

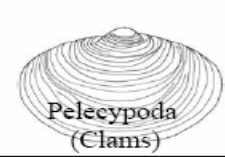
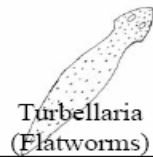
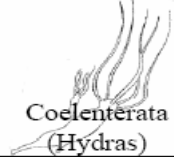
## **Appendix 3: Benthic Macroinvertebrate Index**

Water Body Name: \_\_\_\_\_ Site #: \_\_\_\_\_ Replicate #: \_\_\_\_\_ Date (mm/dd/yyyy) and Time: \_\_\_\_\_

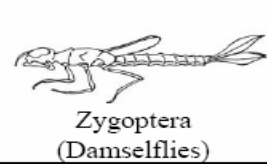
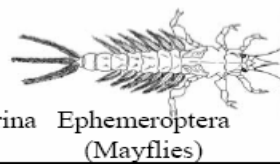
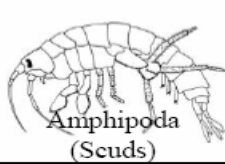
Organization: \_\_\_\_\_ Department \_\_\_\_\_ Address: \_\_\_\_\_

Contact: \_\_\_\_\_ Phone: \_\_\_\_\_ E-mail: \_\_\_\_\_ % picked for 100-count \_\_\_\_\_ # of vials: \_\_\_\_\_

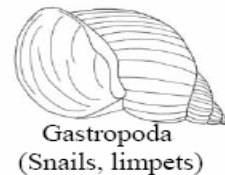
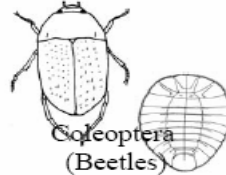
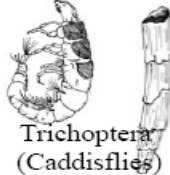
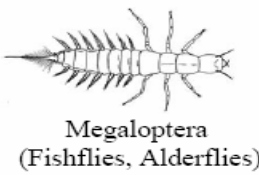
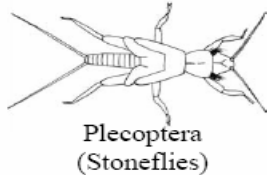
Circle Method: (Sub-sampling) Marchant Box / Teaspoon (Location) Field / Lab (Preservation) Live / Preserved Magnification) Microscope / Unaided



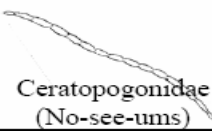
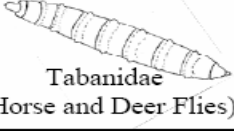
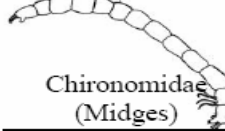
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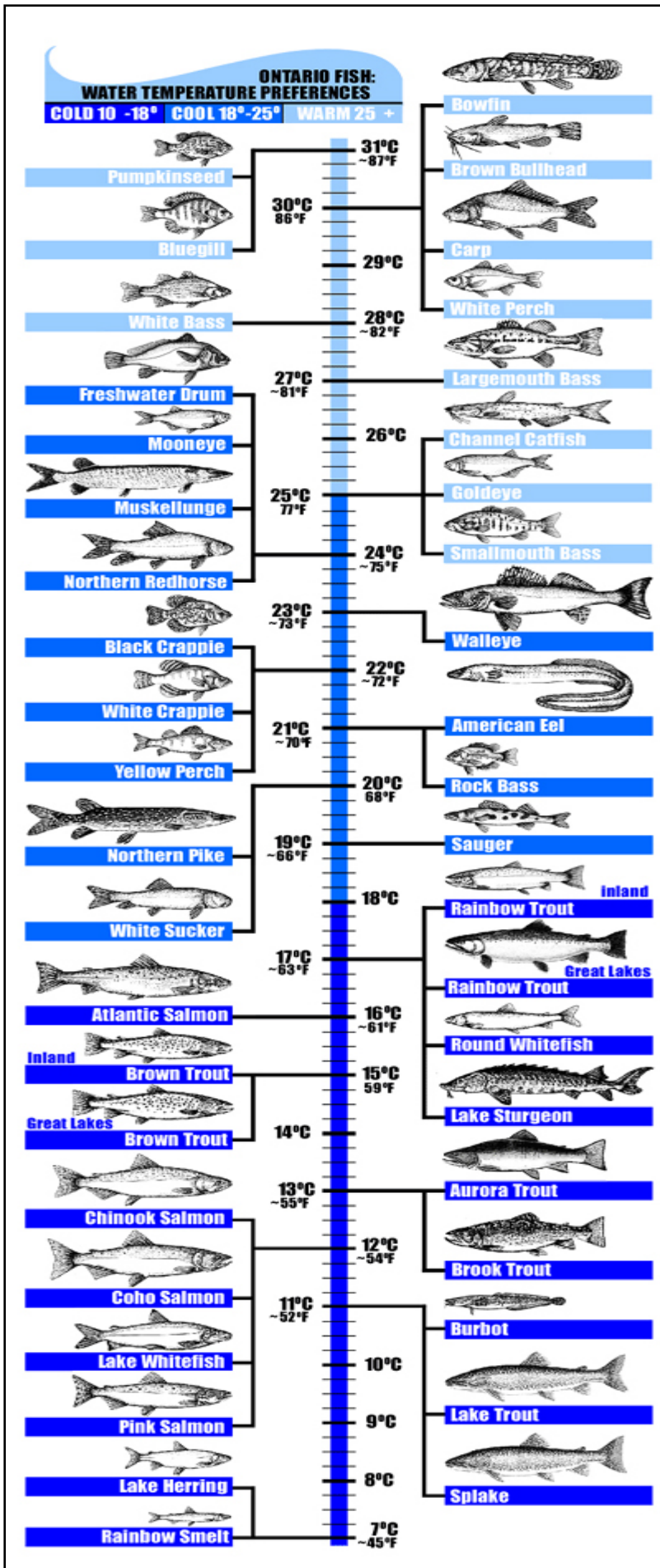


