

# Wisconsin DNR Lake Michigan and Green Bay Research Priorities

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These priority research needs were developed by the Lake Michigan Fisheries Team of the Wisconsin DNR to encourage progress towards meeting objectives in the Lake Michigan Integrated Fisheries Management Plan (LMIFMP) and, in some cases, Lake Michigan Fish Community Objectives (FCOs) set forth by the Great Lakes Fishery Commission's Lake Michigan Committee and Technical Committee. Interested researchers should review the LMIFMP, FCOs, as well as the latest version of the State of Lake Michigan document for additional background information concerning these research priorities. FCOs 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](http://www.glfc.org)). The LMIFMP can be found on the WDNR web site (<http://dnr.wi.gov/topic/fishing/documents/lakemichigan/lmifmp2003-2013.pdf>). **The current list of 25 priority research questions identified by the WDNR Lake Michigan Fisheries Team are indicated below in no particular order of importance**, but any innovative research project that clearly will advance the achievement of FCOs or objectives within the LMIFMP will be encouraged, even if not included on the specific list of priority research questions.

Species	Research Item	Contact
Walleye	Spawning site fidelity/genetics by area (Fox, Oconto, Peshtigo, Menominee, Sturgeon Bay). <u>Is there a single spawning walleye population in Green Bay or are there multiple spawning populations? If there are multiple populations how do they interact?</u>	Steve Hogler <a href="mailto:steven.hogler@wisconsin.gov">steven.hogler@wisconsin.gov</a> 920-662-5480
Walleye	Recruitment by location & habitat (year class structure) <u>What are the population characteristics of walleye in Green Bay? Is recruitment and year class strength the same across Green Bay or are there areas of Green Bay that contribute more to the overall abundance of walleye in the bay? What factors lead to successful recruitment?</u>	Steve Hogler <a href="mailto:steven.hogler@wisconsin.gov">steven.hogler@wisconsin.gov</a> 920-662-5480
Yellow Perch	Bioenergetics/diet study on pelicans. <u>What is the diet composition of the growing population of pelicans in southern Green Bay?</u>	Tammie Paoli <a href="mailto:tammie.paoli@wisconsin.gov">tammie.paoli@wisconsin.gov</a> 715-582-5052
Yellow Perch	Investigate parameters for automating commercial quota system. <u>What parameters and formula would best be utilized to develop an automated commercial quota system for Green Bay yellow perch?</u>	Tammie Paoli <a href="mailto:tammie.paoli@wisconsin.gov">tammie.paoli@wisconsin.gov</a> 715-582-5052
Smallmouth Bass	Genetics. <u>What, if any, types of genetic differences exist among the Green Bay/Lake Michigan "recognized populations"?</u>	Scott Hansen <a href="mailto:scott.hansen@wisconsin.gov">scott.hansen@wisconsin.gov</a> 920-746-2864

Smallmouth Bass	Spawning site fidelity/homing and general movement patterns. Potential impact of tournament relocation. <u>What are the movement patterns of smallmouth bass in Green Bay? Are there homing tendencies? Does relocation of fish during tournaments have the potential to impact smallmouth distribution?</u>	Scott Hansen <a href="mailto:scott.hansen@wisconsin.gov">scott.hansen@wisconsin.gov</a> 920-746-2864
Muskellunge	Spawning/recruitment. <u>Can we add to information already collected to help determine where are Great Lakes spotted musky spawning in Green Bay, Fox River and other tributaries, what sort of habitat is being used for spawning and are there projects that can be completed to enhance the amount spawning habitat available to musky?</u>	Steve Hogler <a href="mailto:steven.hogler@wisconsin.gov">steven.hogler@wisconsin.gov</a> 920-662-5480
Muskellunge	Movement of adults/telemetry. <u>What are the seasonal movements of GLS musky in Green Bay and in the rivers?</u>	Steve Hogler <a href="mailto:steven.hogler@wisconsin.gov">steven.hogler@wisconsin.gov</a> 920-662-5480
Northern Pike	Population characteristics (P.E., growth, age distribution, harvest). <u>How can we gain adequate information on the adult population of northern pike in Green Bay to affect management/regulation changes?</u>	Tammie Paoli <a href="mailto:tammie.paoli@wisconsin.gov">tammie.paoli@wisconsin.gov</a> 715-582-5052
Northern Pike	Identifying unknown spawning habitat locations. <u>What streams &amp; wetlands do northern pike utilize for spawning on the east shore of Green Bay and in southern Lake Michigan? Is habitat a limiting factor? Is fish access/connectivity to potential spawning habitat in these areas adequate?</u>	Tammie Paoli <a href="mailto:tammie.paoli@wisconsin.gov">tammie.paoli@wisconsin.gov</a> 715-582-5052
Lake Sturgeon	Movement in Green Bay, outside of rivers. <u>Is there spawning fidelity to one river or multiple rivers for adult sturgeon? Are there movement patterns (pre- and post-spawning) that relate to staging location, recovery areas post-spawning, or seasonal movements? How long do adult sturgeon remain in each river? Does the amount of time in a river vary from river to river? What are the seasonal movement patterns of juvenile and adult lake sturgeon in Green Bay?</u>	Mike Donofrio <a href="mailto:michael.donofrio@wisconsin.gov">michael.donofrio@wisconsin.gov</a> 715-582-5050
Lake Sturgeon	Survival & outmigration rates of stocked fish. <u>Can we assess survival and outmigration rates in the Milwaukee and Kewaunee Rivers? How can we estimate survival rates for newly stocked fish into these systems?</u>	Brad Eggold <a href="mailto:bradley.eggold@wisconsin.gov">bradley.eggold@wisconsin.gov</a> 414-382-7921
Lake Whitefish	Multiple stock tagging (movement & mortality of Green Bay stocks).	Scott Hansen <a href="mailto:scott.hansen@wisconsin.gov">scott.hansen@wisconsin.gov</a>

