



Contaminant levels in fish due to Chemicals of Mutual Concern (CMCs) has become a growing concern amongst consumers within the Lakehead Watershed. Lake Superior fish are a still nutritious food source and may safely be consumed by following the Guide to Eating Ontario Fish. The following information is intended to provide an overview of CMCs, help consumers make informed decisions to minimize exposure to toxins and provide practical suggestions to reduce our impact on Lake Superior.

## What are Chemicals of Mutual Concern?

Chemicals of Mutual Concern (CMCs) originate from human sources, and both Canada and the U.S. agree are potentially harmful to human health and the environment. CMCs are persistent and can bioaccumulate in the food web, where fish consumption has now become one of the known routes of exposure. To date, eight chemicals have been designated as CMCs. In Canada, these CMCs, are listed as toxic substances and regulated under the Canadian Environmental Protection Act (CEPA) of 1999:

1. mercury
2. polychlorinated biphenyls (PCBs)
3. hexabromocyclododecane (HBCD)
4. polybrominated diphenyl ethers (PBDEs)
5. perfluorooctane sulfonate (PFOS)
6. perfluorooctanoic acid (PFOA)
7. long-chain perfluorocarboxylic acids (LC-PFCAs)
8. short-chain chlorinated paraffins (SCCPs).

## Where are CMCs found?

CMCs have been used in flame retardants, consumer products (appliances and electronics), and industrial manufacturing applications (paper, plastics, and textiles). Polyfluoroalkyl substances (PFAS), a family of synthetic chemicals including PFOS, PFOA, and LC-PFCAs, have been used in many household products such as adhesives, cosmetics, cleaning products, food wrappings, and takeout containers. Further, these chemicals have been utilized to repel water, oil, dirt, or grease from non-stick cookware, carpets, and fabrics for outdoor clothing.



## What are the harmful health effects of CMCs?

Under certain conditions, CMCs may pose a risk to human or environmental health. This depends on the type of chemical and the route of exposure (i.e., food, water, air, etc.). In some instances, exposure to certain chemicals can cause serious health problems. Long-term health effects are usually caused by exposure to harmful chemicals at smaller doses over longer periods of time. These long-term effects can include cancer, liver enlargement, changes to the metabolic systems, and other effects on various organs of the body dependent on the chemical. Exposure to certain chemicals in early developmental stages, such as fetus or infant, can lead to birth defects, and mental and physical developmental problems in children that can continue to adulthood.

## How do CMCs end up in Lake Superior?

CMCs can enter the air, water and soil when they are produced, used, or disposed. CMCs are known to enter Lake Superior through atmospheric deposition, point sources (municipal/industrial wastewater discharges and landfills), non-point sources (stormwater/surface runoff), and releases from existing contaminated bottom sediments in the lake.

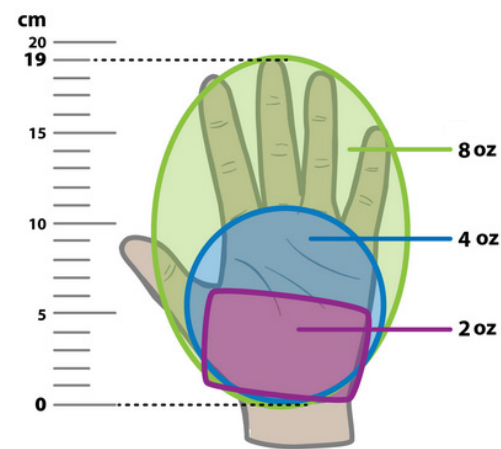
## How do fish accumulate CMCs?

Biomagnification and bioaccumulation are the two ways in which chemicals of mutual concern can accumulate in fish, wildlife, and humans. Freshwater fish absorb CMCs when the water-soluble chemicals pass over the gills or when they are ingested in their diet. Fish eliminate CMCs, specifically mercury, at a very slow rate, allowing these chemical concentrations to gradually increase in the tissues.

