The Lake Michigan Natural Division

Characteristics

Lake Michigan is a dynamic deepwater oligotrophic ecosystem that supports a diverse mix of native and non-native species. Although the watershed, wetlands, and tributaries that drain into the open waters are comprised of a wide variety of habitat types critical to supporting its diverse biological community this section will focus on the open water component of this system. Watershed, wetland, and tributaries issues will be addressed in the Northeastern Morainal Natural Division section.

Species diversity, as well as their abundance and distribution, are influenced by a combination of biotic and abiotic factors that define a variety of open water habitat types. Key abiotic factors are depth, temperature, currents, and substrate. Biotic activities, such as increased water clarity associated with zebra mussel filtering activity, also are critical components.

Nearshore areas support a diverse fish fauna in which yellow perch, rockbass and smallmouth bass are the more commonly found species in Illinois waters. Largemouth bass, rockbass, and yellow perch are commonly found within boat harbors. A predator-prey complex consisting of five salmonid species and primarily alewives populate the pelagic zone while bloater chubs, sculpin species, and burbot populate the deepwater benthic zone.

Challenges

Invasive species, substrate loss, and changes in current flow patterns are factors that affect open water habitat. Construction of revetments, groins, and landfills has significantly altered the Illinois shoreline resulting in an immeasurable loss of spawning and nursery habitat. Sea lampreys and alewives were significant factors leading to the demise of lake trout and other native species by the early 1960s. Zebra mussels and other invasive species are significantly impacting the existing rehabilitated fishery while Asian carp are threatening to invade the Great Lakes through the Chicago Sanitary and Ship Canal system.

Opportunities

The Great Lakes state, federal, tribal, and provincial resource agencies have agreed to the Joint Strategic Plan for Management of the Great Lakes Fisheries. The Lake Michigan Committee coordinates fishery management activities for Lake Michigan. Fish Community Objectives have been agreed to by the Lake Michigan jurisdictional agencies. A reporting process for monitoring progress toward achieving these objectives also has been implemented.

Environmental Objectives are being developed to address environmental and habitat issues that are impeding progress toward achievement of the Fish Community Objectives. Critical pollutants are being addressed through the Lake Michigan Lakewide Management Plan.

A Remedial Action Plan is addressing the only Area of Concern in Illinois waters of Lake Michigan.

Constituent groups, such as Salmon Unlimited, Lake Michigan Federation, and Trout Unlimited provide lobbying support for legislation and funding necessary for prevention of new introductions of aquatic nuisance species and their dispersal, and support lake and brook trout restoration in Lake Michigan.

The open water portion of lake Michigan in Illinois hosts significant numbers of wintering common goldeneye and long-tailed ducks, and loons, grebes, scaup, mergansers and other ducks during spring and fall migration.

Management Guidelines

Effective management of the Lake Michigan fishery requires that Illinois manage its fishery as an integral component of a whole lake management strategy. The long-term objectives for achieving a sustainable fishery are described in the Lake Michigan Fish Community Objectives. Environmental Objectives are being developed to address the environmental and habitat issues that are impeding achievement of the Fish Community Objectives. Environmental issues in the Illinois waters are being addressed through the Waukegan Remedial Action Plan and the Lake Michigan Lakewide Management Plan.

Natural communities

Lake Michigan is a dynamic deepwater oligotrophic ecosystem. The present day fish community is a mix of native and nonnative species that comprise a heavily managed and unstable fishery. The historic fish community consisted of lake trout as the top predator preying upon whitefish, ciscoes, bloater chubs, sculpins, and yellow perch. By the early 1960s the historic fish community had collapsed from the combination of environmental abuse, unregulated harvest, and sea lamprey predation. The existing fishery consists of five salmonid predator species maintained by stocking and yellow perch, and a forage base primarily of alewives, rainbow smelt, and bloater chubs.

Critical species

Lake sturgeon, lake herring; re-establishment of self-sustaining lake trout populations is a critical objective

Emphasis Game & Commercial Species

Nearshore sport fishery consisting primarily of yellow perch, rock bass, smallmouth bass and occasional brook trout. Open water sport fishery consisting primarily of Chinook salmon, coho salmon, rainbow trout, brown trout, and lake trout. Only bloater chubs can be commercially fished in Illinois waters. Yellow perch were commercially fished until poor recruitment forced the 1996 closure of this fishery.

Nongame Indicator Species

lake sturgeon, lake herring, emerald shiners, slimy sculpin, deepwater sculpin, common loon, horned grebe

Recreational Opportunities

The Illinois waters of Lake Michigan provide unique pedestrian and boat fishing opportunities for warm and cold water species. There is a spring and summer sport fishery for coho salmon, Chinook salmon, lake trout, rainbow trout and brown trout. Lower water temperatures near shore in early spring and late fall create trout and salmon fishing opportunities for shore fishermen. Yellow perch generally are caught throughout the year from shore, boats, and winter ice fishing. Smallmouth bass and largemouth bass are generally caught by boat fishermen in harbors and along nearshore structures. Shore fishermen also commonly catch several other species, such as rock bass, common carp, and blue gill.

Education/Interpretive

Chicago has several prominent museums. The Shedd Aquarium exhibits include species from the Great Lakes. The Department's Chicago Urban Fishing Program provides fishing clinics for teaching fishing to kids. The clinics are coordinated with the summer fishing programs sponsored by the Chicago Park District.

Natural Resource Commodities

Historically several fish species were commercially harvested by fishermen utilizing ports in Chicago and Waukegan. After the collapse of the lake trout fishery, two species (bloater chubs and yellow perch) were harvested commercially until 1996 when the commercial harvest of yellow perch was reduced to zero due to poor recruitment.

Key Actions

Achieve no net loss of the productive capacity of habitat supporting Lake Michigan's fish communities. High priority should be given to the restoration and enhancement of historic riverine spawning and nursery areas for anadromous species. Development of an accurate habitat inventory system is necessary to achieve a no-net-loss of the productive capacity of habitat supporting Lake Michigan fish communities.

A geographic information system has been developed but more accurate substrate mapping with finer resolution is necessary to improve its effectiveness as a research and management tool.

Prevent Asian carp species from invading the Great Lakes by way of the Chicago Sanitary and Ship Canal system.

Development of effective ballast water discharge standards to prevent new aquatic nuisance species introductions and dispersal through ballast water discharge.

Prevention of new aquatic nuisance species introductions and dispersal through bait shops, pet shops, live food markets, and other potential pathways.

Suppress the sea lamprey within Lake Michigan to allow the achievement of other fish-community objectives.

Restore self-sustaining lake trout populations, and evaluate the feasibility of restoring native brook trout.

Research and monitoring programs must be augmented to provide the necessary information to progressively manage for a sustainable trout and salmon fishery that is primarily maintained through hatchery stockings.

Diporeia, a benthic crustacean, is a critical component in the Lake Michigan food web. Their abundance has declined substantially in Lake Michigan but the mechanism for this decline is poorly understood and needs to be addressed with ecological studies.

Identify the most important and traditional zones for migratory and wintering waterbirds, and reduce harassment by recreational watercraft.

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