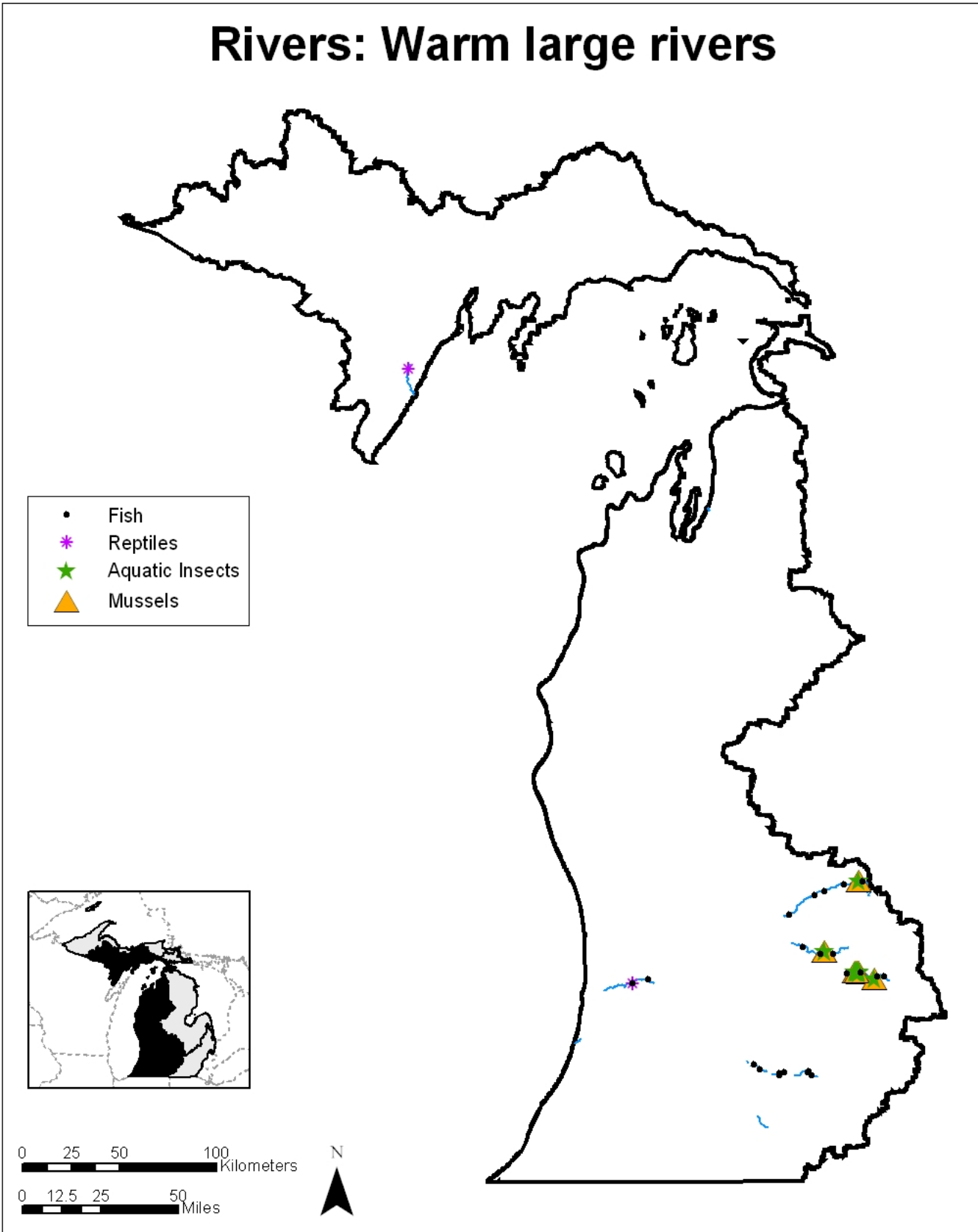


Rivers: Warm large rivers



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 25% in good to excellent condition, 25% in fair condition, and 50% 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

INSECTS

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

FISH

lake sturgeon (*Acipenser fulvescens*)
spotted gar (*Lepisosteus oculatus*)
mooneye (*Hiodon tergisus*)
river chub (*Nocomis micropogon*)
bigmouth shiner (*Notropis dorsalis*)
lake chubsucker (*Erimyzon sucetta*)

FISH cont.

spotted sucker (*Minytrema melanops*)
river redhorse (*Moxostoma carinatum*)
golden redhorse (*Moxostoma erythrurum*)
brown bullhead (*Ameiurus nebulosus*)
stonecat (*Noturus flavus*)
tadpole madtom (*Noturus gyrinus*)
pirate perch (*Aphredoderus sayanus*)
sauger (*Sander canadensis*)

