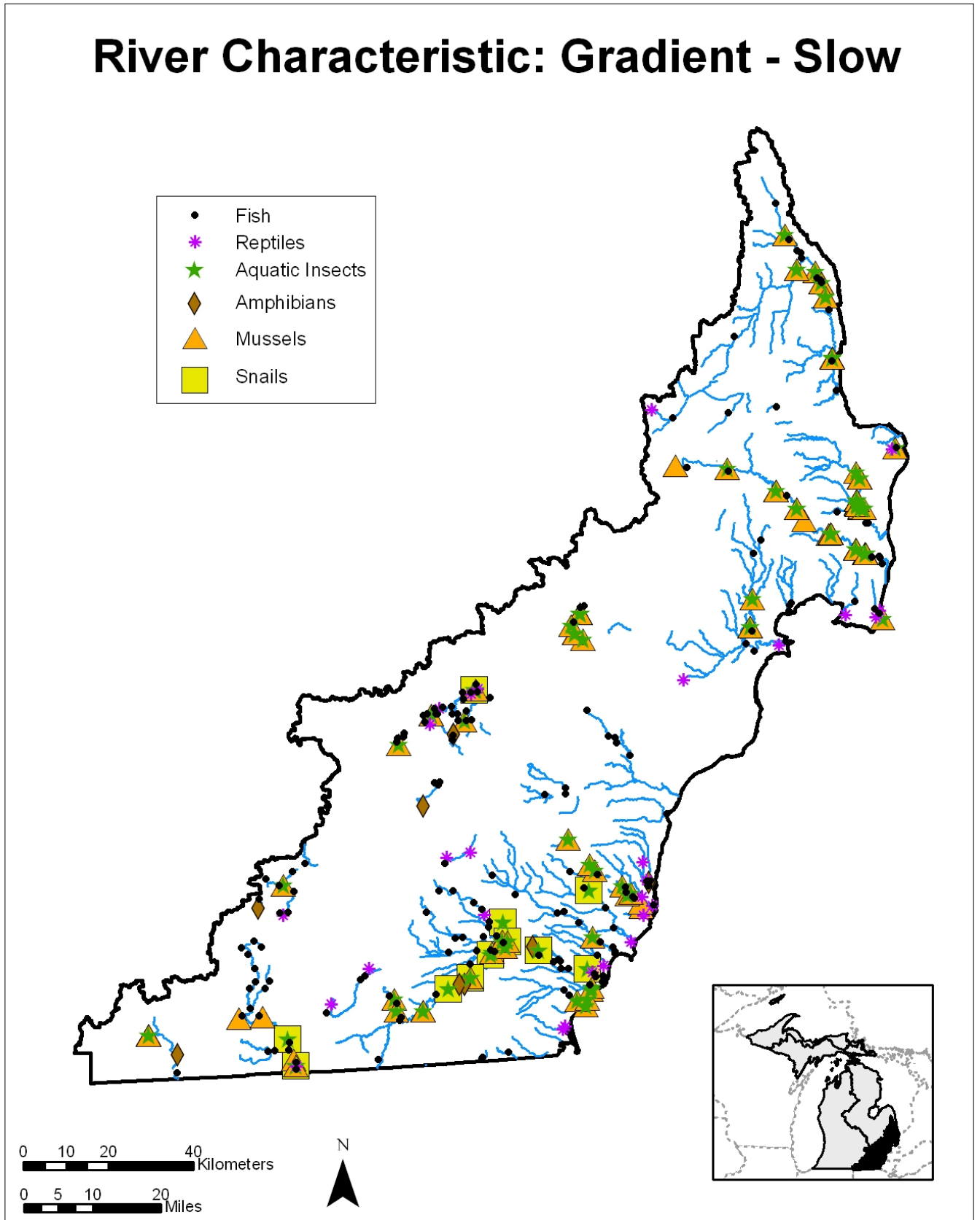


River Characteristic: Gradient - Slow



River Characteristic: Gradient – Slow

Description

Gradient is the general slope, or the change in vertical elevation per unit of horizontal distance, of the water surface in a flowing stream. Slow gradient is defined as having a change in the vertical elevation of the water surface of a flowing stream ranging from 0.0-3.9 feet per mile.

General Condition of Feature

This habitat is considered 20% in good to excellent condition, 30% in fair condition, and 50% in degraded to very degraded condition.

