

Guide to Eating Ontario Sport Fish

2007-2008

Twenty-fourth Edition, Revised

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Preface

This 24th edition of the *Guide to Eating Ontario Sport Fish* gives consumption advice for sport and game fish found at more than 1,700 locations in the province. The format of the 2007-2008 *Guide* is unchanged from the previous 2005 edition. However, there are many changes in the advisory tables reflecting updated guidelines for some contaminants as well as the incorporation of 120,000 test results performed on 12,000 fish.

The advisories continue to be based on health protection guidelines provided by Health Canada. Since 2005, advisories have been provided separately for the general population and for the sensitive population of women of child-bearing age and children under 15.

All users of the *Guide* are advised to read the *Instructions* section prior to proceeding to the consumption tables. This is especially important for families with women of child-bearing age and children under 15.

The *Guide* is published every other year. An electronic copy of the *Guide* is available on the Ministry of the Environment Web site at www.ontario.ca/fishguide. In alternate years any major changes in consumption advice are made public by the Ministry of the Environment through the Public Information Centre and on the ministry Web site. Media are also notified. Consumers with questions on the status of specific consumption advisories should call the Sport Fish Contaminant Monitoring Program at (416) 327-6816 or 1-800-820-2716 or e-mail at sportfish.moe@ontario.ca

Staff at the Ministry of Natural Resources and Ministry of the Environment collect the fish and send them to the Ministry of

the Environment laboratory in Toronto where they are analyzed for a variety of substances, including mercury, PCBs, mirex, DDT and dioxins. The results are used to develop the tables in this *Guide*, which give size-specific consumption advice for each species tested from each location. This advice is based on health protection guidelines developed by Health Canada.

To report pollution or fish kills, contact the nearest office of the Ministry of the Environment or the Ministry's Spills Action Centre (see page 21).

Anyone requiring information on fishing licences, angling regulations, limits of catch, open seasons, provincial parks, maps or hunting should contact a Ministry of Natural Resources office (see page 22) or visit the Ministry of Natural Resources Web site at www.mnr.gov.on.ca

In the past, valuable feedback has been provided by users of the *Guide*. We continue to welcome any comments you may have and invite you to complete a short survey available online at www.ene.gov.on.ca/fishguide/survey. To obtain detailed data for a specific location tested under the Sport Fish Contaminant Monitoring Program or for additional information on the results in this and previous Guides, please contact:

Sport Fish Contaminant Monitoring Program
Ministry of the Environment
125 Resources Road
Etobicoke, ON M9P 3V6
Telephone: (416) 327-6816
or 1-800-820-2716
E-mail: sportfish.moe@ontario.ca

It is highly recommended that you read the text of the *Guide* before referring to the advisory tables. Should you choose not to, please read the following two sections entitled “Instructions on use of the *Guide*” and “Summary of critical information” with page references for more detail.

Instructions on use of the *Guide*

To determine how much fish you can consume:

- Find the table for the water body where the fish was caught. The *Guide* tables are divided into Southern Ontario (south of the French River), Northern Ontario and the Great Lakes.

	Length/ Longueur	15 6"	20 8"	25 10"	30 12"	35 14"	40 16"	45 18"	50 20"	55 22"	60 24"	65 26"	70 28"	75 30"	>75 cm >30"
Emily Lake / Lac Emily															
Sauger Twp./Canton de Sauger, Sturgeon Co./Cité de Sturgeon															
4537/7942															
Northern Pike ⁵ Brochet ⁵							8							4	
Walleye ⁵ Doré ⁵							8	4						0	
Smallmouth Bass ⁵ Achigan à petite bouche ⁵							8	4							
Largemouth Bass ⁵ Achigan à grande bouche ⁵							8	4							
Brown Bullhead ⁵ Barbotte brune ⁵							8								

□ General population/population générale

■ Sensitive population/population sensible – *Women of child-bearing age and children under 15/Les femmes en âge de procréer et les enfants de moins de 15 ans*

- Measure the total length of the fish (tip of nose to tip of tail) and refer to the appropriate length range at the top of the table.
- The upper line (*no shading*) is for the general population and the lower line (*grey shading*) is for women of child-bearing age and children under 15 (sensitive population).
- The number that appears in the consumption advice box represents the maximum number of meals of that size fish from that location that can be consumed each month. The number of meals per month (categories) may be 8, 4, 2, 1, or 0 as indicated.
- Women of child-bearing age and children under 15 are advised to consume fish only in the eight and four meals per month categories.
- Sport fish consumption advice is based on a combination of fish size, species and location. You may eat fish from different categories and locations as long as you track your consumption accordingly. Track each fish meal as a fraction of your monthly intake total (as shown in the following chart), the sum of which should not exceed 1.

Category <i>(Fish meals per month)</i>	Fraction of monthly intake total
8	1/8
4	1/4
2	1/2
1	1

For example:

If you eat:

- Two meals in the four-meal-per-month category, each meal will represent one-quarter of your maximum monthly allotment for a total of one-half your maximum monthly allotment (2 meals x 1/4 = 1/2).

and also eat

- One meal in the two-meal-per-month category, that meal will represent one-half of your monthly allotment (1 meal x 1/2 = 1/2).

The total from these two groups equals one. Therefore, you would have used your total monthly allotment.

- Women of child-bearing age and children under 15 should reduce their consumption of sport fish if they consume commercial fish more than four times per month. As a general guideline, reduce sport fish consumption by one meal per month for every two meals of store-bought fish.
- If you have any questions on determining your consumption, contact the Sport Fish Contaminant Monitoring Program at 416-327-6816, 1-800-820-2716 or sportfish.moe@ontario.ca

As an added level of precaution, women of child-bearing age and children under 15 are advised to consume fish only from the categories of eight meals per month and four meals per month.

Summary of critical information

- Young children and developing fetuses are affected by contaminants at lower levels than the general population (pg. 5).
- The maximum recommended number of meals of sport fish per month is eight (pg. 7). Determine exactly what you can consume using the methods described in the “Instructions on use of the *Guide*.”
- Consumption advice in the tables is based on an average meal size of 227 grams (eight ounces) for an average size adult weighing 70 kilograms (155 pounds). It is assumed that smaller individuals will consume a smaller portion and larger individuals will consume a larger portion.

- If you are an average size adult and your average meal size is substantially less than 227 grams (eight ounces), you may consume more meals than recommended. Conversely, if your meal size is substantially more than 227 grams (eight ounces), you should consume fewer than the recommended number of meals. Contact the Sport Fish Contaminant Monitoring Program for more specific advice.
- Do not harvest dead or dying fish as they may contain harmful microorganisms or toxins (pg. 12).
- Always follow proper food handling and storage techniques, as you would with any fresh meat product, to prevent the growth of harmful bacteria (pg. 12).
- Consumption advice is based on the skinless, boneless dorsal fillet (pg. 14). Do not eat organs of any fish. Fish organs can be high in both heavy metals and pesticides (pg. 6).
- Great Lakes salmon and trout are more likely to have high levels of contaminants such as PCBs and pesticides. Check the consumption tables and consume only the skinless, boneless dorsal fillet of these fish (pg. 6). The flesh on the lower portion of the fish (belly) can have higher levels of PCBs and pesticides.
- At inland locations mercury is the major contaminant. Because mercury is distributed evenly throughout the fillet, in most cases the full side fillet can be consumed (pg. 6). Refer to the consumption tables.
- Top predators, such as walleye and pike, usually have the highest mercury levels. Smaller, younger fish and fish that are not top predators, such as panfish and yellow perch, are lower in contaminants. You can reduce your contaminant intake by choosing these fish to eat (pg. 10).
- If in doubt, contact the Sport Fish Contaminant Monitoring Program (416-327-6816, 1-800-820-2716 or sportfish.moe@ontario.ca).

