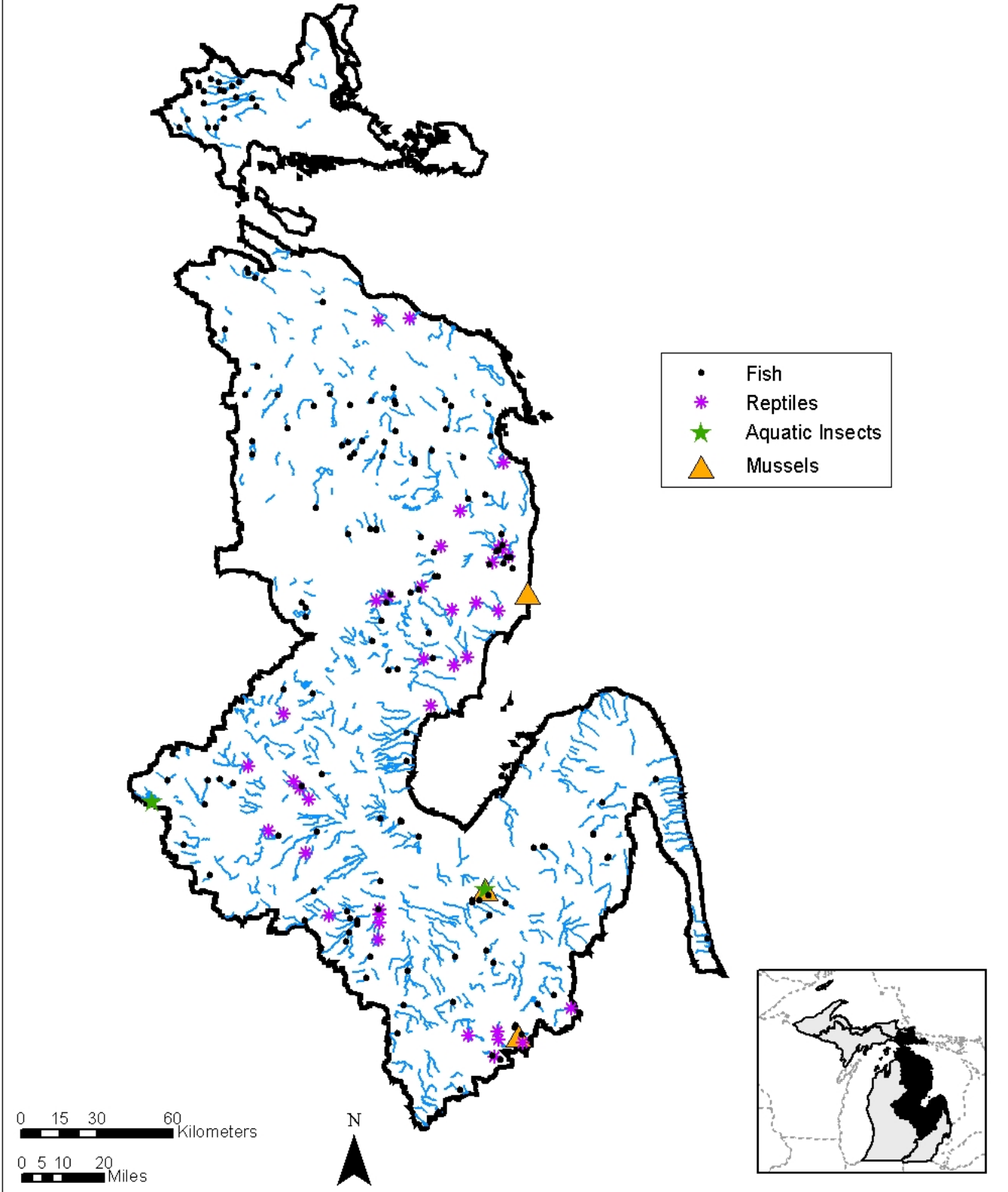


## Rivers: Headwaters/small tributaries



## 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. These streams range from cold to warm in temperature. 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 50% in good to excellent condition, 20% in fair condition, and 30% 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*)
- purple lilliput (*Toxolasma lividus*)

#### CRAYFISH

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

#### INSECTS

- sedge darner (*Aeshna juncea*)
- splendid clubtail (*Gomphus lineatifrons*)
- rapids clubtail (*Gomphus quadricolor*)
- Laura's snaketail (*Stylurus laurae*)
- arrowhead spiketail (*Cordulegaster obliqua*)

#### INSECTS cont.

- Hine's emerald dragonfly (*Somatochlora hineana*)
- incurvate emerald dragonfly (*Somatochlora incurvata*)
- a stonefly (*Ostrocerca albidipennis*)
- a stonefly (*Arcynopteryx compacta*)
- a dobsonfly (*Nigronia fasciatus*)

#### AMPHIBIANS

- four-toed salamander (*Hemidactylium scutatum*)
- mudpuppy (*Necturus maculosus maculosus*)
- Blanchard's cricket frog (*Acris crepitans blanchardi*)

#### REPTILES

- queen snake (*Regina septemvittata*)
- Blanding's turtle (*Emydoidea blandingii*)
- wood turtle (*Glyptemys insculpta*)
- eastern box turtle (*Terrapene carolina carolina*)

### Associated Threats

#### MODIFICATION OF NATURAL PROCESSES

- Altered hydrologic regimes: In-line ponds; Road crossings; Culverts

#### POLLUTION

- Altered sediment loads: Erosion; Sedimentation
- Thermal changes: Increased thermal loading

#### HABITAT CONVERSION

- Dams: Beaver dams; Impoundments
- Dredging and channelization: Dredging; Filling
- Riparian modification: Land use practices within stream corridors, for example logging, urbanization, agriculture, etc.