Associated Species of Greatest Conservation Need

MUSSELS

cylindrical papershell (*Anodontoides ferussacianus*)
eastern pondmussel (*Ligumia nasuta*)
round hickorynut (*Obovaria subrotunda*)
fawnsfoot (*Truncilla donaciformis*)

SNAILS

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

CRAYFISH

digger crayfish (*Fallicambarus fodiens*)

INSECTS

a sand minnow mayfly (*Siphloplecton basale*)
splendid clubtail (*Gomphus lineatifrons*)
Laura's snaketail (*Stylurus laurae*)
a stonefly (*Taeniopteryx burksi*)
a stonefly (*Taeniopteryx maura*)
a stonefly (*Paracapnia opis*)

FISH

lake sturgeon (*Acipenser fulvescens*)
mooneye (*Hiodon tergisus*)
redside dace (*Clinostomus elongatus*)
striped shiner (*Luxilus chrysocephalus*)
silver chub (*Macrhybopsis storeriana*)
pugnose shiner (*Notropis anogenus*)
pugnose minnow (*Opsopoeodus emiliae*)
finescale dace (*Phoxinus neogaeus*)

FISH cont.

western creek chubsucker (*Erimyzon claviformis*)
lake chubsucker (*Erimyzon sucetta*)
spotted sucker (*Minytrema melanops*)
golden redhorse (*Moxostoma erythrurum*)
brown bullhead (*Ameiurus nebulosus*)
tadpole madtom (*Noturus gyrinus*)
brindled madtom (*Noturus miurus*)
grass pickerel (*Esox americanus*)
pirate perch (*Aphredoderus sayanus*)
fantail darter (*Etheostoma flabellare*)
least darter (*Etheostoma microperca*)
orangethroat darter (*Etheostoma spectabile*)
channel darter (*Percina copelandi*)
river darter (*Percina shumardi*)
sauger (*Sander canadensis*)

AMPHIBIANS

smallmouth salamander (*Ambystoma texanum*)
four-toed salamander (*Hemidactylium scutatum*)
mudpuppy (*Necturus maculosus maculosus*)
Blanchard's cricket frog (*Acris crepitans blanchardi*)

REPTILES

copperbelly water snake (*Nerodia erythrogaster neglecta*)
queen snake (*Regina septemvittata*)
Blanding's turtle (*Emydoidea blandingii*)

Associated Threats

MODIFICATION OF NATURAL PROCESSES

- Altered hydrologic regimes: Flow flashiness due to faster runoff from storm water management
- Fragmentation

POLLUTION

- Altered nutrient inflows: Altered macrophytes; Altered water quality related to dissolved oxygen; Nutrient enrichment
- Altered sediment loads: Sedimentation due to increased inputs from construction; Sedimentation; Siltation
- Urban, municipal, and industrial pollution: Contaminated sediments

HABITAT CONVERSION

- Dredging and channelization: Channelization; Dredging
- Riparian modification: Altered banks and riparian areas; Lack of woody debris; Loss of riparian habitat; bank armoring and manipulation and macrophyte removal
- Wetland modification: Loss of wetlands (low threat)

BIOLOGICAL INTERACTIONS

- Invasive plants and animals

EDUCATION

- Social attitudes: Need for public education

Conservation Actions Needed (Threats addressed)

LAND, WATER & SPECIES MANAGEMENT

- Encourage use of natural materials or soft engineering techniques for riparian modification (riparian modification)

- Implement Best management practices (variety of threats)
- Maintain and rehabilitate natural corridors between significant habitats such as wetlands and other water bodies (fragmentation, riparian modification)
- Maintain stream crossings (altered hydrologic regimes, altered sediment loads)
- Maintain, rehabilitate, and protect riparian buffers (altered hydrologic regimes, altered sediment loads, riparian modification)
- Prevent and control aquatic invasive species introductions and establishments (invasive plants and animals)
- Protect and rehabilitate groundwater recharge (altered hydrologic regimes)
- Protect, maintain, and rehabilitate wetlands and floodplains (altered hydrologic regimes, altered sediment loads, wetland modification)
- Use sediment barriers and best management practices during road and stream crossing construction (altered sediment loads)
- Vegetation management should be preformed in conjunction with a watershed management plan (invasive plants and animals, riparian modification)
- Work with road commissions on siting and maintaining road crossings (altered hydrologic regimes, altered sediment loads)

LAW & POLICY

- Avoid stream relocations (dredging and channelization)
- Engineered drainage channels should mimic natural stream channel stability (altered hydrologic regimes, altered sediment loads, dredging and channelization)
- Pipeline and utility crossings should use existing crossings and bore and jack or directional drill installation (altered hydrologic regimes, altered sediment loads)
- Work with Drain Commissioners to use natural channel processes to allow a river to manage sediment and flow (altered hydrologic regimes, altered sediment loads, dredging and channelization, riparian modification)
- Work with local officials on setback and buffer ordinances (riparian modification)

EDUCATION & AWARENESS

- Educate landowners on the value of riparian areas (riparian modification, social attitudes)

Research and Survey Needs

- Determine effective control and prevention techniques for aquatic invasive species
- Determine life history requirements for SGCN associated with slow gradients
- Determine ways to decrease imperviousness in the watershed
- Survey sediment loadings to stream and develop strategies to reduce problems

Monitoring

- Aquatic invasive species
- Riparian modification
- Stream crossings
- Wetland and floodplain modification