Lake Michigan Fisheries Management Plan

(Draft)

Introduction

The Great Lakes represent the largest freshwater ecosystem in the world by surface area and second by volume. Freshwater ecosystems like the Great Lakes provide valuable services. Great Lakes provide clean water and food, help regulate climate, support nutrient cycling, and provide cultural services through recreation, tourism and spiritual or aesthetic benefits. Freshwater fish form a vital component of the Great Lakes ecosystem and contribute significantly to the economies of the region. Fish in the Great Lakes, and Lake Michigan, serve as valuable links in ecosystems through migrations and contributions to the food web, they serve as indicators of ecosystem health, have social value, and provide valuable food sources.

Lake Michigan is the largest freshwater lake entirely within the United States and the fifth largest lake in the world. Lake Michigan is home to the world's largest freshwater dunes, as well as the world's largest freshwater estuary (Green Bay). Sand dunes, marshes, tallgrass prairies, savannas, and forests provide the essential habitats for diverse physical and biological systems in the Lake Michigan basin. Lake Michigan offers diverse fishing opportunities from rivers, piers, the shoreline and the open lake. A diversity of interests are known to harvest fish in Lake Michigan which include commercial, subsistence, hired charters, and a variety of other recreational fishery user groups. Thus, managing such a vast and complex resource requires an ecosystem approach that is adaptive and collaborative among stakeholders responsible for fisheries management.

Governance in the Lake Michigan Basin is divided among four states (Illinois, Indiana, Michigan and Wisconsin), five recognized 1836 tribal interests (Sault Ste. Marie Tribe of Chippewa Indians, Bay Mills Indian Community, Grand Traverse Band of Ottawa and Chippewa Indians, Little Traverse Bay Band of Odawa Indians, and Little River Band of Ottawa Indians), United States Federal Agencies (Interior Department (U.S. Geological Survey, U.S. Environmental Protection Agency, U.S. Fish and Wildlife Service), Commerce (National Oceanic and Atmospheric Administration, Sea Grant), and State Department (Great Lakes Fishery Commission)) representations. Primary authority to regulate fisheries of Lake Michigan is distributed among non-federal entities. The relationships are complex and defined by constitutional powers, ownership rights, court cases, precedent and legislation.

The most extensive efforts to coordinate governance in the Great Lakes occurred in the 1960s and 70s. A Joint Strategic Plan (JSP) for Management of Great Lakes Fisheries was adopted in

1978 coordinated through the Great Lakes Fishery Commission. The JSP instituted lake committees (which had been established in 1964) as the mechanism for implementation of lake-wide fisheries management and research. The Lake Michigan Lake Committee developed shared fish community objectives and defined environmental issues that might impede achievement of objectives. Lake Committees are the place where information exchange among agencies occurs and management decisions are typically made by consensus.

The purpose of this plan is to integrate Great Lakes goals and guiding principles as identified in the JSP, lake specific goals as described in the Fish Community Objectives for Lake Michigan with Fisheries Division goals defined in the strategic plan, Charting the Course, to create Michigan's strategy for managing aquatic resources in Lake Michigan. The Lake Michigan Fisheries Management Plan defines Michigan Department of Natural Resources' management and policy direction pertaining to aquatic resources influencing sport and commercial fisheries in Lake Michigan. The plan is designed to be a concise guide to Fisheries Division's near and long-term goals and objectives related to Lake Michigan fisheries, and it has been developed through extensive engagement with a broad array of stakeholders.

Prior to developing the plan framework, a Great Lakes Management Angler Survey was conducted to assess angler opinions and attitudes towards Great Lakes fisheries management. A smaller survey was also conducted among Fisheries Division staff and the Lake Michigan Citizen's Fishery Advisory Committee to assess alignment with key issues facing Lake Michigan. Five focus groups representing anglers, commercial fishers, tribes, business owners, and community leaders from throughout the basin provided feedback on opportunities and threats related to aquatic resources of Lake Michigan. The plan development process shared mission and vision statements were adopted by all participants and alignment behind these broader statements was confirmed. To establish expectations for engagement when initiating the planning process, we identified seven values to abide by during development, review, and implementation of the plan.

