

Fish Habitat

& FLUCTUATING WATER LEVELS ON THE GREAT LAKES

FACT
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Shoreline areas provide habitat for a variety of aquatic organisms including fish. The nearshore area is where many fish species lay their eggs, feed and seek protection from predators. Changes or disruptions to these areas can threaten their survival. If you own or lease waterfront property, you can help protect the fish populations in your lake or river by protecting fish habitat along your shoreline.

This fact sheet provides information about fluctuating water levels in the Great Lakes, how they affect fish habitat and what you should know before starting any project in or near the water.

Water level fluctuations

The Great Lakes shoreline varies from low gradient slopes where you can find wetlands or beaches to steep high gradient slopes in the form of rock cliffs or sand bluffs. Water level fluctuations are a natural occurrence and contribute to the processes such as erosion and deposition of silt and sediment that create and maintain the different shoreline types.

Fluctuations in water levels have occurred in the Great Lakes since they were formed. They are the result of several natural factors and in recent time have also been influenced by human activities. The water levels of the Great Lakes depend on their storage capacity, outflow characteristics of the outlet channels, operating procedures of the regulatory structures, and the amount of water supply received by each lake. The primary natural factors affecting lake levels include precipitation on the lakes, run-off from the drainage basin, evaporation from the lake surface, inflow from upstream lakes, and outflow to downstream lakes. Human factors that also affect the water levels include diversions into or out of the drainage basin, consumption of water, dredging of outlet channels and the regulation of outflows. Outflows are regulated on Lake Superior and on Lake Ontario.

There are three types of water level fluctuations on the Great Lakes: long-term (multi-year), seasonal (one-year) and short-period (less than an hour to several days).

The long-term fluctuation in Great Lakes water levels result from persistent low or high water supplies. The seasonal fluctuation in Great Lakes levels reflect the annual hydrologic cycle which is characterized by high water



supplies to the lakes during the spring and early summer and lower supplies during the remainder of the year. Short-period fluctuations, lasting from less than an hour to several days, are caused by meteorological conditions. The effect of wind and differences in barometric pressure over the lake surface create temporary imbalances in the water level at various locations.

Additional information on each type of water level fluctuation as well as historical water level data for each lake can be found through the Fisheries and Oceans Canada - Canadian Hydrographic Service (DFO-CHS), Central and Arctic Region Web site for Tides, Currents and Water Levels at <http://biachss.bur.dfo.ca/danp/>.

Boundaries of fish habitat

Although water levels do fluctuate, the boundaries of fish habitat, as defined in the *Fisheries Act* within a body of water, do not change. Fisheries and Oceans Canada, Ontario - Great Lakes Area (DFO-OGLA) determines the boundary of fish habitat using historical long-term water levels, linking the habitat to the requirements of fish populations throughout their life cycles. This means that the extent of fish habitat is not determined by short-period water level fluctuations. For example, in low gradient shoreline areas (e.g. sand beaches and wetlands) small decreases in water level sustained over a long period of time may result in large distances

created between the current water level and the levels that are more indicative of an average year. In low-water years, beaches grow significantly larger and wetland areas flourish with vegetation. The nearshore areas once covered with water may be mistakenly considered "dry" land. As a result, waterfront property owners may propose to fill or excavate within these areas (e.g. shoreline protection works, additions to existing structures, berms, dredging). Although these areas appear to be dry and may have been for a year or more, historical data shows that water levels will rise again and nearshore areas will be re-submerged, providing important spawning, nursery and adult fish habitat. DFO-OGLA considers these areas to be fish habitat, and they therefore fall under the requirements of the *Fisheries Act*.

