



Rivers: Cool 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. Cool large rivers in Michigan are usually runoff-driven systems with fair to moderate baseflow and peak flow. The gradient varies from low to high and most flow through confined or unconfined glacial or alluvial valleys. July weekly mean temperatures in these systems range from 19-22°C (66-72°F).

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

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*)
mooneye (*Hiodon tergisus*)
black redbhorse (*Moxostoma duquesnei*)
golden redbhorse (*Moxostoma erythrurum*)

FISH cont.

least darter (*Etheostoma microperca*)
channel darter (*Percina copelandi*)
river darter (*Percina shumardi*)
sauger (*Sander canadensis*)

AMPHIBIANS

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

REPTILES

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

Associated Threats

MODIFICATION OF NATURAL PROCESSES

- Altered hydrologic regimes: Increased impervious surfaces on the landscape
- Fragmentation

POLLUTION

- Altered nutrient inflows: Nutrient loading - nitrogen = unionized ammonia
- Altered sediment loads: Erosion; Sedimentation
- Thermal changes: Altered thermal regimes due to increased impervious surfaces on the landscape

HABITAT CONVERSION

- Dams: Fish passage & habitat fragmentation
- Dredging and channelization: Channelization; Dredging; Filling (low threat)
- Riparian modification: Riparian development (low threat)

BIOLOGICAL INTERACTIONS

- Invasive plants and animals

EDUCATION

- Social attitudes: Riparian landowners fail to understand their impacts on the river

Conservation Actions Needed (Threats addressed)

LAND, WATER & SPECIES MANAGEMENT

- Assess dam siting to ensure minimal affects and require both upstream and downstream fish passage (dams, fragmentation)
- Encourage and incorporate best management practices (altered hydrologic regimes, altered nutrient inputs, altered sediment loads, riparian modification, thermal changes)
- Encourage the use of, maintain, or establish riparian buffers of at least 50 ft., but 500 ft. or wider maximizes conservation benefits (altered hydrologic regimes, altered nutrient inputs, altered sediment loads, riparian modification, thermal changes)
- Explore other options to dams (i.e., seasonal electric barriers) (dams, fragmentation)
- Protect and rehabilitate groundwater recharge by requiring that all development-related runoff be captured by infiltration basins (altered hydrologic regimes)
- Protect and rehabilitate wetland functions (altered hydrologic regimes, altered nutrient inputs, altered sediment loads)
- Rehabilitate or maintain rivers to their original flow paths and hydrologic functions (i.e., seasonal flooding, connect meanders, throughflow, wetlands)
- Remove dams to rehabilitate natural hydrology and riparian and stream habitat (altered hydrologic regimes, altered nutrient loads, altered sediment loads, dams)

- Remove hard engineered streams sections and use natural materials or soft engineering techniques for any river modification (riparian modification)
- Work with road commissions and forest management agencies to fix perched culverts and rehabilitate eroding stream crossings (altered hydrologic regimes, altered sediment loads, forestry practices, fragmentation)
- Work with road commissions and forest management agencies to site and build effective new stream crossings (altered hydrologic regimes, altered sediment loads, forestry practices, fragmentation)

LAW & POLICY

- Continue developing and refining planning and zoning regulations and ordinances (altered hydrologic regimes, altered nutrient inputs, altered sediment loads, riparian modification, thermal changes)
- Continue Natural Rivers planning (all threats)
- Continue regulating facilities that remove and discharge water into streams (altered hydrologic regimes, thermal changes)
- Discourage water withdrawals in flow limited and groundwater fed systems (altered hydrologic regimes)
- Encourage clustered development rather than evenly spaced home lots (riparian modification)
- Encourage green-space planning (riparian modification)
- Enforce existing environmental laws (sedimentation, endangered species, effluent discharges, etc.) (all threats)
- Enforce the use of sediment barriers and best management practice's during road siting, construction, and maintenance (altered sediment loads)
- Work with local officials to develop planning and zoning guidelines that consider natural processes (riparian modification)
- Manage water releases of dams to mimic natural river conditions, both in flow and temperature (altered hydrologic regimes, dams, thermal changes)
- Protect fishery resources by screening turbine intakes at operating hydroelectric dams (dams)
- Protect riparian greenbelts through adoption and enforcement of zoning standards (altered hydrologic regimes, altered nutrient inputs, altered sediment loads, riparian modification, thermal changes)
- Protect the natural hydrologic regime of streams by protecting existing wetlands, floodplains, and natural upland areas (altered hydrologic regimes, altered nutrient inputs, altered sediment loads, riparian modification, thermal changes)
- 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)
- Require natural fishways (rock arch dams and bypass channels) for both upstream and downstream fish passage at dams (dams, fragmentation)
- Strengthen water quality laws that relate to temperature (thermal changes)
- Work with Federal agencies on Wild and Scenic River designation in Michigan (all threats)

EDUCATION & AWARENESS

- Continue working with and educating Drain Commissioners (altered hydrologic regimes, altered nutrient inputs, altered sediment loads, riparian modification, social attitudes, thermal changes)
- Educate the landowners and townships on the importance of vegetation riparian buffers (altered hydrologic regimes, altered nutrient inputs, altered sediment loads, riparian modification, social attitudes, thermal changes)

Research and Survey Needs

- Determine stream temperatures in areas lacking data
- 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 cool large rivers by mussel, aquatic insect, amphibian, and reptile SGCN
- Determine ways to decrease temperature swings from retention and detention basins in urbanized watersheds
- Develop alternatives to current drainage practices
- Inventory dams and determine those which no longer serve a useful purpose
- Inventory erosion sites and conduct remediation activities
- Model hydrologic flow of watersheds
- Test and compare benefits of best management practice's as conservation tools

Monitoring

- Dam operations
- Dredging and channelization
- Indicator species
- Riparian modification
- Sediment loading
- Stream modification
- Water temperature