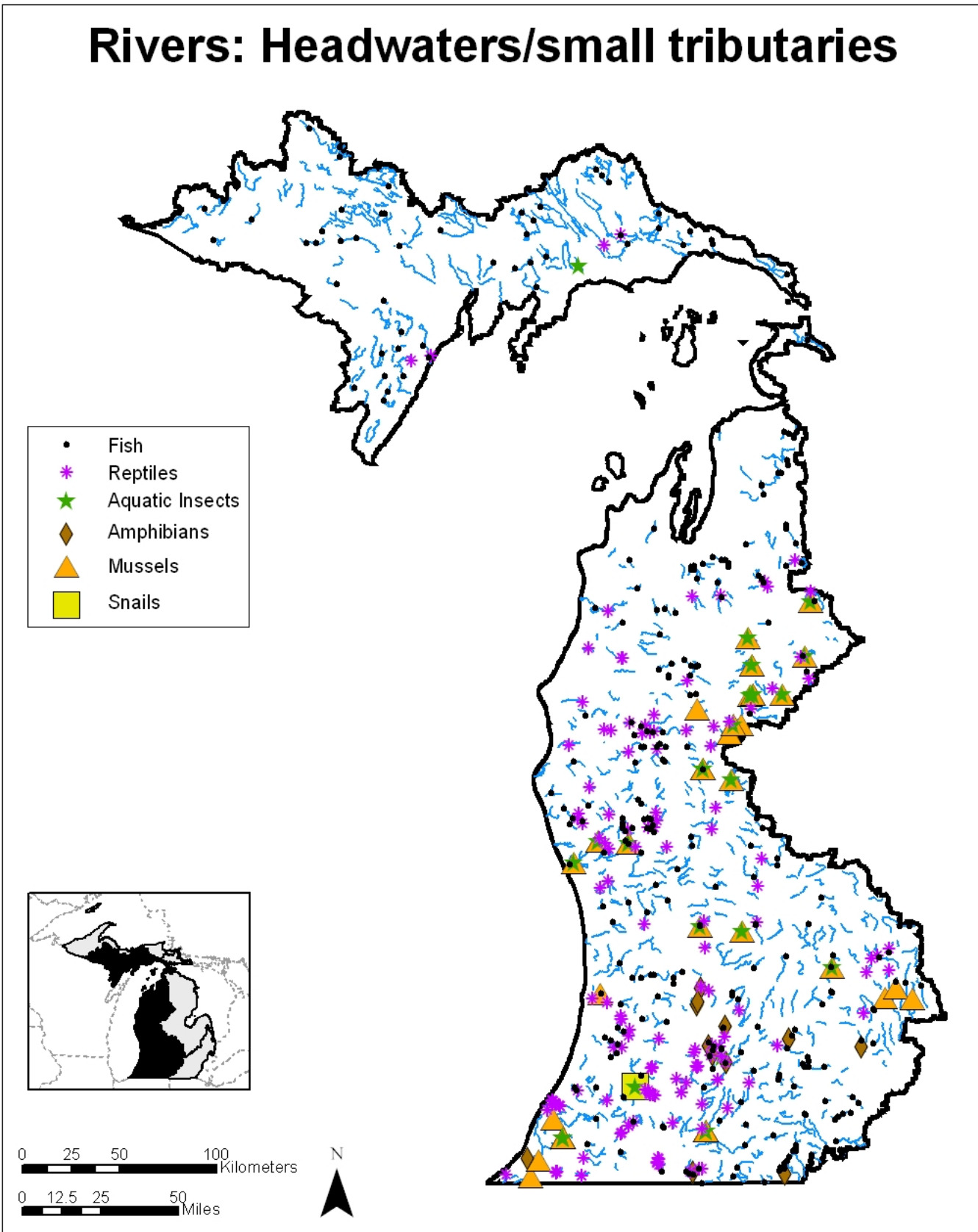


## Rivers: Headwaters/small tributaries



## Rivers: Headwaters & Small Tributaries

### Description

Headwater streams and small tributaries are wadeable systems that have a midpoint catchment area (the land area above the midpoint of the stream from which water drains towards the stream) less than 40 square miles. These low stream order systems join together to form larger streams and rivers, or run directly into other streams, rivers, and lakes. They have great influence on the collective health and functioning of the primary stream network to which they belong. Headwater streams and small tributaries tend to be strongly affected by riparian vegetation. Headwater streams and small tributaries range in temperature from cold to warm. This landscape feature is a catch-all for species with no recorded water temperature preferences as reported in primary literature.

### General Condition of Feature

This habitat is considered 40% in good to excellent condition, 15% in fair condition, and 45% in degraded to very degraded condition.

### Associated Species of Greatest Conservation Need

#### MUSSELS

- slippershell mussel (*Alasmidonta viridis*)
- ellipse (*Venustaconcha ellipsiformis*)
- cylindrical papershell (*Anodontoides ferussacianus*)
- creek heelsplitter (*Lasmigona compressa*)
- eastern pondmussel (*Ligumia nasuta*)

#### SNAILS

- Petoskey pondsnail (*Stagnicola petoskeyensis*)
- brown walker (*Pomatiopsis cincinnatiensis*)

#### CRAYFISH

- devil crawfish (*Cambarus diogenes*)
- digger crayfish (*Fallicambarus fodiens*)

#### INSECTS

- grey petaltail (*Tachopteryx thoreyi*)
- ocellated damer (*Boyeria grafiana*)
- Laura's snaketail (*Stylurus laurae*)
- tiger spiketail (*Cordulegaster erronea*)
- arrowhead spiketail (*Cordulegaster obliqua*)
- Hine's emerald dragonfly (*Somatochlora hineana*)