Additional information

An educational brochure for women of child-bearing age is available, either individually or in bulk, free of charge by contacting the Sport Fish Contaminant Monitoring Program.

A two page summary of the *Guide* is available in the languages listed below. Please call or e-mail the Sport Fish Contaminant Monitoring Program for copies or visit the Web site at www.ontario.ca/fishguide.

Cambodian	English	Hungarian	Ojibway	Spanish
Chinese – Simplified	Filipino	Italian	Polish	Ukrainian
Chinese – Traditional	French	Japanese	Portuguese	Vietnamese
Cree	German	Korean	Russian	

Important advice for women of child-bearing age and children under 15

It is important that women of child-bearing age and children under 15 follow the advice in this *Guide*. Scientific studies clearly show that developing fetuses and young children are affected by contaminants at lower levels than the general population. Women of child-bearing age, including pregnant women and nursing mothers, can affect the health of their offspring through a diet elevated in contaminants such as mercury and PCBs.

Women of child-bearing age and children under 15 are advised to eat only those fish in the 8 and 4 meals per month categories.

The exact number of meals that can be consumed can be calculated by following the directions in the “Instructions on use of the Guide” section (page 2).

These individuals should further reduce their consumption of sport fish if they regularly consume commercial fish, including canned fish, (four times per month or more often) and should not consume sport fish if they are regular consumers of shark, swordfish, fresh or frozen tuna.

As a general guideline, reduce consumption of sport fish by one meal per month for every two meals of store-bought fish. This does not apply to the general population. More detailed information is included in the section “Advice for women of child-bearing age and children” (see page 7).

Contaminants in Ontario sport fish

Ontario is not unique in having consumption restrictions on sport fish. Most jurisdictions in North America also have them. An extensive review of consumption restrictions on sport fish in North America is available on the Internet at www.epa.gov/waterscience/fish/

Contaminants found in sport fish originate not only from local sources, but some are transported thousands of kilometres in the atmosphere before being deposited with rainfall. Mercury, PCBs and toxaphene are a few of the contaminants that are known to be transported long distances and can cause low-level contamination even in isolated lakes and rivers.

The basis for fish consumption advisories

Fish consumption advisories are based on guidelines developed by Health Canada which, through research and review of toxicological data, has determined safe dosages for an extensive list of contaminants. This amount is referred to as a tolerable daily intake. It is then determined what proportion of the tolerable daily intake comes from each of the environmental pathways such as air, water and different types of food, including sport fish. The safe dosage is the same for everyone for all contaminants except mercury, which is lower for the sensitive population of women of child-bearing age and children under 15.

A series of estimates and calculations is then done by the Ministry of the Environment to determine if fish are suitable for consumption. Fish represented in the eight-meals-per-month category have very low contaminant levels. If eight meals per month of these fish were consumed, an individual's tolerable daily intake would not be exceeded for any contaminant. Conversely, fish designated as zero (0) meals per month have high contaminant levels and the consumption of any meals of these fish would result in

individuals exceeding their tolerable daily intake for one or more contaminants.

What part of the fish can be safely consumed?

Laboratory analyses are carried out on the lean, dorsal, skinless, boneless muscle tissue of the fish (as shown on page 13) and the consumption guidelines are based on the results of this portion. Consuming any other portion may increase exposure to contaminants. Please follow the advice below.

1. Do not eat organs of any fish regardless of location. Organs can be high in both heavy metals and pesticides.
2. Consume only the skinless boneless dorsal fillets of salmon, trout, carp and channel catfish, especially if they are from the Great Lakes. Follow the advice in this *Guide* on how to "Clean and cook fish to reduce contaminants." Consumption advisories on these species in the Great Lakes are usually based on PCBs, mirex, toxaphene or dioxins. Because these contaminants are attracted to fat, the highest concentration of contaminants is present in the fat deposits under the skin and in the belly region.
3. You may consume the whole side fillet of lean species such as walleye, pike, bass, perch, and panfish from inland locations. Consumption advisories on these species are based almost exclusively on mercury. Mercury is uniformly distributed in the fillet and is not associated with deposits of fat.

Consumption advisory tables

Contaminant levels for all fish of a given size and species are usually similar within most small or medium sized lakes or rivers which

means that one set of consumption advice is all that is normally required. In large lakes and major river systems, however, contaminant levels can vary widely within the water body.

Fish consumption advisory tables for the Great Lakes, connecting waterways, large lakes and major river systems are provided in blocks or regions. Contaminant levels for all fish of a given size and species should be similar throughout a block. The boundaries of the blocks are established in consultation with fisheries biologists familiar with local fish populations after comparing contaminant levels in fish from several adjacent locations.

If minor differences are found in contaminant levels in fish within a block, the fish with the highest contamination levels are used to set the consumption advisory for that block. Separate consumption advice is provided for localized areas within a block where the fish community or the contaminant levels are different from the remainder of the block. Periodic testing is undertaken at several locations within a block to ensure that there are no major differences in contaminant levels. Detailed maps and written descriptions of the Great Lakes' blocks are provided at the front of each of the Great Lakes' tables.

How to use the *Guide* **To whom does this *Guide* apply?**

The advice in this *Guide* is designed to apply to anglers (and their families) who consume moderate quantities of fish. The consumption advice will protect individuals who follow the advice in the *Guide* and consume no more than eight meals per month of the fish they catch. Many of the fish in the eight-meals-per-month consumption category can be safely consumed more frequently than this. The maximum recommended consumption level was based on the results of questionnaires indicating that most anglers do not consume sport fish more frequently than eight meals per month. Anyone who does consume sport fish

more frequently is advised to contact the Sport Fish Contaminant Monitoring Program at the number given in the preface.

Advice for women of child-bearing age and children

Health Canada guidelines have been developed to protect the health of everyone, including the most sensitive individuals. Generally the most sensitive individuals are considered to be women of child-bearing age, pregnant women and children. Consequently, consumption advice for these sensitive individuals is more restrictive than that for the general population and is provided separately in the consumption tables.

Women of child-bearing age (pregnant women, women who are intending to become pregnant or breast-feeding mothers) and children under 15 are advised to consume only the least contaminated fish which are in the eight and four meals per month categories. Sport fish consumption should be restricted even further if store-bought fish, including canned fish, are regularly consumed. Women of child-bearing age and children under 15 are advised to reduce their consumption of sport fish if they consume store-bought fish four times per month or more often. As a general rule, reduce sport fish consumption by one meal per month for every two meals of store-bought fish.

Furthermore, Health Canada has issued a warning that women of child-bearing age and children should not consume more than one meal per month of shark, swordfish, fresh or frozen tuna as these fish are known to contain higher levels of mercury. As well, women of child-bearing age and children under 15 who are regular consumers of shark, swordfish, fresh or frozen tuna are advised not to consume sport fish. For further advice, contact Health Canada or the Canadian Food Inspection Agency (see page 22).

Key to using *Guide* tables

The *Guide* provides sport fish consumption advice based on the level of contaminants found in fish according to their species, length and location. The water body names and locations were obtained from the *Gazetteer of Canada* (Ontario). The location description includes latitude and longitude, enabling anglers to refer to the *Ontario Official*

Road Map (which is marked accordingly) to determine the general location of the body of water. Larger scale topographical maps can then be used if necessary to pinpoint the exact location. An alphabetical listing of all locations is contained in the index. The following is a key to the various components of the tables, using a hypothetical example called Emily Lake.

Diagram illustrating the components of a *Guide* table for Emily Lake. The table is divided into three sections: Southern Ontario, Northern Ontario, and the Great Lakes. The table shows fish species (Northern Pike, Walleye, Doré) and the number of meals per month (8, 4, 0) for different lengths (15, 20, 25, 30, 35, 40, 45, 50, 55, 60, 65, 70, 75, >75 cm). The table is titled "Emily Lake / Lac Emily" and includes the location "Sauger Twp./Canton de Sauger, Sturgeon Co./Clé de Sturgeon" and the coordinates "4537/7942".

