STATE OF MICHIGAN

Health Consultation

Muskrat muscle analytical results
for St. Clair River Area of Concern

Algonac, Michigan

February 11, 2014

Michigan Department of Community Health

Division of Environmental Health

Lansing, Michigan

Table of Contents

List of Tables

List of Figures

List of Appendices

Acronyms and Abbreviations

AOC	Area of Concern
ATSDR	Agency for Toxic Substances and Disease Registry
BPAC	Binational Public Advisory Council
BUI	Beneficial Use Impairment
DDT	Dichlorodiphenyltrichloroethane
EPA	U.S. Environmental Protection Agency
GLRI	Great Lakes Restoration Initiative
HCB	Hexachlorobenzene
kg	kilograms
MDCH	Michigan Department of Community Health
MDEQ	Michigan Department of Environmental Quality
ng	nanograms
OCS	Octachlorostyrene
PCBs	Polychlorinated biphenyls
µg	micrograms

Summary of Findings

The Michigan Department of Community Health (MDCH) assessed the public health risk of consuming muskrat muscle meat from the St. Clair River Area of Concern (AOC). A convenience sample of muskrat muscle was analyzed for persistent, bioaccumulative chemicals. The resulting dataset cannot be extrapolated beyond the existing data due to the small sample size.

Five chemicals were detected in the muskrat muscle. Four of the chemicals were found at concentrations that represent minimal risk to public health. Polychlorinated biphenyls (PCBs) were detected in one of six samples. However, the amount detected could result in consumption guidance of no more than 24 serving per year. Such consumption guidance would only apply if this PCB concentration occurred frequently in the muskrat population.

Given the limited dataset, MDCH cannot determine if unlimited consumption of muskrat muscle from the St. Clair River AOC could harm people's health.

Background

In 1991, the St. Clair River was designated as an Area of Concern (AOC) under the Great Lakes Water Quality Agreement. The St. Clair River AOC has a Binational Public Advisory Council (BPAC) made up of local, state, and federal representatives from Michigan (United States) and Ontario (Canada). The BPAC works to address the designated beneficial use impairments (BUIs) affecting the St. Clair River.

The BPAC has published documents describing the type of impairments found on the St. Clair River; some of those impairments are due to chemical contamination[1]. Upriver chemical releases from industrial and agricultural activities are the likely source of chemical contaminants in St. Clair River fish. Methylmercury, polychlorinated biphenyls (PCBs), and dioxin-like chemicals found in some species of St. Clair River fish cause public health consumption advisories[2].

[1] St. Clair River Stage 1 Remedial Action Plan Report. 1997. www.epa.gov/glnpo/aoc/stclair/pdfs/1992_1997_SCR_Stg1_Stg2_IM_Up.pdf

[2] Michigan Department of Community Health. 2014. Michigan Fish Consumption Advisory Program Guidance Document. http://www.michigan.gov/documents/mdch/MDCH_MFCAP_Guidance_Document_417043_7.pdf

Muskrats live in the delta wetlands of the St. Clair River. Muskrats eat a wide variety of plants, such as cattails, sedges, arrowhead, pondweed, and ferns. When plant foods are scarce, muskrat have been known to eat animals such as snails, fish, frogs, and salamanders; although, animals tend to make up a small portion of a muskrat's diet[3].

Harvesting muskrats from the St. Clair River AOC is a long-standing tradition for people from Walpole and Harsens Islands, as well as the surrounding region. Native Americans and Aboriginal people harvested more than 100,000 pelts per year prior to 1980[1]. Those numbers declined to around 10,000 pelts by 1989. A 1986 survey of Walpole Island's First Nation households, found that 56 percent of households consumed muskrat meat[1].

In 1987, a small number of muskrat fat (7), liver (10), and muscle (8) samples from Walpole Island were analyzed for organochlorine chemicals. Hexachlorobenzene (HCB) and total PCBs were at low parts per billion (ppb) concentrations (1-2 ppb) in some of the muscle samples[1].

In 2012, MDCH acquired a US Environmental Protection Agency (EPA) Great Lakes Restoration Initiative (GLRI) grant to partner with the MDEQ and evaluate the status of fish consumption BUIs. MDCH and MDEQ partnered with the St. Clair River AOC BPAC to conduct the St. Clair River AOC evaluation of fish. Although not officially part of the BUI, the BPAC requested that muskrat or turtle be analyzed for chemicals of concern due to the local consumption of these meats. The MDEQ funded the collection and analysis of eight samples of muskrat from this area. This health consultation evaluates the potential public health risks from eating St. Clair River AOC muskrat muscle meat based on lab results from this small convenience sample.

Discussion

Exposure Pathway

In the 1986, 56 percent of Walpole Island's First Nation households reported eating muskrat muscle. In 1987, muskrat muscle was analyzed and found to have organochlorine contamination from St. Clair River AOC sources. A plausible completed exposure pathway exists between St. Clair River AOC chemical contaminants and people who eat St. Clair River AOC muskrat meat.

[3] Washington Department of Fish & Wildlife. Living with wildlife. http://www.wdfw.wa.gov/living/muskrats.html

Chemical Concentrations

A total of 13 muskrat were obtained from trappers harvesting in the lower portion the St. Clair River around Harsens and Walpole Islands (Figure 1). Muskrat muscle tissue was removed, homogenized, and analyzed as six muscle tissue samples with one to four individual muskrats included in each sample. Harsens Island samples had 3 or 4 muskrats per composite sample; Walpole Island muskrat were analyzed as individual muscle samples. Each sample was analyzed for a standard suite of persistent, bioaccumulative chemicals that are evaluated in fish tissue (Appendix A). Five chemicals were detected in one or more of the muscle samples (Appendix A).

Toxicological Assessment

The muskrat muscle analytical dataset is limited due to the small number of samples and convenience-sample collection methods used to acquire the muskrats.
This limitation means the dataset cannot necessarily be considered representative of the contamination levels in the population of muskrat from the St. Clair River AOC.

MDCH conducted a reasonable worst-case toxicological assessment based on the maximum detected concentration of each chemical. Chemicals not detected in the muscle tissue were assumed to be zero and no further evaluation was done. This is consistent with the data analysis approach used in the Michigan Fish Consumption Advisory Program[2]. Chemicals not detected in the muscle tissue were aldrin, dieldrin, lindane, heptachlor, heptachlor epoxide, heptachlorostyrene, hexachlorostyrene, mirex, polybrominated biphenyls, pentachlorostyrene, chlorinated terphynyls, total chlordane, and toxaphene (Appendix A).

Five chemicals [hexachlorobenzene, octachlorostyrene (OCS), total dichlorodiphenyltrichloroethane (DDT), total mercury, and total polychlorinated biphenyls (PCBs)] were detected in one or more muskrat muscle samples. Agency for Toxic Substances and Disease Registry (ATSDR) or EPA chemical potency values were used in this evaluation. No potency value for OCS is provided by ATSDR or EPA. MDCH conducted an internet search for documented OCS potency values; however none were found. An EPA website mentions a non-cancer value from Health Canada, but no documentation was found to support this value. OCS was detected in one of the six samples just above the limit of detection (1 nanogram per gram). OCS was detected in the same sample as PCBs, and PCBs often determine the highest risk estimates. MDCH did not pursue further evaluation of OCS.

Based on estimated non-cancer and upper-bound excess cancer risk of the four remaining chemicals, MDCH calculated the number of servings per month of muskrat muscle the public can consume without increasing their risk of chronic disease. These estimates are based on the individual class of chemicals: no cumulative or mixture

toxicity risks are calculated. The risk estimates are considered protective of the most sensitive life-stage or individual in the population.

A hazard quotient (HQ) is the amount of a chemical a person is exposed to, divided by the amount of the chemical that is *not* expected to cause health effects (non-cancer toxicity values). Examples of non-cancer toxicity values are minimal risk levels or reference doses. These values are amounts of chemical that are not expected to cause health effects for anyone, even if they are exposed to that chemical daily for a lifetime.

- If the non-cancer risk is less than 1.0, a person is exposed to less than the non-cancer toxicity value. No further evaluation of this exposure is needed.
- If the non-cancer risk is 1.0, a person is exposed to the non-cancer toxicity value. No further evaluation of this exposure is needed.
- If the non-cancer risk is greater than 1.0, a person is exposed to more than the non-cancer toxicity value. This does not automatically mean that people will have health effects, but that the exposure should be reviewed further as exposure to a larger amount of chemical is occurring.

Cancer risk (CR) values represent the theoretical number of people that may develop cancer from exposure to these chemicals. A higher than normal risk of cancer is a theoretical cancer risk greater than the typically used range of one individual in 10,000 to one individual in 1,000,000.

Meal serving size is based on body weight, such that an 80- kilograms (kg) person’s serving size is an 8-ounce (oz) portion and a 40-kg person’s serving size is 4-oz. Meal sizes can be adjusted by 1-oz per 10 kg of body weight. Risk estimates were not calculated beyond sixteen servings per month (192 servings per year).

Table 1. Cancer risk (CR) and non-cancer risk [hazard quotient (HQ)] for the maximum detected concentration in muskrat muscle collected from the St. Clair River Area of Concern (AOC).

Chemical	Servings per Month	HQ	CR
Hexachlorobenzene	16	0.01	1.2E-06
Octachlorostyrene	--	--	--
Total DDT	16	0.01	1.0E-06
Total Mercury	16	0.29	--
Total PCBs	2	0.72	2.9E-05

Hexachlorobenzene (HCB)

People who were exposed to high levels of HCB had changes in their liver and thyroid function. Experimental animal studies confirm that the liver, kidney, and endocrine glands are primary sites for HCB toxicity[4]. The non-cancer potency value for HCB is based on rodent studies that reported dose-dependent tissue changes in the liver and kidneys. The cancer potency value is based on liver tumor formation.

HCB was detected in two of the six samples; both samples were composites made up of muscle from 3-4 muskrat harvested around Harsens Island. Cancer and non-cancer risks were minimal at a consumption rate of 16 serving per month (Table 1).

Total mercury

Long-term human exposure to low-levels of methylmercury most often occurs from periodic consumption of methylmercury-contaminated fish. Methylmercury exposure prior to birth (as a result of the mother's intake before and during pregnancy) has been correlated with neurological effects in children[5]. Methylmercury can affect autonomic nervous system function and cardiovascular function in adults. Experimental animal studies report reduced immune system function. The non-cancer potency value is based on human prenatal exposure and measures of early-age neurological function. Methylmercury has not been identified as a carcinogen.

Total mercury – assumed to be in the form of methylmercury – was quantified in all muskrat muscle samples. The non-cancer risk due to methylmercury was minimal at the consumption rate of 16 serving per month (Table 1).

Total DDT

Long-term human exposure to low-levels of DDT and its metabolites has been associated with reproductive, developmental, and endocrine effects (e.g., increased risk of type 2 diabetes)[6]. Experimental rodent studies found liver changes at the cellular

[4] Agency for Toxic Substances and Disease Registry (ATSDR). 2013. Toxicological profile for Hexachlorobenzene. *(Draft for Public Comment)* Atlanta, GA: U.S. Department of Health and Human Services, Public Health Service. http://www.atsdr.cdc.gov/ToxProfiles/tp.asp?id=627&tid=115

[5] MDCH 2009. Technical Support Document for a Methylmercury Reference Dose as a Basis for Fish Consumption Screening Values (FCSVs). http://www.michigan.gov/documents/mdch/MDCH_Methylmercury_Reference_Dose_HC_9-10-2009_382034_7.pdf

[6] MDCH 2012. Technical Support Document for DDT, DDD, and DDE Reference Dose (RfD) as the Basis for Michigan Fish Consumption Screening Values (FCSVs). http://www.michigan.gov/documents/mdch/DDT_LHC_FCSV_2012_10_21_402648_7.pdf

level. DDT and its metabolites are probable human carcinogens based on experimental rodent studies. The cancer and non-cancer potency values are based on dose-response liver effects observed in experimental animal studies.

Total DDT, which is the sum of DDT and its metabolites, was detected in two of the Harsens Island composite samples. Cancer and non-cancer risks were minimal at a consumption rate of 16 serving per month (Table 1).

Total PCBs

Eighty-three individual PCB congeners are measured by the MDCH Analytical Laboratory for the total PCB concentrations. People's PCB exposure typically comes from eating foods contaminated with a mixture of PCBs. Associations between human PCB exposure and the occurrence of diabetes, immune system dysfunction, thyroid dysfunction, cardiovascular disease, neurodevelopmental effects in children, memory decrements in adults, and impaired reproductive system function have been reported in observational epidemiology studies[7]. Experimental animal studies report similar toxicity endpoints. PCBs are considered carcinogens based on animal studies.

PCBs were detected in one Harsens Island composite sample. The total PCB concentration was 77 ppb wet-weight with approximately 31 PCB congeners detected in this sample. MDCH does not know if only one or more than one of the four muskrat used in the composite sample were contaminated with PCBs. The maximum individual total PCB muskrat muscle concentration is not discernable from a composite sample. Based on the available data, cancer and non-cancer risk were minimal at a consumption rate of 2 serving per month (24 per year) (Table 1).

Conclusions

MDCH concludes that mercury and organochlorine chemicals from the St. Clair River AOC can accumulate to measureable amounts in muskrat muscle meat. It is unclear why the organochlorine measurements were found only in Harsens Island composite samples, but it may be because fewer muskrat were sampled from Walpole Island. The maximum concentration for each detected compound, except for total PCBs, represents a minimal public health risk at 192 servings per year for 78 years of consumption.

[7] MDCH 2012. Technical Support Document for Polychlorinated Biphenyl Reference Dose (RfD) as a Basis for Fish Consumption Screening Values (FCSVs). http://www.michigan.gov/documents/mdch/MDCH_PCB_Fish_Consumption_Protocol_2012_401298_7.pdf

The data suggest that PCB concentrations in muskrat muscle can reach at least 77 ppb and that around 31 PCB congeners can be detected in the meat. Due to the use of composites, the maximum individual PCB concentration is unknown. It is unclear why only one of the six muscle tissue samples had measurable amounts of PCBs. However, eating 24 servings per year of muskrat meat containing 77 ppb of PCBs for 78 years is not expected to result in a human health risk.

Based on past reports, a completed exposure pathway exists between the St. Clair River AOC chemical contaminants and consumers of muskrat muscle from that region[1]. This assessment is limited to the results of this dataset, and extrapolation of these results is not recommended due to the small number of samples, sample collection methods, and use of composites. MDCH cannot determine if unlimited consumption of muskrat muscle could harm people's health.

Recommendations

1. MDCH recommends this health consultation be provided to the BPAC for their consideration.
2. MDCH recommends working with BPAC to develop outreach materials discussing the findings if requested.

Public Health Action Plan

1. MDCH will provide this health consultation to the BPAC for their consideration.
2. MDCH will work with the BPAC to develop outreach materials discussing the findings if requested.

Figure 1. Location of Harsens and Walpole Islands.

Appendix A. Analytical chemistry results for the six muskrat muscle samples collected from the Harsens and Walpole Islands region within the St. Clair River Area of Concern.

Table A-1. Number of analyses, percentage of chemical detections per analyte, limit of detection and maximum detected concentration for muskrat muscle samples from the Harsens and Walpole Islands region within the St. Clair River Area of Concern.

Chemical	Number of Samples	Percentage of Detections	Limit of Detection	Maximum concentration
			ppm	*ppm*
Aldrin	6	0	0.001	--
Dieldrin	6	0	0.005	--
gamma-BHC (Lindane)	6	0	0.002	--
Heptachlor	6	0	0.001	--
Heptachlor Epoxide	6	0	0.002	--
Heptachlorostyrene	6	0	0.001	--
Hexachlorobenzene	6	33%	0.001	0.0005
Hexachlorostyrene	6	0	0.001	--
Mercury	6	100%	0.001	0.0190
Mirex	6	0	0.001	--
Octachlorostyrene	6	17%	0.001	0.0011
Polybrominated Biphenyls	6	0	0.003	--
Pentachlorostyrene	6	0	0.001	--
Terphynyls	6	0	0.250	--
Total Chlordane	6	0	0.001	--
Total DDT	6	33%	0.001	0.0020
Total PCBs	6	17%	0.001	0.0772
Toxaphene	6	0	0.050	--

Table A-2. Descriptive information for each muskrat muscle sample.

Sample Number	Number of Muskrats per Sample	Location	Collection Date	Species	Percent Fat
1	3	Harsens Island	03-Jan-13	Muskrat	4.83
2	3	Harsens Island	03-Jan-13	Muskrat	2.91
3	4	Harsens Island	03-Jan-13	Muskrat	2.98
4	1	Walpole Island	04-Feb-13	Muskrat	3.11
5	1	Walpole Island	04-Feb-13	Muskrat	0.59
6	1	Walpole Island	04-Feb-13	Muskrat	21.44

Table A-3. Analytical chemistry results for six muskrat muscle samples collected from the Harsens and Walpole Islands region within the St. Clair River Area of Concern.

Chemical	Sample Number					
	1	2	3	4	5	6
Aldrin	0.00025*	0.00025*	0.00025*	0.0013*	0.00025*	0.0011*
Dieldrin	0.0012*	0.0012*	0.0012*	0.0012*	0.0012*	0.0054*
gamma-BHC	0.0005*	0.0005*	0.0005*	0.0005*	0.0005*	0.0021*
Heptachlor	0.00025*	0.00025*	0.00025*	0.0013*	0.00025*	0.0011*
Heptachlor Epoxide	0.0005*	0.0005*	0.0005*	0.0005*	0.0005*	0.0021*
Heptachlorostyrene	0.0005*	0.0005*	0.0005*	0.0013*	0.0005*	0.0011*
Hexachlorobenzene	0.00025*	0.0003	0.0005	0.00025*	0.00025*	0.0011*
Hexachlorostyrene	0.0005*	0.0005*	0.0005*	0.0013*	0.0005*	0.0011*
Mercury	0.0034	0.0039	0.0044	0.0027	0.0014	0.0190
Mirex	0.00025*	0.00025*	0.00025*	0.0013*	0.0005*	0.0011*
Octachlorostyrene	0.00025*	0.00025*	0.0006	0.00025*	0.00025*	0.0011*
Pentachlorostyrene	0.0005*	0.0005*	0.0005*	0.0013*	0.0005*	0.0011*
Polybrominated Biphenyls	0.0005*	0.0005*	0.0005*	0.0027*	0.0005*	0.0021*
Terphynyls	0.250*	0.250*	0.250*	0.250*	0.250*	0.250*
Total Chlordane	0.0005*	0.0005*	0.0005*	0.0005*	0.0005*	0.0021*
alpha-Chlordane	0.0005*	0.0005*	0.0005*	0.0005*	0.0005*	0.0021*
cis-Nonachlor	0.0005*	0.0005*	0.0005*	0.0005*	0.0005*	0.0021*
trans-Nonachlor	0.0005*	0.0005*	0.0005*	0.0005*	0.0005*	0.0021*
gamma-Chlordane	0.0005*	0.0005*	0.0005*	0.0005*	0.0005*	0.0021*
Oxychlordane	0.0005*	0.0005*	0.0005*	0.0005*	0.0005*	0.0021*
Total DDT	0.0010	0.001*	0.0020	0.001*	0.001*	0.001*
2,4'-DDD	0.0005*	0.0005*	0.0005*	0.0005*	0.0005*	0.0021*
2,4'-DDT	0.0005*	0.0005*	0.0005*	0.0005*	0.0005*	0.0021*
4,4'-DDD	0.0001*	0.0005*	0.0001*	0.0001*	0.0001*	0.0043*
4,4'-DDE	0.0001*	0.0001*	0.0016	0.0001*	0.0001*	0.0043*
4,4'-DDT	0.0009	0.0005*	0.0005*	0.0005*	0.0005*	0.0021*
Total PCBs	0.001*	0.001*	0.0772	0.001*	0.001*	0.001*
Toxaphene	0.050*	0.050*	0.050*	0.050*	0.050*	0.050*

* Detection limit; no amount of analyte was quantified above this amount.