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## **Appendix B: Common Fish of Ontario Identification**



## Fish Identification

Here are the types of fish that anglers are likely to catch in Ontario's lakes and streams. Information is provided on the following:

- L:** length.
- D:** distribution/habitat.
- S:** similar fish.
- K:** key identifying characteristics that separate them from those similar fish.

The Ontario record for many of these species can be found on pg. 50.

The fish illustrations were drawn by Rebecca Brebner, with the exception of the muskellunge and the sturgeon, which were drawn by Andreas Radman of the Ontario Ministry of Environment, the bluegill which was drawn by Curtis Atwater, the Great Lakes phase of the rainbow and brown trout which were drawn by Virgil Beck and provided by the Wisconsin Department of Natural Resources. These illustrations were redrawn based on original fish illustrations from two publications: Bulletin 184, Fisheries Research Board of Canada - "Freshwater Fishes of Canada" by Scott and Crossman, and "Fish of Ontario" (poster) distributed by the Ministry of Natural Resources.

### Walleye

**L:** 25 - 85 cm (10 - 33 in.).

**D:** lakes and rivers throughout most of Ontario.

**S:** sauger, yellow perch.

**K:** white tip on lower tail fin; no distinct blotches or bands on adults.



**Favorite Baits:** spinners, jigs, crank baits, worms, minnows, leeches

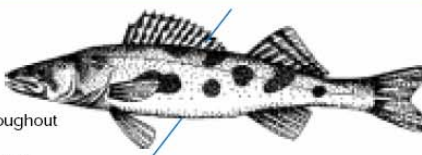
### Sauger

**L:** 25 - 41 cm (10 - 16 in.).

**D:** large, shallow, turbid waters throughout Ontario.

**S:** walleye, yellow perch.

**K:** lacks white tip on lower tail fin; distinct blotches or bands on adults; spots on dorsal fin.



**Favorite Baits:** same as walleye

### Yellow Perch

**L:** 15 - 30 cm (6 - 12 in.).

**D:** clear waters with some vegetation throughout Ontario; often school.

**S:** walleye, sauger, white perch.

**K:** 6 to 8 dark, vertical bands on sides, alternating with light yellow to yellow-green.



**Favorite Baits:** small jigs, small spoons, small minnows, worms

### Pumpkinseed

**L:** 18 - 23 cm (7 - 9 in.).

**D:** clear, shallow, weedy waters north to Temagami.

**S:** rock bass, bluegill.

**K:** 3 anal fin spines; wavy, blue-green stripes on sides of head; ear flap with orange or red spot.



**Favorite Baits:** small jigs, worms

### Bluegill

**L:** 15 - 30 cm (6 - 12 in.).

**D:** warm, vegetated, still waters throughout southern Ontario.

**S:** rock bass, pumpkinseed.

**K:** 3 anal fin spines; black spot at rear end of dorsal fin; ear flap black.



**Favorite Baits:** small jigs, worms, flies

### Northern Pike

**L:** 45 - 100 cm (18 - 39 in.).

**D:** quiet, vegetated waters throughout Ontario.

**S:** muskellunge.

**K:** light yellowish spots on dark green background; tips of tail fin more rounded than muskellunge; see also head close-up below.



