FISHERY RESEARCH PRIORITIES FOR THE GREAT LAKES
Great Lakes Fishery Commission

Current as of October 2025

This listing was compiled based on input from the lake committees and their technical committees and from discussions within the Council of Lake Committees (for more information go to **https://www.glfc.org/council-of-lake-committees.php**) and the Great Lakes Fish Health Committee (**http://www.glfc.org/boardcomm/fhealth/fhealth.php**). Order of listing does **not** imply relative ranking of priorities for the Fishery Research Program funding.

BASIN-WIDE FISHERY RESEARCH PRIORITIES FOR THE GREAT LAKES

Great Lakes Fishery Commission

Updated October 2025

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Research Priorities

The following three high priority research areas should help the Great Lakes Fishery Commission in selecting proposals that are submitted to the Fishery Research Program. These priority areas (in no specific order) are:

Recruitment:

- Spatial, temporal and/or biophysical factors influencing recruitment success
- Relative contributions of native and naturalized populations (e.g. Chinook and Steelhead)

Food Web Dynamics:

- Linking prey availability to recruitment success and biomass trends
- Mapping spatial and seasonal prey distributions and their influence on predator foraging and sampling accuracy
- Understanding relative use of prey fish supply by native and naturalized predator fish

Habitat Restoration:

- What habitat types yield the greatest reproductive success and recruitment?
- What are species-specific bottlenecks (e.g. Walleye, Cisco, Lake Trout, Whitefish)?
- What amount and quality of habitat is needed to achieve measurable population gains?
- How does barrier removal affect connectivity and native fish community structure?

FISHERY RESEARCH PRIORITIES:
LAKE ONTARIO
Great Lakes Fishery Commission

Updated October 31, 2010

This listing was compiled based on input from the Lake Ontario lake committee and its technical committee and from discussions within the Council of Lake Committees (for more information go to **https://www.glfc.org/council-of-lake-committees.php**). Order of listing does **not** imply relative ranking of priorities for the Fishery Research Program funding.

Research Priorities

The Lake Ontario ecosystem is extremely dynamic, and has experienced rapid and significant change in the last decade. The following research priorities were developed by the Lake Ontario Technical Committee, and are presented in the framework of "Fish Community Objectives for Lake Ontario" (Stewart et al. 1999, **http://www.glfc.org/pubs/SpecialPubs/Sp99_1.pdf**). Please note that the current fish community objectives (FCO) document was prepared in 1997, and recent/ongoing disruptions in food web dynamics have rendered some objectives obsolete.

1. Nearshore Fish Community

The nearshore fish community will be composed of a diversity of self-sustaining native fish species characterized by:

a. Maintenance of existing walleye populations and expansion of walleye populations into favorable habitats
   - What are the impacts of thiamine deficiency on walleye?
   - Other than the Bay of Quinte, are there other sources of walleye recruitment to the Eastern Basin and other area of Lake Ontario?
   - Can walleye spawning runs be re-established in Eastern Basin tributaries, and is there adequate forage to sustain additional recruitment from restoration efforts?

b. Maintenance of existing yellow perch populations and expansion of yellow perch populations into favorable habitats

c. A population recovery of the lake sturgeon sufficient for its removal from New York's list of threatened species
   - Where are the primary sources of lake sturgeon recruitment to Lake Ontario, and can they be enhanced and/or better protected from perturbations?
   - How will round goby colonization affect growth and contaminant levels in lake sturgeon?

d. Population levels of smallmouth bass, largemouth bass, and sunfishes attractive to anglers
   - How will round goby colonization affect growth and contaminant levels in smallmouth bass?

e. Increasing numbers of American eels consistent with global efforts for their rehabilitation
   - What local and global management actions are necessary to ensure the future of

American eels in the Lake Ontario/St. Lawrence River system?
- How can we increase passage of American eels into Lake Ontario, and how can we improve survival of out-migrating adults?