REPTILES

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

Associated Threats

MODIFICATION OF NATURAL PROCESSES

- Altered hydrologic regimes
- Climate change: (low threat)
- Fragmentation: Dams are threat to upstream fish migration especially lake sturgeon; Road crossings and culverts can be barriers to fish

POLLUTION

- Altered nutrient inflows: Urban and municipal sewage
- Altered sediment loads
- Urban, municipal, and industrial pollution: Municipal pollution

HABITAT CONVERSION

- Dams: Dams are a threat to upstream fish migration especially lake sturgeon
- Dredging and channelization: Dredging
- Riparian modification: Marina development
- Wetland modification

BIOLOGICAL INTERACTIONS

- Invasive plants and animals

CONSUMPTIVE BIOLOGICAL RESOURCE USE

- Removal of wildlife: (low threat)

EDUCATION

- Social attitudes: (low threat)

Conservation Actions Needed (Threats addressed)

LAND, WATER & SPECIES MANAGEMENT

- Control and prevent aquatic invasive species introductions and establishments (Invasive plants and animals)
- Develop integrated pest management plans (Invasive plants and animals)
- Engineered drainage channels should mimic natural stream channel stability, i.e., channel dimension, pattern, and profile (dredging and channelization)
- Maintain or establish riparian buffers of at least 50 ft., but 500 ft. or wider maximizes conservation benefits (altered sediment loads, riparian modification)
- Maintain or rehabilitate river to original flow path and hydrologic functions, i.e., seasonal flooding, connect meanders, throughflow, wetlands (altered hydrologic regimes)

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

- Soften or remove hard river structures (riparian modification)
- Work with road commissions on the siting and maintenance of stream crossings (fragmentation)

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 use the most current information and innovative methods in cleaning up chemical spills (Urban, municipal, and industrial pollution)
- Continued vigilance and cooperation on preventing more aquatic invasive species establishments (Invasive plants and animals)
- Encourage sound water withdrawal practices that take into account biotic species needs (altered hydrologic regimes)
- Encourage townships to separate combined sewer systems (altered nutrient inflows)
- Encourage use of natural materials or soft engineering techniques for any river modification (riparian modification)
- Enforce the use of sediment barriers and best management practices during road siting, construction, and maintenance (altered sediment loads)
- Implement and continually improve storm water and non-point source best management practices (Urban, municipal, and industrial pollution)
- Implement USDA soil conservation practices to reduce erosion (altered nutrient inflows)
- Include wetland protections in zoning and planning ordinances (wetland modification)
- Manage or modify remaining dams to release water to mimic natural river conditions (altered hydrologic regimes, dams)
- Protect and rehabilitate groundwater recharge by requiring that all development-related runoff be captured by infiltration basins (altered hydrologic regimes)
- Protect fishery 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)
- Reduce effluent flow (Urban, municipal, and industrial pollution)
- Remove dams to rehabilitate natural hydrology and habitat connectivity (altered hydrologic regimes, dams, fragmentation)
- Require natural fishways, rock arch ramps and bypass channels, for both upstream and downstream fish movements at dams (dams)
- Restrict dredging and channelization, especially during spawning and migration seasons and around mussel beds (dredging and channelization)
- Strengthen and enforce air pollution laws (Urban, municipal, and industrial pollution)
- Strengthen existing water quality laws and enforcement of permits controlling effluent discharge (Urban, municipal, and industrial pollution)
- 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 modification)

EDUCATION & AWARENESS

- Expand education programs for the general public regarding natural processes, invasive species, hydrologic cycles, and stewardship issues (social attitudes)
- Increase education on preventing the spread of aquatic invasive species (Invasive plants and animals, social attitudes)

CAPACITY BUILDING

- Support watershed councils and regional conservation groups (variety of threats)

Research and Survey Needs

- Determine effective prevention, control, and survey techniques for aquatic invasive species
- 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
- Determine the number of groundwater withdrawals in the basin
- Determine use of warm large rivers by mussel, aquatic insect, and reptile SGCN
- Establish effective methods of communicating with the public and enhancing their stewardship role
- Inventory dams and determine those which no longer serve a useful purpose
- Inventory erosion sites and conduct remediation activities
- Explore alternatives to dams
- Model hydrologic flow of each watersheds
- Survey loadings of nutrients and sediments to river and develop strategies to reduce identified problems

- Test and compare benefits of Best Management Practice's as conservation tools

Monitoring

- Dam operations
- Dredging
- Effluent flows: municipal wastewater treatment plants, septic systems
- Indicator species
- Nutrient loadings
- Riparian modification
- Road crossings
- Sediment loading
- Stream modification
- Stream water temperatures