The Fisheries Division's Charting the Course framework established the mission and vision for the plan. Goal and objective statements were developed to address issues and challenges identified in angler surveys and focus groups. We adopted an integrated framework for the Lake Michigan Fisheries Management Plan which provides continuity among a variety of accepted processes. There is alignment in reporting and process within MDNR and this allows flexibility to address external agreements, commitments, and the ability to respond to feedback provided in reviews.

A strong base in alignment and principle will serve to anchor the plan and direct focus to achieve desired outcomes for extremely complex systems like the Great Lakes and Lake

Michigan, and allow the plan to be a truly living document that has the flexibility to adapt to a changing aquatic ecosystem. The Goals and Objectives in the plan are broader conceptually and were written to be persistent through time. Strategies are designed to be somewhat persistent but may change through time based on agency capacity, technology, and the future status of the Lake Michigan ecosystem. Desired outcomes are defined for each goal. Outcomes can be evaluated and progress can be reported on. Tactics are more detailed actions that will focus our work to achieve desired outcomes. Tactics will be adapted annually based on review and evaluation.

The Lake Michigan Management Plan will be annually reviewed and feed directly into the process used to make management decisions or recommendations by Fisheries Division staff. Reviews will also be conducted with the Lake Michigan Citizen's Fishery Advisory Committee and broader regional focus groups. Documentation and record keeping will be available on the following website: https://mdnrlmfmp.wordpress.com/ for anyone with interest to review the plan, view supporting documents, and provide feedback.

Mission

To protect and enhance Lake Michigan's aquatic life and habitats for the benefit of current and future generations.

Vision

To provide world-class freshwater fishing opportunities supported by healthy aquatic environments that enhances the quality of life in Lake Michigan communities.

Values

The following seven values guide the work of the Michigan Department of Natural Resources, Fisheries Division staff in the Lake Michigan Basin:

- Integrity
- Leadership
- Innovation
- Professionalism
- Collaboration
- Transparency
- Communication

Goals, Objectives and Strategies

Goal 1: Healthy Aquatic Ecosystems and Sustainable Fish Populations
   Outcomes:

- No introductions of bighead, silver and black carps into Lake Michigan.
- No new aquatic invasive species introduced to the Lake Michigan ecosystem.
- Maintain the lake-wide sea lamprey abundance index at or below targets.
- Add 500 miles of Lake Michigan tributary connectivity through barrier removals and fish passage systems by 2025.
- Increase contribution of wild salmon and trout to the lake-wide fishery.
- Increase contributions of wild walleye to the Bays de Noc fishery.
- Balance the predator and prey community using the Chinook salmon and alewife predator prey model.
- Diverse fishery comprised primarily of Chinook salmon, coho salmon, and steelhead and secondarily of lake trout and brown trout.
- No net loss of offshore and nearshore habitat in Lake Michigan
- Sufficient productivity to support a sustainable food web and fishery.

Objective 1: Enhance control efforts for Aquatic Invasive Species (AIS).

    Strategy 1: Continue to support efforts to prevent introduction and expansion of new invasive species.

        Tactic 1: Assist the Aquatic Species and Regulatory Affairs (ASRA) Unit to collaborate with the Asian Carp Regional Coordinating Committee to produce both short-term and long-term preventive measures to disconnect the Mississippi Basin from Lake Michigan.

        Tactic 2: Cross train with state and federal agencies that have experience with capturing and monitoring invasive carps.

        Tactic 3: Work with State, Federal, Tribal and Provincial agencies to enforce ballast water exchange and treatment for ocean going vessels.

        Tactic 4: Continue to assist with the Mutual Aid Agreement for AIS response in the Great Lakes to respond to immediate AIS threats.

    Strategy 2: Control the spread of existing AIS.

        Tactic 1: Ensure that all Fish Division activities follow gear disinfection policies and guidelines.

        Tactic 2: Work with ASRA to develop a plan which guides us in assisting ASRA Unit and Quality of Life AIS Core Team where appropriate.

