



## 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, 35% in fair condition, and 20% in degraded to very degraded condition.

### Associated Species of Greatest Conservation Need

#### *INSECTS*

a net-winged midge (*Blepharicera tenuipes*)

#### *FISH*

reidside dace (*Clinostomus elongatus*)

slimy sculpin (*Cottus cognatus*)

spoonhead sculpin (*Cottus ricei*)

#### *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: Low levels of groundwater; Altered flow regime
- Fragmentation: Beaver activity can block migration to spawning areas; Road crossings; Culverts

#### *POLLUTION*

- Altered sediment loads: ORV crossings
- Pesticides and herbicides: (low threat)
- Thermal changes: Changes in thermal regime
- Urban, municipal, and industrial pollution: Pollution in groundwater (low threat)

#### *HABITAT CONVERSION*

- Dams: Beaver dams can block migration to spawning areas; Mining dams can lead to impaired habitat
- Dredging and channelization: Channelization (low threat)
- Riparian modifications: Removing canopy; Road crossings
- Wetland modifications

#### *BIOLOGICAL INTERACTIONS*

- Invasive plants and animals: (low threat)

#### *CONSUMPTIVE BIOLOGICAL RESOURCE USE*

- Forestry practices: Logging practices near headwaters areas can cause serious habitat problems
- Mining practices: Mining dams; Proposed mining in basin has potential to impair headwater system

### Conservation Actions Needed (Threats addressed)

#### *LAND & WATER PROTECTION*

- Create and 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*

- Maintain and establish riparian buffers of at least 50 ft., but 500 ft. or wider maximizes conservation benefits (variety of threats)
- Maintain and rehabilitate natural hydrology (altered hydrologic regimes)
- Maintain or rehabilitate streams to original flow paths and hydrologic functions, i.e., throughflow and wetlands (altered hydrologic regimes)
- Manage beaver populations for a variety of natural resources uses (dams, fragmentation)
- Protect existing natural wetlands and rehabilitate degraded wetlands (wetland modification)

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

- Work with road commissions and forest management agencies to fix perched culverts (altered hydrologic regimes, fragmentation)
- Work with road commissions and forest management agencies to site and maintain new road crossings (altered hydrologic regimes, fragmentation)
- Work with road commissions on maintenance and placement of new bridges (altered sediment loads)

**LAW & POLICY**

- Continue Natural Rivers planning (variety of threats)
- Continue to work on forest certification endeavors (forestry practices)
- Encourage clustered development rather than evenly spaced home lots (riparian modifications)
- Encourage green space planning (riparian modifications)
- 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)
- 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)
- Pipeline and utility crossings should use existing stream crossings and bore and jack or directional drill installation methods (fragmentation)
- Protect and rehabilitate groundwater recharge by requiring that development-related runoff be captured by infiltration basins (altered hydrologic regimes)
- Remove dams to rehabilitate natural hydrology and habitat connectivity (altered hydrologic regimes, dams, fragmentation)
- Remove lake-level control structures (altered hydrologic regimes, dams)
- Remove unnecessary or abandoned bridges (fragmentation)
- Restrict mining operations and impose mitigation and remediation requirements for mining impacts (mining practices)
- Restrict surface disturbances to no closer than ¼ mile to any surface water (mining practices)
- Strengthen water quality laws that relate to water temperatures (variety of threats)
- Strengthen wetland regulations, mitigation requirements, and enforcement (wetland modification)
- Use best management practices (variety of threats)
- 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 modifications)

**EDUCATION & AWARENESS**

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

**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 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
- Survey loadings of sediment within watershed and develop strategies to reduce identified problems
- Test and compare benefits of best management practice's as conservation tools

**Monitoring**

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