Michigan Department of Community Health

Eat Safe St. Clair River Muskrat

In 2014, by the request of the St. Clair River Binational Public Advisory Council, the Michigan Department of Environmental Quality (MDEQ) funded the Michigan Department of Community Health (MDCH) to test muskrats from the St. Clair River delta to see if there were chemicals in the meat that could be harmful to human health.

Trappers from Walpole Island and Harsens Island provided 13 muskrat to MDCH to be tested. Thirteen samples is not a lot when looking at large population, so it's important to note that this information only provides a small snapshot of the overall muskrat population in the area.

Many chemicals that the MDCH Laboratory looks for were not found in the muskrat; however, five chemicals were found in one or more muskrat samples:

- DDT (dichlorodiphenyltrichloroethane)
- hexachlorobenzene
- PCBs (polychlorinated biphenyls)
- mercury
- octachlorostyrene

Most of the chemicals were found in very small amounts and would not cause health problems at these levels. However, PCBs were found at a slightly higher amount in one of the muskrats that was tested. To see the full report on St. Clair River delta muskrat, please contact MDCH at 1-800-648-6942 or visit www.michigan.gov/eatsafefish and click on "Find Your Area" and choose "St. Clair River."

What does this mean?

MDCH will not issue official eating guidelines for muskrat because we only have a limited amount of information. However, based on the highest PCB amounts measured in the meat of these muskrats, MDCH calculates that people can safely eat 24 servings each year of muskrat from this area. The serving size depends on how much the person eating the muskrat weighs. There may be more than one serving of muskrat in your full meal; don't forget to count each serving.

ESTIMATE

Weight of Person	*How much muskrat per serving?*	How many servings can be eaten each year?
45 pounds	2 ounces	24
90 pounds	4 ounces	24
180 pounds	8 ounces	24

So what are PCBs?

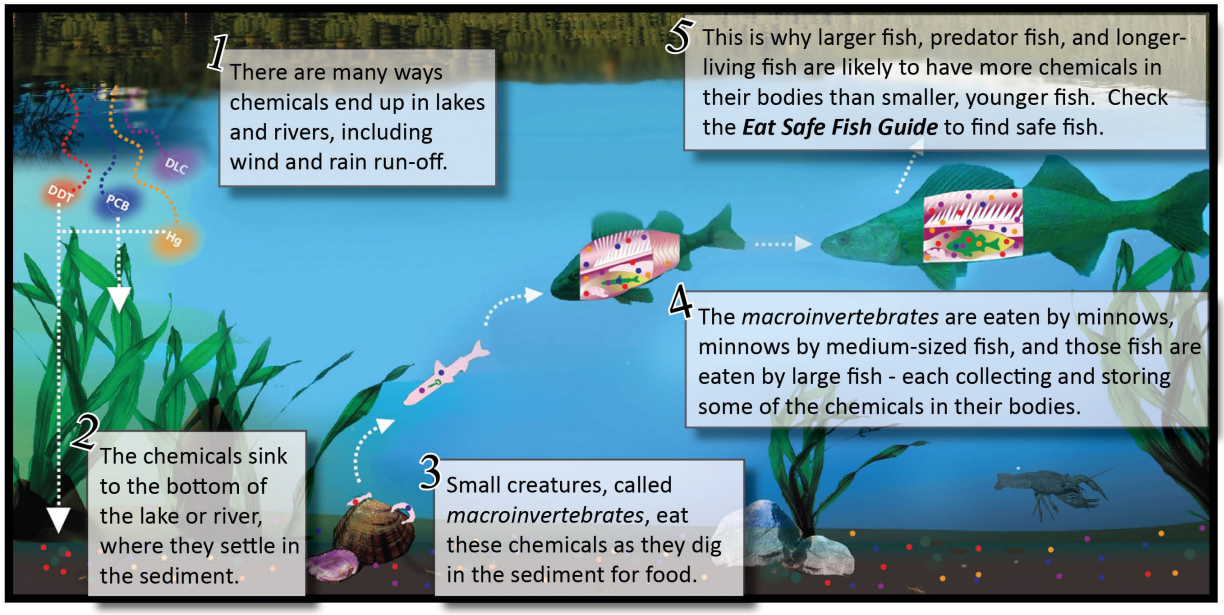
PCBs (also known as polychlorinated biphenyls):

- were used in electrical equipment - like transformers
- were found in hydraulic oils
- were banned from new use in the 1970s
- can harm brain development in fetuses and children
- linked to the development of cancer
- linked to the development of diabetes
- can harm the immune system

Not everyone will get sick from these chemicals. Over time, some people might get sick, and others will not. It depends on your body, how much you eat, and how often. All of the MDCH fish and wildlife guidelines are set to make sure you don't eat too many of these chemicals, too often.

How do chemicals end up in muskrat & fish?

Muskrat are mostly vegetarians, eating cattails and other plants. Sometimes, though, they'll also eat mussels, frogs, salamanders, crayfish, or small fish. Although plants generally have few chemicals in them, the small critters that are eaten may have more chemicals. Muskrats eat a lot. It's estimated that they eat enough food to equal a third to half of their body weight every day! This means even small amounts of chemicals can build up in their bodies quickly.



Learn more about choosing safe locally-sourced foods:

The Michigan Department of Community Health (MDCH) does issue eating guidelines for fish from Michigan and our surrounding Great Lakes. The regional MDCH ***Eat Safe Fish Guides*** list the fish that have been tested and how much is safe to eat.

The MDEQ and Michigan Department of Natural Resources (DNR) collect fish from lakes and rivers around the state, including Lake Huron, the St. Clair River, and Lake St. Clair. The MDCH Laboratory tests the filets of those fish for chemicals. The results of the tests are printed in the ***Eat Safe Fish Guides.***

Unfortunately, chemicals in fish are a problem worldwide and not just limited to Michigan. But no worries - the MDCH ***Buy Safe Fish*** brochure helps you choose store-bought fish that are low in mercury and high in omega-3s. And you can also find links to the fish consumption guidelines for other Great Lakes states by clicking on **Find your Area** at www.michigan.gov/eatsafefish.

The ***Guides***, the ***Buy Safe Fish*** brochure, and other fact sheets are free and available to download to your computer or smartphone at www.michigan.gov/eatsafefish. You can also request free print copies by calling MDCH at 1-800-648-6942.

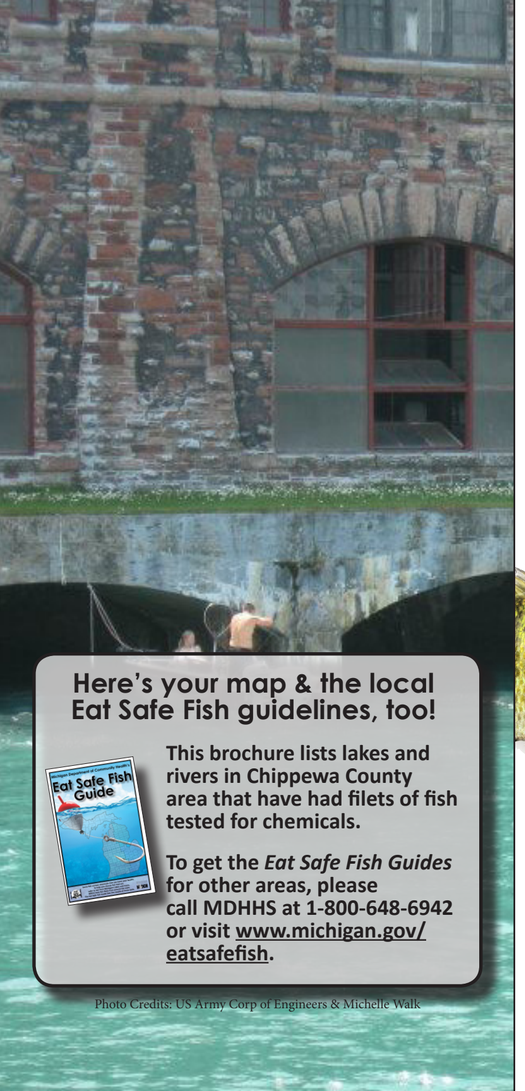
Special thanks to the Bkejwanong Territory/Walpole Island First Nation and Environment Canada for facilitating the collection of muskrat from Walpole Island (Ontario) and to Tom Korthals for collecting the muskrat from Harsens Island (Michigan).

eat safe fish

If you have questions about safely eating fish or other wildlife, please call MDCH at 1-800-648-6942 or visit **www.michigan.gov/eatsafefish**.

If you have questions about trapping muskrat or other wildlife regulations, please call your local DNR Operations Center.

Michigan Department of Community Health
MDCH



Here's your map & the local Eat Safe Fish guidelines, too!

This brochure lists lakes and rivers in Chippewa County area that have had filets of fish tested for chemicals.

To get the *Eat Safe Fish Guides* for other areas, please call MDHHS at 1-800-648-6942 or visit www.michigan.gov/eatsafefish.

Photo Credits: US Army Corp of Engineers & Michelle Walk

What are 'safe' fish?

Safe fish are fish that are low in chemicals. If you use the MDHHS ***Eat Safe Fish Guide*** for your region when you choose fish to catch and eat, you will protect yourself and your family from chemicals that could someday make you sick.

If there are chemicals in the fish, why should I still eat it?

Fish have a lot of great health benefits!

- ☑ **Fish can be a great low-fat source of protein.**
- ☑ **Fish are brain food.**
- ☑ **Some fish have heart-healthy omega-3s.**

Plus, fishing is a fun way to get outside and enjoy Michigan's 11,000 lakes, rivers, and streams!

If you **follow the 3Cs** and go after fish that have **fewer chemicals** in them, you can get a lot of health benefits and have **very little risk**.

Catching fish • Buying fish • Eating fish

For more information on safe fish, call MDHHS at 1-800-648-6942 or visit us online at www.michigan.gov/eatsafefish.

printed with support from the St. Marys River Binational Public Advisory Council & the Great Lakes RESTORATION Initiative

MDHHS Michigan Department of Health & Human Services

Areas of Concern (AOCs)

In the 1980s, the United States and Canadian governments identified 43 places in the Great Lakes region that had severe, long-term environmental problems. These places are called *Areas of Concern* or *AOCs*. Michigan originally had 14 AOCs located in both the upper and lower peninsulas.

People in federal, state, and provincial governments are working to address the problems in these areas. Local groups, known as Public Advisory Councils (PAC), also work on these environmental problems.

Beneficial Use Impairments (BUIs)

These environmental problems are called *beneficial use impairments* or *BUIs.* There are 14 categories of BUIs named in the U.S.-Canadian Great Lakes Water Quality Agreement. However, a place does not have to have all 14 problems to be called an AOC.

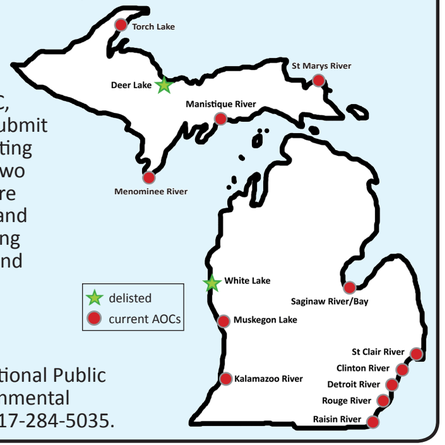
Each BUI has goals that need to be met in order to be removed from the AOC's list of problems. Once all BUIs are removed from the list, the AOC is considered to be no longer impaired and can be *delisted,* or removed from the list of AOCs.

The 14 BUIs that an AOC can have are:

- Restrictions on Fish and Wildlife Consumption
- Tainting of Fish and Wildlife Flavor
- Fish Tumors or Other Deformities
- Degraded Fish and Wildlife Populations
- Loss of Fish and Wildlife Habitat
- Bird or Animal Deformities or Reproductive Problems
- Degradation of Phytoplankton and Zooplankton Populations
- Degradation of Benthos
- Degradation of Aesthetics
- Eutrophication or Undesirable Algae
- Beach Closings
- Added Costs to Agriculture or Industry
- Restrictions on Dredging Activities
- Restrictions on Drinking Water Consumption or Taste and Odor Problems

The Goal: Delisting & a Healthy Environment

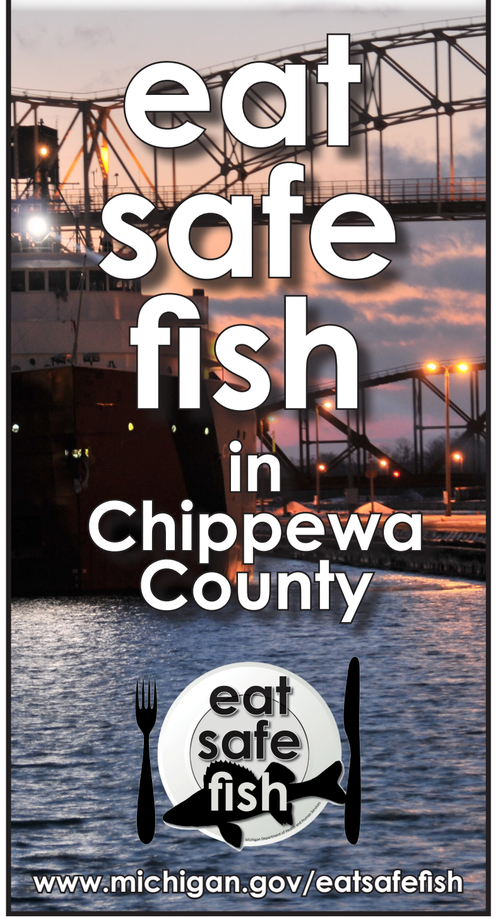
Once all of the assigned BUIs have been removed from an AOC, the PAC and Michigan Department of Environmental Quality submit a petition to the U.S. Environmental Protection Agency requesting it be removed from the list of AOCs. This is called "delisting." Two of Michigan's 14 original AOCs were delisted in 2014. Others are closer to delisting thanks to the dedication of the local, state, and federal stakeholders working to improve our environment, along with funding from the U.S. Environmental Protection Agency and the Great Lakes Restoration Initiative.



You can get involved!

Would you like to volunteer with the St. Marys River AOC Binational Public Advisory Council? Contact the Michigan Department of Environmental Quality's Office of the Great Lakes for more information at 1-517-284-5035.

FREE MAP TO LOCAL FISHING & the MDHHS Safe Fish Guidelines



Get to know the 3Cs

Choose, Clean, Cook

By choosing the right fish and then cleaning and cooking it the right way, you can reduce some of the chemicals in the fish **by nearly half**!

1 Choose

Some fish contain chemicals that can harm your health. MDHHS tests filets of fish taken from Michigan's lakes and rivers to learn which fish are safer to eat. The ***Eat Safe Fish Guides*** make it easy to find out which fish have been tested and easy to choose fish that are safe to eat.

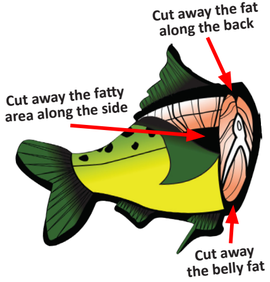
The Eat Safe Fish Guide:

- ☑ **lists fish species that have had filets tested for chemicals by MDHHS.**
- ☑ **protects people who eat Michigan fish often.**
- ☑ **protects anyone who has health problems, is young, is pregnant, or is planning on having children in the future.**

Other lakes and rivers have been tested in the Eastern U.P.. You can find some of these guidelines in the back of this brochure. To get the guidelines for other areas, visit www.michigan.gov/eatsafefish or call 1-800-648-6942.

2 Clean

Some chemicals, like PCBs and dioxins, collect in the fat of the fish.



- ☑ **When cleaning the fish, trim away any of the fat you can see.**
- ☑ **Remove and throw away the organs, too.**

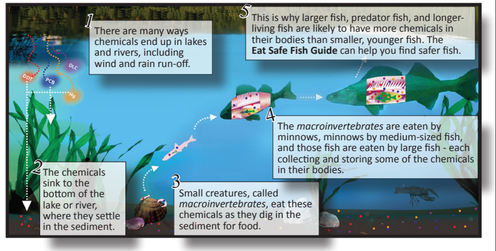
Careful cleaning and cooking can get rid of up to half of these chemicals from the fish.

3 Cook

- ☑ **Poke holes in the skin or remove it completely so that more fat can drip away from the fish filet as it cooks.**
- ☑ **Cook your fish on a grill or on a broiler pan in the oven. More of the fat and chemicals left behind can now drip away from the fish through the grates.**
- ☑ **If you choose to fry your fish, it's best to pan fry and throw away the oil. Please note that frying does not get rid of any of the chemicals that may be in the fish.**

You can't remove mercury or PFOS from fish by cleaning and cooking.
Always choose your fish wisely!

Why are there chemicals in some fish?



- ☑ PCBs, dioxins, and mercury are the most common chemicals found in filets of Michigan fish.
- ☑ These chemicals are *persistent* and *bioaccumulative*. This means the chemicals not only stay in the environment, they also build up in living things.
- ☑ Because of this, they have become part of the food chain for fish, as you can see in the picture above.
- ☑ Some chemicals, like PCBs and dioxins, build up in the fat of the fish. Mercury and PFOS build up in the muscle, or filet, of the fish.
- ☑ If you choose fish lower in mercury and PFOS and follow the **3Cs**, you can keep these chemicals from building up in your body, too.
- ☑ You can't see or taste these chemicals. They do not change how clear or dirty the water looks. The only way to know if these chemicals are in the fish is by testing for them in a laboratory.

Eat Safe Fish Guidelines

These guidelines are from the 2015 *Eat Safe Fish Guide* for the Upper Peninsula. To get the most up-to-date guidelines for lakes and rivers in your county or other areas of Michigan, please visit www.michigan.gov/eatsafefish to download the *Eat Safe Fish Guides* to your smartphone or call 1-800-648-6942 to get a print copy!

Caribou Lake

Type of Fish	Chemicals of Concern	Size of Fish (length in inches)	MI Servings per Month*
Largemouth Bass	Mercury	Under 18"	1
		Over 18"	6 Per Year
Rock Bass	Mercury	Under 10"	2
		Over 10"	1
Smallmouth Bass	Mercury	Under 18"	1
		Over 18"	6 Per Year
Walleye	Mercury	Any	1

Carp Lake

Type of Fish	Chemicals of Concern	Size of Fish (length in inches)	MI Servings per Month*
Walleye	Mercury	Under 18"	2
		Over 18"	1

Frenchman Lake

Type of Fish	Chemicals of Concern	Size of Fish (length in inches)	MI Servings per Month*
Northern Pike	Mercury	Under 30"	4
		Over 30"	2

Les Cheneaux Island Area

Type of Fish	Chemicals of Concern	Size of Fish (length in inches)	MI Servings per Month*
Bluegill	Mercury	Any	12
Carp	PCBs & Dioxins	Any	Limited▲
Largemouth Bass	Mercury	Under 18"	2
		Over 18"	1
Rock Bass	Mercury	Under 8"	8
		Over 8"	4
Smallmouth Bass	Mercury	Under 18"	2
		Over 18"	1
Sunfish	Mercury	Any	12
Yellow Perch	Dioxins	Any	2^{2x}

Please use the Lake Huron guidelines on the other side of this brochure for any fish species not listed above.