#### BIOLOGICAL INTERACTIONS

- Invasive plants and animals: (low threat)

#### EDUCATION

- Social attitudes

### Conservation Actions Needed (Threats addressed)

#### LAND & WATER PROTECTION

- Create or expand conservation easements (all threats)
- Support land conservancy purchase of undeveloped land (all threats)

#### LAND, WATER & SPECIES MANAGEMENT

- Avoid stream relocations (altered hydrologic regimes, altered sediment loads, dredging and channelization, riparian modification)
- Conduct inventories of erosion sites within watersheds and conduct remediation activities at those sites (altered sediment loads)
- Develop comprehensive management plans that consider all interest groups (all threats)

## MICHIGAN'S WILDLIFE ACTION PLAN

### AQUATIC SYSTEMS: LAKE HURON BASIN

- Encourage use of, maintain, or establish riparian buffers of at least 50 ft., but 500 ft. or wider maximizes conservation benefits (altered hydrologic regimes, altered sediment loads, forestry practices, riparian modification, thermal changes, wetland modification)
- Engineered drainage channels should mimic natural stream channel stability (channel dimension, pattern, and profile) (altered hydrologic regimes, altered sediment loads, dredging and channelization)
- Explore other options to dams (i.e., seasonal electric barriers) (dams)
- Manage beaver populations for a variety of natural resource uses (dams)
- Remove dams to rehabilitate riparian and stream habitat and natural hydrology when possible (altered flows, altered sediment loads, dams)
- Rehabilitate channel diversity (dredging and channelization)
- Rehabilitate destroyed or degraded wetlands (altered hydrologic regimes, altered sediment loads)
- Rehabilitate rivers to their original flow paths and hydrologic functions (i.e., seasonal flooding, connect meanders, throughflow, wetlands, etc.) (altered hydrologic regimes)
- Work with road commissions to fix perched culverts and rehabilitate eroding stream crossings (altered hydrologic regimes, altered sediment loads)
- Work with road commissions to site and build effective new stream crossings (altered hydrologic regimes, altered sediment loads)

#### *LAW & POLICY*

- Assess dam siting to ensure minimal affects and require fish passage both upstream and downstream, using natural fishways (exp. Rock arch ramps and bypass channels) where feasible (dams)
- Continue regulating facilities that remove and discharge water into rivers (altered hydrologic regimes, thermal changes)
- Continue working with, developing, and refining planning and zoning regulations and ordinances (altered hydrologic regimes, altered sediment loads, riparian modification, wetland modification)
- Discourage and limit water withdrawals in flow limited and groundwater fed systems (altered hydrologic regimes)
- Enact and enforce better wetland regulations and mitigation requirements (altered hydrologic regimes, altered sediment loads, wetland modification)
- Enforce the use of sediment barriers and best management practice's during road siting, construction, and maintenance (altered sediment loads)
- Ensure that existing environmental laws are enforced (altered sediment loads)
- Protect and rehabilitate groundwater recharge by requiring that all development-related runoff be captured by infiltration basins (altered hydrologic regimes)
- Protect riparian greenbelts through adoption and enforcement of zoning standards (altered sediment loads)
- Protect the natural hydrologic regime of streams by protecting existing wetlands, floodplains, and natural upland areas (altered hydrologic regimes)
- Protect the public trust by requiring dam owners to make appropriate financial provisions for future dam removal or perpetual maintenance (dams)
- Redraft the Michigan Drain code (altered hydrologic regimes)
- Work with regulatory agencies to restrict dredging and channelization activities, especially during spawning & breeding and migration seasons (dredging and channelization)

#### *EDUCATION & AWARENESS*

- Continue educating the public about the benefits of wetlands (social attitudes, wetland modification)
- Continue working with and educating Drain Commissioners (altered hydrologic regimes, altered sediment loads, dredging and channelization, riparian modification, wetland modification)
- Educate legislators, local planning boards, and other policy makers on the importance of natural processes
- Educate riparian land owners and townships on the importance of vegetated riparian buffers along streams (altered hydrologic regimes, altered sediment loads, riparian modification, social attitudes, thermal changes)

#### Research and Survey Needs

- Determine mussel and crayfish distributions
- Determine amphibian and reptile movement corridors
- Determine life history strategies of those SGCN that are lacking this information including temperature preferences
- Determine the number and condition of road and stream crossings
- Determine ways to decrease temperature swings from retention and detention basins in urbanized watersheds
- 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
- Test and compare benefits of Best Management Practice's as conservation tools (riparian modification)

#### Monitoring

- Channelization

- Land use changes
- Riparian modification
- Storm water flows
- Stream modification
- Stream water temperatures
- Wetland modification