**Favorite Baits:** spoons, large spinners, large crank baits, minnows



#### Northern Pike

Cheek fully scaled, upperhalf of opercle only scaled, 10 pores on undersides of lower jaw.



#### Muskellunge

Cheek and opercle both scaled only on upper half, 12-18 pores on undersides of lower jaw.

### Muskellunge

**L:** 71 - 137 cm (28 - 54 in.).

**D:** discontinuous in southern and near northeastern Ontario, and the Lake of the Woods/Rainy River area.

**S:** northern pike.

**K:** dark vertical bands on light background, at times spotted or clear; tips of tail fin more pointed than northern pike; see also head close-up above.



**Favorite Baits:** large bucktail spinners, large body baits, sucker minnows

### Smallmouth Bass

**L:** 25 - 50 cm (10 - 20 in.).

**D:** clear, rocky waters with little vegetation from southern Ontario to Timiskaming and northwestern Ontario.

**S:** largemouth bass.

**K:** upper jaw does not extend beyond eye; shallow notch between dorsal fins; body often with dark, broken bars.



**Favorite Baits:** jigs, spinners, crank baits, minnows, crayfish

### Largemouth Bass

**L:** 25 - 55 cm (10 - 22 in.).

**D:** warm, weedy, slow or still waters primarily in southern Ontario.

**S:** smallmouth bass, rock bass.

**K:** upper jaw extends beyond eye; deep notch between dorsal fins; body often with a broken horizontal stripe.



**Favorite Baits:** spinnerbaits, crank baits, plastic worms, minnows, frogs

### Rock Bass

**L:** 15 - 20 cm (6 - 8 in.).

**D:** warm, slow or still shallows with rocky bottoms, northward to Lake Abitibi.

**S:** pumpkinseed, bluegill.

**K:** large, red eye; six anal fin spines; regular rows of spots on the side in adults.



### White Sucker

**L:** 30 - 50 cm (12 - 20 in.).

**D:** warm, shallow lakes and tributary rivers across Ontario.

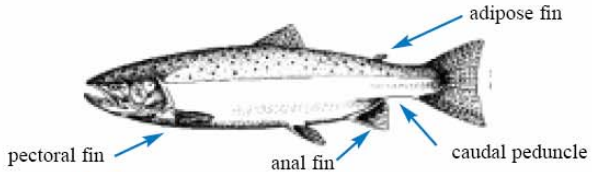
**S:** other suckers (e.g. redbhorse).

**K:** torpedo-shaped; round in cross-section; scales smaller than redbhorse sucker.



## Salmon and Trout Identification

The following features are useful in identifying salmon and trout:



### Chinook Salmon

**L:** 30 - 100 cm (12 - 39 in.).

**D:** found in all Great Lakes and some tributaries.

**S:** coho, Atlantic and pink salmon, rainbow trout (steelhead), brown trout.

**K:** black mouth and black gums; tail entirely spotted; leading ray on anal fin extends 1/3 the length of the fin; short, narrow caudal peduncle.



**Favorite Baits:** spoons, wobbling plugs, dodger and flies

### Rainbow Trout/Great Lakes (Steelhead)

**L:** 35 - 60 cm (14 - 24 in.).

**D:** found in all Great Lakes and many tributaries.

**S:** chinook, coho, pink and Atlantic salmon; brown trout.

**K:** white mouth and gums; body silver with dark spots; spots all over tail in radiating rows; leading anal fin ray extends the length of the fin; long, stocky caudal peduncle.



### Coho Salmon

**L:** 30 - 75 cm (12 - 30 in.).

**D:** found in all Great Lakes and some tributaries.

**S:** chinook, Atlantic and pink salmon, rainbow trout (steelhead), brown trout.

**K:** dark mouth and light grey gums; tail spotted on upper lobe only; leading ray on anal fin extends 1/2 - 2/3 the length of the fin; short, narrow caudal peduncle.