	<u>What level of movement occurs with Green Bay whitefish stocks and how do they contribute to the commercial and sport fisheries with a particular emphasis on the Menominee River spawning population?</u>	920-746-2864
Lake Whitefish	Recruitment in Green Bay and U.P. tributaries. <u>Considering the success of the Menominee River whitefish recolonization, do other Green Bay tributaries exhibit signs of establishing reproductive populations?</u>	Scott Hansen <a href="mailto:scott.hansen@wisconsin.gov">scott.hansen@wisconsin.gov</a> 920-746-2864
Lake Whitefish	How to incorporate fisheries independent data into SCAA model. <u>The current whitefish SCAA model does not include fishery independent information. Some effort has been made to include these data in the model with limited success but further efforts should be made in order to increase confidence in model output.</u>	Scott Hansen <a href="mailto:scott.hansen@wisconsin.gov">scott.hansen@wisconsin.gov</a> 920-746-2864
Rainbow Trout	Natural reproduction for all trout/salmon species, habitat & connectivity in streams. <u>Is natural reproduction of steelhead occurring in Wisconsin streams (if so, where) and how much is natural reproduction contributing to the fishery? Could habitat improvement projects be implemented on any Wisconsin streams to improve natural reproduction, and if so, which streams might be good candidates for habitat projects? Also, what type of habitat improvement projects should be considered? Especially given recent concerns about predator-prey balance and stocking reductions, would an increase in steelhead natural reproduction be positive, or negative?</u>	Nick Legler <a href="mailto:nicholas.legler@wisconsin.gov">nicholas.legler@wisconsin.gov</a> 920-746-5112
Rainbow Trout	CWT use to determine survival by location stocked. <u>Which steelhead stocking locations are most effective? Is survival better at certain locations, which locations contribute the most recruitment into the fishery, what factors may be limiting survival? What genetic strains of steelhead are contributing to the harvest?</u>	Nick Legler <a href="mailto:nicholas.legler@wisconsin.gov">nicholas.legler@wisconsin.gov</a> 920-746-5112
Chinook Salmon  Coho Salmon	CWT use to determine survival by location stocked. <u>Which Chinook stocking locations are most effective? Is survival of stocked Chinook better at certain locations, which locations contribute the most recruitment into the fishery, and what factors may be limiting survival? What is the contribution of Green Bay stocking compared to Lake Michigan stocking efforts?</u>	Nick Legler <a href="mailto:nicholas.legler@wisconsin.gov">nicholas.legler@wisconsin.gov</a> 920-746-5112

Chinook Salmon  Coho Salmon	Timing of runs (when & where do they stage in the late summer and fall). <u>Can we develop a sampling plan and analyze CWT information to determine when Chinook salmon begin to home back to their stocking location?</u>	Nick Legler <a href="mailto:nicholas.legler@wisconsin.gov">nicholas.legler@wisconsin.gov</a> 920-746-5112
Brown Trout	Post-stocking survival (offshore vs. nearshore). <u>Is offshore stocking brown trout effective in increasing survival? Does time of stocking/strain/hatchery source matter? Can we utilize CWT to answer these questions?</u>	Tammie Paoli <a href="mailto:tammie.paoli@wisconsin.gov">tammie.paoli@wisconsin.gov</a> 715-582-5052
Brown Trout	Movements after stocking. <u>Where and when do brown trout move after they are stocked and throughout the summer and fall? Do brown trout stocked offshore move into rivers in the fall? Can we utilize CWT to answer these questions?</u>	Tammie Paoli <a href="mailto:tammie.paoli@wisconsin.gov">tammie.paoli@wisconsin.gov</a> 715-582-5052
Bloater Chubs  Rainbow Smelt	Population estimates, life history, age, recruitment, diet. <u>What information do we need to adequately adjust the commercial quotas for chubs and smelt?</u>	Pradeep Hirethota <a href="mailto:pradeep.hirethota@wisconsin.gov">pradeep.hirethota@wisconsin.gov</a> 414-382-7928
Multiple Species	Tournament mortality (movement of fish, temperature issues, fizzing). <u>The issue of fizzing and temperature related stress to fish in Green Bay, particularly smallmouth bass, has garnered some attention in recent years. Unlike most other waters in Wisconsin, conditions on Green Bay have the potential to impart additional stressors upon tournament caught fish such as barotrauma and wide temperature swings, the latent effects of which are generally unknown. Can we determine mortality as a result of these factors?</u>	Scott Hansen <a href="mailto:scott.hansen@wisconsin.gov">scott.hansen@wisconsin.gov</a> 920-746-2864
Multiple Species	Economics. <u>What is the economic value of sport and commercial fisheries in Lake Michigan and Green Bay?</u>	Various/all
Multiple Species	Tributary studies/Connectivity. <u>Can we identify issues with habitat and connectivity for species that are dependent on tributaries for spawning (i.e. redhorse, longnose sucker, white sucker, northern pike, lake sturgeon)?</u>	various