Also:

- Continued study of holistic models (gaming/risk analysis), with respect to long-term focus on alternate states/management in the nearshore ecosystem
- Specific to areas colonized by double-crested cormorants (DCC), what is an acceptable level of cormorant predation (feeding days) that will not adversely impact sportfishing quality (model development)?
- What lethal and non-lethal control alternatives can be used to manage DCC numbers?
- Causal mechanisms of Type-E botulism outbreaks in Lake Ontario; links to exotic species?
- Impacts of round goby colonization (egg predation on native species, food web/energy flow implications (includes contaminant loading, changes in fish growth/behavior/movements/angler catch rates, potential implications for long term fish assessment data series).
- Efficacy of implementing water level control/fish passage in wetland habitats to improve habitat/fish recruitment
- Impacts of submerged aquatic vegetation control on embayment fish communities
- Fish health issues – *Heterosporis*, etc.

2. Offshore Pelagic Fish Community

The offshore pelagic fish community will be characterized by:

a. A diversity of salmon and trout
   - Nutrient deficiency impacts, particularly with respect to thiamine, on trout and salmon species including reproductive success, behavioral, neurological, etc.
   - Tributary mouth habitat/water clarity influence on predation of juvenile salmonids

b. Chinook salmon as the top predator

c. Abundant populations of rainbow trout (steelhead)

d. Fishable populations of coho salmon and brown trout

e. Populations of Atlantic salmon at levels consistent with investigating the feasibility of restoring self-sustaining populations
   - Atlantic salmon strain evaluations for reintroduction programs

f. Amounts of naturally reproduced (wild) salmon and trout, especially rainbow trout, that are consistent with fishery and watershed plans
   - Contribution of wild vs. stocked salmonines (also, development of cost-effective batch marking/mark reading techniques, refinement of stable isotope techniques)

g. A diverse prey-fish community with the alewife as an important species

- Determine causal mechanisms of exotic species impacts on lower foob webs (*Dreissenids, Cercopagis, Echinogammarus, Neogobius,* etc.)
- Impacts of *Diporeia* and *Mysis* declines on alewife condition/survival, as well as the bioenergetic impacts on predator species?
- What are the food web mechanisms that influence thiaminase and related conditions such as Early Mortality Syndrome?
- Refinement of hydroacoustic preyfish assessment techniques/interpretation

Also:

- Fish health issues – atypical *Furunculosis*, etc.

3. Offshore Benthic Fish Community

The offshore benthic fish community will be composed of self-sustaining native fishes characterized by

a. Lake trout as the top predator
   - causes for continued lake trout decline and low survival including egg predation (possible link to gobies), contaminants, thiamine deficiency related to prey and thiaminase, dreissenid colonization and other mechanisms reducing success of or act of natural reproduction
   - Food web changes and resulting changes in biomagnification, Poly brominated diethyl ether (PDBE's): impacts on humans, impacts on lake trout reproduction.

b. A population expansion of lake whitefish from northeastern waters to other areas of the lake
   - Impacts of dreissenid colonization on whitefish bioenergetics
   - Sustainability of lake whitefish in Lake Ontario
   - Stock discrimination
   - Early life history, growth and survival

c. Rehabilitated native prey fishes
   - Investigations to advance native prey-fish reintroduction initiatives, particularly bloater/deep water ciscoes. Also, investigations into use of historic lake herring spawning sites (Chaumont Bay, Irondequiot Bay, etc.)
   - Feasibility of restoration of extirpated species given recent changes in environment, food web, predator-prey complex, and the predominance of alewife.

Also:

- Impacts of *Cercopagis* blooms on juvenile smelt/other species
- What are the impacts of round goby colonization on slimy sculpin, log perch, others?
- Impacts of dreissenid colonization on other benthic invertebrates/benthic food webs

4. Others:

- Relationship between lipid content vs. wet weight for fish condition analysis
- Coastal GAP Analysis – characterization of coastal segments and fish

communities

- Tributary GAP Analysis – habitat assessment/mapping/GIS layer development; development of correlation models for habitat/fish species
- Substrate characterization of Niagara Bar; significance to fisheries
- Sediment mapping
- Development of offshore bioenergetics model that is holistic with respect to the offshore ecosystem

FISHERY RESEARCH PRIORITIES:
LAKE ERIE
Great Lakes Fishery Commission

Updated October 31, 2009

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Research Priorities

These Lake Erie Fisheries Research Priorities were developed to encourage progress towards meeting the published Lake Erie Fish Community Objectives (FCO's). We wish to emphasize here that specific FCO's must be interpreted in the context of the developed Goals for Lake Erie and the Guiding Principles used to frame specific objectives. Interested researchers should review the Lake Erie Fish Community Goals and Objectives (Ryan et al. 2003 link to http://www.glfc.org/pubs/SpecialPubs/Sp03_2.pdf) for additional background information concerning these research priorities.

