



FISHES OF TORONTO

A GUIDE TO THEIR REMARKABLE WORLD

• City of Toronto Biodiversity Series •

EXECUTIVE SUMMARY



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Atlantic Salmon
illustration: Charles Weiss

Charles Weiss

Need for Action

Two centuries of pollution and poor environmental stewardship have dramatically changed Lake Ontario and its tributaries (streams). Many urban watercourses have been buried in pipes or their forested riparian zones (vegetated banks and floodplain) have been decimated. Water pollution and traditional development methods continue to be serious threats to habitat and the fishes in our waters. The new Toronto Green Standard, encompassing many of the City's environmentally friendly initiatives, is one step in the right direction toward improving both the water quality and the natural ecology of our watersheds (area of land where surface water from rain or melting snow flows towards a stream, lake, or other waterbody). But everyone must do their part to reduce pollution, be it from our vehicles, industry, or our homes. It's not too late, and it is the sincere hope of the City of Toronto and its partners that this informative booklet will help residents and visitors appreciate the wonders living in our waters and do everything they can to protect the fishes of Toronto for current and future generations to enjoy.

City of Toronto Biodiversity Series

Fishes of Toronto is part of the Biodiversity Series developed by the City of Toronto in honour of the Year of Biodiversity 2010. A number of the non-human residents of Toronto will be profiled in the Series. It is hoped that despite the severe biodiversity loss due to massive urbanization, pollution, invasive species, habitat loss and climate change, the Biodiversity Series will help to re-connect people with the natural world, and raise awareness of the seriousness that biodiversity loss represents and how it affects them directly. The Series will inform residents and visitors of opportunities to appreciate the variety of species inhabiting Toronto and how to help reduce biodiversity loss by making informed individual decisions.

Coolwater Fishes

Coolwater fishes are generally found where the water temperature is between 19°C and 25°C. Compared to cold-water fishes, they occur in the warmer parts of cold spring-fed streams and in the shallower parts of lakes. Many of our coolwater fishes are small-bodied minnows and darters, but a few grow larger, including, Northern Pike, Yellow Perch, and Walleye. Most coolwater fishes are non-migratory, moving only short distances to their spawning grounds. They spawn in the spring or early summer in water that is usually above 10°C, but may be as high as 25°C. A few undertake longer migrations to spawning grounds, including the Lake Sturgeon and American Eel. The most widespread and abundant fishes in Toronto's streams, Blacknose Dace, Longnose Dace, Creek Chub, and White Sucker, are all species tolerant to the poor water quality typical of urban water-courses.



Blacknose Dace



Blacknose Shiner



Brassy Minnow



Common Shiner



Creek Chub



Emerald Shiner



Golden Shiner



Hornyhead Chub



Longnose Dace



Northern Redbelly Dace



Redside Dace



Spottail Shiner

Checklist of Coldwater Fishes of Toronto

Fish Status: (N) Native (I) Introduced or Invasive (XP) Extirpated

Fish Statistics: (Average Ontario Length, Record Ontario Length, Maximum Age)