## What are Fish Consumption Advisories?

Canadian and U.S. federal, tribal, state, and provincial agencies monitor the chemical concentrations in the edible portions of fish (i.e. fillets). Consumption advice is issued in an effort to avoid the negative health effects of harmful pollutants found in fish and wildlife. The Guide to Eating Ontario Fish was developed to provide fish consumption advice for both general and sensitive populations (women of child-bearing age and children under 15). Fish consumption advisories are based on location, type of fish, length of fish, and recommended number of meals. A meal is considered 227 grams or 8 ounces for the average adult. The interactive map allows you to zoom into your favorite fishing hot spots to review the consumption advisories.

### A VISUAL GUIDE TO FISH SERVING SIZES




## What's the Status of Fish in Lake Superior?

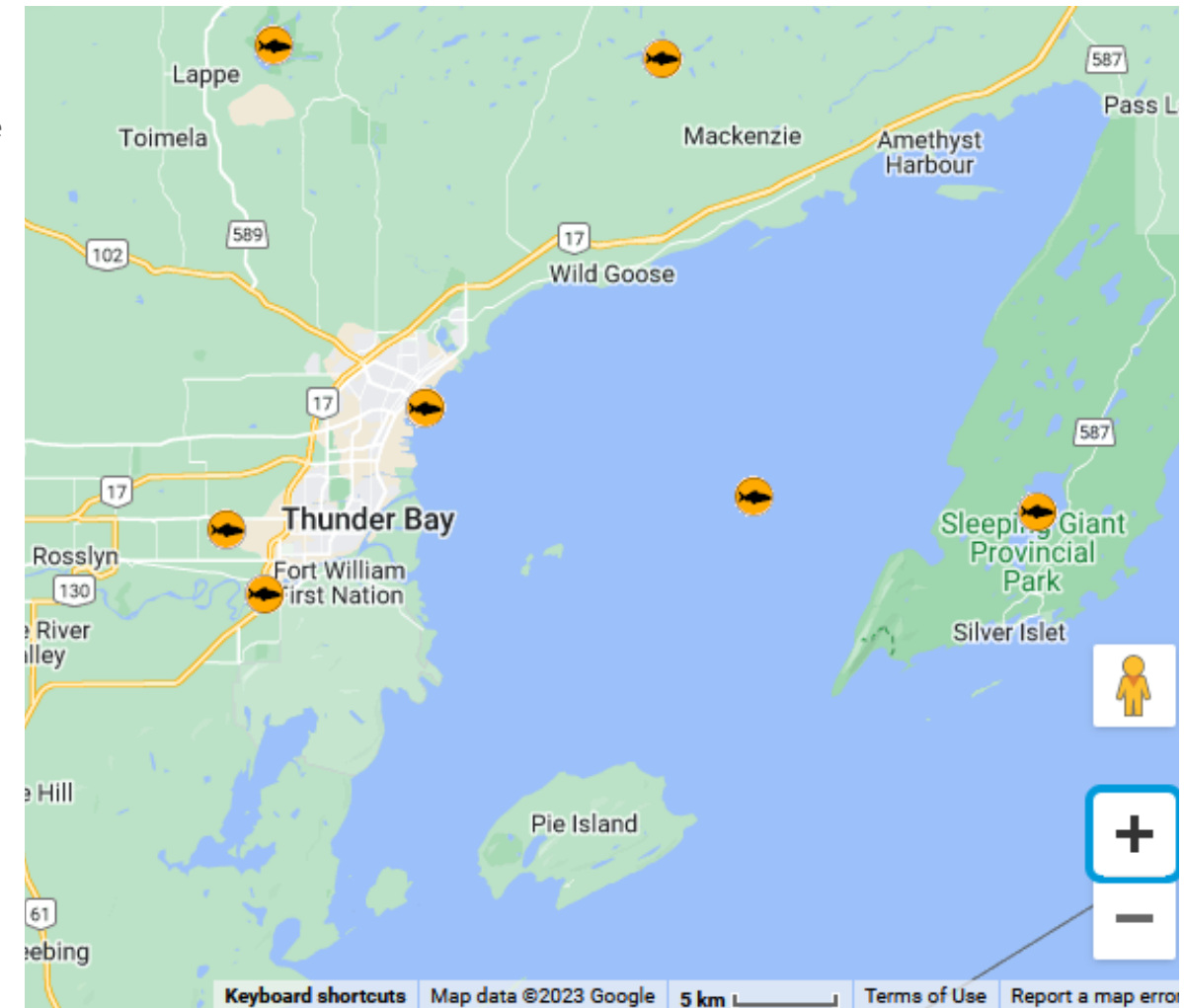
The status of contaminants in edible fish in Lake Superior is classified as “fair” with an “unchanging” trend over the past 10 years based on the 2022 State of the Great Lakes report. Fish consumption advisories in Lake Superior and the Thunder Bay region are largely due to concentrations of mercury and PCBs, and in a few locations, dioxins/furans and toxaphene (ECCC and EPA, 2022).