Length/ Longueur	15 6"	20 8"	25 10"	30 12"	35 14"	40 16"	45 18"	50 20"	55 22"	60 24"	65 26"	70 28"	75 30"	>75 cm >30"
Northern Pike ⁵							8							
Walleye ⁵							4							
Doré ⁵							0							

Location identifiers

- 1 The tables are divided into three sections by region: Southern Ontario, Northern Ontario and the Great Lakes, as noted at the top of each page.
- 2 Water body name.
- 3 The latitude and longitude
- 4 The township, county, territorial district or geographical description of the water body.

Fish species

- 5 The most popular species and (or) the most likely to indicate elevated levels of contaminants are tested (see section "**Selection of fish species for testing**," page 13).

Fish length

- 6, 7 The total length of the fish is measured, from the tip of the nose to the tip of the tail. The fish length is expressed in the tables in both centimetres and inches (at the top and bottom of the tables).

Number of meals

- 8 Acceptable number of meals per month
- 9 Advice for general population
- 10 Advice for women of child-bearing age and children under 15
- 11, 12 No advice provided for these lengths (page 9)

Contaminants

- 13 The number identifies the contaminant or group of contaminants for which the fish was tested:
 1. Mercury
 2. Mercury, PCBs, mirex/photomirex and pesticides
 3. PCBs, mirex/photomirex and pesticides
 4. Mercury, PCBs and mirex
 5. Mercury, other metals, PCBs, mirex/photomirex and pesticides
 6. Mercury and other metals
 7. Dioxins and furans

8. Chlorinated phenols and chlorinated benzenes
9. Polycyclic aromatic hydrocarbons (PAHs)
10. Dioxins, furans and dioxin-like PCBs
11. PCB congeners

The fact that fish were tested for a particular group of contaminants does not mean that the fish will contain any or all of these contaminants. For example, fish analyzed for contaminant group 2 may contain only mercury and not PCBs, mirex/photomirex or pesticides.

In a number of locations, particularly inland locations, fish are analyzed only for mercury as this is likely to be the only contaminant to cause consumption restrictions.

Fish consumption tables

The advice provided in the tables is based on Health Canada's health protection guidelines for the intake of various contaminants tested in sport fish. The number in each box represents the maximum number of meals per month which can be safely consumed provided that sport fish are not consumed from any other category. If, during the month, fish are consumed from more than one category or location, please refer to the "Instructions on use of the *Guide*" section (page 2).

The consumption advice is provided on two lines. The advice on the top line (*no shading*) is provided for the general population. The advice on the bottom line (*grey shading*) is provided for the sensitive population (women of child-bearing age and children under 15).

Please note that a meal is considered to be 227 grams (eight ounces) for an average-sized adult, weighing 70 kilograms (155 pounds). It would be more for larger individuals and less for smaller individuals.

Example

An angler catches a 33 cm (13 in.) walleye from Emily Lake and wants to determine

the suitability of that fish for consumption. The angler should:

- Find Emily Lake in the *Guide* tables

		length / longueur												
		15	20	25	30	35	40	45	50	55	60	65 cm		
		6"	8"	10"	12"	14"	16"	18"	20"	22"	24"	26"		
Emily Lake / Lac Emily														
Saugen / Trép./Canton de Saugen, Sturgeon Co./Cité de Sturgeon 4537/7942														
Walleye*						8							4	
Doré*						4							0	

- General population:

For the general population the advice given for walleye in the 30-35 cm (12-14 in.) range is 8 indicating that eight meals per month of that fish may be consumed by the general population.

- Sensitive population:

For women of child-bearing age and children under 15 the advice given for walleye in the 30-35 cm (12-14 in.) range is 4 indicating that four meals per month of that fish may be consumed by women of child-bearing age and children under 15.

Consumption of fish outside the advisory table range

Advisories are provided only for the size ranges of fish that were tested. Since it is well known that contaminant levels increase with fish length, the following rules can be applied:

- For fish smaller than the advisory table range:
Follow the advice for the smallest tested range.
- For fish larger than the advisory table range:
Consumption advice cannot be predicted, except that it is likely to be more restrictive than the largest tested range.

Consumption advisories for spawning locations of salmon and trout

Please note that many rivers and streams near the Great Lakes are closed to fishing during salmon and trout spawning runs. However, sections of certain rivers and streams do remain open to permit fishing for these species. While salmon and trout from the Great Lakes

spend most of their lives there, they spawn in many of the rivers and streams which flow into them. In this *Guide*, consumption advisories are provided for some of the major spawning rivers such as the Credit and Ganaraska rivers on Lake Ontario and the Nottawasaga River on Georgian Bay. Spawning runs in many smaller rivers have not been sampled. If you catch salmon or trout in the legal fishing areas of these smaller rivers, please follow the consumption advisories for the Great Lakes advisory block into which the river flows. Maps and descriptions are provided at the beginning of each Great Lakes section of this *Guide*.

As an example, for salmon and trout caught in Duffins Creek, follow the advisories for block 6, Northwestern Lake Ontario.

Reducing the risk from contaminants in sport fish

Fish are a healthy part of any diet. They are high in protein and low in fat and offer substantial health benefits when they replace a protein source that is higher in fat. However, it is always prudent to minimize your contaminant intake. Consult the advisory table and the following tips to achieve this:

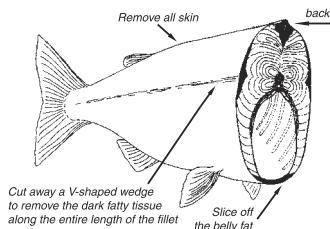
Eat less contaminated species

- Keep smaller fish for eating. Besides tasting better, smaller fish tend to be much less contaminated than larger fish of the same species.
- Species such as perch, sunfish and crappie tend to have much lower contaminants than large predator fish such as walleye and pike.
- In the Great Lakes, species such as bass, pike, walleye, perch and panfish tend to have much lower contaminants than fatty species such as salmon and trout.

Clean and cook fish to reduce contaminants

PCBs, pesticides and dioxins concentrate to the highest levels in fish with fatty flesh such as salmon, trout, carp and catfish. Before cooking, remove the skin, trim off the fatty

areas and discard the flesh around the belly area (as shown in figure below). Further reduction in contaminants can be achieved by allowing fat to drip away during cooking.



Mercury is the cause of most consumption advisories in inland water bodies. Mercury is evenly distributed in fish flesh and there is nothing you can do to reduce or remove it.



Muskellunge

Consumption tables in this *Guide* do not normally provide advisories for muskellunge. To maintain healthy muskellunge populations, the Sport Fish Contaminant Monitoring Program encourages catch and release of this species as it generally cannot sustain heavy fishing pressure. If you do wish to keep a legal-sized muskellunge for consumption, it will likely have elevated mercury levels, and should not be consumed by women of child-bearing age and children under 15. Trophy-sized muskellunge usually have very high mercury levels and should not be consumed by anyone.



American Eel

The *Guide* no longer provides consumption advice for American eel. The Ontario government has increased protection for

the province's dwindling American eel populations by banning recreational eel angling. The number of eel in Ontario waters has been declining since the mid-1990s due to environmental changes that have reduced the number of young eel migrating to Lake Ontario, as well as over fishing and mortality in hydro electric generating facilities. If you catch an American eel, you are required by law to release it back to the waters from which it was collected.