**Favorite Baits:** spoons, dodger and flies

### Rainbow Trout/Inland

**L:** 15 - 40 cm (6 - 16 in.).

**D:** south of a line from Kenora to Kesagami Lake.

**S:** brook and brown trout; juvenile Atlantic salmon.

**K:** many small black spots on body; spots over tail in radiating rows; pink lateral stripe; leading anal fin ray extends the length of the fin; long, stocky caudal peduncle.



**Favorite Baits:** spinners, spoons, roe, worms, flies

### Atlantic Salmon

**L:** 25 - 70 cm (10 - 28 in.).

**D:** reintroduced to Lake Ontario; occasionally in upper Great Lakes and some tributaries, and Trout Lake near North Bay.

**S:** chinook, coho and pink salmon, rainbow trout (steelhead), brown trout.

**K:** white mouth and gums; few large, black spots on gill cover; no spots on tail; leading ray on anal fin extends the length of the fin; long, narrow caudal peduncle; dark-coloured pectoral fins.



### Brown Trout/Great Lakes

**L:** 35 - 60 cm (14 - 24 in.).

**D:** found in all Great Lakes and some tributaries.

**S:** chinook, coho, pink and Atlantic salmon; rainbow trout.

**K:** white mouth and gums; silvery with dark spots on body; only occasional vague spots on tail; only salmon or trout with orange on adipose fin; leading anal fin ray extends the length of the fin; short, stocky caudal peduncle; light-coloured pectoral fins.



### Pink Salmon

**L:** to 46 cm (18 in.).

**D:** found in all Great Lakes.

**S:** chinook, coho and Atlantic salmon, rainbow trout (steelhead), lake trout.

**K:** large black spots on back and tail fin, but not on dorsal fin; forked tail; leading ray on anal fin extends 1/3 - 1/2 the length of the fin; narrow caudal peduncle.



### Brown Trout/Inland

**L:** 20 - 40 cm (8 - 16 in.).

**D:** occasional south of the French River, mostly in Great Lakes tributaries.

**S:** rainbow and brook trout; juvenile Atlantic salmon.

**K:** large black, blue or red spots on body, often surrounded by lighter ring; tail with few spots; only salmon or trout with orange on adipose fin; leading anal fin ray extends the length of the fin; short, stocky caudal peduncle.



**Favorite Baits:** spinners, spoons, worms, flies

### Lake Trout

**L:** 30 - 80 cm (12 - 31 in.).

**D:** cold waters of deep lakes throughout much of Ontario.

**S:** brook trout.

**K:** light wormlike markings and spots on dark background, none red; deeply forked tail; white leading edge on lower fins, but no black line.



**Favorite Baits:** spoons, jigs, crank baits, lake trolls

### Brook Trout

**L:** 15 - 40 cm (6 - 16 in.).

**D:** cold, clear streams, small lakes, Lake Superior.

**S:** lake trout.

**K:** light wormlike markings and spots on dark background, some red and blue; square tail; white leading edge on lower fins, set off by black line.



**Favorite Baits:** spinners, spoons, worms, flies

### Channel Catfish

**L:** 36 - 53 cm (14 - 21 in.).

**D:** Great Lakes and larger lakes and rivers south of the French River and from Lake Nipigon west.

**S:** brown bullhead.

**K:** deeply forked tail.



### Brown Bullhead

**L:** 20 - 36 cm (8 - 14 in.).

**D:** warmer, slow waters throughout southern Ontario and generally south of highways 11 & 17 in the north.

**S:** channel catfish.

**K:** square tail.



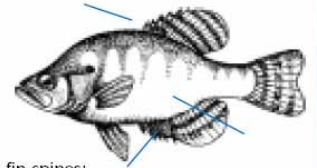
### White Bass

- L:** 20 - 30 cm (8 - 12 in.).
- D:** clear water near rock reefs and sand bars in lower Great Lakes area.
- S:** white perch.
- K:** dark spots in horizontal lines, often faint and irregular; second anal spine distinctly shorter than third.



### White Crappie

- L:** 20 - 30 cm (8 - 12 in.).
- D:** mouths of tributary streams or weedy, sheltered bays in lower Great Lakes area.
- S:** black crappie.
- K:** six dorsal fin spines; 6 or 7 anal fin spines; sides with faint bars.