        Tactic 3: Work with regional partners and stakeholder groups to implement control activities to reduce existing populations of AIS

    Strategy 3: Monitor existing AIS populations and associated aquatic ecosystem influences.

        Tactic 1: Support research and assessment projects that evaluate how AIS affects the Lake Michigan food web.

        Tactic 2: Increase public awareness of current and threatening invasive species as well as prevention measures that can be taken on an individual level.

        Tactic 3: Report new infestations to ASRA staff and in the Fish Collection System and Midwest Invasive Species Information Network.

Strategy 4: Continue support of sea lamprey control efforts in the Great Lakes.

>**Tactic 1:** Annually review adult sea lamprey abundances and wounding rates through Lake Committee and Council of Lake Committee processes.
>
>**Tactic 2:** Annually review TFM Treatment plans with Field and ASRA Unit staffs to maximize sea lamprey and minimize non-target mortality.
>
>**Tactic 3:** Consult with Great Lakes Fishery Commission regarding first barrier removal projects to mitigate ecosystem connectivity benefits with sea lamprey spawning potential.
>
>**Tactic 4:** Encourage and facilitate discussions that evaluate the use of alternate methods for sea lamprey control.

Objective 2: Conserve, rehabilitate, and manage desirable aquatic species and their habitats.

>**Strategy 1:** Protect and enhance natural reproduction of native and desirable naturalized aquatic species.
>
>>**Tactic 1:** Develop and implement strategies which encourage natural recruitment.
>>
>>**Tactic 2:** Evaluate origin of wild fish through microchemistry technology collaborations.
>>
>>**Tactic 3:** Support marking programs of Chinook salmon, lake trout, steelhead, coho salmon, walleye, lake sturgeon, and smallmouth bass to evaluate movement, survival, growth, age, and natural recruitment.
>>
>>**Tactic 4:** Identify and protect waters and habitats critical to reproductive success of important aquatic species.

>**Strategy 2:** Manage for a suite of fish species that is appropriate for resilient and stable aquatic communities.
>
>>**Tactic 1:** Manage predator biomass through stocking and harvest regulations to maintain predator and prey balance.
>>
>>**Tactic 2:** Develop and maintain diverse fisheries and fish populations.
>>
>>**Tactic 3:** Continue collaborations to identify critical linkages and understand factors and interactions controlling Lake Michigan ecosystem functions.

>**Strategy 3:** Protect and enhance nongame and rare fish species.
>
>>**Tactic 1:** Conduct assessments and management actions prioritized in the Wildlife Action Plan.
>>
>>**Tactic 2:** Engage niche angling groups to share information pertaining to species distribution and abundance.
>>
>>**Tactic 3:** Consider discussions to establish reasonable harvest limits on non-game native fish, which are typically classified as "rough fish", and encourage value by reconsidering unlimited harvest.
>>
>>**Tactic 4:** Encourage harvest of non-desirable non-native species to provide user groups the opportunity to utilize this resource to its greatest potential, align management philosophy with the possibility of limiting competition with native species if harvest were effective.

Strategy 4: Monitor and encourage success of native species remaining in the Lake Michigan Basin.

> **Tactic 1:** Continue to stock lake trout in areas that are conducive to natural reproduction until catch per unit effort exceeds 50 fish per 1,000 feet of gill net for three consecutive years.
>
> **Tactic 2**: Encourage harvest strategies for native species that are sustainable.
>
> **Tactic 3:** Monitor the status of cisco and lake whitefish stocks in Lake Michigan.
>
> **Tactic 4**: Monitor stock status and harvest of yellow perch and smallmouth bass in nearshore areas of Lake Michigan to ensure sustainability.

Strategy 5: Ensure habitat and water quality parameters are sufficient to support fisheries related life-history, production and management objectives.