Bold font indicates the **highest priorities** and *italics font* indicates *medium priorities*. Remaining priorities are lower priorities.

Ecosystem Conditions Objective

- *How can we best monitor, manage, and maintain optimum mesotrophic conditions in the west, central, and nearshore east basin?*
- *How can we best develop bathy/thermographic (and other habitat) maps that facilitate our understanding of the size, dynamics, and impact of river or tributary plumes in Lake Erie?*
- *How can we best describe important habitat characteristics, complete mapping of Lake Erie habitat, and distribute this information to managers, researchers, stakeholders, and the public?*
- How can we best map or model known disease dynamics in Lake Erie?

Productivity and Yield Objective

- **What are appropriate biological reference points and fisheries reference points for fished populations and how can they be estimated?**
- **How can we best describe, map, evaluate and maintain suitable nearshore habitats that can support high quality fisheries for smallmouth bass, northern pike, muskellunge, yellow perch, and walleye using hydroacoustics/GIS software?**
- What is the influence of size or slot limits on fish population dynamics?
- What is the impact of fishing sanctuaries on fish populations of interest and are the goals of sanctuaries being met?
- How can we optimize the potential for sustainable harvests of highly valued fish species?
- What changes in catchability have occurred in the commercial and sport fisheries operating on Lake Erie over time?

- What are the spatial and temporal dynamics of invasive species in Lake Erie and what are their impacts on desired fisheries productivity and yields?

Nearshore Habitat Objective

- **How can we best describe, map, evaluate and maintain suitable nearshore habitats that can support high quality fisheries for smallmouth bass, northern pike, muskellunge, yellow perch, and walleye using hydroacoustics/GIS software?**
- *How can we best describe important habitat characteristics, complete mapping of Lake Erie habitat, and distribute this information to managers, researchers, stakeholders, and the public?*

Western Basin Objective

- **What are the stock structures of walleye, yellow perch, smallmouth bass and other desired fish?**
- **How can we identify, rehabilitate, conserve, or protect locally adapted stocks?**
- *How can we best provide sustainable harvest of desirable fish species of fish?*
- What are the stock/spawner-recruitment relationships in desired fish populations?
- What are the natural mortality (M) rates in desired fish populations?
- What are the limiting factors and causes leading to reduced or lost recruitment of desired fish species and what are the solutions to remedy this lost recruitment?

Central Basin Objective

- **What are the stock structures of walleye, yellow perch, smallmouth bass and other desired fish?**
- **How can we identify, rehabilitate, conserve, or protect locally adapted stocks?**
- *How can we best provide sustainable harvest of desirable fish species of fish?*
- What are the stock/spawner-recruitment relationships in desired fish populations?
- What are the natural mortality (M) rates in desired fish populations?
- What are the limiting factors and causes leading to reduced or lost recruitment of desired fish species and what are the solutions to remedy this lost recruitment?

Eastern Basin Objective

- **What are the stock structures of walleye, yellow perch, smallmouth bass and other desired fish**
- **How can we identify, rehabilitate, conserve, or protect locally adapted stocks?**
- *How can we best provide sustainable harvest of desirable fish species of fish?*
- What are the stock/spawner-recruitment relationships in desired fish populations?
- What are the natural mortality (M) rates in desired fish populations?
- What are the limiting factors and causes leading to reduced or lost recruitment of desired fish species and what are the solutions to remedy this lost recruitment?
- How can we best restore self-sustaining populations of lake trout to historic levels of abundance in the east basin?

Fish Habitat Objective

- *What are the best methods for evaluation, protection, and enhancement of fish habitat throughout the Lake Erie watershed?*
- How can we update the Great Lakes Spawning Atlas to reflect recent changes in the Lake Erie basin?

Genetic Diversity Objective

- **What are the stock structures of walleye, yellow perch, smallmouth bass and other desired fish**
- **How can we identify, rehabilitate, conserve, or protect locally adapted stocks?**

Food Web Structure Objective

- How can we best manage the food web structure of Lake Erie to optimize production of highly valued fish species?