**Favorite Baits:** small jigs, small minnows, worms

### White Perch

- L:** 15 - 25 cm (6 - 10 in.).
- D:** Lakes Ontario and Erie, lower Niagara River and Welland Canal.
- S:** white bass, yellow perch.
- K:** colour variable, but spots or stripes not obvious; second and third anal spine roughly equal in length.



### Black Crappie

- L:** 18 - 25 cm (7 - 10 in.).
- D:** clear, weedy lakes and slow rivers primarily Great Lakes, south central near northeast and parts of northwestern Ontario.
- S:** white crappie.
- K:** 7-8 dorsal fin spines; 6 or 7 anal fin spines; irregular mosaic of distinct black blotches.



**Favorite Baits:** small jigs, small minnows, worms

### Lake Whitefish

- L:** 30 - 65 cm (12 - 26 in.).
- D:** Great Lakes and deep, cold, inland lakes across Ontario.
- S:** cisco, round whitefish.
- K:** mouth overhung by snout (see below); body oval in cross-section.



**Favorite Baits:** small jigs, small spoons, small minnows

Profiles of whitefish and herring showing differences due to position of snout or upper jaw.

#### Lake Whitefish

- A:** The mouth is overhung by the snout or upper jaw; rounded profile.



#### Cisco (Lake Herring)

- B:** The mouth is not overhung by the snout; pointed profile.



### Cisco

- L:** 20 - 30 cm (8 - 12 in.).
- D:** cold waters from Great Lakes to Hudson Bay
- S:** lake and round whitefish, rainbow smelt
- K:** mouth not overhung by snout (see above); mouth ends before middle of eye.



### Rainbow Smelt

- L:** 15 - 25 cm (6 - 10 in.).
- D:** throughout Great Lakes area, including some inland lakes.
- S:** cisco.
- K:** mouth extends beyond centre of the eye; tongue with prominent teeth.



### Carp

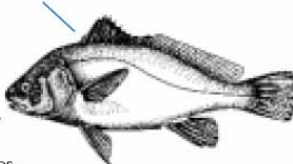
- L:** 30 - 75 cm (12 - 30 in.).
- D:** shallow, warm waters, primarily in southern Ontario.
- S:** freshwater drum.
- K:** "whiskers" beside mouth; one dorsal spine.



**Favorite Baits:** dough, corn, worms, prepared carp bait

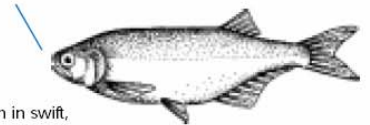
### Freshwater Drum

- L:** 45 - 50 cm (18 - 20 in.).
- D:** large, shallow waterbodies with mud or sandy bottoms, mostly in lower Great Lakes.
- S:** carp.
- K:** no "whiskers"; 8-9 dorsal spines.



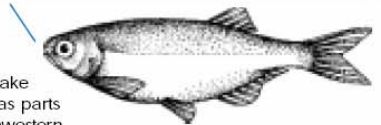
### Goldeye

- L:** 25 - 38 cm (10 - 15 in.).
- D:** parts of northeastern and northwestern Ontario, often in swift, silty waters.
- S:** mooneye.
- K:** iris of eye large and bright golden, forward scales with golden luster.



### Mooneye

- L:** 25 - 30 cm (10 - 12 in.).
- D:** clear rivers and shallow lake waters, southern as well as parts of northeastern and northwestern Ontario.
- S:** goldeye.
- K:** iris of eye large and golden, but not as bright as goldeye; scales silvery.



### Sturgeon

- L:** 90 - 145 cm (3 - 5 ft.).
- D:** larger rivers and lakes, usually less than 30 feet deep.
- S:** none.
- K:** underslung mouth; whiskers; bony plates on sides.



### Burbot (Ling)

- L:** to 38 cm (15 in.).
- D:** cool waters of lakes and rivers throughout Ontario.
- S:** bowfin.
- K:** single "whisker" on tip of chin; long, thin anal fin.



### Bowfin

- L:** 46 - 61 cm (18 - 24 in.).
- D:** swampy, vegetated bays of warm lakes and rivers, primarily in southern Ontario.
- S:** burbot.
- K:** no "whiskers"; anal fin short but deep.





