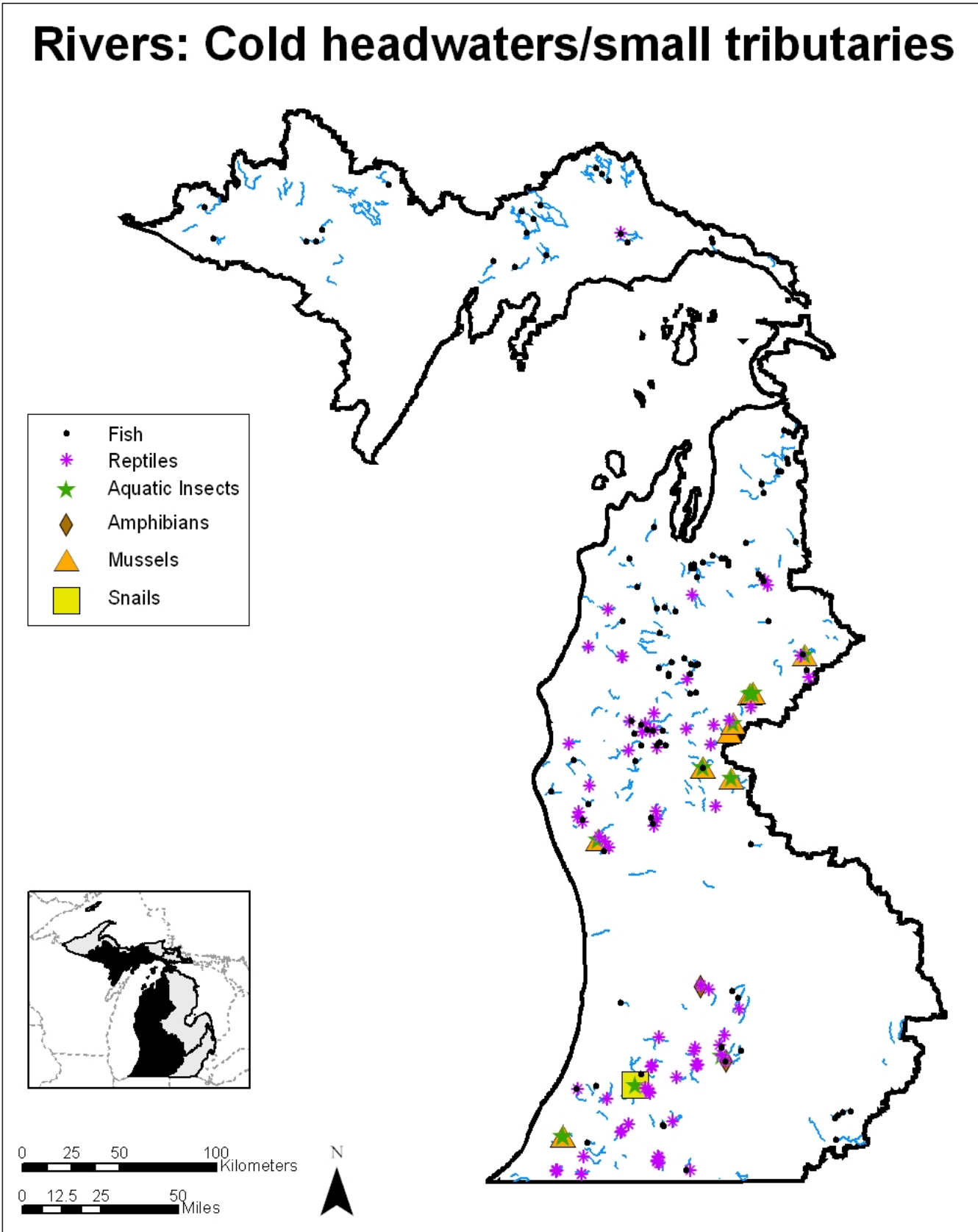


# Rivers: Cold headwaters/small tributaries



## Rivers: Cold 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

Cold headwater streams and small tributaries in Michigan are typically groundwater-dominated systems that pass through unconfined alluvial valleys of varying gradient, although some runoff-driven systems occur. Baseflows are relatively high and stable. July weekly mean temperature in these streams is less than 19°C (66°F).