PFAS are now being more extensively monitored and have recently prompted the issuance of fish consumption advisories in the Neebing River. The elevated levels of PFAS are attributed to the river’s close proximity to the Thunder Bay Airport a PFAS “hot spot” in the region. Fortunately, PFAS levels were low in freshwater fish sampled from Thunder Bay’s inner and outer harbour and did not lead to a change in the consumption advisory.

## How to use the Guide to Eating Ontario Fish:

1. Use the zoom icon (+/-) and the cursor (hand) to navigate to the lake or river of interest or use the search bar to find the location by name.
2. Click the Orange Fish Icon  to display a pop-up window.
3. Ensure the location is correct and click Consumption Advisory Table, this will open the consumption advisory web page for that location.
4. Scroll down to see fish consumption advice based on the location, species, and length (cm/in).
5. Row one and two indicate fish length in centimeters and inches, row three and four indicate the number of meals for general and sensitive populations.
6. The species will have super scripts, a number that appears beside the species name, identifying the contaminant group causing the consumption restrictions.
7. It is advised to keep track of what you have consumed, no more than 100% of your advised monthly consumption.

<https://www.ontario.ca/page/guide-eating-ontario-fish>



SUB-INDICATOR	STATUS - TREND
<i>Treated Drinking Water</i>	Good - Unchanging
<i>Contaminants in Edible Fish</i>	Fair - Unchanging
<i>Toxic Chemicals in Sediment</i>	Good - Unchanging
<i>Toxic Chemicals in Water</i>	Fair - Improving
<i>Toxic Chemicals in Whole Fish</i>	Fair - Unchanging
<i>Toxic Chemicals in Herring Gull Eggs</i>	Good - Improving
<i>Toxic Chemicals in the Atmosphere</i>	Fair - Improving
<i>Groundwater Quality</i>	Undetermined

SOURCE: State of Great Lakes Report - ECCC and EPA, 2021.

## Monitoring and Regulations:

- In Canada, the manufacture, import, and use of chemicals are regulated by a number of laws, including *CEPA, 1999*, the *Hazardous Products Act*, the *Food and Drugs Act*, and the *Pest Control Products Act*.
- The 2020 – 2024 Lake Superior Lakewide Action Management Plan (LAMP) identifies restoration and protection actions to respond to chemical contaminant pollution in Lake Superior.
- Ontario regularly reviews fish consumption advisory benchmarks for PFAS and updates as necessary. Revised PFAS benchmarks may result in more restrictive fish consumption advisories in the future.

## How You Can Prevent CMCs from Contaminating Lake Superior:

- Take household hazardous materials to hazardous waste collection depots.
- Do not burn garbage; prevent the release of toxic compounds such as dioxins, mercury, and lead.
- Properly dispose of unused medication through pharmaceutical take-back programs.
- Choose environmentally-friendly cleaning and personal care supplies.
- Practice energy efficiency at home.
- Utilize driveway sealants that minimize the release of toxic substances in precipitation events.
- Use natural non-toxic pest-control methods.
- Reduce the use of fluorinated consumer products such as non-stick cookware and stain-resistant products.
- Try eco-friendly de-icing alternatives such as sugar, sand, or coffee grinds.
- Join the Public Advisory Committee for the Thunder Bay Area of Concern.

## Helpful Links:

- Guide to Eating Ontario Fish: <https://www.ontario.ca/page/eating-ontario-fish>
- Chemicals of Mutual Concern (Annex 3): <https://binational.net/annexes-issues/a3/>
- Lake Superior 2020-2024 Lakewide Action & Management Plan: <https://binational.net/2022/09/15/lake-superior-lamp-2020-2024/>
- State of the Great Lakes 2022 Report: <https://binational.net/wp-content/uploads/2022/07/State-of-the-Great-Lakes-2022-Report.pdf>



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