Common Name

Status

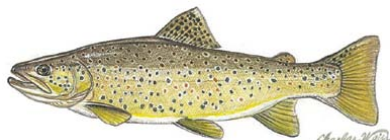
Comments

Trouts and Salmon

- Atlantic Salmon** (46.0 cm, 88.9 cm, 13 yrs) **N,I,XP** Mounts of Atlantic Salmon taken from Samuel Wilmot's hatchery in the late 1800s are stored at the Royal Ontario Museum. DNA from these mounts is being analysed in order to select the best stock to use for reintroduction to Lake Ontario. See page 13.
- Brook Trout** (28.0 cm, 80.0 cm, 7 yrs) **N** The Brook Trout can be recognized by pale yellow spots on the body, pale wavy lines on the back, and lower fins with white leading edges followed by a black stripe. This prized sport fish prefers coldwater streams where temperatures usually do not exceed 17°C.
- Brown Trout** (41.0 cm, 96.5 cm, 38 yrs) **I** The Brown Trout, introduced from Europe, tolerates warmer temperatures than the Brook Trout. Individuals in streams are brown with prominent dark and orange spots, whereas individuals from Lake Ontario are silvery. See page 32.
- Chinook Salmon** (88.0 cm, 119.4 cm, 9 yrs) **I** Chinook Salmon, the largest of the salmon, has been stocked in Lake Ontario since the 1960s, primarily to reduce the large Alewife population. Recent studies suggest a large portion of Lake Ontario Chinook Salmon are from naturalized populations. See page 33.
- Coho Salmon** (48.0 cm, 107.0 cm, 5 yrs) **I** Similar to the Chinook Salmon, it has paler gums and its black spots restricted to the upper lobe of the tail fin. Sexually mature adults have a light pink or rose belly. The Conook is a hybrid with Chinook which grows much larger and is occasionally caught in Lake Ontario.
- Lake Trout** (44.5 cm, 130.9 cm, 50 yrs) **N** Lake Trout restoration efforts began in earnest during the 1970s. Today there is some natural reproduction; however the population in Lake Ontario is currently sustained by stocking hatchery reared fish.
- Rainbow Trout** (53.0 cm, 99.9 cm, 11 yrs) **I** The Rainbow Trout gets its name from its pinkish lateral stripe. It is more closely related to Pacific salmon than to other trout. Rainbow Trout populations are maintained in Lake Ontario by a combination of stocking and natural reproduction. See page 32.

Whitefishes

- Cisco** (25.0 cm, 59.7 cm, 11 yrs) **N** Sometimes also referred to as Lake Herring, the Cisco is the most common and widespread cisco species. It is generally found in shallower waters than the deepwater ciscoes (Bloater, Kiyi, and Shortnose Cisco).
- Bloater** (23.0 cm, 39.5 cm, 10 yrs) **N,XP** The smallest of the deepwater ciscoes, gets its name from becoming bloated when pulled up from deep water. Ciscoes are whitefishes with terminal mouths (point forward), unlike Lake and Round Whitefishes which have subterminal mouths (point downward).
- Kiyi** (25.0 cm, 32.5 cm, 10 yrs) **N,XP** Like all ciscoes in the Great Lakes, the demise of the Kiyi in Lake Ontario is generally linked to overfishing, population /reproductive failure (due in part to historically poor water quality), and predation of larval ciscoes by the non-native Rainbow Smelt and Alewife. Eventually the flourishing Alewife populations also competed with the Kiyi for both food sources and breeding territories. During the 1920s, Kiyi made up more than half of all ciscoes caught in gill nets, but by 1942 it had almost disappeared. The Kiyi was last seen in Lake Ontario in 1964. Although the Kiyi is still extant in Lake Superior, the populations in Lakes Huron, Michigan, and Ontario have been extirpated.
- Lake Whitefish** (38.0 cm, 74.9 cm, 50 yrs) **N** The population of Lake Whitefish crashed coincident with the collapse of its favoured food, *Diporeia hoyi*. This small shrimp-like amphipod declined abruptly following the invasion of Zebra and Quagga Mussels into Lake Ontario.
- Round Whitefish** (25.0 cm, 54.2 cm, 20 yrs) **N** The smaller Round Whitefish is less well known than the Lake Whitefish, but has been recently captured in Lake Ontario around the Toronto area. In comparison to the better known Lake Whitefish, it is sleeker and more round in cross-section.
- Shortnose Cisco** (25.0 cm, <36 cm, 8 yrs) **N, XP** The Shortnose Cisco lived in Lakes Ontario, Huron and Michigan. It disappeared from Lake Ontario in 1964 and was last seen in Lake Huron in 1985. Classified by the Committee on the Status of Endangered Wildlife in Canada as Endangered, it may actually be Extinct.



