



## **Rivers: Warm Large Rivers**

### Description

Large rivers are wadeable and non-wadeable systems that have a midpoint catchment area from 180 to 620 square miles. Large rivers are intermediate stream order systems with diverse substrate and habitat. Warm large rivers in Michigan are generally runoff-driven systems with low to moderate baseflow, high peak flows, and low gradient. The majority flow through unconfined glacial or alluvial valleys. July weekly mean temperatures in these systems are greater than 22°C (72°F).

### General Condition of Feature

This habitat is considered 55% in good to excellent condition, 40% in fair condition, and 5% in degraded to very degraded condition.

### Associated Species of Greatest Conservation Need

#### *FISH*

- lake sturgeon (*Acipenser fulvescens*)
- bigmouth shiner (*Notropis dorsalis*)

### Associated Threats

#### *MODIFICATION OF NATURAL PROCESSES*

- Altered hydrologic regimes: Altered flow regime (low threat)

#### *POLLUTION*

- Altered sediment loads: Sedimentation (low threat)

#### *HABITAT CONVERSION*

- Dams
- Dredging and channelization: Channelization
- Riparian modifications: Riparian development; Road/stream crossings

#### *BIOLOGICAL INTERACTIONS*

- Invasive plants and animals: (low threat)

#### *CONSUMPTIVE BIOLOGICAL RESOURCE USE*

- Forestry practices
- Removal of wildlife

### Conservation Actions Needed (Threats addressed)

#### *LAND & WATER PROTECTION*

- Continue to support landowner incentive programs to foster conservation on private land (variety of threats)

#### *LAND, WATER & SPECIES MANAGEMENT*

- Encourage use of natural materials or soft engineering techniques for any riparian modifications (riparian modifications)
- Maintain or establish riparian buffers of at least 50 ft., but 500 ft. or wider maximizes conservation benefits (forestry practices, riparian modifications)
- Maintain or rehabilitate river to original flow path and hydrologic functions, i.e. seasonal flooding, connect meanders, throughflow, wetlands (altered hydrologic regimes)
- Rehabilitate channel diversity where possible (dredging and channelization)
- Soften or remove hard river structures (riparian modifications)

#### *LAW & POLICY*

- Assess dam siting to ensure minimal affects and require fish passage both upstream and downstream (dams)
- 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)
- Manage or modify remaining dams to mimic natural river conditions (altered hydrologic regimes, dams)
- Protect aquatic resources by screening turbine intakes at operating hydroelectric dams (dams)
- 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 habitat connectivity (altered hydrologic regimes, dams)

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

- Remove dams to rehabilitate natural hydrology, stream and riparian habitat, and habitat connectivity (altered hydrologic regimes, dams)
- Remove lake-level control structures (altered hydrologic regimes, dams)
- Require natural fishways, i.e., rock arch ramps and bypass channels, for both upstream and downstream movements at dams (dams)
- Restrict dredging and channelization activities, especially during spawning and migration seasons and around mussel beds (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 modifications)
- Work with road commissions and forest management agencies on placement and maintenance of new road crossings (altered hydrologic regimes)

*EDUCATION & AWARENESS*

- Continue to educate boaters and other river users on preventing the spread of aquatic invasive species (invasive plants and animals)
- Educate landowners on the importance of vegetated riparian buffers (riparian modifications)
- Educate legislators, other policy makers, and the public on the natural processes of large rivers and the value of macrophytes, riparian vegetation, natural shorelines, wetlands, and stewardship issues (variety of threats)

*CAPACITY BUILDING*

- Support watershed councils

Research and Survey Needs

- Determine amount and condition of riparian areas
- Determine number and condition of road crossings
- Determine the number and condition of areas that are disconnected from the river
- Inventory dams and determine those which no longer serve a useful purpose
- Explore alternatives to dams
- Model hydrologic flow of each watersheds
- Test and compare benefits of best management practice's as conservation tools

Monitoring

- Channelization
- Dam operations
- Indicator species
- Forestry practices
- Riparian modifications
- Road crossings
- Stream modification
- Stream water temperatures