

Vital Statistics of Walleye in Saginaw Bay

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Background

A fishery stock assessment is a tool that fisheries managers and researchers use to describe the characteristics of a fish population (also known as a fish stock). The “vital statistics” of a fish stock, such as the total number of fish present, mortality rates (how many fish die each year due to fishing or natural causes), and exploitation rate (the proportion of fish that are removed from the population each year by fishing) are critical components of any fish stock assessment. Since 1981, this project has been Fisheries Division’s primary stock assessment for Walleye in Saginaw Bay, and by extension, all of the Michigan waters of Lake Huron.

As part of this project, the Southern Lake Huron Management Unit fisheries staff uses electrofishing to collect Walleye from the annual spawning run in the Tittabawassee River. The Walleyes are momentarily stunned with electricity from a boat-mounted generator, captured, tagged, and released alive. The collection effort is also used for Walleye egg collection when the eggs are needed for hatchery production and to obtain other tissue samples for genetics or disease testing. Each year about 3,000 metal jaw tags are affixed to Walleye (Photos 1 and 2). Anglers who catch tagged fish are encouraged to report their catch, including tag number, fish length, and when and where the fish was captured, to Fisheries Division online (<http://www.michigan.gov/taggedfish>) or by mail. In return, the angler is provided a letter of appreciation and details about when and where their fish was tagged. The annual returns over time are used in analyses that provide estimates of vital statistics including mortality, survival, exploitation rate, and population size.



Photo 1. Jaw tagging Walleye.



Photo 2. Walleye with jaw tag.

Recent work by the MDNR exposed some limitations of the tag return analysis, which lead to the development of an alternative population analysis tool, known as a statistical catch-at-age model, for the Saginaw Bay Walleye stock. The limitations of the tagging analysis were addressed by improvements to this project, which include a greater number of annual tagging locations around Saginaw Bay than just the Tittabawassee River and the inclusion of \$100 reward tags that allow the MDNR to account for anglers who don't report the tagged fish that they catch. In the future, it may be possible to merge the tag return analysis and statistical catch-at-age model into a stock assessment that is superior

to its predecessors. If not, there is value to continuing the measurement of Walleye vital statistics using both techniques.

What are some of the key current results?

Returns of jaw tags in 2015, reported by anglers, revealed tag returns between the different tagging sites around the bay differed by as much as 14%. Differences in exploitation (harvest) rate within a single fishery like Saginaw Bay may be caused by age and sex differences of the fish tagged in each spawning run, or by angler behavior with more fishing taking place in some locations. Additional years of data should help reveal what is driving this difference. Tags that included a \$100 reward were reported 38% more than nonreward tags providing biologists with a valuable correction factor for nonreporting. Annual survival was 52% in 2014 (the most recent year that can be estimated by this method) meaning that on average, 52% of the walleye in the population will survive to the following year. Most of the losses are made up for by annual reproduction, entering or “recruiting” to the population as juveniles.

Where can I find detailed results?

A Fisheries Division report that summarizes the 30-year history of this project was recently written and is in the process of being published. This report will be available on Fisheries Division’s website when it is complete. Additional information can be found at http://www.michigan.gov/dnr/0,4570,7-153-10364_52259_19056-333302--,00.html.

What does this project do for fisheries managers and anglers?

The information generated by this project is critical for fisheries managers to understand the Saginaw Bay Walleye population, make informed decisions about this key fishery, and to ensure sustainability of the Saginaw Bay Walleye population. Fisheries managers use the information from this project to set fishing regulations, such as minimum length limits and daily bag limits, which specify the size and number of fish that an angler can harvest in one day. Walleye regulations for Michigan’s waters of Saginaw Bay and other areas of Lake Huron can be found along with the rules for other species by clicking “Rules & Regs” on the MDNR Fisheries Division website at <http://www.michigan.gov/fishing>.