Monocle Lake

Type of Fish	Chemicals of Concern	Size of Fish (length in inches)	MI Servings per Month*
Walleye	Mercury	Under 20"	2
		Over 20"	1

St. Marys River

Type of Fish	Chemicals of Concern	Size of Fish (length in inches)	MI Servings per Month*
Bluegill	Mercury	Any	12
Carp	PCBs	Any	Limited▲
Largemouth Bass	Mercury	Under 18"	2
		Over 18"	1
Northern Pike	Mercury	Under 30"	2
		Over 30"	1
Rock Bass	Mercury	Under 8"	4
		Over 8"	2
Smallmouth Bass	Mercury	Under 18"	2
		Over 18"	1
Suckers	Mercury	Any	4
Sunfish	Mercury	Any	12
Walleye	PCBs & Mercury	Under 22"	2
	Mercury	Over 22"	1
Yellow Perch	Mercury	Any	4

When fishing the river near Lake Huron or Lake Superior (Whitefish Bay), please check the Great Lake guidelines on the other side of this brochure.

For all other lakes and rivers in Chippewa County, please use the Statewide Safe Fish Guidelines found on the other side of this brochure.

Please see the other side of this brochure for the Lake Superior & Lake Huron guidelines.

2X	See the **2x** box on the back of this page to learn how you can eat more of these fish safely.
▲	See the **Limited** and **Do Not Eat** boxes on the back of this page for more information.

To get the full *Eat Safe Fish Guides* with guidelines for other counties and regions in Michigan, please visit www.michigan.gov/eatsafefish or call MDHHS at 1-800-648-6942.

v. 2015

(Open the brochure for the map and to learn how to use the Eat Safe Fish guidelines.)

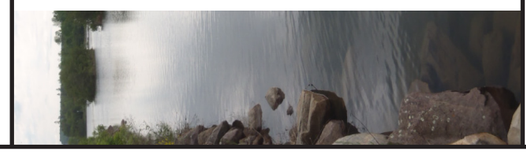
Restoring the St. Marys River

St. Marys River Binational Public Advisory Committee (BPAC) has been working with the U.S. Environmental Protection Agency, the Michigan Department of Environmental Quality (MDEQ) and other partners to improve the local environment for people, animals, and fish!

To learn more about the work that is being done, please visit their website at bpac.algomau.ca or call MDEQ at 1-517-284-5035.

Little Rapids Restoration

Rapids and riffles in rivers provide areas for fish to forage, spawn, and raise their young. Dredging, filling, diversion, and urban development has greatly affected the flow of the St. Marys River over the years.



However, researchers found that by redesigning the base of the Sugar Island causeway to allow for more water to pass through, they can restore the flow of the river over the rapids, improving fish habitat.

In time, we will likely see a larger population of fish in the area, making it even more of a prime and picturesque fishing location!

Catching fish • Buying fish • Eating fish

For more information on safe fish, call MDHHS at 1-800-648-6942 or visit us online at www.michigan.gov/eatsafefish.

MDHHS Michigan Department of Health & Human Services

Using the Eat Safe Fish Guidelines

MDHHS tests only the filets of the fish for chemicals to set these guidelines. *MI Servings* are set to be safe for everyone. This includes **children, pregnant or breastfeeding women, and people who have health problems like cancer or diabetes.**

How much is *MI Serving*?

Weight of Person	*MI Serving* Size
45 pounds	2 ounces
90 pounds	4 ounces
180 pounds	8 ounces

Weigh Less? For every 20 pounds less than the weight listed in the table, subtract 1 ounce of fish.
For example, a 70-pound child's *MI Serving* size is 3 ounces of fish. 90 pounds - 20 pounds = 70 pounds & 4 ounces - 1 ounce = a *MI Serving* size of 3 ounces

Weigh More? For every 20 pounds more than the weight listed in the table, add 1 ounce of fish.
For example, a 110-pound person's *MI Serving* size is 5 ounces of fish. 90 pounds + 20 pounds = 110 pounds / 4 ounces plus 1 ounce = a *MI Serving* size of 5 ounces

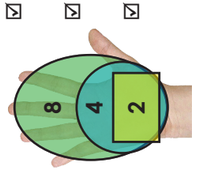
You might eat more than one *MI Serving* in a meal. That's OK, just keep track so you don't have too much.

Are you pregnant?

Fish is good for you and your baby! Use your pre-pregnancy weight to find your *MI Serving* size. It's also best to avoid eating fish labeled as "Limited" when you're pregnant or breastfeeding.

My Michigan, *MI Serving* Size

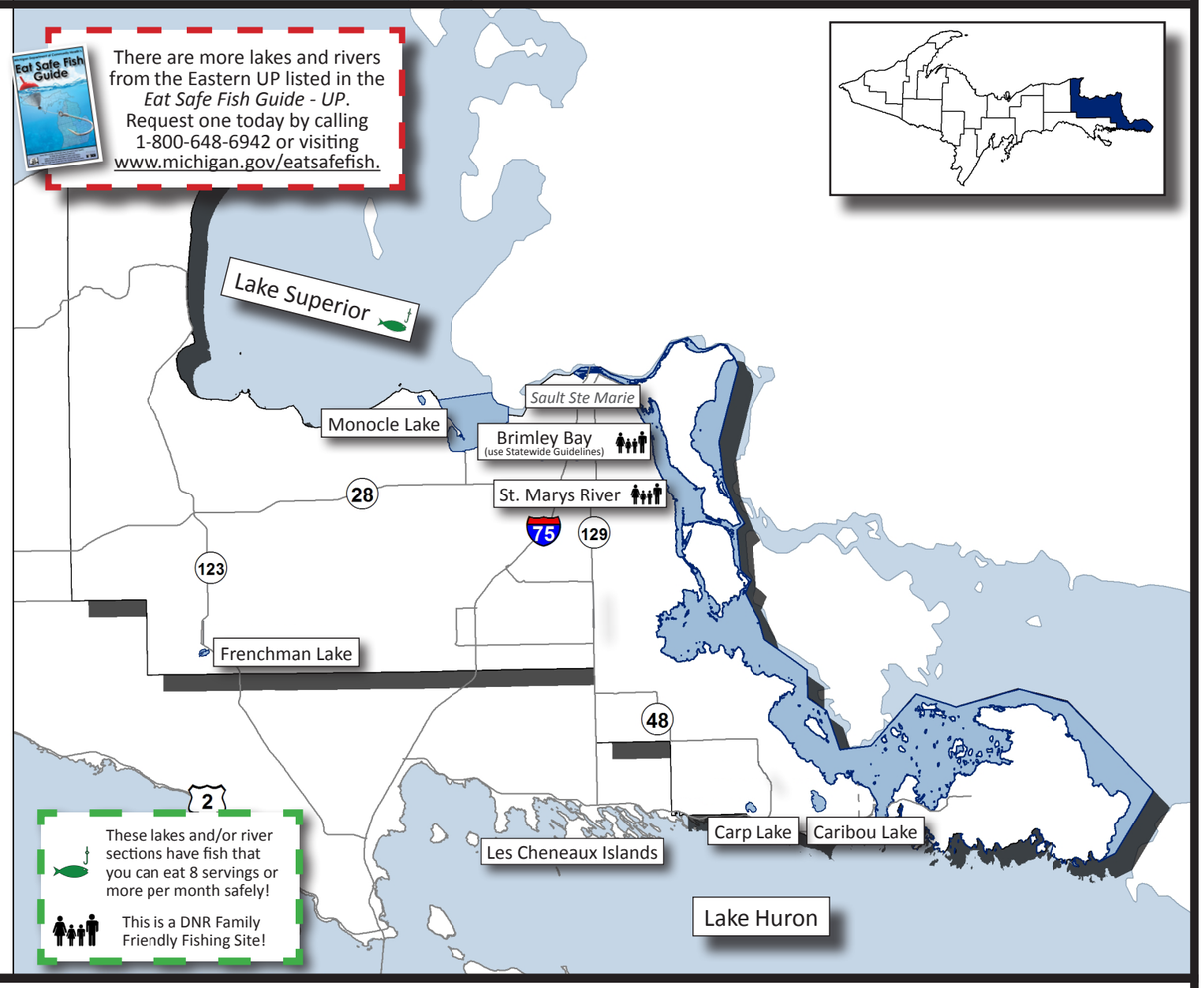
- ☑ 8 ounces of fish = size of an adult's hand (large oval)
- ☑ 4 ounces of fish = size of the palm of an adult's hand (small circle)
- ☑ 2 ounces of fish = size of half a palm of an adult's hand (rectangle)



The MDHHS Safe Fish Guidelines in this brochure are from the MDHHS ***2015 Eat Safe Fish Guide***. For updates, visit www.michigan.gov/eatsafefish or call 1-800-648-6942 and ask for a free *Guide*.

Map of Chippewa County, MI

Check the 2015 Eat Safe Fish Guidelines on the inside of this brochure for the lakes and rivers on this map.
For all other lakes and rivers in Chippewa County, please use the Statewide Guidelines.



Lake Huron

Type of Fish	Chemicals of Concern	Size of Fish (length in inches)	MI Servings per Month*
Brown Trout	PCBs	Any	6 Per Year[2x]
Carp	PCBs & Dioxins	Any	Limited▲
Catfish	Dioxins	Any	Limited▲
Chinook Salmon	PCBs	Any	6 Per Year[2x]
Coho Salmon	PCBs	Any	6 Per Year[2x]
Freshwater Drum	Mercury	Any	1
Lake Trout	PCBs & Dioxins	Under 20”	1[2x]
	PCBs	20” to 24”	6 Per Year[2x]
		Over 24”	Limited▲
Lake Whitefish	Dioxins	Any	6 Per Year[2x]
Northern Pike	PCBs	Any	1[2x]

Type of Fish	Chemicals of Concern	Size of Fish (length in inches)	MI Servings per Month*
Rainbow Trout	PCBs	Any	6 Per Year[2x]
Smelt	PCBs	Any	4[2x]
Steelhead	PCBs	Any	6 Per Year[2x]
Suckers	PCBs	Any	2[2x]
Walleye	Dioxins	Any	6 Per Year[2x]
White (Silver) Bass	PCBs & Dioxins	Any	Limited▲
White Perch	PCBs	Any	6 Per Year[2x]
Yellow Perch	Dioxins	Any	2[2x]

Great Lakes guidelines should also be used for rivers that flow into the lakes, up to the first dam.

Lake Superior

Type of Fish	Chemicals of Concern	Size of Fish (length in inches)	MI Servings per Month*
Brown Trout	PCBs	Any	1[2x]
Burbot	PCBs	Any	Limited▲
Chinook Salmon	PCBs	Any	6 Per Year[2x]
Coho Salmon	PCBs & Toxaphene	Any	4[2x]
Lake Herring	Mercury	Any	8
Lake Trout	PCBs & Toxaphene	Under 24”	2[2x]
	PCBs	24” to 28”	1[2x]
		Over 28”	6 Per Year[2x]

Type of Fish	Chemicals of Concern	Size of Fish (length in inches)	MI Servings per Month*
Lake Whitefish	PCBs, Dioxins, Toxaphene	Any	2[2x]
Northern Pike	Mercury	Any	2
Rainbow Trout	PCBs	Any	2[2x]
Siscowet	PCBs & Toxaphene	Any	Limited▲
Steelhead	PCBs	Any	2[2x]
Suckers	Toxaphene	Any	2[2x]
Walleye	Mercury	Any	2
Yellow Perch	Mercury	Any	2

Statewide Guidelines & More

Don’t see a certain Chippewa County lake or river listed in this brochure? Then the Statewide Safe Fish Guidelines can help you find safer fish to eat. But only use the Statewide Guidelines if...

STOP

- **the Chippewa County lake or river you are fishing in is not listed in this brochure, OR**
- **your lake or river is listed in this brochure, but the fish species is not listed.**

Statewide Safe Fish Guidelines

Type of Fish	Chemical of Concern	Size of Fish (length in inches)	MI Servings per Month*
Black Crappie	Mercury	Any Size	4
Bluegill	Mercury	Any Size	8
Carp	PCBs	Any Size	2
Catfish	PCBs & Mercury	Any Size	4
Largemouth Bass	Mercury	Under 18”	2
		Over 18”	1
Muskellunge	Mercury	Any Size	1
Northern Pike	Mercury	Under 30”	2
		Over 30”	1

Type of Fish	Chemical of Concern	Size of Fish (length in inches)	MI Servings per Month*
Rock Bass	Mercury	Any Size	4
Smallmouth Bass	Mercury	Under 18”	2
		Over 18”	1
Suckers	Mercury	Any Size	8
Sunfish	Mercury	Any Size	8
Walleye	Mercury	Under 20”	2
		Over 20”	1
White Crappie	Mercury	Any Size	4
Yellow Perch	Mercury	Any Size	4

These guidelines are based on the typical amount of chemicals found in fish filets tested from around the state. Some fish may be higher or lower. If any of these fish are listed in the guidelines for the lake or river you are fishing in, use **those** guidelines instead of the statewide guidelines. The *MI Servings* recommendation will be more exact for that lake or river because those filets have been tested. For other counties in Michigan, please visit www.michigan.gov/eatsafefish to get the *Eat Safe Fish Guide* for that region.

2x, Best Choice, Limited, and Do Not Eat

2x

Remove the fat; double the *MI Servings*!

PCBs and dioxins are in the fat of the fish. You can double the number of *MI Servings* if you:

- trim away the fat that you can see from the filet,
- cook the fish on a grill or broiling pan so more fat can drip away

Best Choice

Do you eat fish at least twice a week?

When using the MDHHS *Eat Safe Fish Guide*, watch for this MDHHS “Best Choice” symbol. The hook and fish mark species that you and your family can safely eat 8 *MI Servings* or more each month!

Limited

If you:

- are under the age of 15,
- -or-
- have health problems, like cancer or diabetes,
- -or-
- are planning on having children in the next several years, currently pregnant, or breastfeeding,

MDHHS suggests you **avoid eating all fish listed as *“Limited”*** because of higher levels of chemicals.

If **NONE** of the above apply to you, it is usually OK to eat fish listed as “*Limited*” **1 or 2 times each year**.

Do Not Eat

No one should eat fish listed as Do Not Eat, regardless of age or health.

When these fish were tested, MDHHS found very high levels of chemicals. Eating even one meal of these fish could possibly lead to health problems in the future, regardless of age or health.

v. 2015

Fishing Lake Superior

What's the Catch?

Some fish have less chemicals than others because of what they eat, how long they live, and how lean or fatty they are. Smaller fish of the same species usually have less chemicals than the bigger ones. It's best to keep the small fish for eating and to snap a picture and return trophy fish to the water!

How to Catch Whitefish

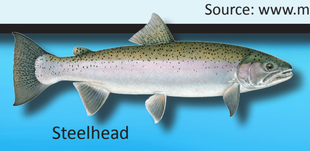
- Whitefish are generally found in deep water, on or near the bottom. However, they move up onto shoals or into rivers to spawn.
- You can catch whitefish with spawn, minnows, wigglers, swimming jigs or spoons.
- Whitefish also are a popular pier catch in some locations for anglers using spawn or wax worms.

How to Catch Steelhead

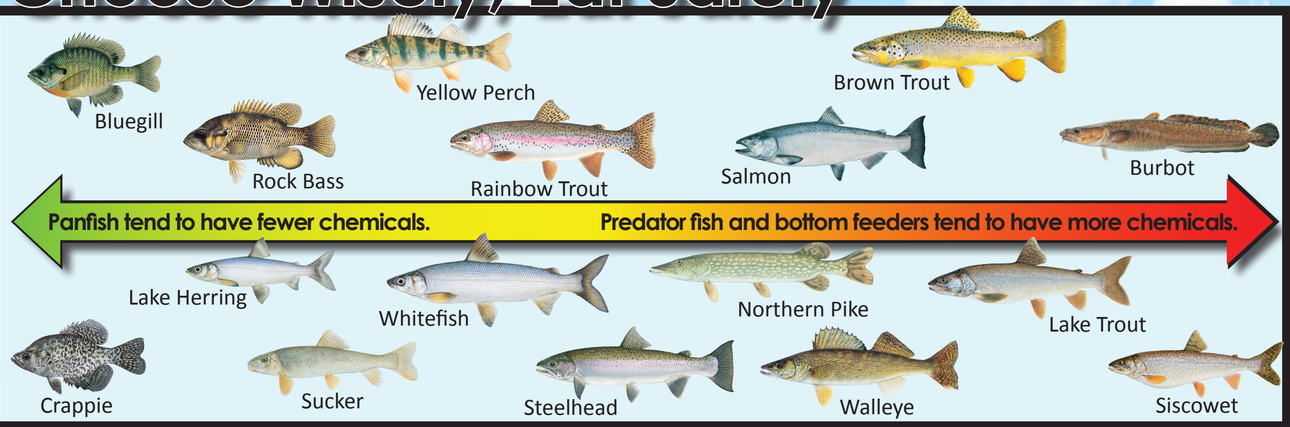
- Steelhead begin heading upstream in October and fishing for them continues through May
- Many anglers go after them from piers or in the streams.
- Steelhead are often taken on spawn, either loose eggs tied in bags or whole skein cut into chunks, fished on the bottom or below a bobber. But other fishermen enjoy casting for them with spinners and plugs.

Source: www.michigan.gov/howtofish


Whitefish

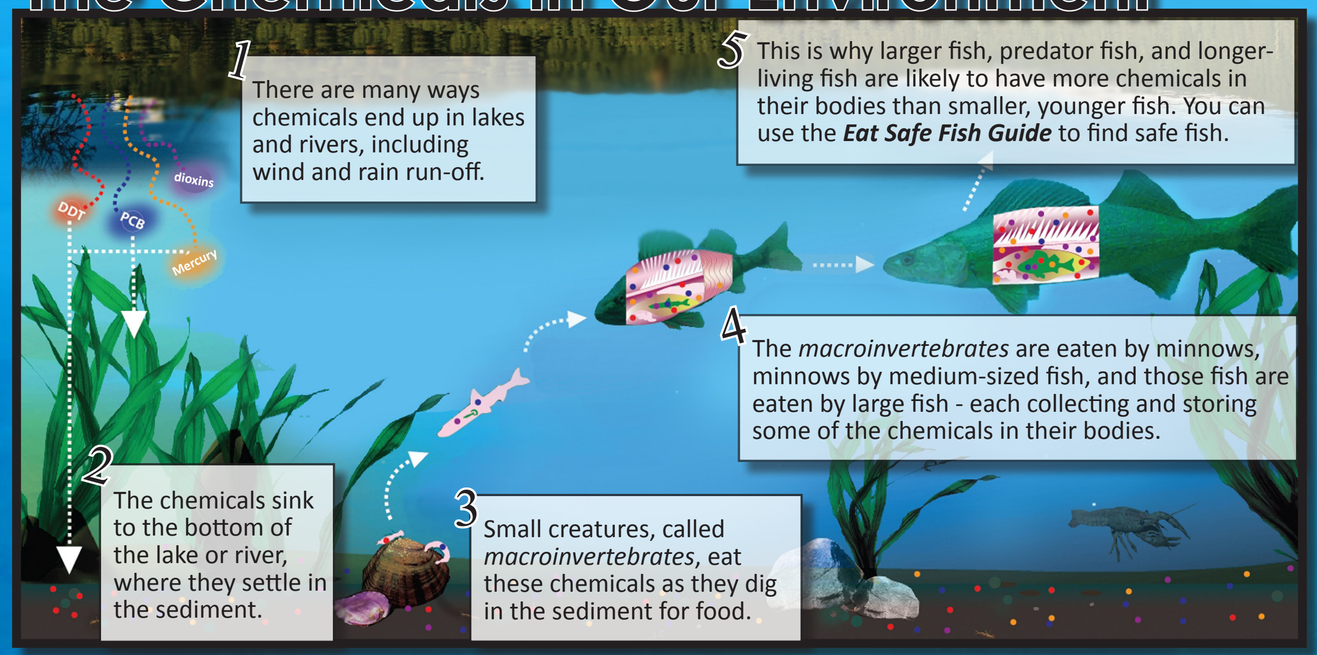

Steelhead

Choose Wisely, Eat Safely



You can use the *Eat Safe Fish Guide* to find specific guidelines for Lake Superior and other nearby rivers and lakes.