FISHERY RESEARCH PRIORITIES:
LAKE HURON
Great Lakes Fishery Commission

Updated October 31, 2010

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Research Priorities

A review of the fish community objectives for Lake Huron (link http://www.glfc.org/pubs/SpecialPubs/Sp95_1.pdf) and the Lake Huron State of the Lake Report (http://www.glfc.org/pubs/SpecialPubs/Sp95_2.pdf) provides a useful context for the questions listed below.

The Lake Huron Technical Committee (LHTC) has identified 5 "Issues", or major subject areas, which we feel need to be addressed in Lake Huron. Under each of these Issue Categories is a list of Research Priority questions along with some examples. **HIGH** priority items are **bolded** and *MEDIUM* items *italicized*. Finally, the LHTC summarizes by identifying three broad research areas that capture the LHTC's leading priorities for research in 2010-2011. These three chosen **HIGH PRIORITY** research areas are purposefully rather broad so as not to constrain unnecessarily the scope of potential research proposals. Researchers submitting proposals for funding are urged to look at the Research Issues list for insights into some specific research questions the LHTC considered in the process of developing the **HIGH PRIORITY** Research List for 2010-2011.

Text in blue font color shows some of the current or recent GLFC and other projects related to specific research priorities.

Research Issues:

ISSUE: Impediments to Lake Trout Rehabilitation

The LHTC is concerned that impediments exist which are limiting, delaying, or preventing lake trout rehabilitation efforts in Lake Huron waters. The nature of the impediments, the level of their impacts, and how to deal with them are all questions the LHTC would like to see addressed.

1) What are the major existing impediments to lake trout rehabilitation in Lake Huron? **[HIGH]**
   Examples:
   - What factors may be affecting declining size of lake trout at older ages? Is this related to diet? And/or to shift in distribution to colder temperature regimes? **[current diet study using angler-caught fish, USGS 2009-10; He et al. project funded in 2010 by GLFC titled: Quantifying new top-down influences on the rapidly changing food web in the main basin of Lake Huron]**
   - What is the relative contribution of declining growth to changes in lake trout spawning stock biomass. What other factors are contributing to changes in spawning biomass?
   - What level of recruitment is required in order to promote and sustain lake trout populations? What factors limit recruitment of hatchery and wild fish?
   - What effect is EMS having on the ability of lake trout to naturally reproduce in Lake Huron?
   - What explains recent trend in wild lake trout? Lake wide increase in wild fish has been observed **(Riley et al. 2007).** Genetic strain assessments indicates large contribution of Seneca strain to wild age-0 fish and that age-0 fish are consuming benthic invertebrates **(Roseman et al. 2009).**

- What is the genetic heritage strain of recent wild recruits in Lake Huron?
- Is lake trout success dependant on early life history stage success of lake whitefish and cisco? Are these linkages between species life history stages important to provide lake trout with a large bodied prey? **[current diet study using angler-caught fish, USGS 2009-10]**

2) Is there one life stage which is more critical to lake trout rehabilitation than any other life stage? [*Medium*]

Examples:

- What is the variation in rates of egg deposition, fry emergence, and fry survival on historically productive lake trout spawning reefs and what factors contribute to this variation.
- What is the variability in post-stocking survival of hatchery lake trout and what factors (stocking density, prey availability for adults, predation, exotic species) influence survival rates?

3) Are there specific life history information gaps which are limiting our ability to rehabilitate lake trout? [*Medium*]

Examples:

- What is the level of lake trout hooking mortality by size category? **(This is directly related to existing lake trout population models in Lakes Huron, Michigan, and Superior.)**
- What is the natural mortality of lake trout, by age group, in Lake Huron?
- What is the spatial definition, physical description, and present utilization of current and historic lake trout spawning reefs in Lake Huron today and how are they being utilized for spawning?
- Is declining prey availability and size having an adverse effect on lake trout age at maturation, spawning capacity? **[He et al. project funded in 2010 by GLFC titled: Quantifying new top-down influences on the rapidly changing food web in the main basin of Lake Huron] [also see related pro funded by GLFC to Y. Zhao in 2010 addressing mortality-induced changes in lake trout and lake whitefish with respect to fisheries management]**

Riley, S.C., He, J.X., Johnson, J.E., O'Brien, T.P. and Schaeffer, J.S. 2007. Evidence of widespread natural reproduction by lake trout *Salvelinus namaycush* in the Michigan waters of Lake Huron. J. Great Lakes Res. 33:917-921.