Brown Trout
illustration: Charles Weiss



Lake Trout
illustration: Charles Weiss



Kiyi
illustration: Karen Klitz, University of Michigan Museum of Zoology

Featured Coolwater Fish: Northern Pike (*Esox lucius*)

While many of Toronto's fish species are found elsewhere in eastern Canada and North America, few are found throughout both Canada and the rest of the northern hemisphere. The Northern Pike, however, is very widespread. It ranges from Alaska to Missouri, Europe to Siberia and is one of the most well known freshwater species in the world.

A long, narrow fish with a ferocious-looking grin, Northern Pike are coolwater predators and a popular sport fish. They spawn in April and May, and require vegetated areas in bays, marshes, and streams in which to scatter their eggs. They often spawn in water less than

20 cm deep, and the young fish need similar habitat, which leaves them vulnerable to changes in water level. Older juvenile and adult pike live in generally similar, but somewhat deeper, habitat – slow-moving rivers or weedy areas of lakes. Young pike grow quickly. Once they are 50 mm or longer they feed mainly on other fish, frogs, and crayfish; larger Northern Pike will occasionally eat ducks and mice!

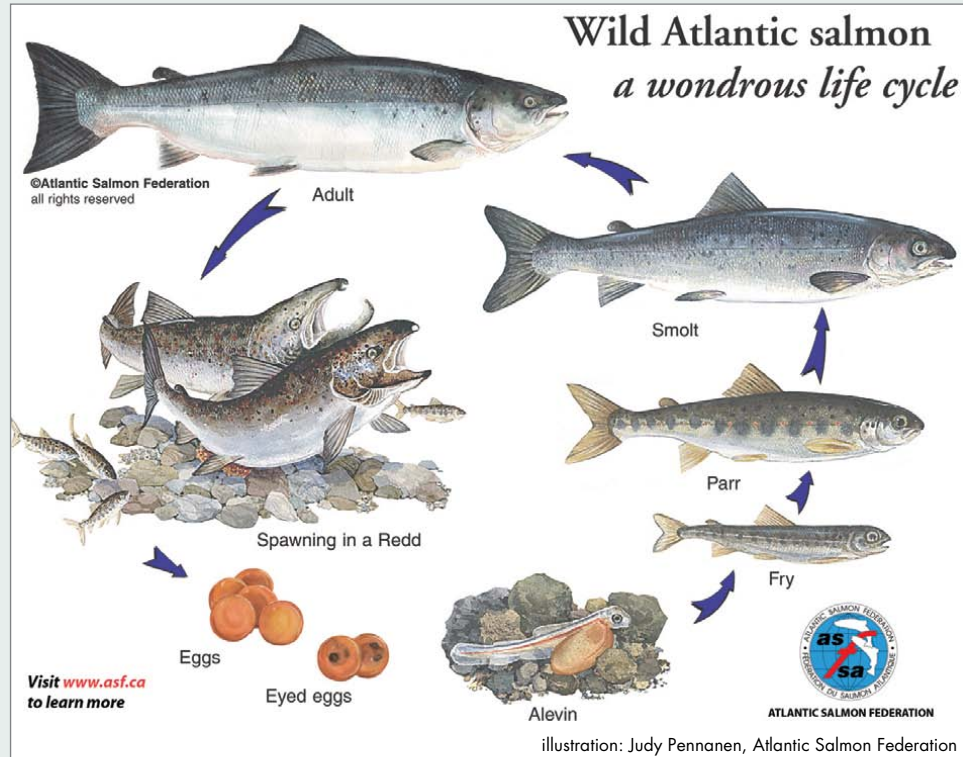
Female Northern Pike in Toronto reach maturity between 2 and 4 years of age, with males maturing earlier. While they can live for more than 20 years, a more typical lifespan is 10-12 years. The largest recorded Northern Pike caught in Ontario weighed just over 19 kg (42 lbs).



Northern Pike
photo: Nature's Images Inc.