The Chemicals in Our Environment



No Guide? Be S.A.F.E.

S **Smaller fish are better.**
They tend to have fewer chemicals.

a **Avoid large predator fish and the bottom feeders.**
They tend to have more chemicals. Please check the ***Eat Safe Fish Guide*** before eating these fish.

f **Fat should be removed.**
Some chemicals are in the fat of the fish.

e **Eat fish that have been broiled or grilled on a rack.**
More of the fat and chemicals can drip away. You can reduce some chemicals by up to half!

Have Questions? Want an *Eat Safe Fish Guide*?

- **You can call the Michigan Department of Health & Human Services (MDHHS) at 1-800-648-6942 and ask for a free *Eat Safe Fish Guide* or pick up an *Eat Safe Fish* brochure from the Sault Ste Marie Welcome Center or any of our local partners.**
- **You can also download this information to your smartphone 24/7 at www.michigan.gov/eatsafefish!**

The Guide and brochure include maps to nearby lakes and rivers where fish have been tested for chemicals by MDHHS. The MDHHS Lab tests the filets of fish for chemicals, and all of the MDHHS guidelines are based only on this data.

Many thanks to our partners:

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United States Environmental Protection Agency
St Marys Bi-National Public Advisory Council
Department of Natural Resources Michigan DNR
eat safe fish
Great Lakes Commission des Grands Lacs
DEQ
Great Lakes Restoration

Fishing Waishkey River & Lake Superior

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How to Catch Walleye

- Walleye fishing is often best early and late in the day...or even after dark!
- You can catch walleye with live bait; nightcrawlers drifted along the bottom or minnows fished on a tight line are best. In the fall, jigging with spoons in deep water is a good way to get a bite.
- Cast your line out and slowly reel it in. You might want to try different depths to see what works, but you should have the best luck letting your bait skim along the bottom.

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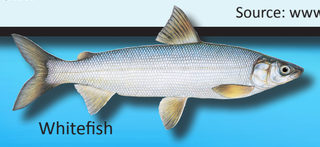
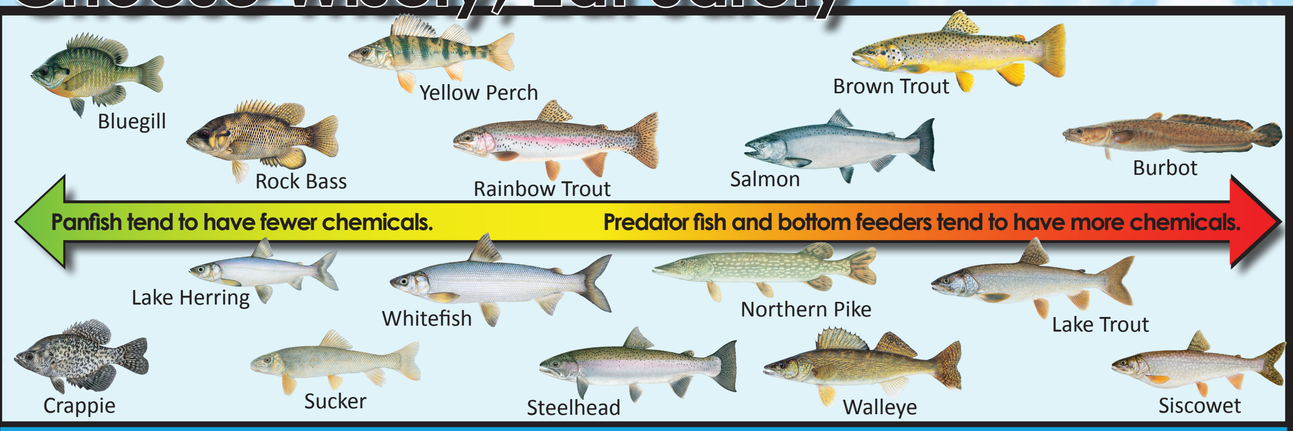
Source: www.michigan.gov/howtofish


Walleye


Whitefish

Choose Wisely, Eat Safely



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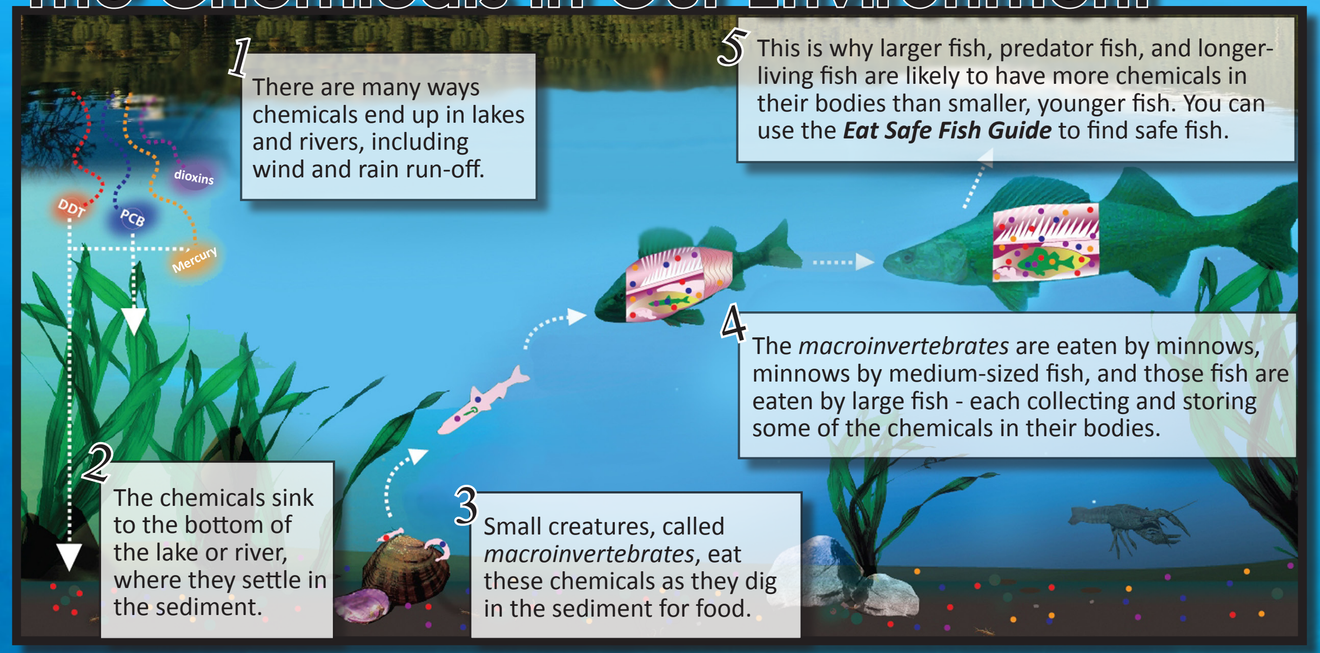

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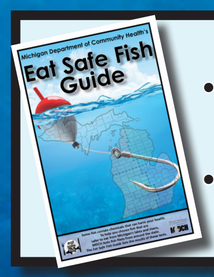

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eat safe fish
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DEQ
Great Lakes Restoration

Fishing the St Marys River

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- Cast your line out and slowly reel it in. You might want to try different depths to see what works, but you should have the best luck letting your bait skim along the bottom.

How to Catch Yellow Perch

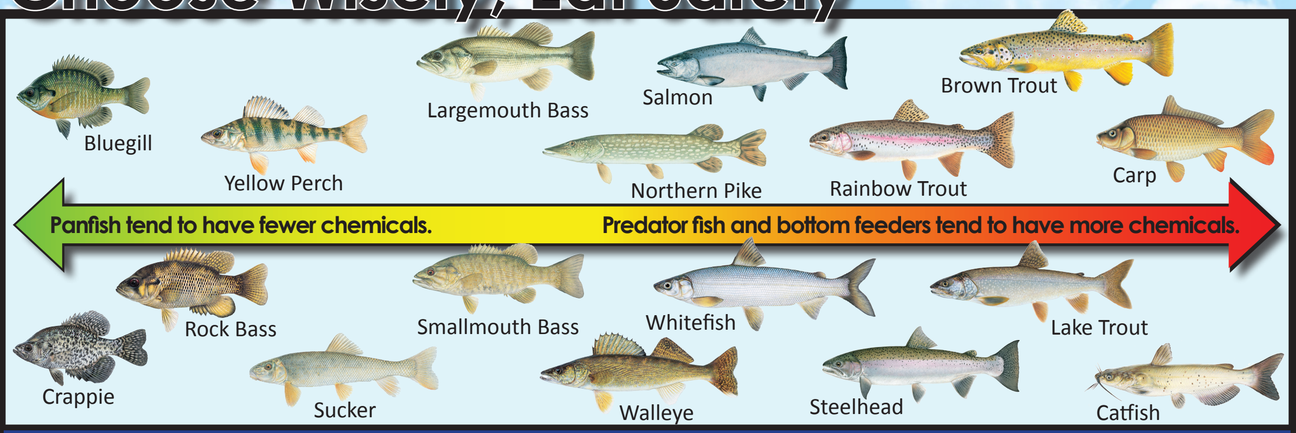
- Perch tend to bite all day long, but aren't very active after dark.
- You can catch yellow perch with live bait; minnows, wigglers, earthworms, leeches, wax worms or small crayfish are best. Use a sinker on the end of the line with a pair of hooks (No. 6 or 8) tied on leaders about a foot apart just above the sinker.
- Perch can be found around rocky bottoms in deeper waters, but may be found near weed beds in shallower areas.

Source: www.michigan.gov/howtofish


Walleye

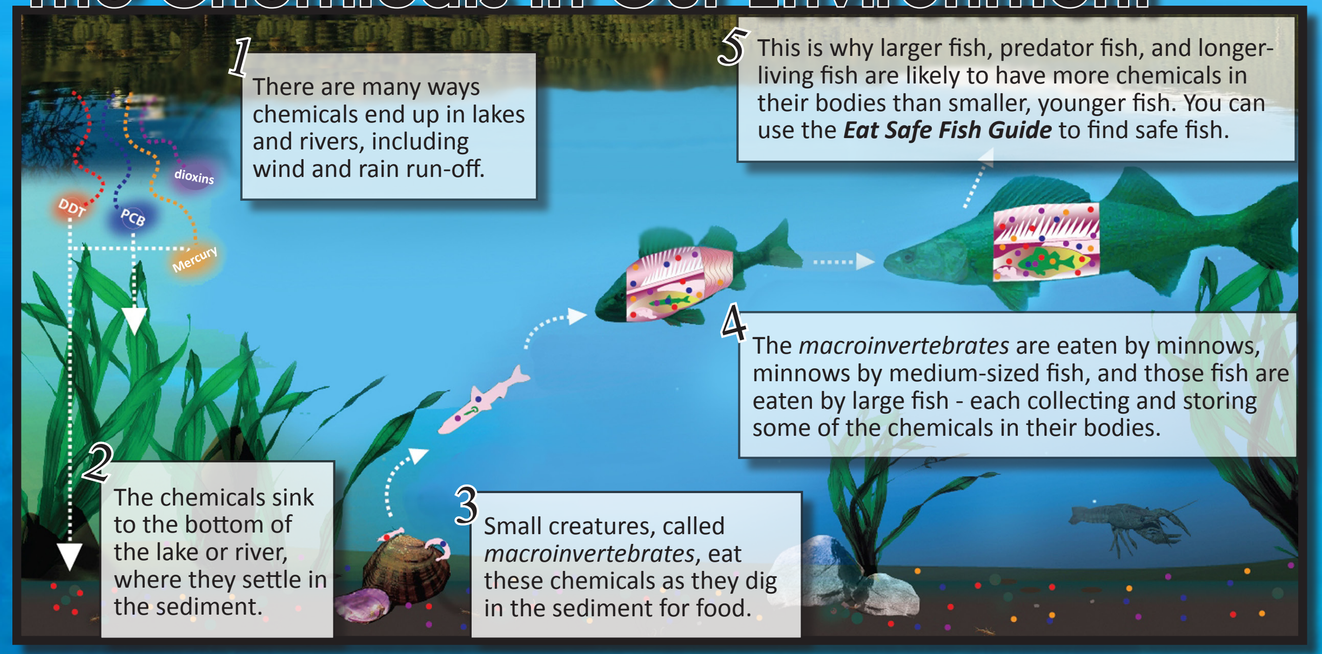

Yellow Perch

Choose Wisely, Eat Safely



You can use the *Eat Safe Fish Guide* to find specific guidelines for the St Marys River, Lake Superior, and Lake Huron.

The Chemicals in Our Environment



No Guide? Be S.A.F.E.

S **Smaller fish are better.**
They tend to have fewer chemicals.

a **Avoid large predator fish and the bottom feeders.**
They tend to have more chemicals. Please check the ***Eat Safe Fish Guide*** before eating these fish.

f **Fat should be removed.**
Some chemicals are in the fat of the fish.

e **Eat fish that have been broiled or grilled on a rack.**
More of the fat and chemicals can drip away. You can reduce some chemicals by up to half!

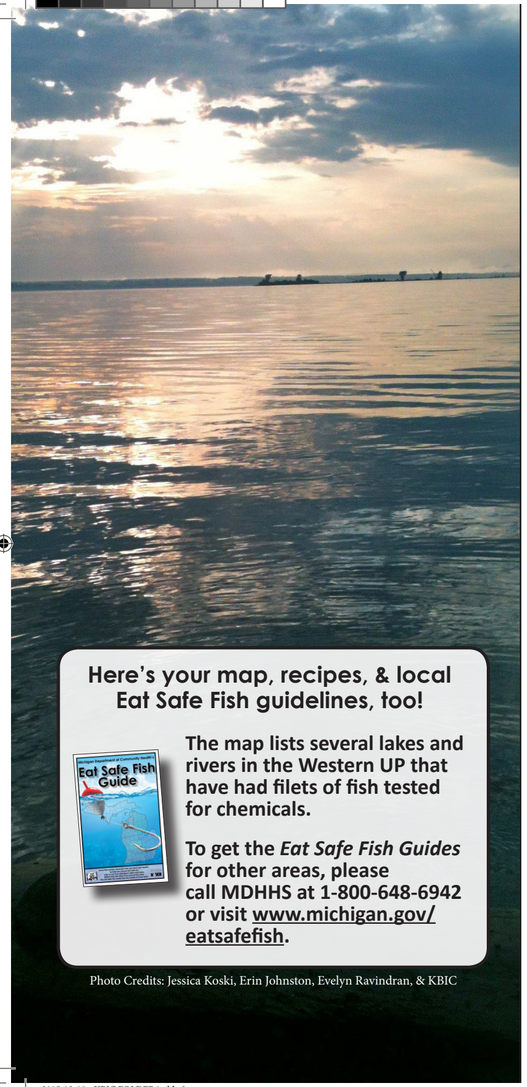
Have Questions? Want an *Eat Safe Fish Guide*?

- **You can call the Michigan Department of Health & Human Services (MDHHS) at 1-800-648-6942 and ask for a free *Eat Safe Fish Guide* or pick up an *Eat Safe Fish* brochure from the Sault Ste Marie Welcome Center or any of our local partners.**
- **You can also download this information to your smartphone 24/7 at www.michigan.gov/eatsafefish!**

The Guide and brochure include maps to nearby lakes and rivers where fish have been tested for chemicals by MDHHS. The MDHHS Lab tests the filets of fish for chemicals, and all of the MDHHS guidelines are based only on this data.

Many thanks to our partners:

MDHHS Michigan Department of Health & Human Services
United States Environmental Protection Agency
St Marys Bi-National Public Advisory Council
Department of Natural Resources DNR Michigan
eat safe fish
Great Lakes Commission des Grands Lacs
DEQ
Great Lakes Restoration



Here's your map, recipes, & local Eat Safe Fish guidelines, too!

The map lists several lakes and rivers in the Western UP that have had filets of fish tested for chemicals.

To get the *Eat Safe Fish Guides* for other areas, please call MDHHS at 1-800-648-6942 or visit www.michigan.gov/eatsafefish.

Photo Credits: Jessica Koski, Erin Johnston, Evelyn Ravindran, & KBIC

Legacy of the First Fisherman

Fishing in Keweenaw Bay has a lineage centuries long. Although humans have lived in the Great Lakes region for thousands of years, recorded Great Lakes legacy extends back to the 16th and 17th centuries when European explorers, tradesmen, and missionaries came to the region. From their descriptive writings shaped the glory of the Lakes as well as the image of the Indian living in the Great Lakes region: he was a fisherman.

A Fishing Community

There is a social order for Fish Clans—sturgeon, bullhead, muskie, northern pike, walleye and then sucker. They all maintain the health of the water for water spirits and each has specific roles to play in that protection. Presently, each and every family is woven to fishing in some way. As their ancestors did before them, subsistence fishermen continue harvesting for their families and community members as well as provide for both ceremonial and communal feasts. Fishing is the strand of the cultural core that ties history to present day to future; it is a vital foundation for cultural beliefs and values, traditional lifeways, and even individual identity.

Catching fish • Buying fish • Eating fish

For more information on safe fish,
call MDHHS at 1-800-648-6942
or visit us online at www.michigan.gov/eatsafefish.

printed with support from the & the Great Lakes RESTORATION Initiative

Anooj Dinowag Giigoonyag (Fish) & the Environment

Fish play an important role in the entire ecosystem food webs including essential consumption for humans and other species, ecological community dynamics, socioeconomic impacts, and health. Lake Superior and nearby lands have provided bountiful sources of food for the Anishinaabe over time. Settlement on its shores has allowed tribal fishermen to harvest many fish including lake trout, whitefish, and sturgeon.