> **Tactic 1:** Actuate Lake Michigan Environmental Principles by identifying functional habitats, priority management areas, and manageable impediments by 2019.
>
> **Tactic 2:** Add 500 miles of Lake Michigan tributary connectivity through barrier removals and fish passage systems by 2025.
>
> **Tactic 3:** Evaluate the potential for reef enhancement in both nearshore and offshore waters.
>
> **Tactic 4:** Collaborate with Great Lake agencies to develop broad-range data collection methods that quantify the abundance and diversity of plankton communities.
>
> **Tactic 5:** Work with the Environmental Protection Agency and Michigan Department of Environmental Quality to review and prioritize permits and restoration projects that influence nutrient inputs to Lake Michigan.

Goal 2: Provide Diverse Fishing Opportunities

Outcomes:

- Increase salmonine effort to 1,100,000 hours (median effort from 2001-2016) annually for Michigan waters of Lake Michigan (2016's effort was 687,000).
- Increase Lake Michigan fishing awareness, participation, and opportunities.
- Increase economic activity and quality of life for Lake Michigan communities.

Objective 1: Increase public awareness of Michigan's diverse fishing opportunities.

> **Strategy 1**: Promote diverse fishing opportunities lake-wide by providing targeted information and updates to specific regions, demographics, interest groups, and the media.
>
> > **Tactic 1**: Develop a Road Map to Fish Lake Michigan illustrating what to fish for, where to fish, and when to fish.
> >
> > **Tactic 2**: Develop a promotional YouTube video.
> >
> > **Tactic 3**: Promote content through emails, videos, special tracking links, social media, and through other public relations.

Tactic 4: Review tournament registration database for insightful fishing patterns and opportunities.

Strategy 2: Work with local tourism and economic development organizations to demonstrate and market the connections between Lake Michigan's diverse fishing opportunities and quality of life, both economic and non-economic.

Tactic 1: Work with Focus Group partners to develop promotional content for local communities to highlight their fishing opportunities.

Tactic 2: Work with regional prosperity teams to identify and implement projects in local communities.

Strategy 3: Instill awareness and appreciation of Lake Michigan's fish, fishing heritage, and fishing opportunities into the culture, education, and consciousness of all Lake Michigan Basin citizens.

Tactic 1: Consider podcasts and social media to highlight Lake Michigan's and local community fishing opportunities and fishing heritage.

Tactic 2: Use news outlets, social media, and podcast to showcase Lake Michigan's commercial fishing heritage and importance to Michigan's economy.

Objective 2: Create, maintain, and enhance fishing opportunities.

Strategy 1: Identify and catalog areas where fishing access is needed, prioritize locations, and work with partners to address these needs.

Tactic 1: Inventory ADA public fishing sites noting areas where additional sites could be constructed.

Tactic 2: Advertise Great Lakes access sites though links to the Great Lakes Fishery Trust and Michigan's Recreational Boating Information System.

Strategy 2: Manage aquatic resources to sustainably provide diverse opportunities for fishing.

Tactic 1: Implement a "Zonal Management" concept to help promote the fishery and match fishery opportunities with available habitat that are consistent with lake-wide goals and fish community objectives.

Tactic 2: Manage for sustainable harvest of native species (lake trout, cisco, whitefish, black bass, walleye, and yellow perch)

Tactic 3: Manage prey fish abundance and predator demands to encourage sustainable forage levels and limit annual fluctuations in abundance to the most reasonable extent possible.

Tactic 4: Stock salmonid species (coho salmon, steelhead, Chinook salmon, and brown trout) to supplement naturally reproducing populations in the fishery.

Tactic 5: Encourage voluntary harvest of stocked over naturalized fish.

Tactic 6: Improve stocking strategies to maximize survival and return rates for desired fisheries.

Tactic 7: Implement cormorant control strategies to increase survival of stocked and naturally reproduced fish.

> **Tactic 8**: Develop guidelines for reporting and handling by-catch of lake sturgeon in commercial (mandatory for state and tribal) and recreational (voluntary) fishers.

> **Strategy 3**: Implement fishing regulations expressly designed to create special or unique fishing opportunities.

> > **Tactic 1**: Consider regulations in areas which encourage trophy fisheries for smallmouth bass.

Objective 3: Increase participation and interest in Lake Michigan fishing among all demographic groups.

