered sediment loads: Agricultural practices can increase sediment loads; Increased sediment transport; Sedimentation; Upland erosion; Sedimentation from old logging scars that haven't healed; Current logging practices; Road crossings; Culverts
- Pesticides and herbicides
- Thermal changes
- Urban, municipal, and industrial pollution

HABITAT CONVERSION

- Dams
- Dredging and channelization: Channelization; Dredging
- Incompatible natural resources management
- Riparian modification: Unregulated development
- Wetland modification

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

BIOLOGICAL INTERACTIONS

- Disease, pathogens, and parasites
- Invasive plants and animals: (low threat)

CONSUMPTIVE BIOLOGICAL RESOURCE USE

- Forestry practices
- Mining practices: Gravel mining
- Removal of wildlife

NON-CONSUMPTIVE BIOLOGICAL RESOURCE USE

- Macrophyte removal: (low threat)

EDUCATION

- Lack of scientific knowledge: (low threat)
- Social attitudes: (low threat)

Conservation Actions Needed (Threats addressed)

LAND, WATER & SPECIES MANAGEMENT

- Maintain or establish riparian buffers of at least 50 ft., but 500 ft. or wider maximizes conservation benefits (altered hydrologic regimes, altered sediment loads, riparian modification)
- Maintain or rehabilitate natural hydrology (altered hydrologic regimes)
- Reduce pesticide and herbicide use (pesticides and herbicides)
- Soften or remove hard stream and shoreline structures (riparian modification)
- Survey erosion sites within watershed and develop strategies to address problems (altered nutrient inflows, altered sediment loads)
- Use natural materials or soft engineering instead of hard structures for shoreline or riparian modification (riparian modification)
- Work with road commissioners on siting and maintaining river crossings (altered hydrologic regimes, altered sediment loads)

LAW & POLICY

- Encourage townships to separate combined sewer systems (altered nutrients inflows)
- Enforce the use of sediment barriers and best management practices during road siting, construction, and maintenance (altered sediment loads)
- Implement and continually improve storm water and non-point source best management practices (altered hydrologic regimes, urban, municipal, and industrial pollution)
- Remove dams to rehabilitate natural hydrology and habitat connectivity (altered hydrologic regimes, dams, fragmentation)
- Restrict and impose mitigation and remediation requirements on mining activities (mining practices)
- Restrict dredging and channelization (dredging and channelization)
- Strengthen existing environmental laws and enforcement of permits controlling effluent discharge (variety of threats)
- Strengthen wetland regulations, mitigation requirements, and enforcement (wetland modification)
- Use best management practices (Variety of threats)
- Work with Drain Commissioners to use natural channel processes to allow a river to manage sediment and flow and decrease the amount of channelization needed (variety of threats)
- Work with local governments to develop and refine planning and zoning regulations and ordinances that consider natural processes (variety of threats)

EDUCATION & AWARENESS

- Educate public on the use of and reasons for maintaining septic systems (altered nutrients inflows)
- Expand education programs for the general public regarding natural processes and stewardship issues (social attitudes)

Research and Survey Needs

- Determine effective prevention, control, and survey techniques for aquatic invasive species
- Determine amount of sediment loading to a watershed
- Determine incompatible natural resource management threats
- Determine life history requirements for SGCN associated with rock substrates
- Determine number of dams and identify those which no longer serve a necessary purpose
- Determine number and condition of erosion sites
- Determine number of sand and gravel mining operations in each watershed
- Model hydrologic flows

Monitoring

- Aquatic invasive species
- Dam operations

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