



Inland Lakes: Small Lakes

Description

Small lakes are permanent standing water bodies that are greater than 5 acres and less than 99 acres in area. Water bodies in this group are highly diverse in terms of chemical and biological variables. Stratification status can range from fully stratified throughout the summer season, to no stratification. In lakes with stratification, there is development of true open-water (pelagic) zones that are distinct from shallow nearshore zones. Small lakes can range from cold to warm water depending on amounts of groundwater inflows, lake depth, and climate. Winter oxygen levels are also variable and depend on lake depth. If lakes are shallow (< 2 m average depth), there are two states in which they are generally found. The first is characterized by high nutrients, high wind resuspension, no rooted plants, and turbid water, and the second is characterized by low to medium nutrients, low wind resuspension, rooted plants dominant, and clear water.

General Condition of Feature

This habitat is considered 85% in good to excellent condition, 10% in fair condition, and 5% in degraded to very degraded condition.

Associated Species of Greatest Conservation Need

SNAILS

spindle lymnaea (*Acella haldemani*)

INSECTS

sedge darner (*Aeshna juncea*)

spatterdock darner (*Aeshna mutata*)

lake emerald (*Somatochlora cingulata*)

a stonefly (*Arcynopteryx compacta*)

FISH

bigmouth shiner (*Notropis dorsalis*)

finescale dace (*Phoxinus neogaeus*)

brown bullhead (*Ameiurus nebulosus*)

slimy sculpin (*Cottus cognatus*)

FISH cont.

spoonhead sculpin (*Cottus ricei*)

least darter (*Etheostoma microperca*)

AMPHIBIANS

mudpuppy (*Necturus maculosus maculosus*)

pickerel frog (*Rana palustris*)

northern leopard frog (*Rana pipiens*)

REPTILES

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

MAMMALS

water shrew (*Sorex palustris*)

Associated Threats

MODIFICATION OF NATURAL PROCESSES

- Altered hydrologic regimes: (low threat)
- Fragmentation: Sale of large parcels into smaller shoreline lots (low threat)

POLLUTION

- Altered nutrient inflows: Alterations of shoreline and nutrients into lakes due to shoreline development
- Altered sediment loads
- Pesticides and herbicides: Fertilizers from development and agriculture; macrophyte removal chemicals
- Thermal changes
- Urban, municipal, and industrial pollution: Mercury loading (low threat)

HABITAT CONVERSION

- Dams
- Dredging and channelization
- Riparian modifications: Shoreline development (may be a low threat); Development
- Wetland modifications: (low threat)

BIOLOGICAL INTERACTIONS

- Disease, pathogens, and parasites: (low threat)
- Invasive plants and animals: Eurasian Milfoil

CONSUMPTIVE BIOLOGICAL RESOURCE USE

- Removal of wildlife: Over harvest of fish species (low threat)

NON-CONSUMPTIVE BIOLOGICAL RESOURCE USE

- Macrophyte removal

Conservation Actions Needed (Threats addressed)

LAND & WATER PROTECTION

- Continue to support landowner incentive programs to foster conservation on private lands (variety of threats)
- Create and expand conservation easements (riparian modifications, wetland modification)
- Support land conservancy purchase of undeveloped land (riparian modifications, wetland modification)

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

LAND, WATER & SPECIES MANAGEMENT

- Control and prevent aquatic invasive species introductions and establishments (invasive plants and animals)
- Maintain or establish riparian buffers of at least 50 ft., but 500 ft. or wider maximizes conservation benefits (altered sediment loads, riparian modifications, thermal changes)
- Protect existing natural wetlands and rehabilitate degraded wetlands (altered nutrient inflows, altered sediment loads, thermal changes)
- Reduce pesticide and herbicide use (pesticides and herbicides)
- Removal of invasive vegetation should preserve 60-80% of native vegetation (invasive plants and animals)

LAW & POLICY

- Continued vigilance and cooperation on preventing aquatic invasive species establishments (invasive plants and animals)
- Encourage townships to separate combined sewer systems (altered nutrient inflows)
- Enforce the use of sediment barriers and best management practices during road siting, construction, and maintenance (altered sediment loads)
- Restrict dredging in small lakes, especially during spawning and breeding seasons (dredging and channelization)
- Strengthen water quality law, including those related to water temperatures (variety of threats)
- Upgrade septic systems (altered nutrient inflows)
- Use best management practices (variety of threats)
- Work with Drain Commissioners to allow or closely mimic natural hydrologic processes on lake-level control structures (altered hydrologic regimes)
- 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 landowners and lake users on preventing the spread of invasive species (invasive plants and animals)
- Educate the public on the use of and reasons for maintaining septic systems (altered nutrient inflows)

Research and Survey Needs

- Determine effective prevention, control, and survey techniques for aquatic invasive species
- Determine breeding migration pathways of amphibians and reptiles at important small lake systems
- Determine effects of over-zealous macrophyte removal on native vegetation and species communities
- Determine unknown life history requirements for SGCN associated with small lakes
- Determine the amount of shoreline development along small lakes
- Determine the number of natural lake outlets and socially acceptable ways of maintaining them
- Determine effects of over zealous macrophyte removal on native vegetation and species communities
- Determine effects of various pollutants on small lakes and their processes
- Survey loadings of sediments to small lakes and develop strategies to reduce identified problems

Monitoring

- Aquatic invasive species
- Indicator species
- Land use changes
- Macrophyte removals
- Pesticide and herbicide use
- Riparian modifications
- Stream modification
- Water levels in water-level controlled lakes to ensure they mimic natural hydrologic regimes within lake
- Water temperatures