Some Popular Native Fish of Lake Superior

Adikaameg
[Lake Whitefish]

Chinamekos
[Lake Trout and Siscowet]

Adikamig
[Lake Herring]

Name
[Lake Sturgeon]

Namekos
[Brook trout]

Ogaa
[Walleye]

Anooj Dinowag Giigoonyag Habitat:

Quality fish habitat requires healthy waters where fish can feed, spawn, breed, and grow to maturity. Although Lake Superior supports fewer fish per surface area than the other Great Lakes, the improved health of the fishery in the past 40 years has enabled a large 74 suite of native fish species to thrive. Lake Superior waters and the whole ecosystem can be affected by threats from many sources and requires vigilant monitoring and environmental protection of the Lake Superior basin. GLIFWC and its member bands work with the Lake Superior Binational Program and the International Joint Commission to protect and preserve Lake Superior as an Outstanding Resource Water (ORW), and keep a watchful eye on any threat that could adversely impact the lake's water quality and surrounding land to preserve this precious resource habitat for the future.

This section courtesy of the KBIC Natural Resources Department and the 2014 KBIC Wildlife Stewardship Plan.

What Can You Do?

There are many things you can do at home to help keep our local waters clean and our fish healthy.

Reduce, Reuse, Recycle!

Wait! Think before you throw things away. Can you reuse it? Can it be recycled? If not, make sure it ends up in the garbage, not on the ground.

Please do not burn your trash. Burning releases chemicals into the air. Plus, the smoke is not healthy for anyone to breathe.

Protect our storm drains! Storm drains lead directly to our lakes and streams. The water does not get filtered or cleaned first. Whatever goes down the drain comes out in Mother Superior.

Conserve!

In the Western UP, we're surrounded by water, so it's hard to imagine life without it. However, it's easy to install a rain barrel. You can use the saved rain to water your garden and flowers. Water in the evening so less water evaporates. Also, consider using native plants in your landscaping. They depend on Mother Earth for their nutrients and usually need less water to grow.

Grow!

You can grow and gather delicious and nutritious native foods to feed your family cheaply, as well as keep our heritage alive and thriving. Participating in the People's Garden in L'Anse is a great way to get started. Call the Keweenaw Bay Indian Community Natural Resources Department at (906) 524-5757 for more information.

You can get involved!

There are a lot of ways to get involved and keep our community and environment healthy. Call the Keweenaw Bay Indian Community Natural Resources Department at (906) 524-5757 to learn more!

Would you like to volunteer with the Torch Lake Area of Concern Public Advisory Council? Contact the Michigan Department of Environmental Quality's Office of the Great Lakes for more information at (517) 284-5035.

FREE LOCAL FISHING MAP & MDHHS Eat Safe Fish Guidelines

Get to know the 3Cs

Choose, Clean, Cook

By choosing the right fish and then cleaning and cooking it the right way, you can reduce some of the chemicals in the fish **by nearly half**!

1 Choose

Some fish contain chemicals that can harm your health. MDHHS tests filets of fish taken from Michigan's lakes and rivers to learn which fish are safer to eat. The ***Eat Safe Fish Guides*** make it easy to find out which fish have been tested and easy to choose fish that are safe to eat.

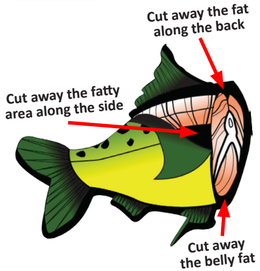
The Eat Safe Fish Guide:

- ☑ **lists fish species that have had filets tested for chemicals by MDHHS.**
- ☑ **protects people who eat Michigan fish often.**
- ☑ **protects anyone who has health problems, is young, is pregnant, or is planning on having children in the future.**

Other lakes and rivers have been tested in the Western UP. You can find some of these guidelines on the flyer in the back of this brochure. To get the guidelines for others, visit www.michigan.gov/eatsafefish or call 1-800-648-6942.

2 Clean

Some chemicals, like PCBs and dioxins, collect in the fat of the fish.



- ☑ **When cleaning the fish, trim away any of the fat you can see.**
- ☑ **Remove and throw away the organs, too.**

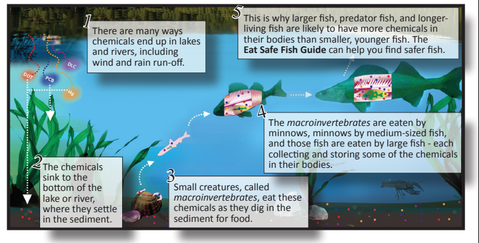
Careful cleaning and cooking can get rid of up to half of these chemicals from the fish.

3 Cook

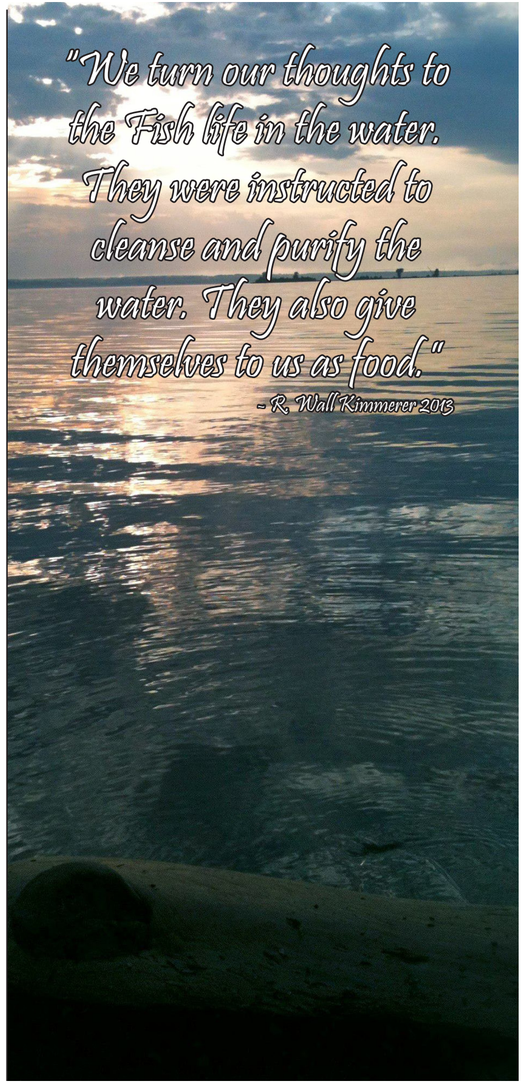
- ☑ **Poke holes in the skin or remove it completely so that more fat can drip away from the fish filet as it cooks.**
- ☑ **Cook your fish on a grill or on a broiler pan in the oven. More of the fat and chemicals left behind can now drip away from the fish through the grates.**
- ☑ **If you choose to fry your fish, it's best to pan fry and throw away the oil. Please note that frying does not get rid of any of the chemicals that may be in the fish.**

You can't remove mercury or PFOS from fish by cleaning and cooking.
Always choose your fish wisely!

Why are there chemicals in some fish?



- ☑ PCBs, dioxins, and mercury are the most common chemicals found in filets of Michigan fish.
- ☑ These chemicals are *persistent* and *bioaccumulative*. This means the chemicals not only stay in the environment, they also build up in living things.
- ☑ Because of this, they have become part of the food chain for fish, as you can see in the picture above.
- ☑ Some chemicals, like PCBs and dioxins, build up in the fat of the fish. Mercury and PFOS build up in the muscle, or filet, of the fish.
- ☑ If you choose fish lower in mercury and PFOS and follow the **3Cs**, you can keep these chemicals from building up in your body, too.
- ☑ You can't see or taste these chemicals. They do not change how clear or dirty the water looks. The only way to know if these chemicals are in the fish is by testing for them in a laboratory.



Eat Safe Fish Guidelines

These guidelines are from the 2015 *Upper Peninsula Eat Safe Fish Guide.*
To get the most up-to-date guidelines for lakes and rivers in Houghton County and other areas in Michigan, please visit www.michigan.gov/eatsafefish to download a copy of the *Eat Safe Fish Guide* to your smartphone or call 1-800-648-6942 to get a print copy!

Bob Lake

Type of Fish	Chemicals of Concern	Size of Fish (length in inches)	MI Servings per Month*
Walleye	Mercury	Any	1

Boston Pond

Type of Fish	Chemicals of Concern	Size of Fish (length in inches)	MI Servings per Month*
Suckers	None	Any	16[2x]
Yellow Perch	Mercury	Under 12"	12
		Over 12"	8

Emily Lake

Type of Fish	Chemicals of Concern	Size of Fish (length in inches)	MI Servings per Month*
Walleye	Mercury	Any	2

Lake Superior

Type of Fish	Chemicals of Concern	Size of Fish (length in inches)	MI Servings per Month*
Brown Trout	PCBs	Any	1[2x]
Burbot	PCBs	Any	Limited▲
Chinook Salmon	PCBs	Any	6 Per Year[2x]
Coho Salmon	PCBs & Toxaphene	Any	4[2x]
Lake Herring	Mercury	Any	8
Lake Trout	PCBs & Toxaphene	Under 24"	2[2x]
	PCBs	24" to 28"	1[2x]
		Over 28"	6 Per Year[2x]
Lake Whitefish	PCBs, Dioxins, Toxaphene	Any	2[2x]
Northern Pike	Mercury	Any	2
Rainbow Trout	PCBs	Any	2[2x]
Siscowet	PCBs & Toxaphene	Any	Limited▲
Steelhead	PCBs	Any	2[2x]
Suckers	Toxaphene	Any	2[2x]
Walleye	Mercury	Any	2
Yellow Perch	Mercury	Any	2

Otter Lake

Type of Fish	Chemicals of Concern	Size of Fish (length in inches)	MI Servings per Month*
Suckers	Mercury	Any	2
Walleye	Mercury	Under 20"	1
		Over 20"	6 Per Year

Pike Lake

Type of Fish	Chemicals of Concern	Size of Fish (length in inches)	MI Servings per Month*
Northern Pike	Mercury	Under 30"	6 Per Year
		Over 30"	Do Not Eat▲

Portage Lake

Type of Fish	Chemicals of Concern	Size of Fish (length in inches)	MI Servings per Month*
Brown Trout	Mercury	Under 20"	2
	PCBs & Mercury	Over 20"	2
Northern Pike	Mercury	Any	2
Walleye	Mercury	Under 24"	2
		24" to 28"	1
		Over 28"	6 Per Year

Rice Lake

Type of Fish	Chemicals of Concern	Size of Fish (length in inches)	MI Servings per Month*
Northern Pike	Mercury	Under 24"	4
		Over 24"	2
Walleye	Mercury	Under 22"	2
		Over 22"	1

Roland Lake

Type of Fish	Chemicals of Concern	Size of Fish (length in inches)	MI Servings per Month*
Rock Bass	Mercury	Under 9"	2
		Over 9"	1

Torch Lake

Type of Fish	Chemicals of Concern	Size of Fish (length in inches)	MI Servings per Month*
Largemouth Bass	PCBs & Mercury	Under 18"	2
		Over 18"	1
Northern Pike	PCBs	Any	2[2x]
Smallmouth Bass	PCBs & Mercury	Under 18"	2
		Over 18"	1
Suckers	PCBs & Mercury	Under 16"	12
	Mercury	Over 16"	4
Walleye	PCBs & Mercury	Under 22"	1
		Over 22"	6 Per Year

2X	See the **2x** box on the back of this page to learn how you can eat more of these fish safely.
▲	See the **Limited** and **Do Not Eat** boxes on the back of this page for more information.

To get the guidelines for other regions in Michigan and nearby states, please visit www.michigan.gov/eatsafefish or call MDHHS at 1-800-648-6942.

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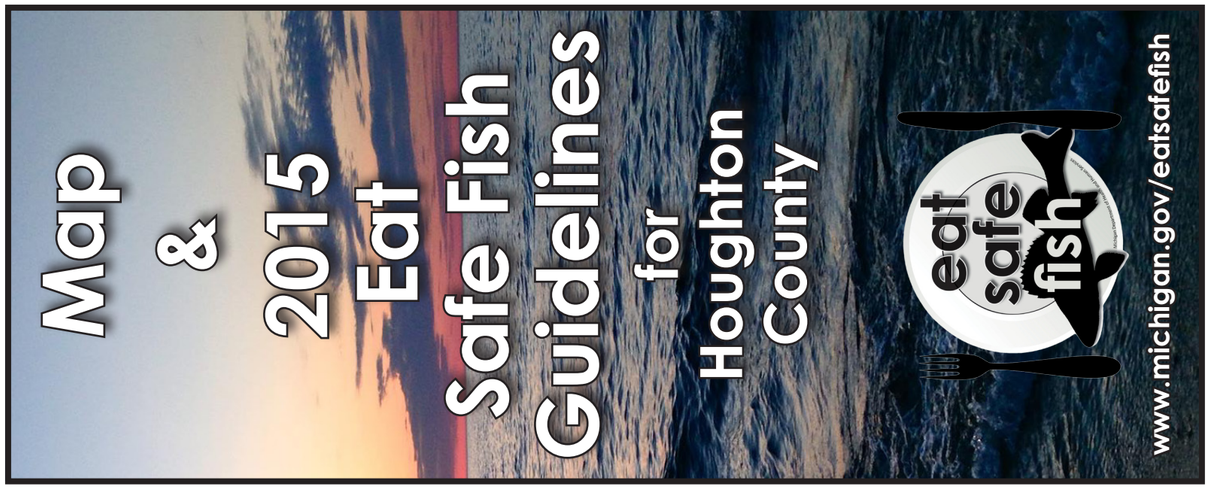
(Open the brochure for more area information and to learn how to use the Eat Safe Fish guidelines.)



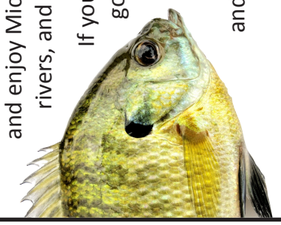
What are 'safe' fish?
Safe fish are fish that are low in chemicals. If you use the ***Eat Safe Fish Guide*** when you choose fish to catch and eat, you will protect yourself and your family from chemicals that could someday make you sick.

If there are chemicals in the fish, why should I still eat it?
Fish have a lot of great health benefits.

- ☑ **Fish can be a great low-fat source of protein.**
- ☑ **Fish are brain food.**
- ☑ **Some fish have heart-healthy omega-3s.**

Plus, fishing is a fun way to get outside and enjoy Michigan's 11,000 lakes, rivers, and streams!

If you **follow the 3Cs** and go after fish that have **fewer chemicals** in them, you can get a lot of health benefits and have **very little risk.**



Catching fish • Buying fish • Eating fish
For more information on safe fish, call MDHHS at 1-800-648-6942 or visit us online at www.michigan.gov/eatsafefish.

MDHHS Michigan Department of Health & Human Services

Using the Eat Safe Fish Guidelines
MDHHS tests only the filets of the fish for chemicals to set these guidelines. *MI Servings* are set to be safe for everyone. This includes **children, pregnant or breastfeeding women, and people who have health problems like cancer or diabetes.**

How much is *MI Serving*?

Weight of Person	*MI Serving* Size
45 pounds	2 ounces
90 pounds	4 ounces
180 pounds	8 ounces

Weigh Less? For every 20 pounds less than the weight listed in the table, subtract 1 ounce of fish.
For example, a 70-pound child's *MI Serving* size is 3 ounces of fish. 90 pounds - 20 pounds = 70 pounds & 4 ounces - 1 ounce = a *MI Serving* size of 3 ounces

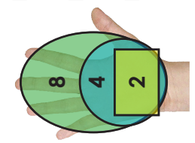
Weigh More? For every 20 pounds more than the weight listed in the table, add 1 ounce of fish.
For example, a 110-pound person's *MI Serving* size is 5 ounces of fish. 90 pounds + 20 pounds = 110 pounds / 4 ounces plus 1 ounce = a *MI Serving* size of 5 ounces

You might eat more than one *MI Serving* in a meal. That's OK, just keep track so you don't have too much.

Are you pregnant?
Fish is good for you and your baby! Use your pre-pregnancy weight to find your *MI Serving* size. It's also best to avoid eating fish labeled as "Limited" when you're pregnant or breastfeeding.

My Michigan, *MI Serving* Size

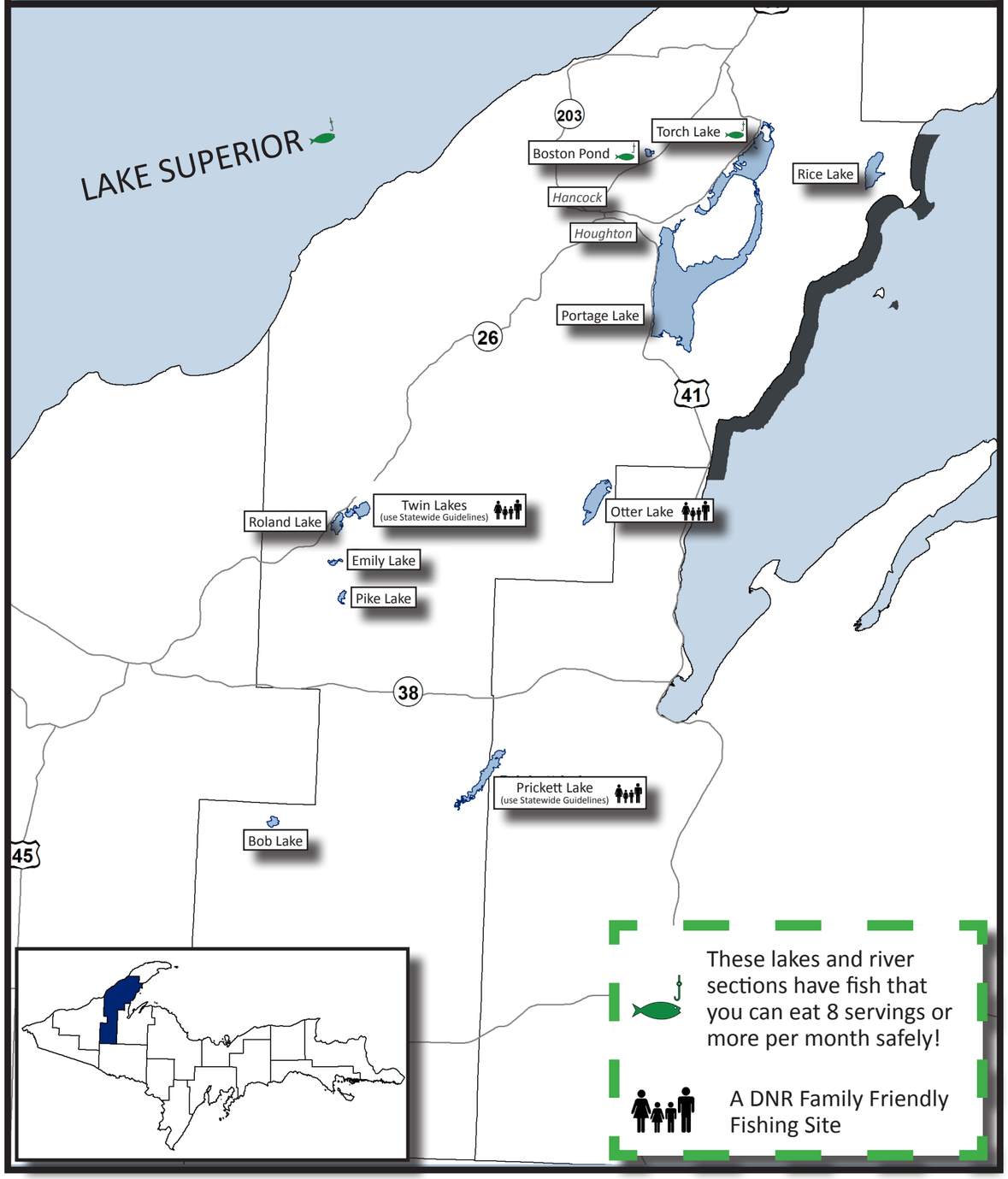
- ☑ 8 ounces of fish = size of an adult's hand (large oval)
- ☑ 4 ounces of fish = size of the palm of an adult's hand (small circle)
- ☑ 2 ounces of fish = size of half a palm of an adult's hand (rectangle)



The MDHHS guidelines in this brochure are from the MDHHS ***2015 Eat Safe Fish Guide.***
For updates, visit www.michigan.gov/eatsafefish or call 1-800-648-6942 and ask for a free ***Guide.***

Map of Houghton County, Michigan

Check the 2015 Eat Safe Fish Guidelines on the inside of this brochure for the lakes on this map. For all other lakes and rivers in Houghton County, please use the Statewide Guidelines.



