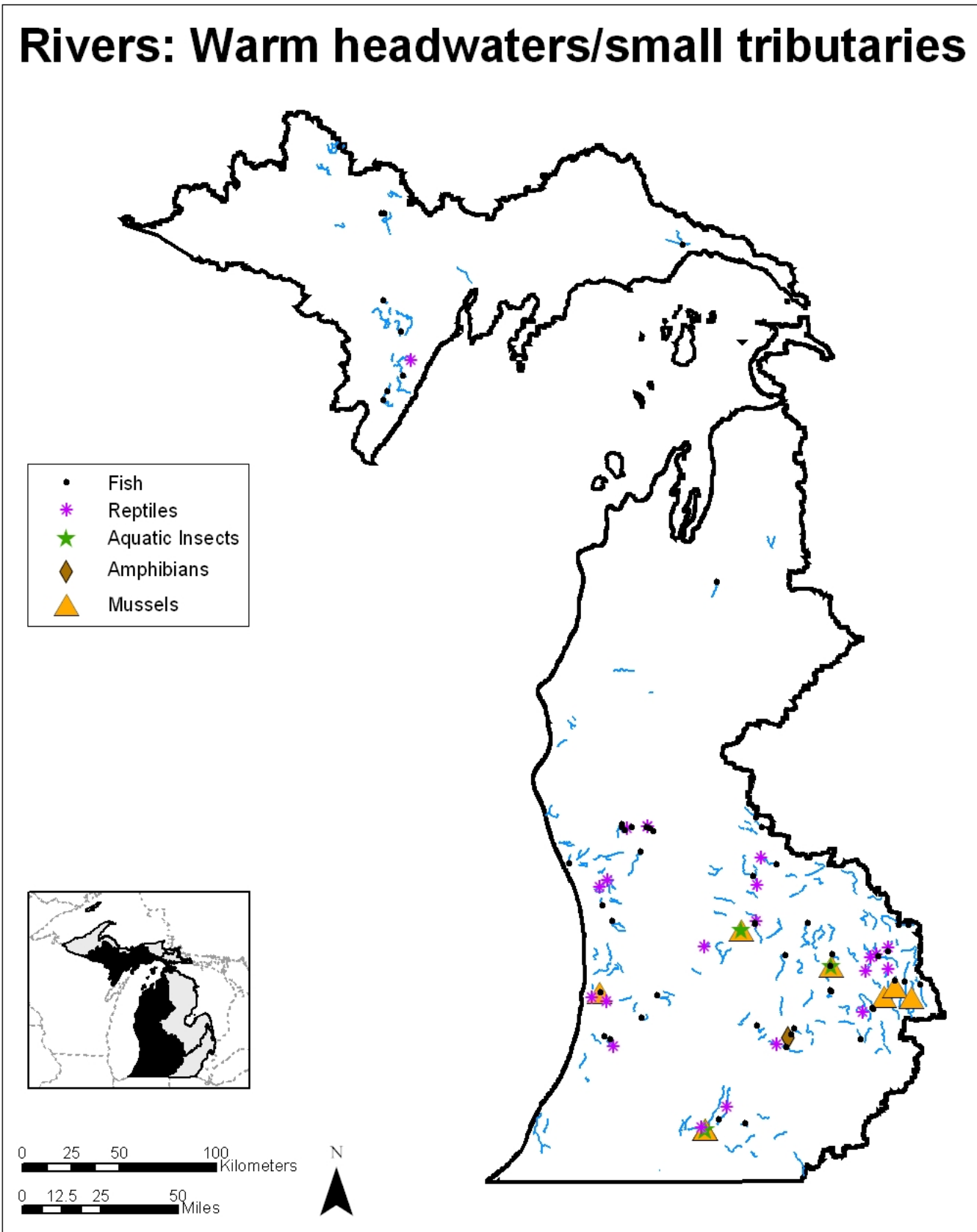


## Rivers: Warm headwaters/small tributaries



## Rivers: Warm Headwater & 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.

Warm headwater streams and small tributaries are generally low-gradient, runoff-driven systems that pass through unconfined alluvial valleys, but tend to have lower baseflows and higher peak flows than cool headwater systems. July weekly mean temperatures in these systems are greater than 22°C (72°F).

### General Condition of Feature

This habitat is considered 35% in good to excellent condition, 20% in fair condition, and 45% in degraded to very degraded condition.