Roseman, E.F., W. Stott, T.P. O'Brien, S.C. Riley, and J.S. Schaeffer. 2009. Heritage strain and diet of wild young of year and yearling lake trout in the main basin of Lake Huron. Journal of Great Lakes Research 35(4):620-626.

ISSUE: Effects of Invasive Species on Indigenous Species

While indigenous species still exist in Lake Huron, they continue to be threatened by an ever expanding number of invasive nuisance species. The LHTC needs to know what impacts invasive species are having or may have on Lake Huron indigenous species.

1) How might round gobies affect the sustainability or recovery of native species in Lake Huron? **[HIGH]**

Examples:

- How do they affect lake whitefish production in Lake Huron? (i.e. predation on embryos, competition between all life stages) **[Riley et al. GLFC funded in 2007 – food web dynamics and thiamine deficiency complex: identifying trophic pathways]**
- Are round gobies having a negative effect on reproductive success of native species in Lake Huron?
- How does the consumption of round gobies contribute to thiamine levels in lake trout?
- What are the densities of round gobies in Lake Huron?

- Is bioaccumulation of contaminants affected by predator switching to newly invasive species?

2) Do alewives and smelt have negative impacts on the recovery/existence of indigenous species in Lake Huron. **[HIGH]**

   Examples:

   - If so, what types of interactions exist between these species?
   - Are alewives and smelt having any impact on the ability of lake herring to recover in Lake Huron? **[Riley et al. GLFC funded in 2007 – food web dynamics and thiamine deficiency complex: identifying trophic pathways]**
   - What are alewife biomass estimates in proximity to successful spawning sites for lake herring? Other spring-hatching species? **[Jared Meyers, Bence and Jones project working with CORA and MDNRE and others on cisco recruitment, 2009-2011]**

3) What life stage of indigenous species is most likely to be impacted by invasive species in Lake Huron [*Medium*]

   Examples:

   - Are Dreissenid mussels and declining Diporeia affecting lake whitefish diet, growth, maturation, and body condition? **[Ebener pilot project to assess thiamine levels in lake whitefish eggs with respect to dreissenid consumption, 2009] [Mike Rennie (DFO) and Erin Dunlop, GLFC funded project examining stable isotopic signatures from archived lake whitefish scale samples, benthic invertebrate, and sediment cores, in order to assess the impact of dreissenid establishment on lake whitefish growth and feeding habits. Part of the work also involves doing back-calculations of length at ages in order to assess early growth rates. We will be comparing the isotopic signatures and growth rates from whitefish scales collected prior to and after dreissenid establishment. We are targeting populations from around Lake Huron, as well as other parts of the Great Lakes]**
   - Is there an EMS phenomenon in walleye progeny from brood that consume a thiaminase-rich diet such as alewives?
   - What impact are exotics (principally Dreissenid mussels) having on spawning habitat of native fish species in Lake Huron?
   - What is the lethality of attack from sea lampreys, by species and size group on Chinook salmon, lake whitefish, walleye, bloater chub?

<u>ISSUE: The carrying capacity of Lake Huron</u>

In order to manage Lake Huron fish communities more effectively, it is necessary that we know what the carrying capacity of the lake is and how carrying capacity changes with changes to individual fish communities and populations.

1) What is the abundance of Chinook salmon in Lake Huron and what determines it? [*Medium*]

   Examples:

   - What is the extent of natural reproduction of Chinook salmon in Lake Huron and where is it occurring? What is the variability from year to year, from location to location? **[Currently being assessed by ON scientists, Steve Marklevitz/Y. Morbey using otolith micro-chemical signatures, 2009-10; funded by GLFC in 2007]**
   - Is Chinook reproduction auto-regulated and, if so, how is it related to the prey abundance in the lake?
   - To what extent has "benthic shift" caused by Dreissenid colonization reduced production of Chinook and other pelagic fish in Lake Huron? **[He et al. project funded in 2010 by GLFC titled: Quantifying new top-down influences on the rapidly changing food web in the main basin of Lake Huron]**
   - What is the spatial extent of Chinook shoal spawning in Lake Huron and what amount of production, if any, comes from these sites?