Typical Atlantic Salmon Spawning and Life Cycle Facts

- Lake Ontario Atlantic Salmon are permanent freshwater residents, spending their adult life in the Lake, instead of migrating to the ocean
- adults turn dark bronze and migrate up the streams in the fall to spawn
- lay approximately 2000 to 8000 **Eggs** (5 to 7 mm in diameter)
- eggs hatch late winter/early spring, about 3 months after fertilization
- newly hatched **Alevin** (1 to 3 cm) remain buried in the gravel nest (redd) and feed off their yolk-sacs for 1 to 3 months
- emerge from their redd as free swimming **Fry** (3 to 8 cm) and begin foraging for food
- enter the **Parr** stage (6 to 20 cm) at about 3 to 6 months and develop large dark vertical parr marks on the sides of their body
- remain in the stream until 1 to 3 years of age, feeding on aquatic invertebrates (insects and their larvae) and terrestrial insects that fall into the stream or live on the surface
- when ready to swim downstream to Lake Ontario, they change from dark to bright silver and lose their parr markings, becoming **Smolts** (14 to 25 cm)
- grow and mature in the Lake for 1 to 3 more years (40 to 100 cm) until ready to spawn
- **Adults** feed on invertebrates (insects, crayfish), Cisco, Alewife, Rainbow Smelt, shiners, and sometimes sculpins and gobies
- usually return to their native streams, migrating to the headwaters to spawn at about 3 to 5 years old
- salmon that spawn after only one year in the Lake are called **Grilse**
- of the eggs laid, only about 20% (400-1600) hatch, typically only 5% (100-400) reach the Lake as Smolt, and on average only 0.25% (5-20) actually reach spawning age
- migrating salmon typically forage very little until after spawning
- most Atlantic Salmon do NOT die after spawning (like Pacific Salmon do) but return to the Lake



- returning adults resume feeding and change back to a silver colour
- a small percentage of Atlantic Salmon survive several spawning runs
- wild Atlantic Salmon can live up to 20 years, but have a typical maximum age of 9 to 11 years
- adult Lake Ontario Atlantic Salmon are typically between 3 to 10 kg
- record catches in Europe have been over 35 kg and 150+ cm; but in Lake Ontario the historic population record is just over 20 kg
- the largest recorded Atlantic Salmon caught from the newly restored (post 1980) Lake Ontario population is currently 11 kg

How You Can Help

There are many actions you can take to improve and protect fish and fish habitat. Below are listed a selection of ways that individuals can improve water quality, reduce the impact of stormwater flows, and protect native aquatic life.

Here are some easy things ...

- Stoop and scoop animal waste.
- Check your car for leaks of fuel, oil, brake, transmission and other harmful fluids. Fix the leaks! Use a drop cloth if you do-it-yourself.
- Reduce usage of your car: ride your bike, take transit, or car pool.
- Eliminate or at least reduce your use of fertilizers and pesticides, and follow application guidelines! (Ontario banned the use of cosmetic pesticides in 2009.)
- Grasscycle! Leave grass clippings on your lawn when you mow (mulch). They'll help your lawn absorb more rain and return nutrients to the soil. This will allow you to cut back on both lawn watering, and fertilizing, which frequently contribute to polluted stormwater runoff adding excessive nutrients into surface waters.
- Don't dump toxic substances into the sewer system. ONLY rain or clean water is allowed in the catchbasins on your road.
- Drop-off harmful products such as oil, household cleaners, paint, pesticides, batteries, and prescription medicines at the City of Toronto's Household Hazardous Waste Depots (call 311 for details plus hours and locations).
- Try to limit your use of any hazardous product. Buy only as much as you need and use it all up. If you do end up with leftovers, consider sharing them with a neighbour or donating them to a local community organization. Better still, why not use environmentally safe alternatives for home and laundry cleaning products and gardening/lawn maintenance.
- Don't use soap to wash your car in the driveway. Soap is not allowed to be discharged to the road or catchbasins. If you can, wash your car over a surface that will allow water to soak into the earth, or use a commercial car wash.
- Don't discharge your chlorinated swimming pool water or backwash to the catchbasin. Saltwater disinfection pool water must be discharged to the sanitary sewer or stay on your property.





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"Sundown on the Lake"
Walleye feeding on Yellow Perch
illustration: Charles Weiss