Statewide Guidelines & More

Don't see a certain Houghton County lake or river listed in this brochure? Then the Statewide Safe Fish Guidelines can help you find safer fish to eat.

Only use the Statewide Guidelines if...

STOP

- **the Houghton County lake or river you are fishing in is not listed in this brochure, OR**
- **your lake or river is listed in this brochure, but the fish species is not listed.**

Statewide Safe Fish Guidelines

Type of Fish	Chemical of Concern	Size of Fish (length in inches)	MI Servings per Month*
Black Crappie	Mercury	Any Size	4
Bluegill	Mercury	Any Size	8
Carp	PCBs	Any Size	2
Catfish	PCBs & Mercury	Any Size	4
Largemouth Bass	Mercury	Under 18"	2
		Over 18"	1
Muskellunge	Mercury	Any Size	1
Northern Pike	Mercury	Under 30"	2
		Over 30"	1
Rock Bass	Mercury	Any Size	4
Smallmouth Bass	Mercury	Under 18"	2
		Over 18"	1
Suckers	Mercury	Any Size	8
Sunfish	Mercury	Any Size	8
Walleye	Mercury	Under 20"	2
		Over 20"	1
White Crappie	Mercury	Any Size	4
Yellow Perch	Mercury	Any Size	4

These guidelines are based on the typical amount of chemicals found in fish filets tested from around the state. Some fish may be higher or lower. If any of these fish are listed in the guidelines for the lake or river you are fishing in, use **those** guidelines instead of the statewide guidelines. The *MI Servings* recommendation will be more exact for that lake or river because those filets have been tested. For other counties in Michigan, please visit www.michigan.gov/eatsafefish to get the *Eat Safe Fish Guide* for that region.

2x, Best Choice, Limited, and Do Not Eat

2x

Remove the fat; double the *MI Servings*!

PCBs and dioxins are in the fat of the fish. You can double the number of *MI Servings* if you:

- trim away the fat that you can see from the filet,
- cook the fish on a grill or broiling pan so more fat can drip away
- **Note, you can't remove mercury, selenium, or PFOS from the fish.** Do not double the *MI Servings* for fish with those chemicals listed as a Chemical of Concern.

Limited

If you:

- are under the age of 15,

-or-

- have health problems, like cancer or diabetes,

-or-

- are planning on having children in the next several years, currently pregnant, or breastfeeding,

MDHHS suggests you **avoid eating all fish listed as *"Limited"*** because of higher levels of chemicals.

If **NONE** of the above apply to you, it is usually OK to eat fish listed as "*Limited*" **1 or 2 times each year**.

Best Choice

Do you eat fish at least twice a week?

When using the MDHHS *Eat Safe Fish Guide*, watch for this MDHHS "Best Choice" symbol. The hook and fish mark species that you and your family can safely eat 8 *MI Servings* or more each month!

Do Not Eat

No one should eat fish listed as Do Not Eat, regardless of age or health.

When these fish were tested, MDHHS found very high levels of chemicals. Eating even one meal of these fish could possibly lead to health problems in the future, regardless of age or health.

v. 12-2015

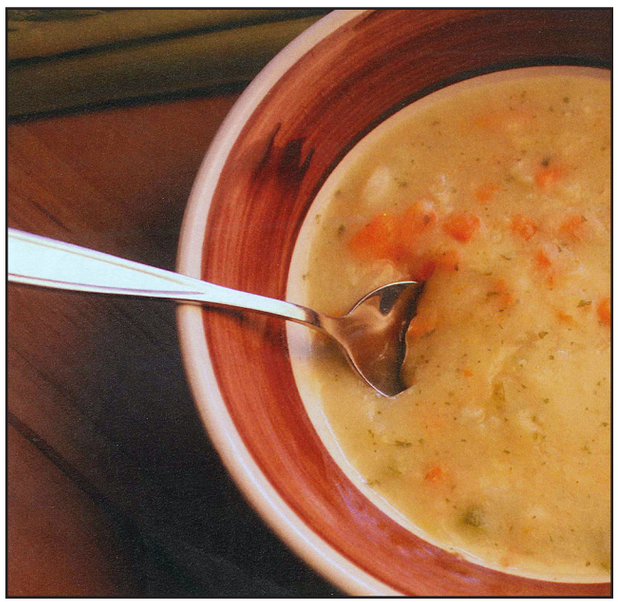
Walleye Soup

Original concept from Laura and Tom Maulson, Lac du Flambeau; Mino Wiisinidaa Cookbook

Prep Time: 30 minutes • Cook Time: 1 hour
Total Time: 1 hour 30 minutes
Serving Size: 1 cup • Yield: 7

Ingredients

1 tablespoon sunflower seed oil
3 cloves garlic, minced
2 ribs celery, diced (about 1 cup)
3 medium carrots, diced (about 1 cup)
1 medium red bell pepper, diced
2 quarts low sodium chicken stock
1 tablespoon dried sweet fern, ground
1 teaspoon salt
1/2 teaspoon black pepper, ground
1 1/2 pound skinless, boneless walleye filet, cut into 1/2" cubes
1 quart cream of celery soup
1/4 cup wild rice slurry, if needed



Directions

1. In a medium stock pot, heat oil over medium high heat.
2. Add garlic and saute for 2 minutes. Add the remaining vegetables and saute until vegetables begin to soften, about 10 minutes
3. Pour in stock, sweet fern, salt, and pepper. Bring to a boil, reduce to a simmer and continue to cook until vegetables are soft, about 25 minutes.
4. Add fish and continue to simmer until fish is opaque and cooked through, about 10 minutes.
5. Take off heat and vigorously whisk in "cream" soup, a little at a time until combined. If soup is not thickened to your taste add in the wild rice slurry.
6. Serve hot.

Chef Notes

If you prefer thicker soup, make a wild rice slurry by combining 2 teaspoons of cornstarch, 4 teaspoons of wild rice flour, and 2 tablespoons of warm water. Soup can be thickened more by adding a can of evaporated milk.

Soup should be properly cooled within 2 hours of cooking. Refrigerate in small batches in covered, air tight containers for up to 4 days. This recipe can be frozen but may separate when reheated. To discourage separation, stir well when reheating. Always reheat food to 165°F before eating.

Catching fish • Buying fish • Eating fish

For more information on safe fish, call MDHHS at 1-800-648-6942 or visit us online at www.michigan.gov/eatsafefish.

printed with support from the Great Lakes Restoration Initiative

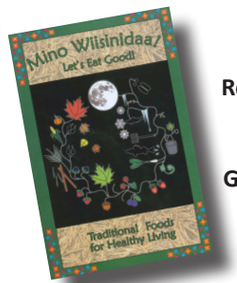
MDHHS Michigan Department of Health & Human Services

Photos from the Mino Wiisinidaa Cookbook

Mino Wiisinidaa
Anooj Dinowag Giigoonyag!

Let's Eat Good Fish!

Traditional Fish Recipes from the Anishinaabe people



Recipes adapted with sincere gratitude from the Mino Wiisinidaa! Let's Eat Good! Cookbook available at http://www.glifwc.org/

Lemon Baked Fish

Original concept from biskakone Greg Johnson,
Lac du Flambeau

Prep Time: 20 minutes • Cook Time: 15 minutes
Total Time: 35 minutes
Serving Size: 4 ounces / Yield: 4

Ingredients

1 tablespoon sunflower seed oil, divided

2 lemons, cut into 1/4'' slices, divided

2 shallots, diced, divided

1 tablespoon fresh chives, minced, divided

1 tablespoon fresh dill, divided

1 pound skinless, boneless lake trout filets, divided

Directions

1. Using a 9x13 baking dish, layer half the oil, lemon, shallot, herbs, and one filet and repeat.
2. Position the oven rack so that the fish will be 4-5 inches below the broiler.
3. Broil on high heat for 10-15 minutes or until fish flakes easily.

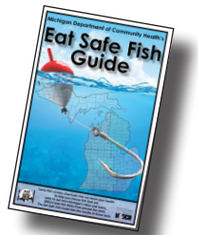
Chef Notes

If you're using an electric oven, preheat the broiler for 5-10 minutes before broiling the fish. If you're using a gas oven, there is no need to preheat the oven.

Local Fish, Local Guide

If you eat fish caught in Michigan or any of the Great Lakes often, **please call MDHHS to request the *Eat Safe Fish Guide*.**

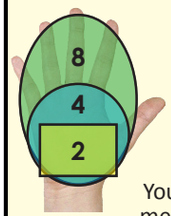
The ***Eat Safe Fish Guide*** lists Michigan fish that have been tested for mercury and other harmful chemicals, like PCBs and dioxins. Only the parts of the fish that are commonly eaten are tested for chemicals and included in this booklet.



Call 1-800-648-6942 to request a free copy of the *Eat Safe Fish Guide* for the Upper Peninsula, or visit www.michigan.gov/eatsafefish to download the *Eat Safe Fish Guide* to your smartphone.

What is 'MI Serving'?

MI Serving depends on who you are:



- ☑ **For an adult, *MI Serving* is:**
  8 ounces of cooked fish = size of an adult's hand (large oval)
- ☑ **For a child, *MI Serving* is:**
  2-4 ounces of cooked fish = size of the palm on an adult's hand (small circle/rectangle)

You might eat more than one *MI Serving* in a meal. That's OK, just keep track so you know!

Other Resources

Sustainable & Planet-Friendly Fish

Monterey Bay Aquarium Seafood Watch
http://bit.ly/McxPS or 1-877-229-9990

Cooking & Food Safety

Fresh & Frozen Seafood -
Selecting & Serving It Safely (FDA)
http://1.usa.gov/qYLlyL or 1-888-723-3366

Eat 8!

A Guide to Help You Choose Fish Low in Mercury from **Restaurants and Grocery Stores**

EAT no more than... 8 points per month

High in heart-healthy omega-3 fatty acids

Is the fish you're buying caught in Michigan waters? If so, please check the *Eat Safe Fish Guide* for advice.

Per MI Serving 1 Point

- Anchovies
- Catfish (farm-raised)
- Crab
- Crawfish
- Flatfish (flounder, sole)
- Herring
- Mullet
- Oysters
- Perch (ocean or freshwater)
- Pollock
- Salmon (canned, frozen, fresh)
- Sardines
- Scallops
- Shrimp
- Squid
- Tilapia
- Trout (freshwater)
- Whitefish

Per MI Serving 2 Points

- Cod
- Freshwater Drum (aka Sheepshead)
- Jack Smelt
- Mahi Mahi
- Snapper
- Tuna (canned light)

Per MI Serving 4 Points

- Bass (sea, striped, rockfish)
- Bluefish
- Halibut
- Lobster
- Sablefish
- Scorpion Fish
- Tuna (Albacore, canned white)
- Tuna (fresh, frozen)
- Weakfish (sea trout)

Per MI Serving 8 Points

- Grouper
- Mackerel
- Marlin
- Orange Roughy

Do not eat these fish:
Shark, Swordfish, Tilefish, King Mackerel

Questions? Call MDHHS at 1-800-648-6942.

Great choices to go...You can cut the list out & take it with you!

Eat Safe Fish Guidelines

These guidelines are from the 2015 *Upper Peninsula Eat Safe Fish Guide.*
To get the most up-to-date guidelines for lakes and rivers in Houghton County and other areas in Michigan, please visit www.michigan.gov/eatsafefish to download a copy of the *Eat Safe Fish Guide* to your smartphone or call 1-800-648-6942 to get a print copy!

Bob Lake

Type of Fish	Chemicals of Concern	Size of Fish (length in inches)	MI Servings per Month*
Walleye	Mercury	Any	1

Boston Pond

Type of Fish	Chemicals of Concern	Size of Fish (length in inches)	MI Servings per Month*
Suckers	None	Any	16[2x]
Yellow Perch	Mercury	Under 12"	12
		Over 12"	8

Emily Lake

Type of Fish	Chemicals of Concern	Size of Fish (length in inches)	MI Servings per Month*
Walleye	Mercury	Any	2

Lake Superior

Type of Fish	Chemicals of Concern	Size of Fish (length in inches)	MI Servings per Month*
Brown Trout	PCBs	Any	1[2x]
Burbot	PCBs	Any	Limited▲
Chinook Salmon	PCBs	Any	6 Per Year[2x]
Coho Salmon	PCBs & Toxaphene	Any	4[2x]
Lake Herring	Mercury	Any	8
Lake Trout	PCBs & Toxaphene	Under 24"	2[2x]
	PCBs	24" to 28"	1[2x]
		Over 28"	6 Per Year[2x]
Lake Whitefish	PCBs, Dioxins, Toxaphene	Any	2[2x]
Northern Pike	Mercury	Any	2
Rainbow Trout	PCBs	Any	2[2x]
Siscowet	PCBs & Toxaphene	Any	Limited▲
Steelhead	PCBs	Any	2[2x]
Suckers	Toxaphene	Any	2[2x]
Walleye	Mercury	Any	2
Yellow Perch	Mercury	Any	2

Otter Lake

Type of Fish	Chemicals of Concern	Size of Fish (length in inches)	MI Servings per Month*
Suckers	Mercury	Any	2
Walleye	Mercury	Under 20"	1
		Over 20"	6 Per Year

Pike Lake

Type of Fish	Chemicals of Concern	Size of Fish (length in inches)	MI Servings per Month*
Northern Pike	Mercury	Under 30"	6 Per Year
		Over 30"	Do Not Eat▲

Portage Lake

Type of Fish	Chemicals of Concern	Size of Fish (length in inches)	MI Servings per Month*
Brown Trout	Mercury	Under 20"	2
	PCBs & Mercury	Over 20"	2
Northern Pike	Mercury	Any	2
Walleye	Mercury	Under 24"	2
		24" to 28"	1
		Over 28"	6 Per Year

Rice Lake

Type of Fish	Chemicals of Concern	Size of Fish (length in inches)	MI Servings per Month*
Northern Pike	Mercury	Under 24"	4
		Over 24"	2
Walleye	Mercury	Under 22"	2
		Over 22"	1

Roland Lake

Type of Fish	Chemicals of Concern	Size of Fish (length in inches)	MI Servings per Month*
Rock Bass	Mercury	Under 9"	2
		Over 9"	1

Torch Lake

Type of Fish	Chemicals of Concern	Size of Fish (length in inches)	MI Servings per Month*
Largemouth Bass	PCBs & Mercury	Under 18"	2
		Over 18"	1
Northern Pike	PCBs	Any	2[2x]
Smallmouth Bass	PCBs & Mercury	Under 18"	2
		Over 18"	1
Suckers	PCBs & Mercury	Under 16"	12
		Over 16"	4
Walleye	PCBs & Mercury	Under 22"	1
		Over 22"	6 Per Year

2X	See the **2x** box on the back of this page to learn how you can eat more of these fish safely.
▲	See the **Limited** and **Do Not Eat** boxes on the back of this page for more information.

To get the guidelines for other regions in Michigan and nearby states, please visit www.michigan.gov/eatsafefish or call MDHHS at 1-800-648-6942.

v. 12-2015

(Open the brochure for more area information and to learn how to use the Eat Safe Fish guidelines.)

FREE LOCAL FISHING MAP & Eat Safe Fish Guidelines

What are 'safe' fish?

Safe fish are fish that are low in chemicals. If you use the ***Eat Safe Fish Guide*** when you choose fish to catch and eat, you will protect yourself and your family from chemicals that could someday make you sick.

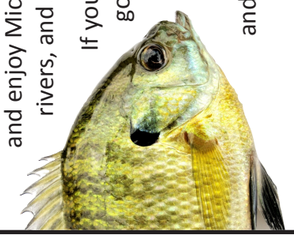
If there are chemicals in the fish, why should I still eat it?

Fish have a lot of great health benefits.

- ☑ **Fish can be a great low-fat source of protein.**
- ☑ **Fish are brain food.**
- ☑ **Some fish have heart-healthy omega-3s.**

Plus, fishing is a fun way to get outside and enjoy Michigan's 11,000 lakes, rivers, and streams!

If you **follow the 3Cs** and go after fish that have **fewer chemicals** in them, you can get a lot of health benefits and have **very little risk.**



Catching fish • Buying fish • Eating fish
For more information on safe fish, call MDHHS at 1-800-648-6942 or visit us online at www.michigan.gov/eatsafefish.

MDHHS Michigan Department of Health & Human Services

Using the Eat Safe Fish Guidelines

MDHHS tests only the filets of the fish for chemicals to set these guidelines. *MI Servings* are set to be safe for everyone. This includes **children, pregnant or breastfeeding women, and people who have health problems like cancer or diabetes.**

How much is *MI Serving*?

Weight of Person	*MI Serving* Size
45 pounds	2 ounces
90 pounds	4 ounces
180 pounds	8 ounces

Weigh less?
For every 20 pounds less than the weight listed in the table, subtract 1 ounce of fish.
For example, a 70-pound child's *MI Serving* size is 3 ounces of fish. 90 pounds - 20 pounds = 70 pounds & 4 ounces - 1 ounce = a *MI Serving* size of 3 ounces

Weigh more?
For every 20 pounds more than the weight listed in the table, add 1 ounce of fish.
For example, a 110-pound person's *MI Serving* size is 5 ounces of fish. 90 pounds + 20 pounds = 110 pounds / 4 ounces plus 1 ounce = a *MI Serving* size of 5 ounces

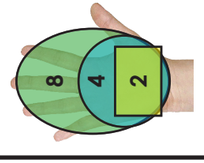
You might eat more than one *MI Serving* in a meal. That's OK, just keep track so you don't have too much.

Are you pregnant?

Fish is good for you and your baby! Use your pre-pregnancy weight to find your *MI Serving* size. It's also best to avoid eating fish labeled as "Limited" when you're pregnant or breastfeeding.