- What is the genetic make up of naturally reproducing Chinook salmon in Lake Huron? How much and how fast is genetic drift occurring?
- What is the best way to evaluate natural reproduction of Chinook salmon in Lake Huron? What is the error rate of oxytetracycline mark detection? What is the error rate in assigning age classes, using vertebrae, scales, and other structures, to Lake Huron's slow-growing Chinook salmon?
- What is the extent and variation of inter-lake migration of Chinook salmon originating in Lake Huron? Originating in Lake Michigan? **[Currently being assessed by ON scientists, Steve Marklevitz/Y. Morbey using otolith micro-chemical signatures, 2009-10; funded by GLFC in 2007]**

2) Has production potential changed in Lake Huron and has there been a shift in production/pathways? How is energy being moved to fish? **[HIGH]**

Examples:

- Has primary productivity changed in Lake Huron and, if so, why, where, and to what degree?
- How do changes in lower food web pathways (particularly with respect to Dreissenid colonization) affect fish populations? **[He et al. project funded in 2010 by GLFC titled: Quantifying new top-down influences on the rapidly changing food web in the main basin of Lake Huron]**
- Are there essential nutrients that are missing/sequestered (not channeled to fish, i.e. mussel colonies)?
- What is amphipod production in Lake Huron and has it changed in recent years? **[EPA work with Dave Jude et al., Tom Nalepa's work; J. Stockwell funded by GLFC in 2007 to assess Mysis relicta as a keystone species in native fish communities of the Great Lakes]**
- To what degree are episodes of hyper-productivity in the near-shore zone (especially Saginaw Bay) functions of foodweb change or nutrient inputs (rising nutrient loading from the watershed)? Can we design an index of biological integrity (for example, burrowing mayfly abundance) as a tool in monitoring nearshore trophic state? **[Pothoven, Hook, et al. current assessment of foodwebs and environments in Saginaw Bay, 2009 – 2011]**

3) Has the carrying capacity of Lake Huron tributaries and spawning shoals changed in such a way as to affect overall fish production in the lake? [*Medium*]

Examples:

- Which rivers/streams still maintain lake sturgeon natural reproduction and what is the magnitude of the production? How variable is it from year to year?
- Does shoal spawning of lake sturgeon still occur in Lake Huron and if so, to what extent?
- What are the sources of wild walleyes in Saginaw Bay? Do the outer shoals have the potential to contribute to the population?
- Can micro-chemical analysis be used to identify natal sources of fish?
- What are the sources of wild walleyes in the St. Mary's River? What is the magnitude of natural reproduction?
- What is the sediment contribution of tributaries to Saginaw Bay and what are the consequences for habitat quality and walleye reproduction?

4) What are abundance, distribution, and composition of Lake Huron's prey base. **[HIGH].** (Recent increases in effort by USGS appear to be adequately addressing elements of this issue.)

Examples:

- What are the abundance, distribution, and composition of Lake Huron's prey base as determined by hydro acoustic assessment? Does this agree with estimates using other techniques?

- Remnant populations of lake herring exist in Lake Huron. Where do they exist and what factors allow them to persist in some areas and not in others?
- Can the cisco (lake herring) be expanded beyond its current range in order to become a major prey item in Lake Huron? **[MDNRE culture experiments in 2008-present]**
- What is the cause of the recent dramatic decline in deepwater bloater populations? Are sex ratios in bloater populations a useful indicator of stress?
- Is prey fish availability in Lake Huron adequately represented with bottom trawling and hydroacoustics? What is the biomass of prey fish on hard substrates (that are not currently sampled)? What is the location and extent of these hard-substrates in Lake Huron?

ISSUE: Habitat

Habitat degradation and manipulation is an on-going issue in the Great Lakes. Knowing what types and amounts of habitat are available at different points in time is critical to understanding the ecosystem as a whole.