Fish parasites

Anglers sometimes catch fish which contain worms, grubs, cysts or nodules in the flesh. When cleaning fish, anglers may notice worms in or around the intestines of the fish or fungus growths on the skin, fins or gills. These parasites are a normal part of the ecosystem in which the fish lives. While not aesthetically pleasing, the edible portions containing parasites do not present a health hazard if properly and thoroughly cooked. Some of the most commonly seen parasites associated with fish are black spot, yellow grub, leeches, lamprey, fish lice and gill flukes.

Following is a description of black spot and yellow grub:

a) Black spot

Black spot, one of the most frequently observed parasites of fish, appears as small black spots or cysts in the skin, fins and flesh of fish. In the black spot life cycle, fish-eating birds such as herons and kingfishers eat an infected fish. The larval stage, which is inside the black cyst, develops into an adult in the bird. Eggs are laid by the adult and pass into the water where they hatch and infect snails. Eventually they leave the snail host and burrow through the skin of fish and form cysts, which the fish surrounds with a black pigment. This organism does little harm to the fish, but gives the fish an unsightly appearance. Infected fish can be consumed with proper cooking.

b) Yellow Grub

Yellow grub is closely related to black spot and has a similar life cycle. It appears as yellow or white spots in the flesh, sometimes over one-half cm long. Smallmouth bass and yellow perch tend to be the species most commonly inflicted with yellow grub in Ontario. There are no external signs on a fish to indicate that the flesh contains yellow grub. If only a few grubs are found in a fillet, they can be easily removed with a knife tip. Otherwise, infected fish can be consumed with proper cooking.

Tumours in fish

Occasionally, anglers catch fish with external growths, tumours, sores or other lesions. Such abnormalities generally result from viral or bacterial infections. Abnormalities in the liver or intestine are sometimes seen in coarse fish such as white suckers and brown bullhead, and can be caused by parasites or tumours. Concern about the potential effects of these diseases on the fish themselves and the possible role of pollution in causing tumours in some coarse fish has prompted ongoing investigations into these abnormalities. Growths on game fish caused by viruses include lymphocystis, dermal sarcoma and lymphosarcoma.

Lymphocystis, a viral disease affecting walleye and perch, is common throughout Canada. Viruses infect the fish's skin through contact with infected fish during the spring spawning run, forming pale or white cauliflower-like growths. Lymphocystis does not kill affected fish. Tagging studies have shown that these fish can lose the growths by the following spring.

Dermal sarcoma, another viral disease affecting walleye, is caused by viruses which infect cells and cause growths just under the skin. These growths can be removed by skinning the fish. A study by the Ministry of the Environment and the Ministry of Natural Resources has shown that walleye with external skin lesions such as lymphocystis and dermal sarcoma do not have higher contaminant levels than unaffected fish.

Lymphosarcoma is a viral disease affecting muskellunge and northern pike. This virus is transmitted at spawning, but the lesions caused by it can vary depending on the season and stage of the disease. In the spring, affected fish have thick white patches on their skin from which viruses are shed and these in turn infect other fish. Later in the year these patches may heal, forming blotchy red sores or even normal skin. The virus causing lymphosarcoma infects the white blood cells of the fish and can spread throughout the body during the summer or over several years. This disease can kill infected fish.

Other Growths. Coarse fish in various parts of the Great Lakes have been found to have lip and skin growths similar to human warts in appearance. Growths on coarse fish kept in the laboratory often disappear and new ones can develop very quickly, suggesting that viruses likely cause these tumours. Studies on Canadian and American areas of the Great Lakes have found an increased rate of lip and skin growth on coarse fish captured in polluted areas; in some extremely polluted areas, liver and intestinal tumours have been found in these fish. Studies suggest that pollution may cause the liver tumours and may indirectly cause skin growths – warmer water often found in polluted areas attracts larger numbers of fish, thus increasing their risk of becoming infected with viruses. Considerable research, much of it conducted or funded by the Ontario and Canadian governments, has been undertaken to determine whether pollution is a cause of these tumours. While the appearance of viral or bacterial infections in fish is unsightly, there is no known health risk from consuming an infected fish that meets the consumption guidelines as long as they are prepared properly.



Clams

Although freshwater clams are often readily available in many Ontario water bodies, it is advised that they not be consumed. Clams are filter feeders and therefore they are usually low in chemical contaminants, but for the same reason, they can harbour harmful bacteria and other pathogens. If they are not sufficiently cooked, they may cause health problems, such as food poisoning.

E. coli bacteria

E. coli is a type of bacteria that is found in warm-blooded animals. It is not normally associated with fish. Therefore, in a water body that has elevated levels of *E. coli*, and may be closed for swimming, fish can still be consumed provided they are properly cooked and the advice in the consumption tables is followed.

Botulism E

Fish and bird “die-offs,” attributed to Type E botulism, have been occurring during the summer and fall along the shorelines of the Great Lakes. Concern has been expressed that handling and consuming fish from these lakes may pose a health hazard.

Health Canada has concluded that there is no concern from consuming fish from these lakes, as long as normal practices are adhered to, including appropriate handling and storage of the fish and adequate cooking. Anglers are also advised not to keep any fish that appear to be sick, are dying or already dead when caught.

The Sport Fish Contaminant Monitoring Program

Selection of locations for testing

With more than 250,000 lakes, innumerable rivers and streams and many local areas in the Great Lakes, it would not be practical or economical to test fish from every water body.

A location may be selected for testing for one or more of the following reasons:

- It is a popular angling area
- There is a known or suspected source of pollution nearby
- It is a major source of food for local inhabitants (usually lakes in the vicinity of First Nations' communities)
- It is being opened for recreational development
- It is part of a monitoring program for long-term studies of contaminants in fish

The selection of testing sites is an ongoing process and public input is welcomed.

Selection of fish species for testing

Most lakes and rivers contain a variety of fish species. When selecting appropriate species for contaminant testing, the fact that not all species accumulate a particular contaminant at the same rate has to be taken into account. One kind of fish of a certain size may have a much lower contaminant concentration than another species of the same size. This is due to the fact that different fish feed on different things, prefer different habitats, grow at different rates and are physiologically different.

For example, walleye (yellow pickerel) and northern pike are likely to contain higher levels of mercury than whitefish of the same size since walleye and pike are top predators, feeding on smaller fish which may also contain elevated mercury levels. Whitefish on the other hand, feed lower down in the food chain,

on aquatic insects and invertebrates which contain less mercury than do small fish.

When testing fish for mercury in a specific area, the practice is to initially select those species which are top predators, as they likely indicate the highest mercury levels. If low levels of mercury are found in predators, the testing of other species may not be necessary.

In testing for organic contaminants such as PCBs and mirex, species with high fat levels, such as salmon, trout, carp and catfish, are selected since organic chemicals tend to accumulate in fatty tissue.

Again, if these species do not contain excessive levels of organic contaminants, then species with less fat from the same location may not have to be tested.

Collection of fish for testing

The fish are collected by staff from the Ministry of Natural Resources and the Ministry of the Environment using various methods. Whenever possible, the selection includes 10 or more fish of each species with lengths and weights representative of the size range of that species in the locations being tested. The length, weight and sex of each fish collected are recorded.

A boneless, skinless fillet of dorsal muscle flesh is removed from the fish (see illustration), packaged and frozen for shipment to the Ministry of the Environment laboratory in Toronto.



Retesting of locations

Since the mid-1970s the Sport Fish Contaminant Monitoring Program has continued to add new locations each year, as well as retesting many lakes and rivers

when necessary. In areas remote from human activity, where fish are relatively unaffected by pollution, any consumption restrictions are usually limited to elevated mercury levels in the larger and older predatory species such as walleye and northern pike. The source of mercury in these areas can be natural or from long-range transport. Consequently, concentrations in fish do not change substantially over time.

However, in areas directly affected by human sources of pollution, the number of possible contaminants may be much larger and the levels found in fish can be significantly affected by changes in the levels of pollution.