> **Strategy 1**: Identify what prevents people from fishing.

> **Strategy 2**: Increase education, outreach, and engagement through programs and partners, both existing and new.

> > **Tactic 1:** Develop website with content and links to programs that teach fishing 101.

> **Strategy 3:** Encourage a broader diversity of demographic interests in participating in fishing or fisheries related activities.

> > **Tactic 1:** Encourage the development of fishing clubs within schools and other institutions.

Goal 3: Strategic Resource Partnerships

Outcome:

- Accomplish Lake Michigan fishery management, outreach, research, and financial needs through collaborative efforts.
- Ecosystem based lake-wide fishery management decisions through Lake Michigan Committee consensus.

Objective 1: Achieve fisheries management goals through partnerships.

> **Strategy 1**: Increase Lake Michigan's annual fish production and survival through cooperative arrangements and methods.

> > **Tactic 1**: Maintain and encourage new partnerships for salmon acclimation pens and walleye ponds.

> > **Tactic 2:** Reduce avian predation on stocked fish through voluntary harassment techniques with local angling groups.

> > **Tactic 3:** Support an Upper Lakes Work Shop to determine early life history bottlenecks for lake whitefish.

> **Strategy 2**: Assume leadership roles and fully participate in fisheries management and regulatory processes involving interjurisdictional resources (e.g., Great Lakes, interstate, US/Canadian, Tribal).

> > **Tactic 1**: Attend all Lake Committee and Council of Lake Committee meetings to ensure Lake Michigan interests and issues are represented.

> > **Tactic 2**: Interact directly with agencies sharing resources or borders to ensure best coordination and use of resources occurs.

> **Strategy 3**: Work with partners to maximize the potential of habitat enhancement projects.

> > **Tactic 1**: Each management unit identifies one potential habitat project that can be completed collaboratively with other local, State, Federal, Tribal partners, and non-government organizations.
> > **Tactic 2**: Evaluate new projects to ensure habitat and fish population objectives are accomplished.
> > **Tactic 3**: Support the development of the West Michigan Drowned River mouth Lake Network as part of the National Estuarine Research Reserve System.

> **Objective 2**: Promote aquatic resource stewardship and watershed management.
> > **Strategy 1**: Support, enhance, and foster the growth of existing programs to assist in teaching Michigan's youth about stewardship principles and aquatic resources.
> > **Strategy 2**: Partner with local chambers of commerce or other economic development groups to promote Lake Michigan resource stewardship and to develop region-specific quality of life messages disseminated through multimedia outlets.
> > **Strategy 3**: Collaborate with Michigan DNR land management divisions to promote aquatic habitat on state managed lands.
> > > **Tactic 1**: Participate in development of land management plans and forest compartment reviews.

Goal 4: Strategically Focused Assessment and Decision Support Tools
> **Outcomes:**
> - Maintain and enhance data collection and analyses to monitor fish populations, quantify angler use and harvest, and evaluate management actions.
> - Improve knowledge of Lake Michigan habitats.
> - Development and use of best available models to set sustainable harvest limits for state and tribal fishers appropriately.
> - Quantification of attributes for desirable naturally reproduced fish populations for improved fishery management.
> - New technologies and analyses to manage the Lake Michigan fishery effectively and efficiently.

> **Objective 1**: Conduct comprehensive assessments of fish and other aquatic life, habitat, and aquatic resource users.
> > **Strategy 1**: Support a standardized program to annually assess Lake Michigan nearshore and offshore fish communities.
> > > **Tactic 1**: Continue to implement the Lake-wide Assessment Protocol to evaluate populations of lake trout, lake whitefish, yellow perch, and burbot populations in Michigan's waters of Lake Michigan.
> > > **Tactic 2**: Continue standardized fish community assessments in nearshore waters along the Upper Peninsula shoreline of Lake Michigan.
> > > **Tactic 3**: Continue to participate in standardized nearshore fish population monitoring efforts (LWF-Cisco larval seines, bottom trawling, neuston netting for yellow perch larvae, other?).