### Associated Species of Greatest Conservation Need

#### MUSSELS

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

#### INSECTS

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

#### FISH

striped shiner (*Luxilus chrysocephalus*)  
pugnose shiner (*Notropis anogenus*)  
bigmouth shiner (*Notropis dorsalis*)  
western creek chubsucker (*Erimyzon claviformis*)  
golden redhorse (*Moxostoma erythrurum*)

#### FISH cont.

grass pickerel (*Esox americanus*)  
starhead topminnow (*Fundulus dispar*)  
fantail darter (*Etheostoma flabellare*)  
least darter (*Etheostoma microperca*)  
banded darter (*Etheostoma zonale*)

#### AMPHIBIANS

western lesser siren (*Siren intermedia nettingi*)

#### REPTILES

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

### Associated Threats

#### MODIFICATION OF NATURAL PROCESSES

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

#### POLLUTION

- Altered sediment loads: Unstable banks from cattle and human access; Increased sedimentation alters habitat for spawning
- Pesticides and herbicides
- Urban, municipal, and industrial pollution

#### HABITAT CONVERSION

- Dams
- Dredging and channelization: Channelization
- Riparian modification: Agriculture development
- Wetland modification: Wetland filling; Reducing wetlands alters headwaters of warm streams

#### CONSUMPTIVE BIOLOGICAL RESOURCE USE

- Forestry practices: (low threat)
- Removal of wildlife: (low threat)

#### NON-CONSUMPTIVE BIOLOGICAL RESOURCE USE

- Macrophyte removal: (low threat)

#### EDUCATION

- Social attitudes

### 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)

## MICHIGAN'S WILDLIFE ACTION PLAN

### AQUATIC SYSTEMS: LAKE MICHIGAN BASIN

#### *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)
- Maintain and rehabilitate natural hydrology (altered hydrologic regimes)
- 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 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)
- Reduce pesticide and herbicide use (pesticides and herbicides)
- Soften or remove hard stream structures (riparian modification)
- Survey erosion sites within watersheds and develop strategies to reduce identified problems (altered sediment loads)
- Work with road commissions on placement and maintenance of stream crossings (altered sediment loads)
- 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 townships to separate combined sewer systems (altered hydrologic regimes, altered nutrient inflows)
- Encourage use of bridges over culverts for new crossings (altered hydrologic regimes, fragmentation)
- Enforce the use of sediment barriers and best management practices during road siting, construction, and maintenance (altered sediment loads)
- If culverts are necessary, use single large capacity culverts that match bankfull channel width (altered hydrologic regimes, fragmentation)
- Implement and continually improve storm water and non-point source best management practices (Urban, municipal, and industrial pollution)
- Include wetland protections in zoning and planning ordinances (wetland modification)
- 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 connectivity of system (dams, fragmentation)
- Remove dams to rehabilitate natural hydrology (altered hydrologic regimes, dams)
- Remove lake-level control structures (altered hydrologic regimes, dams)
- Restrict dredging and channelization activities on headwater streams (dredging and channelization)
- Strengthen existing water quality laws (Urban, municipal, and industrial pollution)
- 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 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)

#### *EDUCATION & AWARENESS*

- Educate legislators, other policy makers, and the public on the importance of natural headwater stream watersheds and natural processes (social attitudes)
- Educate the public on the use of and reasons for maintaining septic systems (altered nutrient inflows)
- Work with and educate ORV groups to provide environmentally friendly stream crossings (altered sediment loads)

#### *CAPACITY BUILDING*

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

#### Research and Survey Needs

- Create hydrologic models of warm headwaters and small tributaries and their watersheds
- Determine how much riparian corridor exists and its condition
- Determine use of warm headwaters and small tributaries by mussel, aquatic insect, and reptile SGCN
- Determine ways of decreasing imperviousness in southern watersheds
- Develop alternatives to current drainage practices
- Explore other options to dams

- Inventory dams and determine those that no longer serve a useful purpose
- Inventory erosion sites and conduct remediation activities
- Inventory stream crossings and address those which are eroding or interfering with stream flow
- Inventory wetlands and floodplains and determine their condition
- Create more opportunities for the public to learn about natural processes

**Monitoring**

- Channelization
- Effluent discharges: waste water treatment plants, septic systems
- Filling of streams and wetlands
- Indicator species
- Land use changes
- Riparian modification
- Storm water flows
- Stream enclosures
- Stream modifications
- Stream water temperatures
- Water withdrawals
- Wetland modifications