#### INSECTS cont.

- incurvate emerald dragonfly (*Somatochlora incurvata*)
- a stonefly (*Ostrocerca albidipennis*)
- a stonefly (*Arcynopteryx compacta*)
- Douglas Stenelmis riffle beetle (*Stenelmis douglasensis*)
- a dobsonfly (*Nigronia fasciatus*)

#### AMPHIBIANS

- four-toed salamander (*Hemidactylum scutatum*)
- mudpuppy (*Necturus maculosus maculosus*)
- Fowler's toad (*Bufo fowleri*)
- Blanchard's cricket frog (*Acris crepitans blanchardi*)

#### REPTILES

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

### Associated Threats

#### MODIFICATION OF NATURAL PROCESSES

- Altered hydrologic regimes: Groundwater modification; Water withdrawals
- Climate change (low threat)
- Fragmentation: Road crossings and culverts can fragment habitat

#### POLLUTION

- Altered nutrient inflows: Changes in allochthonous inputs (low threat)
- Altered sediment loads: Modification of habitat due to erosion (low threat)
- Thermal changes: Water temperature increases & changes

#### HABITAT CONVERSION

- Dams: Beaver dams; human made dams
- Dredging and channelization: Channelization
- Incompatible natural resources management; Erosion control reduces sand banks, helps fish management but reduces nesting sites for wood turtles (low threat)
- Riparian modification: Riparian development
- Wetland modification: (low threat)

#### CONSUMPTIVE BIOLOGICAL RESOURCE USE

- Forestry practices: (low threat)

#### EDUCATION

- Social attitudes: Education is needed to explain to landowners and the public the importance of leaving headwaters undeveloped

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

Conservation Actions Needed (Threats addressed)

*LAND & WATER PROTECTION*

- Create and/or expand conservation easements (variety of threats)
- Support land conservancy purchase of undeveloped land (variety of threats)
- Support landowner incentive programs to foster conservation on private land (variety of threats)

*LAND, WATER & SPECIES MANAGEMENT*

- Decrease the amount of impervious surfaces within watershed (altered hydrologic regimes)
- Engineered drainage channels should mimic natural stream channel stability, i.e., channel dimension, pattern, and profile (dredging and channelization)
- If culverts are necessary, use single large capacity culverts that match bankfull channel width (altered hydrologic regimes, fragmentation)
- Maintain or rehabilitate river to original flow path and hydrologic functions, i.e., seasonal flooding, throughflow (altered hydrologic regimes)
- Manage beaver populations for a variety of natural resource uses (altered hydrologic regimes, dams)
- Soften or remove hard stream structures (riparian modification)
- Work with road commissions to fix perched culverts that are barriers to aquatic species movements (altered hydrologic regimes, fragmentation)

*LAW & POLICY*

- Avoid stream relocations (dredging and channelization)
- Encourage green space planning (riparian modification)
- Encourage use of bridges over culverts for new crossings (altered hydrologic regimes, fragmentation)
- Implement and continually improve storm water and non-point source best management practices (variety of threats)
- Limit water withdrawals in flow-limited or groundwater fed systems (altered hydrologic regimes)
- Protect and rehabilitate groundwater recharge by requiring that all development-related runoff be captured by infiltration basins (altered hydrologic regimes)
- Protect the public trust by requiring dam owners to make appropriate financial provisions for future dam removal or perpetual maintenance (dams)
- Remove dams to rehabilitate natural hydrology and connectivity of system (altered hydrologic regimes, dams, fragmentation)
- Remove lake-level control structures (altered hydrologic regimes, dams)
- Restrict dredging and channelization activities on headwater streams, especially during spawning and breeding seasons (dredging and channelization)
- Strengthen existing water quality laws (variety of threats)
- Work with Drain Commissioners to use natural channel processes to allow a stream to manage sediment and flow and decrease the amount of channelization needed (altered hydrologic regimes, altered sediment loads, dredging and channelization)
- Work with local governments to develop and refine planning and zoning regulations and ordinances that consider natural processes (variety of threats)
- Work with local officials on setback and buffer ordinances (riparian modification)
- Use best management practices (variety of threats)

*EDUCATION & AWARENESS*

- Educate legislators, other policy makers, and the public on the importance of natural headwater stream watersheds and natural processes (variety of threats)

*CAPACITY BUILDING*

- Support watershed councils and regional conservation groups (variety of threats)

Research and Survey Needs

- Inventory the amount and condition of riparian buffer
- Determine effective ways of communicating natural resource concerns with the public
- Determine effective ways of getting local planning groups to work together
- Investigate life history strategies for SCGN that use headwaters and small tributaries
- Create hydrologic models of headwaters and small tributaries and their watersheds
- Determine amphibian and reptile movement corridors
- Determine mussel, snail, and crayfish distributions
- Determine the number and condition of road and stream crossings
- Develop alternatives to current drainage practices (altered hydrologic regimes, dredging and channelization)
- Inventory dams and determine those that no longer serve a useful purpose
- Inventory stream crossings and address those which are eroding or interfering with stream flow
- Inventory wetlands and floodplains and determine their condition
- Determine temperature preferences for associated fish species

- Test and compare benefits of best management practice's as conservation tools (riparian modifications)

**Monitoring**

- Amphibian and reptile corridors
- Channelization
- Land use changes
- Mussels populations
- Riparian modification
- Road crossings
- Septic systems and wastewater treatment plants
- Storm water flows
- Stream modification
- Stream water temperatures
- Wetland modifications