Retesting locations are divided into three general groups:

- Areas where contaminant levels for one or more pollutants are either unusually elevated or change substantially. These locations are retested every one to three years, depending on their angling popularity or whether they are a major food source for local inhabitants.
- Areas that show no signs of substantial changes in contaminant levels but are very popular angling areas. These locations are retested at least every five years.
- All other areas – usually relatively remote locations with no major sources of pollution nearby and no indication of changing contaminant levels in fish. These locations are retested approximately every 10 years.

Testing of fish

A boneless, skinless dorsal fillet sample not only provides the most consistent test results, but is also the most edible portion of the majority of sport fish.

The fish tissue is analyzed for contaminants at the Ministry of the Environment laboratory using a variety of methods depending on the contaminant.

Preserving and preparing your fish for cooking

If you decide to keep and eat your catch, you should keep it in the best possible condition until it reaches the table. Freshly caught fish should be chilled on ice or in a refrigerator as soon as possible to avoid spoilage. Then, at the earliest opportunity, the fish should be cleaned, dressed and refrigerated or preserved for future use.

The following is one of the procedures commonly used for gutting, filleting and skinning fish:

1. Slit open the belly from the vent (anal opening) and remove the internal organs.
2. Trim away the head and fins.
3. Lay the fish on its side on a cutting board. With a thin sharp knife, cut through the skin and flesh just behind the head down to the backbone. Turn the knife blade along the backbone and, with a sawing motion of the blade, follow the backbone down to the tail, keeping as close to the backbone as possible.
4. Repeat for the fillet on the other side of the fish.
5. Laying each fillet skin-side down on the board, remove the rib bones by inserting the knife blade just under the ribs and separate them from the fillet with as little flesh left on as possible. Trim away the pelvic fin and any belly fat from the ventral portion of the fillet.
6. Lay the fillets skin-side down and, starting at the tail with the knife blade parallel to the skin and as close to it as possible, slice forward with a sawing motion to separate the skin from the fillet. You are then left with skinless, boneless fillets. Wash in clean cold water and cook, refrigerate, freeze or preserve as desired.

Note: if the fish you are cleaning are fatty fish caught in the Great Lakes, please follow the advice in the section “Clean and cook fish to reduce contaminants” on page 10.

The Ministry of Natural Resources has specific requirements for transport or storage of fish to ensure that a Conservation Officer can determine the number, size and species of fish in your possession. This includes leaving a piece of skin on the fillet. Refer to the *Recreational Fishing Regulations Summary* for details.

How to release fish

A number of anglers fish for the thrill of the catch, and release their fish to allow them to be caught again. If you decide not to keep a particular fish, here are some tips to apply to safely return the fish to the water:

1. Time is essential, so quickly play and release the fish. A fish played for too long will be too exhausted to recover. A fish hooked in deep water should be brought up slowly to prevent stress due to pressure and temperature changes.
2. Keep the fish in the water as much as possible, since fish out of water will suffocate. Do not allow the fish to flop on the ground or on the rocks. Just a few centimetres of water under a thrashing fish will act as a protective cushion.
3. Gentle handling of the fish is essential and hands should be kept wet at all times while handling any fish. Do not put your fingers in the gills or in the eye sockets. Small fish should not be squeezed but should only be lifted by the lower lip. A net is helpful while handling fish, but keep it in the water.
4. Remove hooks quickly using needle-nosed pliers. If the fish is deeply hooked, cut the line and leave the hook in, as it will dissolve and will not harm the fish. Do not try to tear out hooks.
5. To revive an unconscious fish, hold it upright in the water. If there is a current, hold it heading upstream. Apply artificial respiration by moving the fish forward and backward so that water runs through the gills. It may take a few minutes for the fish to revive. When the fish does begin to struggle, release it.

Contaminants in fish

There are many naturally occurring substances, which at levels normally found in air, water and food, pose no hazard to the environment or to human health. A number of naturally occurring substances such as mercury, and synthetic compounds, such as PCBs, mirex and dioxins, may also be found in the environment at levels that are hazardous.

The following section describes some of the broad range of substances which may be tested in Ontario sport fish and the levels which result in consumption restrictions. Consumption guidelines developed for use by Ontario anglers are based on tolerable daily intake guidelines provided by Health Canada. For more information on these substances and their health implications, please contact the office of the Sport Fish Contaminant Monitoring Program at the number listed in the preface.

Inorganic substances

Mercury

Mercury is a naturally occurring metal which is found in very low levels in air, water, rocks, soil, and plant and animal matter.

At one time mercury was widely used in industry; however, government and industry took action to reduce its use in the late 1960s and early 1970s and direct discharges of mercury from major industrial sources have been virtually eliminated. Residual contamination from these point sources is still evident in fish in a few locations in Ontario. Significant quantities of mercury still enter the aquatic environment from the atmosphere from both man-made and natural sources.

Mercury is attracted to particles in the water and settles to the bottom sediments where it can be converted by microorganisms into methylmercury. Methylmercury is rapidly absorbed by a fish either directly from water passing over its gills or ingested with its diet. Since fish eliminate mercury at a very slow rate, concentrations of this substance gradually accumulate.

Health Canada recently reduced the tolerable daily intake for mercury for women of child-bearing age and children, but not for the general population. The new tolerable daily intake is temporary, pending the completion of a long-term study of people in the Seychelle Islands who eat large quantities of fish.

As a result, for women of child-bearing age and children under 15, consumption restrictions for sport fish containing mercury begin at levels of 0.26 parts per million with total restriction advised for levels above 0.52 parts per million. For the general population, consumption restrictions begin at levels above 0.61 parts per million with total restriction advised for levels above 1.84 parts per million.

Other metals

Lead, copper, nickel, zinc, cadmium, manganese, chromium, arsenic and selenium are found in fish tissue but not at levels that would suggest a need for consumption restrictions.

Industrial chemicals

Polychlorinated biphenyls (PCBs)

PCBs are a group of chlorinated organic compounds first commercially developed in the late 1920s. They are not formed naturally in the environment, so their presence is always attributed to human activity.

PCBs persist for years in the natural environment and bioaccumulate readily in the aquatic ecosystem. As a result, top predator species of fish with a high fat content such as salmon and trout (but not walleye and pike which have a low fat content) have accumulated PCBs in some Ontario waters to levels which restrict consumption. PCBs have been banned in all new products and are now only found as an insulating fluid in existing closed electrical power transformers and capacitors. Strict regulations for the storage and disposal of PCBs and PCB-contaminated equipment minimize the chance of further releases of PCBs into the environment and have resulted in declining levels of PCBs in the aquatic environment.

Health Canada has two guidelines for PCBs, one based on the total of all PCBs present in a sample and the other based on a select few PCBs with toxicological properties similar to dioxins. The dioxin-like PCBs are found at extremely low levels and for consumption advisory purposes are included with the dioxins. Refer to the following section "Dioxins, furans and dioxin-like PCBs" for more information. Consumption restrictions for total PCBs in sport fish begin at levels of 0.153 parts per million with total restriction advised for levels above 1.22 parts per million.

Dioxins, furans and dioxin-like PCBs

Dioxins and furans are unintentional byproducts of several industrial processes and in some cases, incomplete combustion. There are 210 different dioxins and furans but only 17 are toxic enough to be of concern. Studies have shown that there are also 12 forms of PCBs, usually referred to as dioxin-like PCBs which have toxicological properties similar to toxic forms of dioxins. The Ministry of the Environment monitors the 17 toxic forms of dioxins and furans and 12 dioxin-like PCBs in sport fish. The concentration of each of the 29 forms is multiplied by an equivalency factor to convert it to a number referred to as a toxic equivalent which represents its toxicity relative to the most toxic form of dioxins – 2,3,7,8-TCDD. The sum of the 29 toxic equivalents is the total toxic equivalent and is compared to the dioxin guideline

Recent studies have found that the amount of dioxin-like PCBs in fish can be estimated from a much less expensive analysis of total PCBs. Starting with the 2007-2008 *Guide*, at locations where dioxin-like PCBs have not been analyzed, toxic equivalents from dioxin-like PCBs have been estimated from total PCBs and added to dioxin and furan toxic equivalents to give the total toxic equivalent.

