

underwater

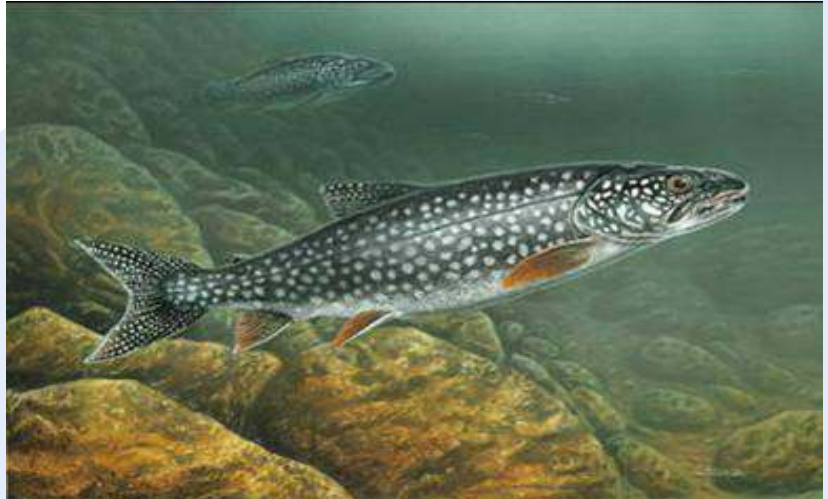
Haliburton lake trout: a precious genetic resource

Dr. Chris Wilson

Lake trout are a uniquely Canadian species that is adapted for living in cold conditions and long winters. Part of what makes lake trout special is their Ice Age heritage, where they were one of the most successful species in coping with and adapting to conditions caused by the glaciers more than 10,000 years ago. Unfortunately, their cold-water existence also makes them uniquely vulnerable to changing climates and warm-water species that are expanding their ranges.

Haliburton County is home to many of southern Ontario's lake trout. The Haliburton Highlands have many coldwater lakes that provide good habitat for lake trout, which in turn provide good fishing opportunities for anglers. As well as being a valued resource for local communities and anglers, the Haliburton and neighbouring populations are important for the entire species. Almost a quarter of all known lake trout populations occur in Ontario, and the Algonquin, Bancroft, and Haliburton Highlands are one of the densest concentrations of lake trout populations anywhere. The large number of small- to medium-sized lakes with good habitat has made the area being a southern stronghold for lake trout, with many small-bodied populations. Lake trout in these populations generally mature earlier than fish elsewhere, and may be adapted for warmer yearly conditions than lake trout in most of the species range.

The Haliburton Highlands Outdoors Association, Ontario Federation of Anglers and Hunters and the Ontario Ministry of Natural Resources (OMNR) are working together to ensure a vibrant future for local lake trout populations. As part of this, the OMNR Fisheries Genetics lab at Trent University is building a 'genetic map' of the lake trout populations in the region. Using several genetic tools or marker systems that show the history and ancestry of populations and individual fish, this project is identifying which lake trout populations are native to the county, and looking for



other populations related to the 'glacial relict' fish in McDonald Lake. The same information is also being used to identify the genetic ancestry of populations, to tease apart how effective stocking has been in contributing to wild, reproducing populations.

This project was started in the winter of 1999, and will be completed in the next two years. So far, mapping out the genetic diversity and ancestry of Haliburton lake trout populations has detected many more native populations, including three that are related to the known "relict" populations. Other populations show genetic traces from past stocking events, and several lakes stand out as introductions of provincial hatchery fish from Great Lakes sources.

The mapping project has also turned up some surprises. Several populations that had been stocked on top of for decades show little or no genetic traces of either hatchery fish or a mixed ancestry. Why stocking has little or no effect in some populations but works in others is still being worked out. At present, OMNR scientists are investigating possible links between stocking effectiveness and genetic contributions to wild populations with lake size, depth, and fish community, as well as accessibility and fishing pressure. Some evidence also suggests that local populations are better adapted to area habitats, which gives them a fitness

advantage over stocked fish from outside the area. To identify more native populations and resolve the ancestry of others, building the county 'gene map' will be continued for two more years, as will the search for more unrecognized populations of "Haliburton gold".

Identifying and mapping out native lake trout populations in the Haliburton area has sparked similar interest in finding other heritage populations elsewhere. So far, other unique populations of lake trout have been identified in Algonquin Park and near Bancroft. These findings have directly resulted from the science going into the Haliburton Lake Trout Project, and provide a good example of how research on lake trout in Haliburton County is benefiting our knowledge of these fish beyond the county borders. As lake trout populations across the species range are faced with increasing challenges from development, climate change, other fish species and water level changes, the self-sustaining native Haliburton populations will only become more precious, and more important to the species' future.

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