Be aware of the *Fisheries Act* and other legislation

The federal *Fisheries Act* provides for the protection of fish habitat. Under the *Fisheries Act*, no one may carry out any work or undertaking that results in the harmful alteration, disruption or destruction of fish habitat (HADD), unless this HADD has been authorized by the Minister of Fisheries and Oceans Canada. The Act also states that no one is permitted to deposit a deleterious (harmful) substance into water containing fish. Violations to the *Fisheries Act* can result in substantial fines, and/or the risk of

imprisonment. If found guilty, then the violator may also be required to cover the costs of restoring the habitat at the site and/or be required to fulfill other court ordered remedies. Other legislation that may also be relevant is outlined in the introductory Fact Sheet: *Working Around Water? What you should know about Fish Habitat.*

Contacts and approvals

Keep in mind that approval from one government agency does not guarantee that you will be able to obtain approval from another agency. As well as the *Fisheries Act*, other agencies have legal requirements that may affect how to proceed with projects in and around water. The lead review agency for project proposals and their areas of responsibility, listed in the table on this page, will assist you in determining what other agencies need to be contacted for permits and approvals. Remember you should obtain all approvals before starting work.

Environmentally friendly practices

The following environmentally friendly practices are intended to prevent any potential harmful impacts to fish and fish habitat that may result from work in or near water:

Get advice before starting work

Seek advice from agency staff if you are unsure whether the nearshore area you plan to do work on is considered fish habitat. Even if the area appears to have been dry for more than a year, it may still be considered fish habitat under the *Fisheries Act*.

Do your homework

Before planning works in or near the water, be sure you are aware of the historical water levels for your lake so you are not surprised if water levels change significantly in the future.

Avoid dredging or blasting

Dredging or blasting to gain boat access should be your last consideration. It may be best to wait until water levels return to normal. Often, areas that were dredged during low-water conditions are quickly filled in with sediment through wind and wave energy.

Use alternatives to gain water access

Before planning projects that will have permanent and/or significant impacts to fish habitat in the nearshore area, consider alternatives such as extending a dock with temporary floating sections. When water levels return to normal, simply remove the temporary structures.

Avoid in-filling

In-filling occurs when materials or structures are placed on fish habitat, resulting in the permanent loss of fish habitat, i.e. a HADD.

Preserve wetlands

The majority of Great Lakes fish species (e.g. pike, muskellunge, bass) depend on coastal wetlands to complete their spawning, nursery, juvenile or adult stages of their life cycles. During long-term periods of low-water, wetlands flourish and increase in size, while during long-term periods of high-water, wetlands are eroded and reduced in size. The destruction of a wetland by humans is detrimental at any time. Fluctuating water levels can contribute to the long term health of coastal wetlands.

Do not remove rocks or woody material

Rocks, stumps, logs and woody material provide good fish habitat and prevent erosion. These materials should not be removed from areas under the average annual high-water mark. If any materials need to be temporarily removed, they should be stockpiled and replaced to where they came from, or to an adjacent area of similar water depth.

Contact information – Ontario

If the property where the work will be carried out is . . .

- in the Rideau Canal or Trent-Severn Waterway
 - in a federally owned small craft harbour
 - below the average annual high-water mark in a public (Crown) land or on a private water lot
 - above the average annual high-water mark but within a regulatory flood plain
 - above the average annual high-water mark and is on private property
- Your first contact should be . . .**
- Parks Canada Agency
 - Fisheries and Oceans Canada (DFO) - Small Craft Harbours
 - Your local Conservation Authority (CA). Where there is no designated CA, contact your local Ontario Ministry of Natural Resources office.
 - Your local CA
 - Approvals may be required from your local CA if the structure is within the flood plain or fill regulated area

Working together to protect and conserve Ontario's aquatic resources



Fisheries and Oceans Canada

Pêches et Océans Canada

www.dfo-mpo.gc.ca/canwaters-eauxcan



Parks Canada

Parcs Canada

www.pc.gc.ca



Ontario

www.mnr.gov.on.ca



www.conservation-ontario.on.ca

Working together to protect fish habitat

Help maintain the quality and quantity of fish habitat in our lakes and streams. For more advice on how to work in or around water in an environmentally friendly manner, contact local agency staff directly.

Contact information

Fisheries and Oceans Canada

[www.dfo-mpo.gc.ca/
canwaters-eauxcan](http://www.dfo-mpo.gc.ca/canwaters-eauxcan)

Canadian Hydrographic Service

<http://biachss.bur.dfo.ca/danp/>

Canada

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