Consumption restrictions for sport fish begin at levels of 2.7 parts per trillion, with total restriction advised for levels above 21.6 parts per trillion for toxicity equivalents of 2,3,7,8-TCDD.

Mirex/photomirex

Mirex is a chlorinated carbon compound that was used as a pesticide in the southern United States but never registered for such use in Canada.

Mirex has been detected in fish primarily from Lake Ontario. The sources were found to be a former processor of mirex in Niagara Falls, New York and a manufacturing plant in Oswego, New York. This problem is being addressed through the binational Niagara River Toxics Management Plan. Some mirex is modified and transformed in the environment into a similar compound called photomirex. The behaviour of mirex and photomirex in the aquatic environment is similar to that of PCBs in that they remain in the environment for a long period of time and have a high affinity for fats.

Separate consumption guidelines have been developed by Health Canada for mirex and photomirex. Consumption restrictions for mirex in sport fish begin at 0.082 parts per million with total restriction advised for levels above 0.657 parts per million. Photomirex consumption restrictions begin at 0.015 parts per million with total restriction advised for levels above 0.122 parts per million.

Pesticides

DDT

DDT, which was developed during World War II, gained widespread use as an insecticide for agricultural and public health purposes. DDT, like PCBs and mirex, is only slowly broken down in the natural environment.

However, levels of this substance in fish flesh have declined in the three decades since the use of DDT was severely restricted and today there are no cases where DDT is a consumption-limiting contaminant.

Toxaphene

Toxaphene is an insecticide that is extremely persistent in the aquatic environment. It was removed from general use in Canada in 1974 and restricted in the United States in 1982. Consumption restrictions for sport fish containing toxaphene begin at levels above 0.235 parts per million, with total restriction advised at levels above 1.877 parts per million.

Toxaphene is found at levels which could restrict the consumption of sport fish from Lake Superior and some parts of northern Lake Huron. Currently, other contaminants such as dioxins result in more restrictive consumption advice.

Other pesticides

As part of the Sport Fish Contaminant Monitoring Program, a number of pesticides and other chlorinated organic compounds used widely in the past throughout North America are routinely analyzed. These substances are lindane, heptachlor, aldrin, and chlordane. In Ontario they have not been detected at levels which would require any restrictions on the consumption of fish.

Other contaminants

The Sport Fish Contaminant Monitoring Program tests for all known substances for which there is a reasonable probability that levels of the substance are of concern to the health of consumers. The chlorinated organic compounds hexachlorobenzene and octachlorostyrene have been tested in sport fish since the early 1980s. Other substances added to the list in recent years include chlorinated phenols, chlorinated benzenes and polycyclic aromatic hydrocarbons (PAHs). Based on the results, these substances are only found occasionally in fish and at such low levels that they would not affect consumption.

Recently, the Ministry of the Environment laboratory has developed the methods to analyse the levels of brominated flame retardants, fluorinated surfactants and polychlorinated naphthalenes in fish.

Causes of fish consumption advisories

Although fish from many locations listed in the *Guide* have been tested for a wide variety of contaminants, most of the consumption restrictions are caused by mercury, dioxins, furans and PCBs. Other contaminants, such as mirex, photomirex, toxaphene, and chlordane remain elevated but with recent changes to Health Canada guidelines are no longer consumption-limiting contaminants.

The pie charts following illustrate the percentage of the consumption restrictions caused by each of the contaminants in the four Ontario Great Lakes and their connecting channels and inland locations. These statistics are for the general population. The sensitive population has a higher percentage of restrictions caused by mercury.

In the 2005 *Guide*, a large proportion of the restrictions on Great Lakes' fish, ranging from 25 to 79 per cent, were caused by PCBs. In the charts shown below, PCBs do not appear because the dioxin-like component of PCBs have been combined into a single category called dioxins, furans and dioxin-like PCBs.

Lake Superior

Consumption restrictions on lake trout, whitefish and Chinook salmon are caused by dioxins, furans and dioxin-like PCBs. Restrictions on northern pike and walleye are caused by mercury. Toxaphene would cause restrictions for some fish if the levels of other contaminants declined. In total 37.9 per cent of the advice given for sport fish from Lake Superior results in some level of restriction.

Mercury: 9%



Dioxin, furan & dlPCBs: 91%

Lake Huron (including Georgian Bay, North Channel and St. Marys River)

Consumption restrictions on trout, salmon, carp and channel catfish are caused by dioxins, furans and dioxin-like PCBs. Restrictions on other species are caused by mercury. Toxaphene levels are elevated in some species from northern Lake Huron and the North Channel and would cause restrictions if the levels of other contaminants declined. In total 44.0 per cent of the advice given for sport fish from Lake Huron results in some level of restriction.

Mercury: 6%

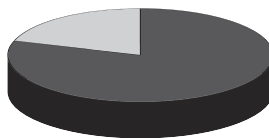


Dioxin, furan & dlPCBs: 94%

Lake St. Clair and St. Clair and Detroit rivers

In total, 40.2 per cent of the advice given for sport fish from these locations results in some level of consumption restriction.

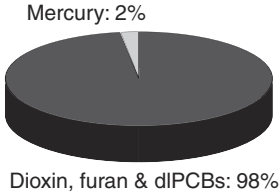
Mercury: 21%



Dioxin, furan & dlPCBs: 79%

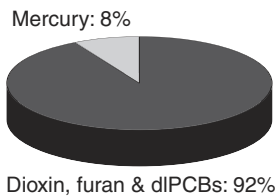
Lake Erie

In total, 62.4 per cent of the advice given for sport fish from these locations results in some level of restriction. The majority of restrictions are caused by dioxins, furans and dioxin-like PCBs.



Lake Ontario (including Niagara and St. Lawrence rivers)

In the various species of trout and salmon found in Lake Ontario, dioxins, furans, dioxin-like PCBs, mirex, photomirex, toxaphene and chlordane can be elevated in the same fish. However, dioxins, furans and dioxin-like PCBs are the consumption-limiting contaminants. Consumption of species such as walleye, pike, bass and perch is usually restricted because of mercury. In total, 60.7 per cent of the advice given for sport fish from Lake Ontario results in some level of consumption restriction.



Inland locations

Very few inland locations have been exposed to discharges of pesticides and other organic compounds which cause the majority of consumption restrictions on Great Lakes fish. Consequently, 85.3 per cent of all consumption restrictions on sport fish from inland locations are as a result of mercury. In total, 33.0 per cent of the advice given for sport fish from inland locations results in some level of consumption restriction.

Dioxin, furan & dlPCBs: 15%



Mercury: 85%

The history of sport fish contaminant monitoring in Ontario

The deaths of 90 people in Minamata, Japan between 1954 and 1965 from the consumption of fish contaminated with methylmercury, and reproductive failure and deformities in fish-eating wildlife from the combined effects of mercury, PCBs, DDT and other pesticides in North America and elsewhere, awakened us to the potential threat of contaminants in the fish we eat.

In the 1960s in Ontario, several industries were discharging large quantities of mercury into the environment. Forty years of the manufacture, widespread use and inappropriate disposal of PCBs and the widespread application of persistent pesticides such as DDT, aldrin and dieldrin was taking a toll on fish and wildlife, especially in and around the Great Lakes.

