

Lake Huron

Managing Chinook salmon in Lake Huron Current Findings and Proposed Management Options July 2011, Executive Summary

In 2005, the Michigan DNR produced a document entitled "Lake Huron Management in Times of Change, August 2005". The 2005 report recommended a 50% reduction in Chinook salmon stocking that was eventually adopted by the Department and implemented in the spring of 2006. Monitoring of the ecosystem and fishery over the past five years indicates that the lake has experienced a large food-web shift most likely linked to invasive zebra and quagga mussels, and the harvest and catch rate of stocked Chinook salmon in Lake Huron are at all-time lows.

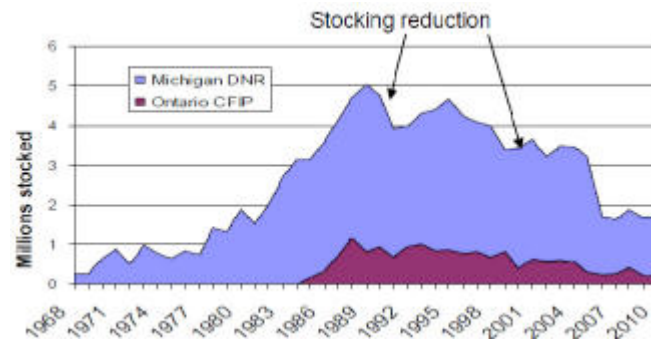


Fig 1-Lake Huron Chinook salmon stocking (MDNR)

Evidence from creel surveys and feedback from stakeholders at workshops and public meetings reveal a strong desire to modify Chinook salmon stocking practices, with the main rationale being that current stocking rates represent a poor use of anglers' license dollars. Anglers understand that the ecosystem and fishing opportunities have changed, and they are concerned about future management of Chinook salmon and other key salmonids.

alter management direction if necessary. The indicators that the DNR monitors include: harvest, catch rate, weir returns, stocked vs. wild production, growth, and age of fish.

Stocked vs. Wild

It is estimated that during 2000-2003 the number of wild Chinook salmon entering Lake Huron from tributary streams was approximately 15 million/year (Johnson et al, 2010). Estimates are not available for the years following 2003, but indications are that natural reproduction and recruitment of Chinook salmon has remained high. To better understand the contribution of wild and stocked Chinook salmon to the Lake Huron fishery, the DNR worked in cooperation with the Ontario Ministry of Natural Resources to mark all Chinook salmon stocked in Lake Huron from 2000-2008 (nearly 24 million fish). Based on this work, it is estimated that more than 80% of the Chinook salmon in the creel were wild, thus bringing into question the value and discretion of stocking Chinook salmon into Lake Huron at current levels.

Predator Diet Study and the impacts of Alewife

In recent years, scientists have analyzed the diets of predators in Lake Huron. Roseman et al, 2010, collected angler-caught walleye, lake trout, Chinook salmon, steelhead, and other gamefish species and looked at their stomach contents. The results revealed few alewives in Chinook salmon diets. Instead, the most numerous prey item in Chinook salmon stomachs was the spiny water flea, an invasive zooplankton that often clumps on fishing lines and downrigger cables. Smelt were also found in significant numbers of Chinook salmon stomachs. In contrast to a similar diet study performed in the 1990s, analyses of current lake trout and walleye stomachs show significant numbers of round gobies (another invasive species) and stocked salmonids. It appears that in

In developing this proposal, the Department worked closely with an external advisory committee called the Lake Huron Citizens Fishery Advisory Committee (LHCFAC). The LHCFAC is comprised of representatives of many statewide fishing organizations that have a keen interest in Great Lakes fisheries. The Department meets regularly with the LHCFAC and this group provides important feedback on management proposals including Chinook salmon management on Lake Huron. The LHCFAC is generally supportive of significant reductions in Chinook salmon stocking throughout the lake.