1) What is the quantity and quality of fisheries habitat in Lake Huron and its tributaries? [*Medium*]

Examples:

- How accurate are current tributary classifications? (Ground truthing of GIS classification data.)
- Are there specific habitat types that are in short supply and thus impeding the survival/recovery of native fish species in Lake Huron?
- What is the status of the littoral fish community in the St Mary's River and how does it vary with shoreline type and anthropogenic development?
- If you reclaimed an inner bay reef in Saginaw Bay, would it be used by spawning walleyes or other species (whitefish for example) and actually produce fry?
- If fish passage were restored to rivers with barriers what levels of walleye and lake sturgeon reproduction could be expected? **[Boase/Ania USFWS work in Saginaw Bay tributaries]**
- Where is the most critical spawning habitat for lake sturgeon in the Lake Huron watershed, what percentage is above dams or other man-made barriers, and what percentage is inundated by impoundments and therefore not available even if fish passage is provided?
- What risk does dam removal pose in increasing the range and production of invasive species, including Dreissenids, gobies and sea lampreys, in tributaries to Lake Huron? Would the positive benefits of dam removal on desirable species be significantly eroded by competition with or predation by exotics? Can fish passage be engineered so as to more selectively pass non-jumping native species while minimizing risk of passage by invasives?
- What levels of fish production can be expected from rehabilitated Saginaw Bay and St. Mary's River?
- Has reef spawning habitat quality been influenced by colonization of the reefs by dreissenids? What is the extent and exact location of these reef habitats?

2) What is the high resolution surficial geology of Lake Huron? [*Medium*]

Examples:

- Can maps be developed to identify geological features, in particular bedrock outcroppings, as they relate to lake whitefish and lake trout distribution and spawning habitat?

ISSUE: Sea lamprey control

Sea lamprey control has been the foundation for rehabilitation of Great Lakes fisheries. Yet, certain sea lamprey control measures have unintended consequences to native species. Building barriers to sea lamprey spawning migrations may reduce reliance on TFM (and nontarget mortality of fish) but it may also inhibit reproduction of native potamodromous fishes. There is a need to continue to develop sea lamprey control methods that minimize effects on nontarget species while maximizing effectiveness of

sea lamprey control. The Lake Huron Technical Committee believes this research area should be funded by the GLFC sea lamprey control research program.

1) What are the risks of TFM treatment options designed to reduce incidental kills of nontarget fish, relative to potential increased survival of sea lampreys and increased sea lamprey depredation rates on adult sturgeon and other species? [*Medium*]
2) If barriers are removed to restore passage of desirable fish species, how much would the spawning and larval habitat for sea lampreys be increased and what level of production would be expected? Could the potentially destructive impacts of increased sea lamprey production be mitigated using other control methods, such as lampricide application? [*Medium*]
3) Are there barrier designs that would allow passage of non-jumping fish, such as sturgeons, suckers, and walleyes, while preventing passage of sea lampreys? [**High**]

High Priority Research List for 2010-11, Lake Huron Technical Committee

1) What are the chief impediments during early life stages to lake trout rehabilitation? What is the genetic heritage strain of recent wild recruits in Lake Huron? What are the effects of alewives, dreissenids, round gobies, rusty crayfish, and other egg/fry predators on early life stage (from egg stage to recruitment to the fisheries) survival? What is the relationship between abundance and growth of early life history and juvenile stages of lake whitefish and cisco with lake trout growth and recruitment? (do these species serve as large-bodied prey for lake trout and how does their abundance and growth reflect in lake trout performance?) What are the effects of thiamine deficiency on reproductive success?
2) How have lower foodweb linkages (nearshore/offshore, pelagic/benthic, primary to secondary, for example) been affected by dreissenid colonization and other non-native invasive species, and how have those changes influenced fish production, with particular emphasis on species with recreational, commercial, and heritage values?
3) How can agencies optimize their investments in fish passage improvements, particularly with respect to dams that presently prevent upstream migration of native fishes such as lake sturgeon, walleyes, and suckers identified in the Fish Community Objectives? Are there ways of improving and restoring connectivity between tributaries and Lake Huron while limiting passage of undesirable species such as sea lamprey? What percentage of spawning habitat, particularly for lake sturgeon, is inundated by the impoundments of these dams and therefore can only be made available by dam removal?

FISHERY RESEARCH PRIORITIES:
LAKE MICHIGAN
Great Lakes Fishery Commission

Updated August 2025

This listing was compiled based on input from the Lake Michigan lake committee and its technical committee and from discussions within the Council of Lake Committees **(for more information go** to https://www.glfc.org/council-of-lake-committees.php**)**. Order of listing does **not** imply relative ranking of priorities for the Fishery Research Program funding.