My Michigan, *MI Serving* Size

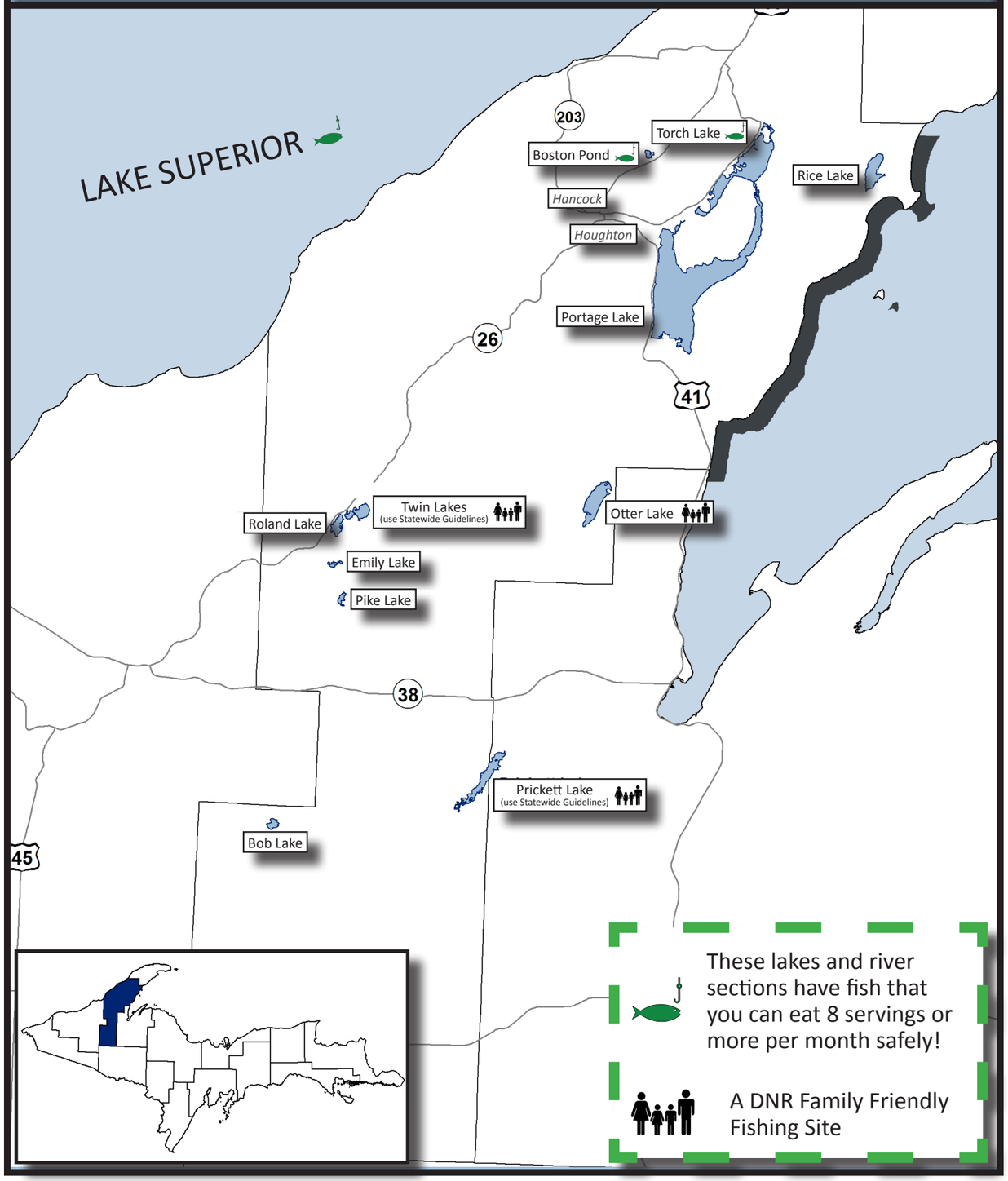
- ☑ 8 ounces of fish = size of an adult's hand (large oval)
- ☑ 4 ounces of fish = size of the palm of an adult's hand (small circle)
- ☑ 2 ounces of fish = size of half a palm of an adult's hand (rectangle)



The MDHHS Safe Fish guidelines in this brochure are from the MDHHS ***2015 Eat Safe Fish Guide.***
For updates, visit www.michigan.gov/eatsafefish or call 1-800-648-6942 and ask for a free ***Guide.***

Map of Houghton County, Michigan

Check the 2015 Eat Safe Fish Guidelines on the inside of this brochure for the lakes on this map.
For all other lakes and rivers in Houghton County, please use the Statewide Guidelines.



Statewide Guidelines & More

Don't see a certain Houghton County lake or river listed in this brochure?
Then the Statewide Safe Fish Guidelines can help you find safer fish to eat.

Only use the Statewide Guidelines if...

STOP

- **the Houghton County lake or river you are fishing in is not listed in this brochure, OR**
- **your lake or river is listed in this brochure, but the fish species is not listed.**

Statewide Safe Fish Guidelines

Type of Fish	Chemical of Concern	Size of Fish (length in inches)	MI Servings per Month*
Black Crappie	Mercury	Any Size	4
Bluegill	Mercury	Any Size	8
Carp	PCBs	Any Size	2
Catfish	PCBs & Mercury	Any Size	4
Largemouth Bass	Mercury	Under 18"	2
		Over 18"	1
Muskellunge	Mercury	Any Size	1
Northern Pike	Mercury	Under 30"	2
		Over 30"	1
Rock Bass	Mercury	Any Size	4
Smallmouth Bass	Mercury	Under 18"	2
		Over 18"	1
Suckers	Mercury	Any Size	8
Sunfish	Mercury	Any Size	8
Walleye	Mercury	Under 20"	2
		Over 20"	1
White Crappie	Mercury	Any Size	4
Yellow Perch	Mercury	Any Size	4

These guidelines are based on the typical amount of chemicals found in fish filets tested from around the state. Some fish may be higher or lower. If any of these fish are listed in the guidelines for the lake or river you are fishing in, use **those** guidelines instead of the Statewide Guidelines. The *MI Servings* recommendation will be more exact for that lake or river because those filets have been tested. For other counties in Michigan, please visit www.michigan.gov/eatsafefish to get the *Eat Safe Fish Guide* for that region.

2x, Best Choice, Limited, and Do Not Eat

2x

Remove the fat; double the *MI Servings*!

PCBs and dioxins are in the fat of the fish. You can double the number of *MI Servings* if you:

- trim away the fat that you can see from the filet,
- cook the fish on a grill or broiling pan so more fat can drip away
- **Note, you can't remove mercury, selenium, or PFOS from the fish.** Do not double the *MI Servings* for fish with those chemicals listed as a Chemical of Concern.

Limited

If you:

- are under the age of 15,
  - or -
- have health problems, like cancer or diabetes,
  - or -
- are planning on having children in the next several years, currently pregnant, or breastfeeding,

MDHHS suggests you **avoid eating all fish listed as *"Limited"*** because of higher levels of chemicals.

If **NONE** of the above apply to you, it is usually OK to eat fish listed as *"Limited"* **1 or 2 times each year**.

Best Choice

Do you eat fish at least twice a week?

When using the MDHHS *Eat Safe Fish Guide*, watch for this MDHHS "Best Choice" symbol. The hook and fish mark species that you and your family can safely eat 8 *MI Servings* or more each month!

Do Not Eat

No one should eat fish listed as Do Not Eat, regardless of age or health.

When these fish were tested, MDHHS found very high levels of chemicals. Eating even one meal of these fish could possibly lead to health problems in the future, regardless of age or health.

v. 12-2015

Fishing in Torch Lake

What's the Catch?

Some fish in Torch Lake have more chemicals than others because of what they eat, how long they live, and how fatty they are. Smaller fish of the same species usually have less chemicals than the bigger ones. It's best to keep the small fish for eating and snap a picture and return trophy fish to the water! If you eat a lot of fish, check the *Eat Safe Fish Guide* to find the safest fish to eat.

How to Catch Yellow Perch

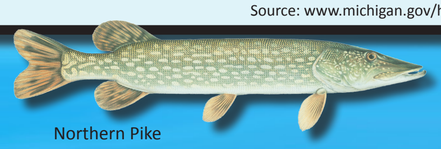
- Perch can be found around rocky bottoms in deeper waters, but may also be found near weed beds in shallower areas.
- Perch tend to bite all day long, but aren't very active after dark.
- You can catch yellow perch with live bait; minnows, wigglers, earthworms, leeches, wax worms or small crayfish are best. Use a sinker on the end of the line with a pair of hooks (No. 6 or 8) tied on leaders about a foot apart just above the sinker.

How to Catch Northern Pike

- Pike are typically found in shallower waters in the spring. They move deeper after spawning.
- You can catch pike with minnows or almost any kind of artificial lure. Some anglers recommend using a wire leader because of their sharp teeth. Watch your fingers!
- Keep your bait moving - either go trolling in a boat or cast and slowly reel it in.

Source: www.michigan.gov/howtofish

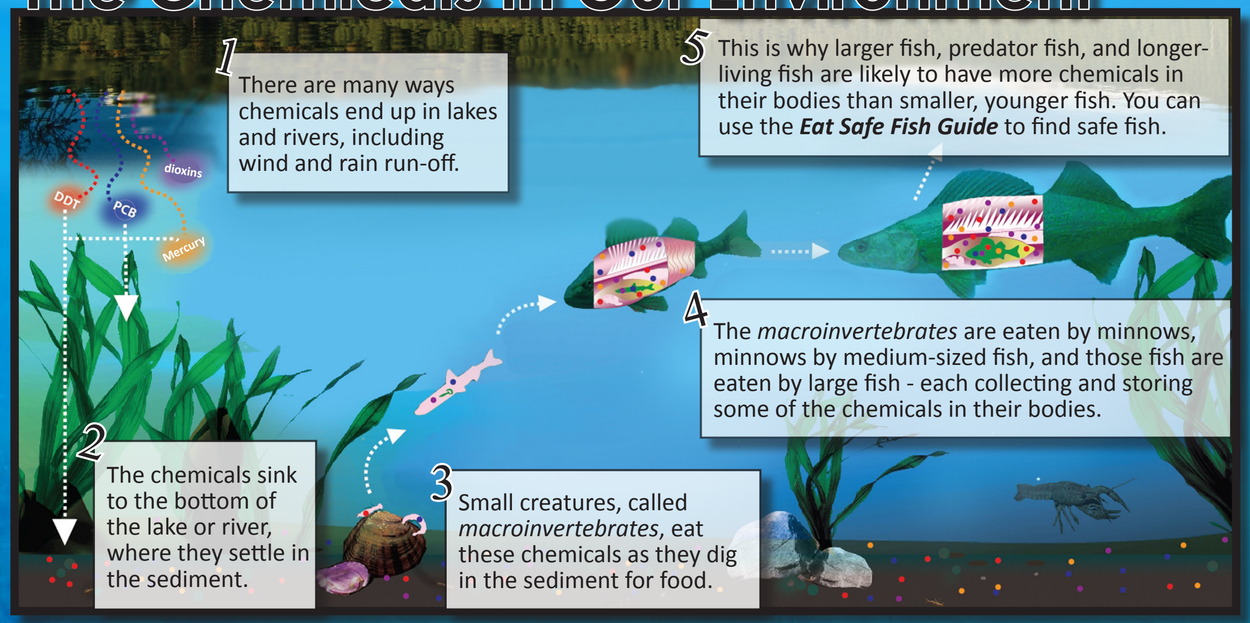

Yellow Perch


Northern Pike

Choose Wisely, Eat Safely

You can use the *Eat Safe Fish Guide* to find specific guidelines for Torch Lake and other nearby rivers and lakes.

The Chemicals in Our Environment



No Guide? Be S.A.F.E.

S **Smaller fish are better.**
They tend to have fewer chemicals.

a **Avoid large predator fish and the bottom feeders.**
They tend to have more chemicals. Please check the ***Eat Safe Fish Guide*** before eating these fish.

f **Fat should be removed.**
Some chemicals are in the fat of the fish.

e **Eat fish that have been broiled or grilled on a rack.**
More of the fat and chemicals can drip away. You can reduce some chemicals by up to half!

Have Questions? Want an *Eat Safe Fish Guide*?

- **You can call the Michigan Department of Health & Human Services (MDHHS) at 1-800-648-6942 and ask for a free *Eat Safe Fish Guide* or pick up an *Eat Safe Fish* brochure at the Keweenaw Convention & Visitors Center or from any of our local partners.**
- **You can also download this information to your smartphone 24/7 at www.michigan.gov/eatsafefish!**

The Guide and brochure include maps to nearby lakes and rivers where fish have been tested for chemicals by MDHHS. The MDHHS Lab tests the filets of fish for chemicals, and all of the MDHHS guidelines are based only on this data.

Many thanks to our partners:

The Communities of Torch Lake

Great Lakes Commission des Grands Lacs

MDHHS Michigan Department of Health & Human Services

Great Lakes RESTORATION

Muskegon Co. Eat Safe Fish Guidelines

These guidelines are from the 2015 *Southwest Michigan Eat Safe Fish Guide.*
To get the most up-to-date guidelines for lakes and rivers in Muskegon County or other areas of Michigan, please visit www.michigan.gov/eatsafefish to download the *Eat Safe Fish Guides* to your smartphone or call 1-800-648-6942 to get a print copy!

Bear Lake

Type of Fish	Chemicals of Concern	Size of Fish (length in inches)	MI Servings per Month*
Carp	PCBs	Any	Do Not Eat▲
Largemouth Bass	PCBs	Any	6 Per Year[2x]
Northern Pike	PCBs & Mercury	Any	2
Smallmouth Bass	PCBs	Any	6 Per Year[2x]
Walleye	Mercury	Under 18"	4
	PCBs	18" to 22"	6 Per Year[2x]
		Over 22"	Limited▲
All Other Species	PCBs	Any	6 Per Year[2x]

Big Blue Lake

Type of Fish	Chemicals of Concern	Size of Fish (length in inches)	MI Servings per Month*
Largemouth Bass	Mercury	Under 16"	2
		Over 16"	1
Smallmouth Bass	Mercury	Under 16"	2
		Over 16"	1

Black Creek

Type of Fish	Chemicals of Concern	Size of Fish (length in inches)	MI Servings per Month*
Carp	PCBs	Any	Limited▲
Suckers	PCBs	Any	6 Per Year[2x]

Mona Lake

Type of Fish	Chemicals of Concern	Size of Fish (length in inches)	MI Servings per Month*
Carp	DDT	Under 18"	2[2x]
	PCBs	18" to 28"	6 Per Year[2x]
		Over 28"	Limited▲
Largemouth Bass	PCBs	Any	6 Per Year[2x]
Smallmouth Bass	PCBs	Any	6 Per Year[2x]
Walleye	PCBs	Under 20"	1[2x]
		Over 20"	6 Per Year[2x]
All Other Species	PCBs	Any	6 Per Year[2x]

Muskegon Lake

Type of Fish	Chemicals of Concern	Size of Fish (length in inches)	MI Servings per Month*
Carp	PCBs	Any	Do Not Eat▲
Largemouth Bass	PCBs	Any	6 Per Year[2x]
Northern Pike	PCBs & Mercury	Any	2
Smallmouth Bass	PCBs	Any	6 Per Year[2x]
Walleye	Mercury	Under 18"	4
	PCBs	18" to 22"	6 Per Year[2x]
		Over 22"	Limited▲
All Other Species	PCBs	Any	6 Per Year[2x]

Muskegon River

(downstream from Croton Dam in Newaygo Co.)

Type of Fish	Chemicals of Concern	Size of Fish (length in inches)	MI Servings per Month*
Suckers	Mercury	Any	2
Walleye	PCBs	Any	6 Per Year[2x]

Ruddiman Creek Lagoon

Type of Fish	Chemicals of Concern	Size of Fish (length in inches)	MI Servings per Month*
Carp	PCBs	Any	Do Not Eat▲
Largemouth Bass	PCBs	Any	1[2x]
Smallmouth Bass	PCBs	Any	1[2x]
All Other Species	PCBs	Any	6 Per Year[2x]

White Lake

Type of Fish	Chemicals of Concern	Size of Fish (length in inches)	MI Servings per Month*
Carp	PCBs	Any	Limited▲
Largemouth Bass	Mercury	Under 18"	2
		Over 18"	1
Northern Pike	PCBs & Mercury	Any	2
Smallmouth Bass	Mercury	Under 18"	2
		Over 18"	1
Suckers	PCBs	Any	1[2x]
Walleye	PCBs	Any	6 Per Year[2x]

For all other lakes and rivers in Muskegon County, please use the Statewide Safe Fish Guidelines found on the other side of this brochure.

Please see the other side of this brochure for the Lake Michigan guidelines.

2X	See the **2x** box on the back of this page to learn how you can eat more of these fish safely.
▲	See the **Limited** and **Do Not Eat** boxes on the back of this page for more information.

To get the full *Eat Safe Fish Guides* with guidelines for other counties and regions in Michigan, please visit www.michigan.gov/eatsafefish or call MDHHS at 1-800-648-6942.

v. 2015

(Open the brochure for the map and to learn how to use the Eat Safe Fish guidelines.)

FREE LOCAL FISHING MAP & Eat Safe Fish Guidelines

What are 'safe' fish?

Safe fish are fish that are low in chemicals. If you use the ***Eat Safe Fish Guide*** when you choose fish to catch and eat, you will protect yourself and your family from chemicals that could someday make you sick.

If there are chemicals in the fish, why should I still eat it?

Fish have a lot of great health benefits.

- ☑ **Fish can be a great low-fat source of protein.**
- ☑ **Fish are brain food.**
- ☑ **Some fish have heart-healthy omega-3s.**

Plus, fishing is a fun way to get outside and enjoy Michigan's 11,000 lakes, rivers, and streams!

If you **follow the 3Cs** and go after fish that have **fewer chemicals** in them, you can get a lot of health benefits and have **very little risk.**

Catching fish • Buying fish • Eating fish
For more information on safe fish, call MDHHS at 1-800-648-6942 or visit us online at www.michigan.gov/eatsafefish.

MDHHS Michigan Department of Health & Human Services

Using the Eat Safe Fish Guidelines

MDHHS tests only the filets of the fish for chemicals to set these guidelines. *MI Servings* are set to be safe for everyone. This includes **children, pregnant or breastfeeding women, and people who have health problems like cancer or diabetes.**

How much is *MI Serving*?

Weight of Person	*MI Serving* Size
45 pounds	2 ounces
90 pounds	4 ounces
180 pounds	8 ounces

Weigh Less? For every 20 pounds less than the weight listed in the table, subtract 1 ounce of fish.
For example, a 70-pound child's *MI Serving* size is 3 ounces of fish. 90 pounds - 20 pounds = 70 pounds & 4 ounces - 1 ounce = a *MI Serving* size of 3 ounces

Weigh More? For every 20 pounds more than the weight listed in the table, add 1 ounce of fish.
For example, a 110-pound person's *MI Serving* size is 5 ounces of fish. 90 pounds + 20 pounds = 110 pounds / 4 ounces plus 1 ounce = a *MI Serving* size of 5 ounces

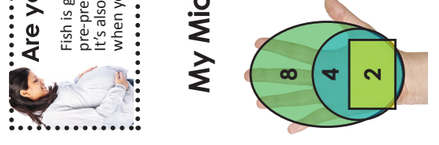
You might eat more than one *MI Serving* in a meal. That's OK, just keep track so you don't have too much.

Are you pregnant?

Fish is good for you and your baby! Use your pre-pregnancy weight to find your *MI Serving* size. It's also best to avoid eating fish labeled as "Limited" when you're pregnant or breastfeeding.