Tactic 4: Continue to collaborate with other agencies to complete standardized hydro-acoustic forage estimates for Lake Michigan.

Tactic 5: Implement sturgeon protocols developed by the Lake Michigan Sturgeon Work Group.

Tactic 6: Complete biodata collection requirements in the weir protocol.

Strategy 2: Better understand habitat in off-shore, near-shore and connected waterways of Lake Michigan.

Tactic 1: Encourage participation of MDNR staff in collaborative projects to map, assess, and improve habitat in Lake Michigan.

Strategy 3: Support standardized surveys to measure angler harvest and effort on key fisheries.

Tactic 1: Continue standardized creel surveys in Michigan waters of Lake Michigan and connected waterways.

Tactic 2: Continue Standardized Great Lakes charter fishery reporting program.

Tactic 3: Encourage development of standardized reporting for river guides.

Tactic 4: Develop and use new technologies to assess aquatic resource users (i.e. drones, cameras, satellites, social media polls).

Strategy 4: Support efforts to track the public's opinions, attitudes and participation related to Lake Michigan angling and aquatic resources.

Objective 2: Develop new and improved existing decision-support tools to optimize Michigan's fisheries and aquatic resources.

Strategy 1: Support efforts to improve and enhance development of GIS or other modelling tools to inform decisions with regard to habitat protection and rehabilitation, fish passage barriers, and climate change.

Strategy 2: Develop, refine, and implement stock assessment models and tools for intensively managed species.

Tactic 1: Continue the implementation and progress in assessing lake trout population status with catch-at-age models in treaty waters of Lake Michigan.

Tactic 2: Continue the implementation and progress in assessing whitefish population status with catch-at-age models in treaty waters of Lake Michigan.

Tactic 3: Continue the implementation and progress in assessing walleye population status with catch-at-age models in waters of northern Green Bay.

Tactic 3: Continue to support development of lake trout population models for non-treaty waters in Lake Michigan.

Tactic 4: Continue to support and participate in the predator-prey modelling effort for Lake Michigan.

Tactic 5: Improve models contributing to predator-prey modelling effort for Lake Michigan (particularly CAA models for steelhead, coho, and brown trout) and Green Bay (walleye, lake whitefish).

Tactic 6: Continue to monitor and explore the status of Cisco stocks and harvest in Lake Michigan.

Tactic 7: Support lake whitefish research to identify and address life history impediments.

Strategy 3: Focus more research projects to provide information on the fish community and inform management decisions.

Tactic 1: Support projects refining the use of otolith microchemistry to define fish stock origins, including steelhead, coho salmon, Chinook salmon and walleye.

Tactic 2: Support the use of mass-marking to evaluate stocked fish populations.

Tactic 3: Support research into the assessment of diet composition of predators in Lake Michigan.

Tactic 4: Support projects defining the stock status and composition of Cisco in Lake Michigan and connected waterways.

Tactic 5: Support projects that evaluate the costs and benefits of stocking efforts (Chinook salmon, coho salmon, steelhead, lake trout, brown trout, and walleye) to best utilize resources.

Tactic 6: Support research evaluating the population status, movement and harvest of smallmouth bass in Grand Traverse Bay, Green Bay, and northern Lake Michigan.

Tactic 7: Explore the potential for re-introduction of Elk Lake lake trout strain into Lake Michigan.

Tactic 8: Explore the potential to develop an acoustic array via partnerships in northern Lake Michigan (evaluate movement of lake trout, cisco, lake whitefish, smallmouth bass, walleye, and lake sturgeon). Support efforts to better understand movements of these species in Lake Michigan and Green Bay.

Tactic 9: Support efforts to better understand impediments to natural reproduction of walleyes in northern Green Bay.

Tactic 10: Support efforts to characterize post-dreissenid abundance of nearshore zooplankton and its potential influence on recruitment of nearshore fishes (e.g., yellow perch, walleye, and other species).

Objective 3: Evaluate fisheries management actions.

Strategy 1: Evaluate key management actions and annually report on status of key fisheries in Lake Michigan.

