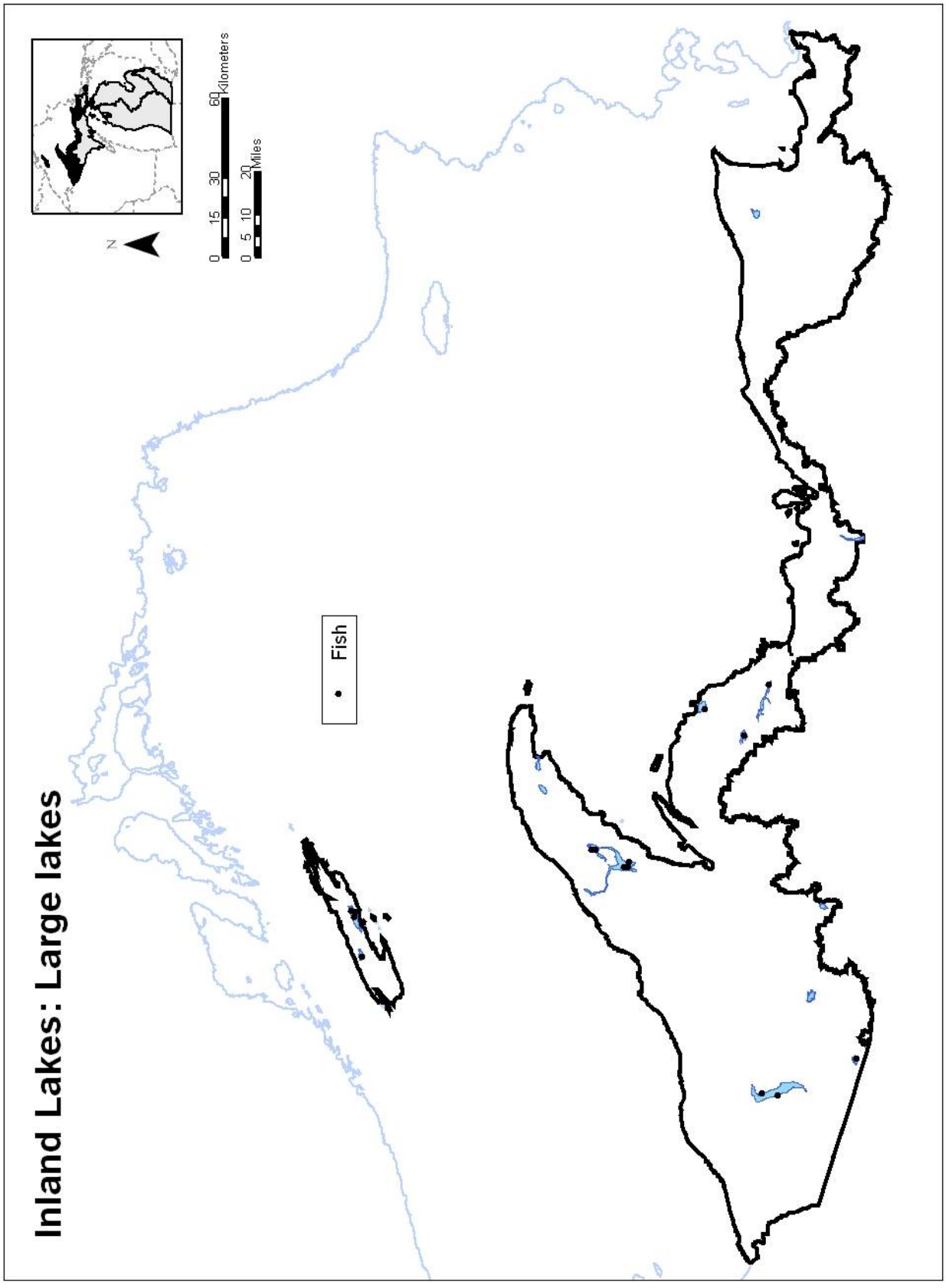
Inland Lakes: Large lakes
Fish
N
0 15 30 60 Kilometers
0 5 10 20 Miles

Inland Lakes: Large Lakes

Description

Large lakes are permanent standing water bodies greater than 1000 acres in area. These lakes are more homogeneous in terms of chemical and biological variables than smaller lakes, although there is still some diversity. They are typically oligotrophic to mesotrophic and most are dominated by open-water zones (pelagic) and are stratified. Large lakes are more likely to have wave-washed shores compared to smaller lakes and are unlikely to have low winter oxygen levels. There is more diversity of within-lake habitats in these lakes than smaller lakes. These lakes are the most likely to have public access points.