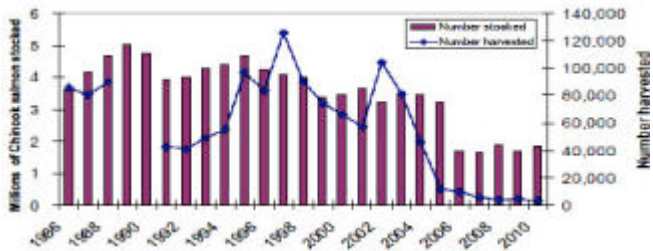


Fig 2-Lake Huron stocking/harvest of Chinook salmon (MDNR)

The Lake Huron food web has radically changed during the previous 10-15 years, and the forage base (prey fish) is no longer dominated by alewife and smelt. Increasing populations of lake trout and walleye are contributing to post-stocking predation and mortality on stocked spring fingerling Chinook salmon. In recent years the returns of stocked Chinook salmon to the creel (angler harvest) and the Swan River weir have been at record low levels, and it is estimated that more than 80% of the Chinook salmon in Lake Huron are wild. A Chinook salmon stocking reduction is a defensible approach to managing the fishery in Lake Huron and should be viewed as adaptive management in the face of historic changes to the ecology of Lake Huron.

the absence of alewife, lake trout, walleye, smallmouth bass and other predators in Lake Huron now include stocked Chinook salmon and brown trout in their diet.

Based on evaluation of these indicators, three possible scenarios for future Chinook salmon stocking have been considered by fisheries managers:

1) Maintain current Chinook salmon stocking numbers and locations on Lake Huron:

Based on an analysis of the indicators and trends discussed above, maintaining current stocking rates is not recommended at this time.

2) Maintain Chinook salmon stocking at all current locations on Lake Huron, but reduce by 50% the number stocked at each location:

Recent data suggests that stocked Chinook salmon are not surviving to be harvested, especially from mid-lake and southern ports. Also, catch rates and harvest of Chinook salmon are at all-time lows. *Consequently, this option is not recommended at this time.*

3) Maintain Chinook salmon stocking at Nunn's Creek and Swan River, and suspend Chinook salmon stocking at all other Lake Huron locations:

The DNR is obligated to stock Nunn's Creek (St. Martin's Bay) as a result of negotiations with Native American Tribes in the 1836 Treaty-ceded waters of the Great Lakes. The Swan River is an important site for Chinook salmon egg collection. *This option is an acceptable management strategy and maintaining some level of stocking at the Swan River location is recommended. A decision to discontinue Chinook salmon stocking at all other locations on Lake Huron would result in an annual stocking reduction of approximately 630,000 fish.*

In 2004, alewife populations in Lake Huron effectively disappeared from the USGS surveys. While forage fish populations tend to fluctuate over time, the alewife collapse in 2004 was extraordinary. Not surprisingly, the harvest of Chinook salmon followed a similar trend. The estimated Chinook salmon harvest from Lake Huron in 2010 was fewer than 3,200 fish, the lowest level recorded in the time series from 1986-present.

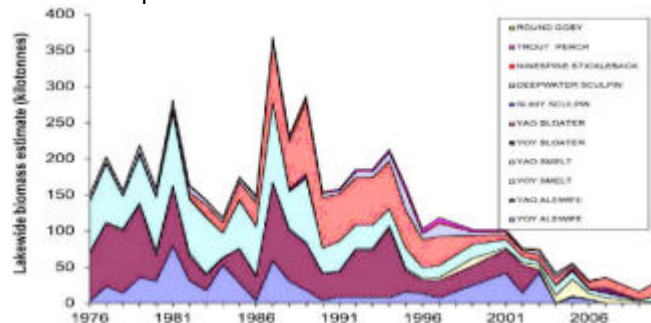


Fig 3-Bottom trawl forage fish survey data, 1976-2010 (USGS)

Stocking Options

To assess the fishery, the DNR monitors and evaluates several key biological indicators. Collectively, these serve as an index of how well stocking programs are performing and contributing to the overall fishery in Lake Huron. The indicators allow managers to track the success of previous decisions and provide them with information they need to

Decision timeline and public input

It is imperative that decisions affecting the number of fish to be stocked in 2012 are made in time to adjust fall egg take. Consequently, a decision affecting the 2012 stocking of Chinook salmon must be made by October of 2011 before egg take is completed. If stocking changes are implemented in 2012, a reasonable time frame for collection of data and assessing the impacts of the reduction is five to six years before discussing changes to future management direction. The reason is that any measurable affects to Chinook salmon fishing will most likely not become apparent for at least three years after implementation. This time frame to collect data provides fisheries managers a minimum of three full years of assessment and evaluation. Angler input is encouraged and will be accepted through August 31.

Anglers are asked to submit their comments on this proposal and associated stocking options by visiting the DNR's website at: www.michigan.gov/fishpublicinput

Written comments can be mailed to:
Lake Huron Chinook Salmon Stocking Proposal
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