### General Condition of Feature

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

#### *SNAILS*

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*

brassy minnow (*Hybognathus hankinsoni*)  
finescale dace (*Phoxinus neogaeus*)

#### *FISH cont.*

slimy sculpin (*Cottus cognatus*)

#### *AMPHIBIANS*

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

#### *REPTILES*

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

#### *MAMMALS*

water shrew (*Sorex palustris*)

### Associated Threats

#### *MODIFICATION OF NATURAL PROCESSES*

- Altered hydrologic regimes: Groundwater modification; Irrigation; Water withdrawals
- Climate change: (low threat)
- Fragmentation: Stream crossings create passage barriers; Road culverts (perched, sedimentation) fragment cold headwaters and tributaries

#### *POLLUTION*

- Altered nutrient inflows
- Altered sediment loads: Increased sediment deposition; ORV crossings increase sedimentation
- Pesticides and herbicides: Sea Lamprey control chemical treatments
- Thermal changes: Changes in temperature regime; Sedimentation and removing canopy (increase stream temp)
- Urban, municipal, and industrial pollution: Road crossings and associated problems - pollution

#### *HABITAT CONVERSION*

- Dams: Sea Lamprey control barriers; Small dams, community mill ponds can create barriers and increase stream temperatures; Beavers and habitat change
- Dredging and channelization: Channelization
- Incompatible natural resources management: Beaver dams; Riparian and aspen management; Fish management practices (stocking)
- Riparian modification: Beaver dams; Riparian & aspen management; General development - urban, industrial, agricultural; Riparian development, including building inline dams; Riprap and other bank stabilization and armoring; Sedimentation and removing canopy (increase stream temp) are main threats
- Wetland modification:

#### *CONSUMPTIVE BIOLOGICAL RESOURCE USE*

- Forestry practices: Forest clearing warms up water; Logging- improper practices; Timber harvest
- Mining practices
- Removal of wildlife: Mussel Collection

#### *NON-CONSUMPTIVE BIOLOGICAL RESOURCE USE*

- Non-consumptive recreation: ORV crossings increase sedimentation

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

*EDUCATION*

- Social attitudes: Beaver dams; Riparian and aspen management; Public impounds tributaries to create backyard ponds

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)
- Encourage use of bridges over culverts for new crossings (altered hydrologic regimes, fragmentation)
- 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, but 500 ft. or wider maximizes conservation benefits (altered hydrologic regimes, altered sediment loads, forestry practices, riparian modification, thermal changes)
- 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)

*LAW & POLICY*

- Avoid stream relocations (dredging and channelization)
- Continue to work on forest certification endeavors (forestry practices)
- Encourage green space planning (riparian modification)
- Enforce the use of sediment barriers and best management practices during road siting, construction, and maintenance (altered sediment loads)
- 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)
- Implement and continually improve storm water and non-point source best management practices (variety of threats)
- Impose mitigation and remediation for mining impacts (mining practices)
- Impose mitigation practices to minimize logging effects (forestry practices)
- 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 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 (dredging and channelization)
- Restrict surface disturbances to no closer than ¼ mile to any surface water (mining practices)
- Strengthen water quality laws (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 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)
- 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)

*EDUCATION & AWARENESS*

- Educate legislators, other policy makers, and the public on the importance of natural headwater stream watersheds and natural processes (variety of threats)
- 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 cold headwaters and small tributaries in each watershed
- Determine the number and condition of road and stream crossings
- Determine use of cold headwaters and small tributaries by mussel, snail, aquatic insect, amphibian, and reptile SGCN
- Determine ways of decreasing imperviousness in southern watersheds
- Determine ways to decrease temperature swings from retention and detention basins in urbanized watersheds
- Determine effect of different lumber harvest methods on hydrologic flow regimes of a watershed
- Explore other options to dams
- Inventory erosion sites and conduct remediation activities
- Model hydrologic flows in each watershed
- Test and compare benefits of Best Management Practice's as conservation tools

Monitoring

- Channelization
- Dam operations
- Indicator species
- Land use changes
- Logging operations
- Riparian modification
- Sediment loading
- Stream modifications
- Stream water temperature and flows
- Water withdrawals
- Wetland modifications