Studies undertaken in the 1960s in two areas – Lake St. Clair in southern Ontario and the English-Wabigoon River system in northwestern Ontario – found disturbingly high levels of mercury in fish. Commercial fisheries in these areas were immediately closed. Since that time, direct discharges of mercury from major industrial sources have been virtually eliminated. Other studies in the 1960s and early 1970s found high levels of contaminants such as PCBs and DDT in fish. Action was immediately taken to ban or severely restrict the use of contaminants such as DDT, PCBs, toxaphene, aldrin and mirex. Investigations continue to this day to track down and eliminate the residual sources of some of these chemicals.

Despite ongoing activities to eliminate residual sources of these chemicals, it was apparent that immediate action had to be taken to protect human health. The public needed to be informed of the health risks of consuming sport fish.

In 1976, the Sport Fish Contaminant Monitoring Program was formed. In 1977, the first edition of the *Guide* was published and consisted of a brochure listing the 170 locations where data had been collected. Consumption advisories for individual water bodies were mailed out on request. By 1979, the database had grown considerably and the annual *Guide* consisted of data from over 600 locations. It was distributed widely through government offices and beer and liquor stores.

Starting in 1993, the *Guide* was published every other year and between then and 2005, to meet growing demand, production increased from 200,000 to 350,000 copies. With increasing availability of the data in electronic format, production has been reduced to 50,000 copies. In this, the 24th edition of the *Guide*, consumption advisories are available for over 1700 locations and the contaminant database consists of nearly 1.6 million records.

As the program has grown, so has the list of contaminants monitored in fish. The list now includes contaminants such as dioxins, furans, polycyclic aromatic hydrocarbons as well as more recent contaminants of concern such as brominated flame retardants. This latter group has been increasing in the aquatic environment but has not reached critical levels in fish. However, monitoring such contaminants in fish and in other parts of the environment has resulted in measures being taken to control their manufacture and use in North America and Europe. Despite the fact that fish are being tested for more and more contaminants, consumption advisories continue to be caused by the same chemicals – mercury, PCBs, toxaphene, mirex/photomirex and dioxins. Many of the new chemicals on the market, especially pesticides, tend to break down rapidly in the environment and do not bioaccumulate.

Over time, methods used to calculate consumption advisories have changed. Originally, advisories for most contaminants were based on limits imposed on commercial fish. For example, when the *Guide* was first published, the PCB limit on fish for sale was 2 parts per million. This limit was also applied to sport fish. Eventually, the health protection guidelines developed by Health Canada were adopted. These guidelines are usually referred to as “tolerable daily intakes” which are the amounts of contaminants that can be safely consumed on a daily basis for a lifetime, with reasonable assurance that an individual’s health will not be threatened. These methods are described in some detail in the section “The basis for fish consumption advisories.”

Over the years most health protection guidelines have been revised, usually downwards, making consumption advice more restrictive. Revisions result from toxicological investigations becoming far more sophisticated in identifying both subtle and low probability effects. As well, analytical equipment and technology has improved so smaller amounts can be detected and quantified. Many people have expressed concern that what was acceptable for consumption last year is unacceptable this year. However, safety margins built into the fish consumption guidelines should alleviate this concern. In the 2007–2008 *Guide* there was a change in the opposite direction. The toxicity equivalency factors for dioxins, which includes dioxins, furans and dioxin-like PCBs (see section on dioxins) were changed after an expert panel of the World Health Organization evaluated new and existing toxicity data. The toxicity was found to be less than originally estimated for some of these compounds and greater for others. The result being that the overall dioxin toxicity in fish is about 20 per cent less than previously estimated.

We expect that the *Guide* will continue to change in the future to incorporate new health protection guidelines and new methods of evaluation so that we can continue to provide the best available advice to the public.

Addresses

Ministry of the Environment

Public Information Centre

135 St. Clair Ave. W., 1st Floor
Toronto, ON M4V 1P5
Tel.: Toronto: 416/325-4000
: toll-free: 1-800-565-4923

Spills Action Centre

Tel.: Toronto: 416/325-3000
: toll-free: 1-800-268-6060

Regional, District and Area Offices

Central Region

Central Region Office,
Metro Toronto District Office
5775 Yonge St., 8th floor
North York, ON M2M 4J1
Tel.: 416/326-6700
: 1-800-810-8048

Halton-Peel District Office
4145 North Service Rd., Suite 300
Burlington, ON L7L 6A3
Tel.: 905/319-3847
: 1-800-335-5906
(from area code 905 or 509)

York-Durham District Office
230 Westney Rd. S., 5th floor
Ajax, ON L1S 7J5
Tel.: 905/427-5600
: 1-800-376-4547

Southwestern Region

Southwest Regional Office
733 Exeter Rd.
London, ON N6E 1L3
Tel.: 519/873-5000
: 1-800-265-7672
(from area code 519)

Barrie District Office
54 Cedar Pointe Dr.
Unit 1203
Barrie, ON L4N 5R7
Tel.: 705/739-6441
: 1-800-890-8511

Owen Sound Area Office
1580-20th St. E., P.O. Box 967
Owen Sound, ON N4K 6H6
Tel.: 519/371-2901
: 1-800-265-3783
(from area code 519)

Sarnia District Office
1094 London Rd.
Sarnia, ON N7S 1P1
Tel.: 519/336-4030
: 1-800-387-7784

Windsor Area Office
4510 Rhodes Dr., Unit 620
Windsor, ON N8W 5K5
Tel.: 519/948-1464
: 1-800-387-8826

West Central Region

Hamilton Regional Office
119 King St. W., 12th floor
Hamilton, ON L8P 4Y7
Tel.: 905/521-7640
: 1-800-668-4557

Guelph District Office
1 Stone Road W., 4th Floor
Guelph, ON N1G 4Y2
Tel.: 519/826-4255
: 1-800-265-8658

Hamilton District Office
119 King St. W., 9th floor
Hamilton, ON L8P 4Y7
Tel.: 905/521-7650
: 1-800-668-4557

Niagara District Office
301 St. Paul St., 9th floor
St. Catharines, ON L2R 3M8
Tel.: 905/704-3900
: 1-800-263-1035

Eastern Region

Kingston Regional Office
1259 Gardiners Road, Unit 3
Kingston, ON K7P 3J6
Tel.: 613/549-4000
: 1-800-267-0974
(from area codes 613/705/905)

Belleville Area Office
345 College Street East
Belleville, ON K8N 5S7
Tel.: 613/962-9208
: 1-800-860-2763
(from area code 613)

Cornwall Area Office
113 Amelia St., 1st Floor
Cornwall, ON K6H 3P1
Tel.: 613/933-7402
: 1-800-860-2760
(from area code 613)

Kingston District Office
1259 Gardiners Road
Kingston, ON K7P 3J6
Tel.: 613/549-4000 ext. 2692
: 1-800-267-0974
(from area codes 613/705/905)

Ottawa District Office
2430 Don Reid Drive
Ottawa, ON K1H 1E1
Tel.: 613/521-3450
: 1-800-860-2195

Peterborough District Office
300 Water St., Robinson Place
2nd Floor, South Tower
Peterborough, ON K9J 8M5
Tel.: 705/755-4300
: 1-800-558-0595
(from area codes 613/705/905)

Northern Region

Thunder Bay Regional Office
435 James St. S., Suite 331
Thunder Bay, ON P7E 6S7
Tel.: 807/475-1205
: 1-800-875-7772
(from area codes 705/807)

Kenora Area Office
808 Robertson St.
P.O. Box 5150
Kenora, ON P9N 3X9
Tel.: 807/468-2718
: 1-888-367-7622
(from area code 807)

North Bay Area Office
191 Booth Road, Unit 16 & 17
North Bay, ON P1A 4K3
Tel.: 705/497-6865
: 1-800-609-5553
(from area code 705)