Tactic 1: Evaluate change in lake trout regulations to ensure meeting harvest criteria.

Tactic 2: Evaluate options for regulating nearshore fish populations (e.g., smallmouth bass, walleye, northern pike, and Great Lakes muskellunge), looking at trade-offs between harvest and growth, angler interests.

Tactic 3: Evaluate success of salmonid stocking programs.

Strategy 2: Quantify and report on contributions of naturally produced fishes to the Lake Michigan system.

Tactic 1: Monitor production of naturalized steelhead through use of mass marking, growth analysis in aging structures (ratio 23), and otolith microchemistry analysis.

Tactic 2: Monitor production of naturalized lake trout through use of mass marking and genetic analysis of unmarked fish to identify contributing strains.

Tactic 3: Monitor contribution of naturalized Chinook salmon through use of mass marking.

Tactic 4: Use a combination of otolith microchemistry and marking of stocked fish to evaluate the contribution of naturalized coho salmon to the lake-wide stock.

Tactic 5: Monitor production of lake sturgeon through use of PIT and coded wire tags.

Strategy 3: Quantify and report on contributions of stocked fish to the Lake Michigan system.

Tactic 1: Support the use of mass-marking to evaluate steelhead stocking.

Tactic 2: Continue long-term efforts to index mark with coded-wire tags stocked steelhead and Chinook salmon and consider initiating coho salmon.

Tactic 3: Support the use of mass-marking to evaluate lake trout stocking efforts.

Tactic 4: Support use of otolith microchemistry to quantify contribution of river and reef sources of natural reproduction to the Green Bay walleye population.

Tactic 5: Monitor stocking practices of lake sturgeon through use of PIT and coded wire tags.

Goal 5: Strategically fund priorities identified in this plan.

Outcomes:
- Increased license sales and fishing related business purchases.
- Increased or sustained number of projects that collaborate with partners to co-fund projects or initiatives which meet goals and objectives in the Lake Michigan management plan.
- Obtain competitive funding for relevant specialized projects through collaboration with university researchers.
- Maximize the use of Sport Fish Restoration funds and other federal funding sources to achieve management plan goals and objectives.

Objective 1: Increase funding and use existing Sport Fish Restoration and Game and Fish funds efficiently.

Strategy 1: Support opportunities to increase license sales and fishing equipment purchases.

Strategy 2: Review budget and spending within each program to maximize funding for priority projects.

Objective 2: Seek and secure federal, tribal, state, and private grant funds.

Strategy 1: Capitalize on grant funds to support Lake Michigan management, outreach, and research.

> **Tactic 1:** Pursue funding for development of lake-wide statistical catch-at-age models for lake trout in southern and western Lake Michigan.
>
> **Tactic 2:** Pursue funding to improve knowledge of consumption and dietary preferences of abundant predatory fish species in Lake Michigan.
>
> **Tactic 3:** Pursue funding to complete mixed stock analysis via otolith microchemistry work with steelhead populations in Lake Michigan.
>
> **Tactic 4:** Support efforts to fund mass marking.

Strategy 2: Maximize allocation and use of Sport Fish Restoration funds and other federal funding sources to achieve management plan goals and objectives.

Objective 3: Develop relationships and programs with community foundations.

Strategy 1: Collaborate with community organizations to increase fishing engagement, opportunities, and access.

> **Tactic 1:** Meet with at least three port communities per year.

Objective 4: Work with partners to accomplish shared management actions.

Strategy 1: Collaborate with others to maximize potential of habitat dam removal projects.

> **Tactic 1:** Work with the City of Traverse City, CRA, and GLFC to fund Boardman Dams removals and the FishPass Project.
>
> **Tactic 2:** Work with the City of Niles to fund removal of Pucker Street Dam.
>
> **Tactic 3:** Continue co-funding relationship with the Nature Conservancy to continue habitat improvement evaluations on reef in Grand Traverse Bay.
>
> **Tactic 4:** Work with Explore the Shores to increase access opportunities at Little Manistee Weir.

Strategy 2: Collaborate with others to complete comprehensive surveys and assessments.