



Rivers: Cool 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.

Cool headwater streams and small tributaries are usually low-gradient, runoff-driven systems with fair to moderate baseflows and moderate to high peak flows. Many of these systems pass through unconfined alluvial valleys. July weekly mean temperature in cool headwater streams range from 19-22°C.

General Condition of Feature

This habitat is considered 95% in good to excellent condition, 3% in fair condition, and 2% in degraded to very degraded condition.

Associated Species of Greatest Conservation Need

FISH

reside dace (*Clinostomus elongatus*)
brassy minnow (*Hybognathus hankinsoni*)
bigmouth shiner (*Notropis dorsalis*)
finescale dace (*Phoxinus neogaeus*)
least darter (*Etheostoma microperca*)

AMPHIBIANS

pickerel frog (*Rana palustris*)

REPTILES

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

Associated Threats

MODIFICATION OF NATURAL PROCESSES

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

POLLUTION

- Altered sediment loads: Sedimentation
- Pesticides and herbicides: (low threat)
- Thermal changes: Warming
- 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: Canopy removal; Road/stream crossings

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

- If culverts are necessary, use single large capacity culverts that match bankfull channel width (altered hydrologic regimes, fragmentation)
- Maintain and establish riparian buffers of at least 50 ft., but 500 ft. or wider maximizes conservation benefits (variety of threats)
- 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)
- Work with road commissions and forest management agencies to fix perched culverts (altered hydrologic regimes, fragmentation)

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

- 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)
- Impose mitigation practices to minimize logging effects (forestry practices)
- 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)
- 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

- Determine effect of different lumber harvest methods on hydrologic flow regimes of a watershed
- Inventory dams and determine those which no longer serve a useful purpose
- Inventory erosion sites and conduct remediation activities
- Inventory stream crossings and condition
- Model hydrologic flows of cool water streams in each watershed
- Establish effective methods of communicating with the public their stewardship role
- Survey loadings of sediment within watershed and develop strategies to reduce identified problems

Monitoring

- Dam operations
- Forestry practices
- Indicator species
- Mining operations
- Riparian modifications
- Sediment loading
- Stream modification
- Water temperature