General Condition of Feature

This habitat is considered 84% in good to excellent condition, 15% in fair condition, and 1% in degraded to very degraded condition.

Associated Species of Greatest Conservation Need

SNAILS
acorn ramshorn (*Planorbella multivolvis*)

INSECTS
stygian shadowdragon (*Neurocordulia yamaskanensis*)
lake emerald (*Somatochlora cingulata*)

FISH
lake sturgeon (*Acipenser fulvescens*)
brown bullhead (*Ameiurus nebulosus*)

FISH cont.
cisco or lake herring (*Coregonus artedi*)
slimy sculpin (*Cottus cognatus*)
spoonhead sculpin (*Cottus ricei*)
deepwater sculpin (*Myoxocephalus thompsonii*)
sauger (*Sander canadensis*)

AMPHIBIANS
mudpuppy (*Necturus maculosus maculosus*)

Associated Threats

POLLUTION
- Altered nutrient inflows: Increased eutrophication due to development
- Altered sediment loads: (low threat)
- Pesticides& herbicides: (low threat)
- Urban, municipal, and industrial pollution: Mercury loading

HABITAT CONVERSION
- Dams: Large hydro-dam impoundments
- Dredging and channelization: Shoreline development (low threat)
- Riparian modifications: Conversion of corporate lands to private development; Development

BIOLOGICAL INTERACTIONS
- Disease, pathogens, and parasites: (low threat)
- Invasive plants and animals: Exotics not a problem yet

CONSUMPTIVE BIOLOGICAL RESOURCE USE
- Removal of wildlife: (low threat)

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)

LAND, WATER & SPECIES MANAGEMENT
- Control and prevent aquatic invasive species introductions and establishments (invasive plants and animals)
- Develop management plans for medium lakes (invasive plants and animals)
- Maintain or establish riparian buffers of at least 50 ft., but 500 ft. or wider maximizes conservation benefits (riparian modifications)
- Protect existing natural wetlands and rehabilitate degraded wetlands (altered nutrient inflows, altered sediment loads, thermal changes, urban, municipal, and industrial pollution (pollution)
- Removal of invasive vegetation should preserve 60-80% of native vegetation (invasive plants and animals)
- Require all vegetation management to occur in conjunction with a watershed management plan (invasive plants and animals)
- Soften or remove hard shoreline structures (riparian modifications)
- Use natural materials or soft engineering instead of hard structures for shoreline modification (riparian modifications)

LAW & POLICY

- Continued vigilance and cooperation on preventing more aquatic invasive species establishments (invasive plants and animals)
- Enact and enforce shoreline protection regulations (riparian modifications)
- Encourage townships to separate combined sewer systems (altered nutrient inflows)
- Implement and continually improve storm water and non-point source best management practices (urban, municipal, and industrial pollution)
- Reduce effluent flow (urban, municipal, and industrial pollution)
- Restrict dredging in large lakes, especially during spawning and breeding seasons (dredging and channelization)
- Strengthen water quality and air pollution laws (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 Drain Commissioners to use natural processes to manage sediment and flows and decrease the amount of channelization needed (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)

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
- Conduct mudpuppy surveys and determine status of populations
- Determine the amount of shoreline development in large lakes
- Determine the number of natural lake outlets and socially acceptable ways of maintaining them
- Determine the number and method of operation of lake-level control structures
- Determine unknown life history requirements for SGCN associated with large lakes

Monitoring

- Aquatic invasive species
- Indicator species
- Effluent discharges: waste water treatment plants, septic systems; industrial
- Lake-level control structures
- Land use changes
- Riparian modifications