Research Priorities

These Lake Michigan Priority Research Needs were developed to encourage progress towards meeting Lake Michigan Fish Community Objectives (FCOs; http://www.glfc.org/pubs/SpecialPubs/Sp95_3.pdf). We emphasize that the specific FCOs need to be interpreted in the context of the Goals and Guiding Principles within which they were framed. Interested researchers should review the FCOs (Eshenroder et al. 1995), as well as the latest version of the State of Lake Michigan document (Holey and Trudeau 2005), for additional background information concerning these research priorities. Priorities are updated annually; copies of the most recent priority list, the Fish Community Objectives, and the State of Lake Michigan report are available on the GLFC web site (www.glfc.org), from the chairperson of the Lake Michigan Committee (Tom Gorenflo - CORA), or from the chairperson of the Lake Michigan Technical Committee (Greg Wright – CORA). **The current list of priority research questions identified by the Lake Michigan Committee and Technical Committee is indicated below**, but any innovative research project that clearly will advance the achievement of FCOs will be given serious consideration for support by the LMC, even if not included on the specific list of priority research questions.

1. Whitefish – What are the mechanisms contributing to the collapse, and lack of recovery, of Diporeia?

2. Lake Trout/Telemetry – Determine movement patterns and spawning locations of both wild and stocked Lake Trout in the southern basin of Lake Michigan.

3. Alewife/Prey – What are spatial and seasonal patterns in prey distribution and how do those movements impact the ability to effectively sample prey biomass/composition?

4. Chinook/Steelhead – What are the reproductive contributions and drivers of annual variation of naturalized populations?

FISHERY RESEARCH PRIORITIES:
LAKE SUPERIOR
Great Lakes Fishery Commission

Updated October 30, 2025

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Research Priorities

1. What are broad scale lake trout and lake whitefish movement patterns within Lake Superior, with particular focus on the western arm? Can these movement patterns be incorporated into SCAA models to improve management?

   Context: Through various data sources, fisheries managers seek to understand vital rates within populations such as mortality and recruitment, with the intent of estimating both the trajectory and absolute value of populations. Bias can result from a poor understanding of movement patterns, influencing what it deemed a population and estimates of key parameters. SCAA models are used in many areas to monitor populations, but decisions about what data to include and how a population is defined has a heavy impact on output and model utility. Using modern methods to assess movement patterns of lake trout and lake whitefish will improve population monitoring and provide managers with better information for decision making.

2. How many acres of lake trout and whitefish spawning habitat exist in Lake Superior? Does habitat supply relate to carrying capacity?

   Context: It is assumed that spawning habitat is not limiting in Lake Superior; however, quantifying that habitat has not occurred. Technology has vastly expanded our ability to map and quantify habitat types. The fisheries management community continues to have a poor understanding of the role habitat plays in limiting population size. Quantifying spawning habitat over discrete areas and relating its quality to population size will serve as a benchmark to assess future changes and help identify limiting factors to population growth that could improve management decisions and user expectations.

3. What factors drive whitefish and cisco recruitment?

   Context: Successful fisheries management depends on a sound understanding of key population metrics. Recruitment is arguably the most important and most poorly understood of them all. Lake whitefish and cisco are critical to both the ecosystem within Lake Superior and the users who depend on them. A better understanding the biotic and abiotic drivers of recruitment and its key bottlenecks will lead to a more holistic understanding of the Lake Superior ecosystem and improve management decisions.

FISHERY RESEARCH PRIORITIES:
GREAT LAKES FISH HEALTH COMMITTEE
Great Lakes Fishery Commission

October 2025

What factors may affect early rearing of Great Lakes salmonids focusing on the effects of thiamine deficiency, wild fish diet changes, contaminants such as PFOS/PFAS, and the impact of rising fall water temperatures on spawning success and adult fish health?

What diagnostic methods can be developed and validated to detect fish pathogens or pathogens of concern in the Great Lakes Basin? One pathogen of concern to the committee includes *Tetracapsuloides bryosalmonae* (T. bryo).

Development of a vaccine for *Flavobacterium psychrophilum* is very important to sustain the health of fish stocks in hatcheries around the Great Lakes. The Fish Health Committee encourages researchers to develop effective vaccines that can be successfully deployed in a hatchery setting.

How great are disease transmission risks from common fishery management practices such as fin clipping, or moving fish from outside the Great Lakes Basin via the bait industry or movement of fish or fish by-products?