My Michigan, *MI Serving* Size

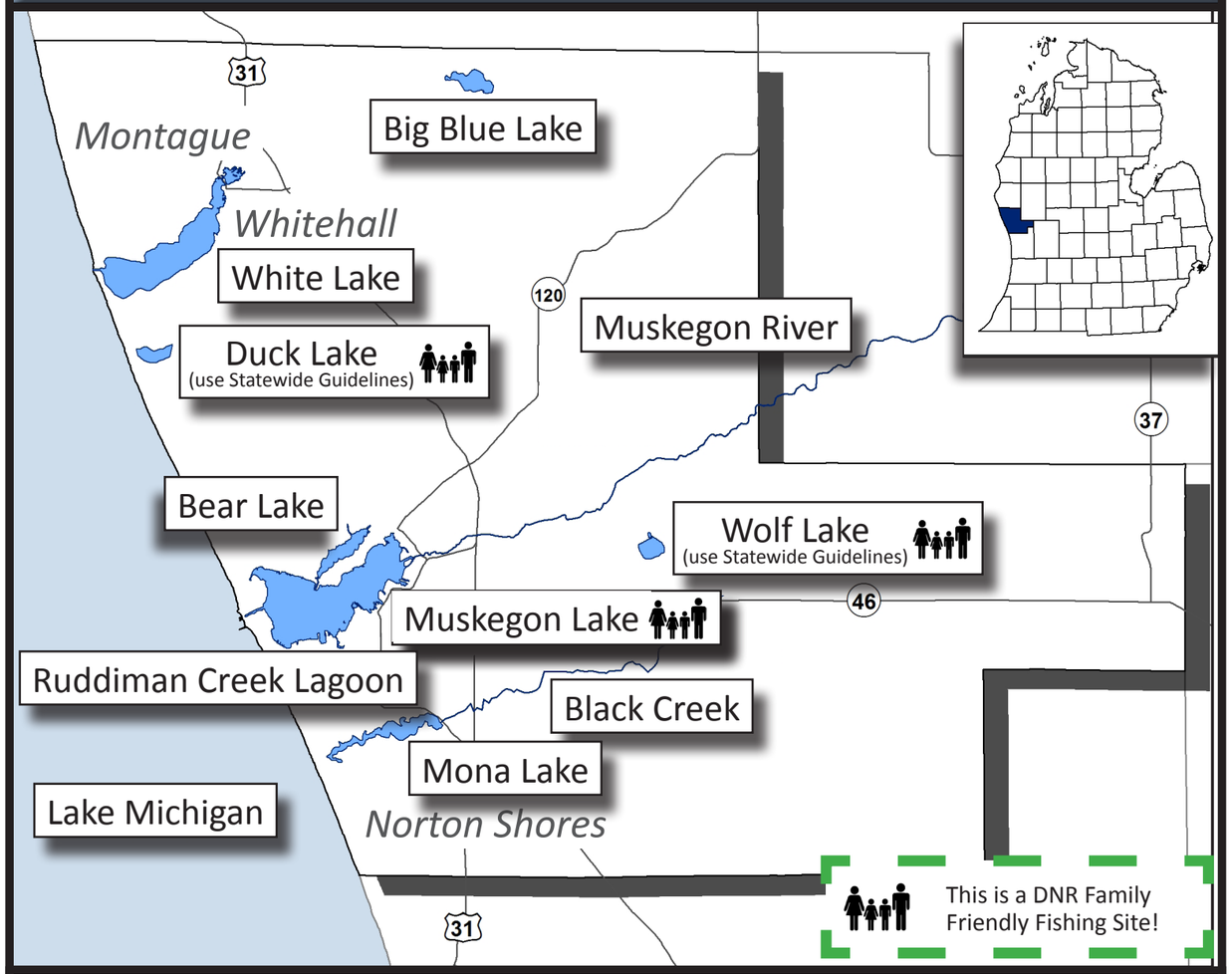
- ☑ 8 ounces of fish = size of an adult's hand (large oval)
- ☑ 4 ounces of fish = size of the palm of an adult's hand (small circle)
- ☑ 2 ounces of fish = size of half a palm of an adult's hand (rectangle)



The MDHHS Safe Fish Guidelines in this brochure are from the MDHHS ***2015 Eat Safe Fish Guide.*** For updates, visit www.michigan.gov/eatsafefish or call 1-800-648-6942 and ask for a free ***Guide.***

Map of Muskegon County, MI

Check the 2015 Eat Safe Fish guidelines on the inside of this brochure for the lakes and rivers on this map.
For all other lakes and rivers in Muskegon County, please use the Statewide Guidelines.



Lake Michigan

Type of Fish	Chemicals of Concern	Size of Fish (length in inches)	MI Servings per Month*
Brown Trout	PCBs	Any	Limited▲
Burbot	PCBs	Any	1[2x]
Carp	PCBs	Any	Do Not Eat▲
Chinook Salmon	PCBs	Any	6 Per Year[2x]
Coho Salmon	PCBs	Any	1[2x]
Lake Trout	Dioxins	Under 24”	6 Per Year[2x]
		Over 24”	Limited▲
Lake Whitefish	PCBs & Dioxins	Any	Limited▲
Rainbow Trout	PCBs	Under 20”	2[2x]
		Over 20”	6 Per Year[2x]
Smelt	PCBs	Any	2[2x]
Steelhead	PCBs	Under 20”	2[2x]
		Over 20”	6 Per Year[2x]
Suckers	PCBs	Any	6 Per Year[2x]
Walleye	PCBs & Mercury	Under 18”	2
	PCBs	18” to 22”	6 Per Year[2x]
	PCBs	Over 22”	Limited▲
Yellow Perch	PCBs	Under 10”	4[2x]
	PCBs & Mercury	Over 10”	4

Please see the other side of this brochure for the guidelines for other Muskegon Co. lakes and rivers that have been tested.

Statewide Guidelines & More

Don’t see a certain Muskegon County lake or river listed in this brochure?
Then the Statewide Safe Fish Guidelines can help you find safer fish to eat.

Only use the Statewide Guidelines if...

STOP

- **the Muskegon County lake or river you are fishing in is not listed in this brochure, OR**
- **your lake or river is listed in this brochure, but the fish species is not listed.**

Statewide Safe Fish Guidelines

Type of Fish	Chemical of Concern	Size of Fish (length in inches)	MI Servings per Month*
Black Crappie	Mercury	Any Size	4
Bluegill	Mercury	Any Size	8
Carp	PCBs	Any Size	2
Catfish	PCBs & Mercury	Any Size	4
Largemouth Bass	Mercury	Under 18”	2
		Over 18”	1
Muskellunge	Mercury	Any Size	1
Northern Pike	Mercury	Under 30”	2
		Over 30”	1
Rock Bass	Mercury	Any Size	4
Smallmouth Bass	Mercury	Under 18”	2
		Over 18”	1
Suckers	Mercury	Any Size	8
Sunfish	Mercury	Any Size	8
Walleye	Mercury	Under 20”	2
		Over 20”	1
White Crappie	Mercury	Any Size	4
Yellow Perch	Mercury	Any Size	4

These guidelines are based on the typical amount of chemicals found in fish filets tested from around the state. Some fish may be higher or lower. If any of these fish are listed in the guidelines for the lake or river you are fishing in, use **those** guidelines instead of the Statewide Guidelines. The *MI Servings* recommendation will be more exact for that lake or river because those filets have been tested. For other counties in Michigan, please visit www.michigan.gov/eatsafefish to get the *Eat Safe Fish Guide* for that region.

2x, Best Choice, Limited, and Do Not Eat

2x

Remove the fat; double the *MI Servings*!

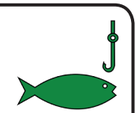
PCBs and dioxins are in the fat of the fish. You can double the number of *MI Servings* if you:

- trim away the fat that you can see from the filet,
- cook the fish on a grill or broiling pan so more fat can drip away
- **Note, you can’t remove mercury, selenium, or PFOS from the fish.** Do not double the *MI Servings* for fish with those chemicals listed as a Chemical of Concern.

Best Choice

Do you eat fish at least twice a week?

When using the MDHHS *Eat Safe Fish Guide*, watch for this MDHHS “Best Choice” symbol. The hook and fish mark species that you and your family can safely eat 8 *MI Servings* or more each month!



Limited

If you:

- are under the age of 15,

-or-

- have health problems, like cancer or diabetes,

-or-

- are planning on having children in the next several years, currently pregnant, or breastfeeding,

MDHHS suggests you **avoid eating all fish listed as “*Limited*”** because of higher levels of chemicals.

If **NONE** of the above apply to you, it is usually OK to eat fish listed as “*Limited*” **1 or 2 times each year**.

Do Not Eat

No one should eat fish listed as Do Not Eat, regardless of age or health.

When these fish were tested, MDHHS found very high levels of chemicals. Eating even one meal of these fish could possibly lead to health problems in the future, regardless of age or health.

v. 12-2015

Fishing White Lake

What's the Catch?

Some fish have less chemicals than others because of what they eat, how long they live, and how lean or fatty they are. Smaller fish of the same species usually have less chemicals than the bigger ones. It's best to keep the small fish for eating and to snap a picture and return trophy fish to the water!

How to Catch Yellow Perch

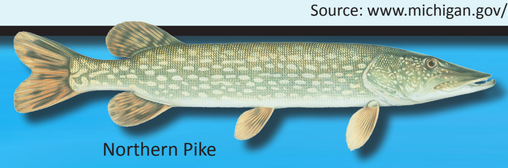
- Perch can be found around rocky bottoms in deeper waters, but may be found near weed beds in shallower areas.
- Perch tend to bite all day long, but aren't very active after dark.
- You can catch yellow perch with live bait; minnows, wigglers, earthworms, leeches, wax worms or small crayfish are best. Use a sinker on the end of the line with a pair of hooks (No. 6 or 8) tied on leaders about a foot apart just above the sinker.

How to Catch Northern Pike

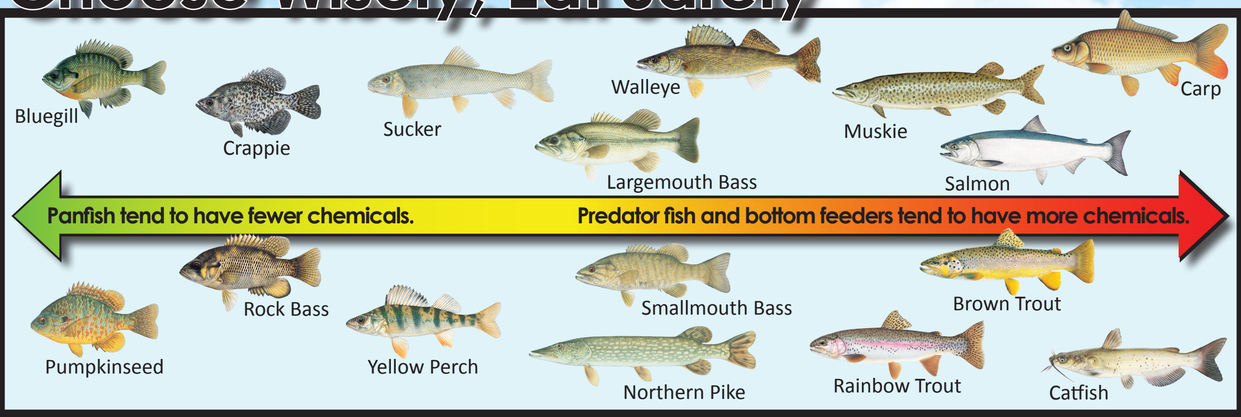
- Pike are typically found in shallower waters in the spring. They move deeper after spawning.
- You can catch pike with minnows or almost any kind of artificial lure. Some anglers recommend using a wire leader because of their sharp teeth. Watch your fingers!
- Keep your bait moving - either go trolling in a boat or cast and slowly reel it in.

Source: www.michigan.gov/howtofish


Yellow Perch

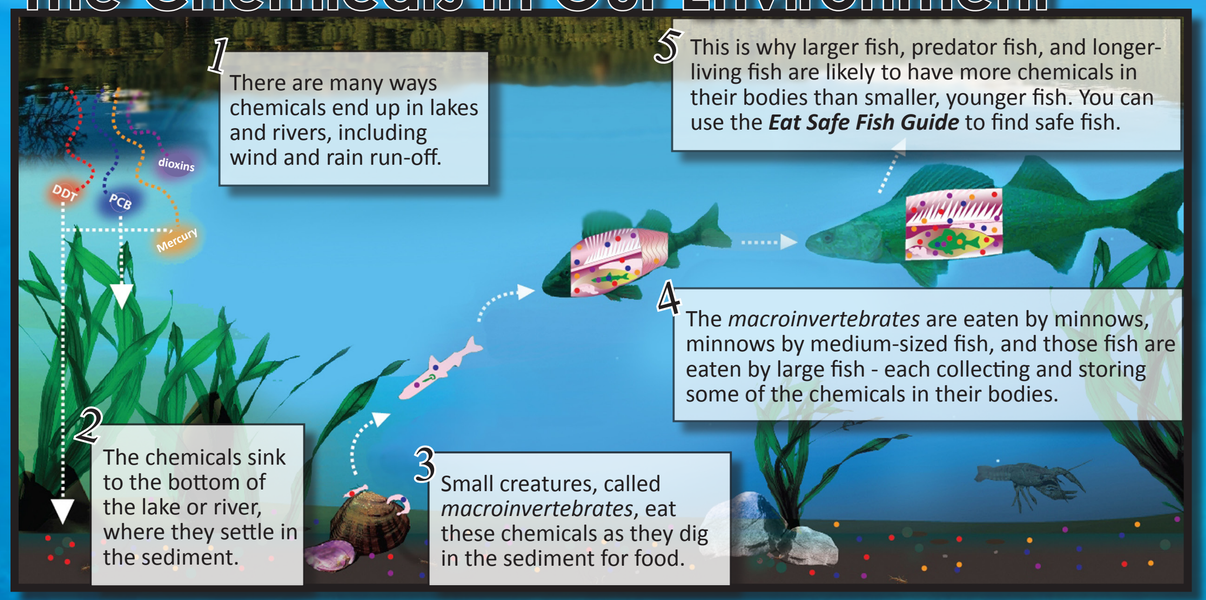

Northern Pike

Choose Wisely, Eat Safely



You can use the *Eat Safe Fish Guide* to find specific guidelines for White Lake & Lake Michigan.

The Chemicals in Our Environment



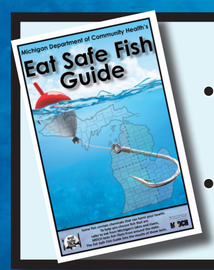
No Guide? Be S.A.F.E.

S **Smaller fish are better.**
They tend to have fewer chemicals.

a **Avoid large predator fish and the bottom feeders.**
They tend to have more chemicals. Please check the ***Eat Safe Fish Guide*** before eating these fish.

f **Fat should be removed.**
Some chemicals are in the fat of the fish.

e **Eat fish that have been broiled or grilled on a rack.**
More of the fat and chemicals can drip away. You can reduce some chemicals by up to half!



Have Questions? Want an *Eat Safe Fish Guide*?

- **You can call the Michigan Department of Health & Human Services (MDHHS) at 1-800-648-6942 and ask for a free *Eat Safe Fish Guide* or pick up an *Eat Safe Fish* brochure at the White Lake Chamber of Commerce or from any of our local partners.**
- **You can also download this information to your smartphone 24/7 at www.michigan.gov/eatsafefish!**

The Guide and brochure include maps to nearby lakes and rivers where fish have been tested for chemicals by MDHHS. The MDHHS Lab tests the filets of fish for chemicals, and all of the MDHHS guidelines are based only on this data.

Many thanks to our partners:

MDHHS Michigan Department of Health & Human Services · Muskegon Conservation District · White Lake Association · AOC Delisted! the White Lake Beautiful Moving Forward · United States Environmental Protection Agency · Department of Natural Resources Michigan DNR · eat safe fish · Great Lakes Commission des Grands Lacs · White River Watershed Partnership · White Lake Area Sportfishing Association · DEQ · Great Lakes Restoration

Fishing in White Lake

YES! You can eat the fish!

Although White Lake has had its share of problems, a lot of work has been done over the years to improve the environment in the area. There are fish you can safely eat from White Lake.

The Michigan Department of Community Health tests filets from fish taken from Michigan's lakes and rivers to learn which fish are safer to eat. This information can be found in MDCH's ***Eat Safe Fish Guide (ESF Guide)***. MDCH will test the fish in White Lake and other lakes and rivers in Michigan for years to come. The guidelines below are taken from the ***2014-2015 ESF Guide***:

Let's Go Fishing!

Everyone can eat up to <u>8 MI Servings</u> a month of these fish:

Bluegill

Pumpkinseed (Sunfish)

- or -

Everyone can eat up to <u>4 MI Servings</u> a month of these fish:

Black Crappie
White Crappie
Rock Bass
Yellow Perch

- or -

Everyone can eat up to <u>2 MI Servings</u> a month of these fish:

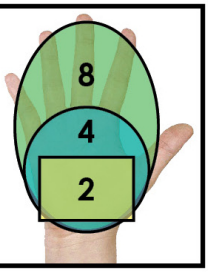
Northern Pike
Largemouth Bass (under 18")
Smallmouth Bass (under 18")

NOTE: Some fish from White Lake & Lake Michigan should be eaten less often. Please check the MDCH *ESF Guide for Southwest Michigan* to learn more.

What is a MI Serving?

My Michigan, *MI Serving* Size

- ☑ **8 ounces of fish** = size of an adult's hand (large oval); serving size for a typical adult (~180 pounds)
- ☑ **4 ounces of fish** = size of the palm of an adult's hand (small circle) serving size for a child/teen (~90 pounds)
- ☑ **2 ounces of fish** = size of half a palm of an adult's hand (rectangle) serving size for a small child (~45 pounds)



Chemicals can be in fish you catch or buy from anywhere in the world, but there are always good options to eat. MDCH makes it easy to choose safer fish to eat. Visit <u>www.michigan.gov/eatsafefish</u> or call MDCH at 1-800-648-6942 to request a free ***Eat Safe Fish Guide*** today!

Michigan Department of Community Health
MDCH

eat safe fish

Common Michigan Fish

The fish listed here can be found in lakes and rivers around Michigan.
Once you ID your fish, you can use the guidelines in the MDCH ***Eat Safe Fish Guide*** to see how often the fish is safe to eat.


Black Crappie


Bluegill


Brook Trout


Brown Trout


Burbot


Carp


Channel Catfish


Chinook Salmon
(King Salmon)

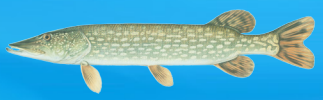

Coho Salmon


Lake Herring


Lake Trout


Largemouth Bass
(Green Bass)


Muskellunge
(Muskie)


Northern Pike


Pumpkinseed
(Sunfish)


Rainbow Trout


Rock Bass


Sheepshead
(Freshwater Drum)


Smallmouth Bass


Sucker


Walleye


White Bass
(Silver Bass)


White Crappie


Whitefish


Yellow Perch

Fish are not to scale.

Thank you to everyone who continues to work toward improving the environmental quality of White Lake!
To learn more about this work, visit **www.michigan.gov/eatsafefish** and click on the ***Find Your Area*** button today!

DEPARTMENT OF NATURAL RESOURCES DNR MICHIGAN

White River Watershed Partnership

Michigan Department of Community Health MDCH

White Lake Public Advisory Council

MUSKEGON Conservation District

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

Great Lakes RESTORATION

ELASA
WHITE LAKE AREA SPORTFISHING ASSOCIATION

White Lake Association

DEQ

Great Lakes Commission des Grands Lacs

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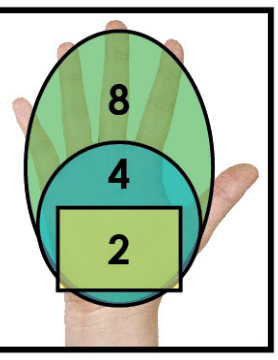

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