Sault Ste. Marie Area Office
289 Bay Street, 3rd Floor
Sault Ste. Marie, ON P6A 1W7
Tel.: 705/942-6354
: 1-800-965-9990
(from area codes 705/807)

Sudbury District Office
199 Larch St., 12th Floor, Suite 1201
Sudbury, ON P3E 5P9
Tel.: 705/564-3237
: 1-800-890-8516
(from area codes 705/807)

Thunder Bay District Office
435 James St. S., Suite 331
Thunder Bay, ON P7E 6S7
Tel.: 807/475-1315
: 1-800-875-7772
(from area codes 705/807)

Timmins District Office
Ontario Govt. Complex
Hwy. 101 E., P.O. Bag 3080
South Porcupine, ON P0N 1H0
Tel.: 705/235-1500
: 1-800-380-6615
(from area codes 705/807)

Addresses

Ministry of Natural Resources

Natural Resources Information Centres

Toronto:

Toll-free (English):
1-800-667-1940

Toll-free (French):
1-800-667-1840

Peterborough:

General Inquiry:
705/755-2000

Regional and area offices

Northwest Region

Regional Office –
Thunder Bay
435 S. James St., Suite 221A
Thunder Bay, ON P7E 6S8
Tel.: 807/475-1261

Atikokan Office
108 Saturn Ave.
Atikokan, ON P0T 1C0
Tel.: 807/597-6971

Dryden Office
479 Government Rd.
(Hwy.17)

Box 730
Dryden, ON P8N 2Z4
Tel.: 807/223-3341

Fort Frances Office
922 Scott St.
Fort Frances, ON P9A 1J4
Tel.: 807/274-5337

Geraldton Office
208 Beamish Ave. W.
Box 640
Geraldton, ON P0T 1M0
Tel.: 807/854-1030

Ignace Office
Box 448
Ignace, ON P0T 1T0
Tel.: 807/934-2233

Kenora Office
808 Robertson St.
Box 5080
Kenora, ON P9N 3X9
Tel.: 807/468-2501

Nipigon Office
5 Wadsworth, Box 970
Nipigon, ON P0T 2J0
Tel.: 807/887-5000

Red Lake Office
227 Howey St., Box 5003
Red Lake, ON P0V 2M0
Tel.: 807/727-2253

Sioux Lookout Office
49 Prince St., Box 309
Sioux Lookout, ON P8T 1A6
Tel.: 807/737-1140

Terrace Bay Office
Box 280
Terrace Bay, ON P0T 2W0
Tel.: 807/825-3205

Thunder Bay Office
435 S. James St.
Suite B001
Thunder Bay, ON P7E 6S8
Tel.: 807/475-1471

Southern Region

Regional Office –
Peterborough
300 Water St., 4th floor,
South Tower
P.O. Box 7000
Peterborough, ON K9J 8M5
Tel.: 905/755-2000

Algonquin Park Office
Box 219
Whitney, ON K0J 2M0
Tel.: 613/637-2780

Aurora, Greater Toronto
Area
50 Bloomington Rd. W., R.R. 2
Aurora, ON L4G 3G8
Tel.: 905/713-7400

Aylmer Office,
615 John Street North
Aylmer, ON N5H 2S8
Tel.: 519/773-9241

Bancroft Office
Box 500, 106 Monck St.
Bancroft, ON K0L 1C0
Tel.: 613/332-3940

Bracebridge Office
R.R. 2, Hwy 11 North @ High
Falls Road
Bracebridge, ON P1L 1W9
Tel.: 705/645-8747

Chatham Office
870 Richmond St., Box 1168
Chatham, ON N7M 5L8
Tel.: 519/354-7340

Clinton Office,
100 Don St., Box 819
Clinton, ON N0M 1L0
Tel.: 519/482-3428

Guelph Office
1 Stone Rd. West
Guelph, ON N1G 4Y2
Tel.: 519/826-4955

Kemptville Office
Postal Bag 2002
10 Campus Drive
Kemptville, ON K0G 1J0
Tel.: 613/258-8204

Kingston Office
Ontario Government
Building
Beachgrove Complex
51 Heakes Lane
Kingston, ON K7M 9B1
Tel.: 613/531-5700

Midhurst (Huronía) Office
2284 Nursery Rd.
Midhurst, ON L0L 1X0
Tel.: 705/725-7500

Minden Office
Hwy. 35 Bypass, Box 820
Minden, ON K0M 2K0
Tel.: 705/286-1521

Niagara Office
P. O. Box 5000
4890 Victoria Ave. N.
Vineland Station, ON
L0R 2E0
Tel.: 905/562-4147

Owen Sound Office
1450 7th Ave. E.
Owen Sound, ON N4K 2Z1
Tel.: 519/376-3860

Parry Sound Office
7 Bay St.
Parry Sound, ON P2A 1S4
Tel.: 705/746-4201

Pembroke Office
31 Riverside Dr., Box 220
Pembroke, ON K8A 8R6
Tel.: 613/732-3661

Peterborough Office
300 Water St., P. O. Box 7000
Peterborough, ON K9J 8M5
Tel.: 705/755-2001

Tweed Office
Postal Bag 70, Old Troy Rd.
Tweed, ON K0K 3J0
Tel.: 613/478-2330

Northeast Region

Regional Office –
South Porcupine
Ontario Government
Complex
Hwy. 101 E., P.O. Bag 3020
South Porcupine, ON
P0N 1H0
Tel.: 705/235-1157

Blind River Office
62 Queen Ave.
Blind River, ON P0R 1B0
Tel.: 705/356-2234

Chapleau Office
190 Cherry St.
Chapleau, ON P0M 1K0
Tel.: 705/864-1710

Cochrane Office
2 Third Ave., Box 730
Cochrane, ON P0L 1C0
Tel.: 705/272-4365

Espanola Office
148 Fleming St.
Espanola, ON P5E 1R8
Tel.: 705/869-1330

Gogama Office
2000 Low Avenue, Box 129
Gogama, ON P0M 1W0
Tel.: 705/894-2000

Hearst Office
613 Front St., Box 670
Hearst, ON P0L 1N0
Tel.: 705/362-4346

Kapuskasing Office
122 Government Road West
Kapuskasing, ON P5N 2X8
Tel.: 705/335-6191

Kirkland Lake Office
10 Government Rd. E.
Box 910
Kirkland Lake, ON
P2N 3K4
Tel.: 705/568-3222

Manitouwadge Office
Box 309
Manitouwadge, ON
P0T 2C0
Tel.: 807/826-3225

Moosonee Office
Revillion Rd., Box 190
Moosonee, ON P0L 1Y0
Tel.: 705/336-2987

North Bay Office
3301 Trout Lake Rd.
North Bay, ON P1A 4L7
Tel.: 705/475-5550

Sault Ste. Marie Office
64 Church St.
Sault Ste. Marie, ON
P6A 3H3
Tel.: 705/949-1231

Sudbury Office
3767 Hwy. 69 S., Suite 5
Sudbury, ON P3G 1E7
Tel.: 705/564-7823

Timmins Office
Ontario Government
Complex
Hwy. 101 East
P.O. Bag 3090
South Porcupine, ON
P0N 1H0
Tel.: 705/235-1300

Wawa Office
160 Mission Rd., Box 1160
Wawa, ON P0S 1K0
Tel.: 705/856-2396

Health Canada

Tel.: 613/957-2991
Internet: www.hc-sc.gc.ca

Canadian Food Inspection Agency

Tel.: 705/795-9666
www.inspection.gc.ca

The Ontario Federation of Anglers and Hunters

P.O. Box 2800
Peterborough, ON K9J 8L5
Tel.: 705/748-6324
www.ofah.org