Lake of the Woods Fall Gill Net Assessment

The fall gill net survey is the longest continuous data series we have. This survey has been conducted annually since 1981, and duplicates a series of fall gill net surveys conducted from 1968 through 1970. Overall, that gives us 30 years of netting data with which to examine trends and evaluate how fish populations on the Minnesota portion of Lake of the Woods have changed.

What makes this survey so valuable is that the time period in which it is conducted, and the thirteen core sites that are sampled, have not changed through the history of the survey. The only changes to the survey have been the addition of three sites (in 2001) to sample the off-shore portion of the lake. When long-term trends are evaluated these sites are analyzed separately.

With the addition of the off-shore nets, we have found differences between the near-shore and off-shore walleye and sauger populations. Walleye are usually evenly distributed through the depth ranges sampled, but average size increases as the water gets deeper. Larger sauger also inhabit the deeper portions of the lake, but sauger become much more abundant as depth increases. Keep in mind that though these generalities are true for the period sampled (September), these fish species may distribute differently at other times of the year.

The survey starts on the first working day after Labor Day, and is conducted continuously for about the next three weeks, with allowances for bad weather (wind) days. The sixteen sampling sites are comprised of four nets, each set in a different depth range. With this sampling strategy, all water from 6 through 36 feet deep is sampled.

Walleye and sauger are the primary targets of this assessment. Yellow perch, cisco (tullibee) and white sucker are also species in which we are interested. A variety of other species (13 to 16 additional species annually) are also captured, but their sample sizes are too low to follow trends.

The primary trends we follow are: growth (if fish start to grow faster they could be over-harvested), age of maturity (fish maturing earlier could be an indication of over-harvest), age distribution (losing the oldest fish in a population may be a sign of over-harvest), year class strength (allows us to look for commonalities that produce strong or weak year classes), abundance and size distribution (in combination, abundance and size distribution allow us to inform anglers of what they can expect to catch, and also to make population estimates).

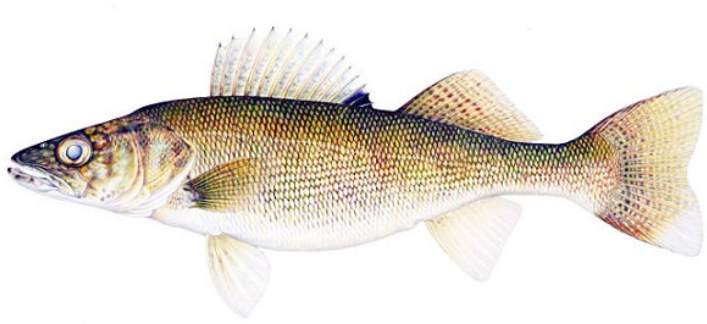
2010 Results

The fall of 2010 was a windy one, and that caused some sampling challenges. Despite the demanding conditions, sampling was completed in a timely manner. The samples collected this past September continue to describe the walleye and sauger populations as healthy.

The 2001 year class was the strongest walleye year class produced in Lake of the Woods since 1966. When this year class entered the walleye population, overall walleye abundance rose to the highest level it had been since 1970. The weak and moderate year classes produced after 2001 could not sustain the high level of abundance, and it gradually decreased through 2009. In 2010 walleye abundance increased above the 2009 level, likely due to the production of a series of moderate year classes, and the lack of a weak year class since 2004. Walleye abundance should continue to increase for the next several years, if no weak year classes are produced. The most abundant size of walleye in the gill net sample ranged from 14 to 17 inches long, though small (9-10 inch) walleye were also common.

Sauger are present at almost two times their historical average abundance. This very high abundance resulted from the production of strong year classes from 2005 through 2009. The production of 5 strong year classes in sequence is extremely rare! Anglers should expect to

catch good numbers of sauger from 10 to 14 inches long, with sauger from 11 to 13 inches long being particularly abundant in the winter of 2010-2011.

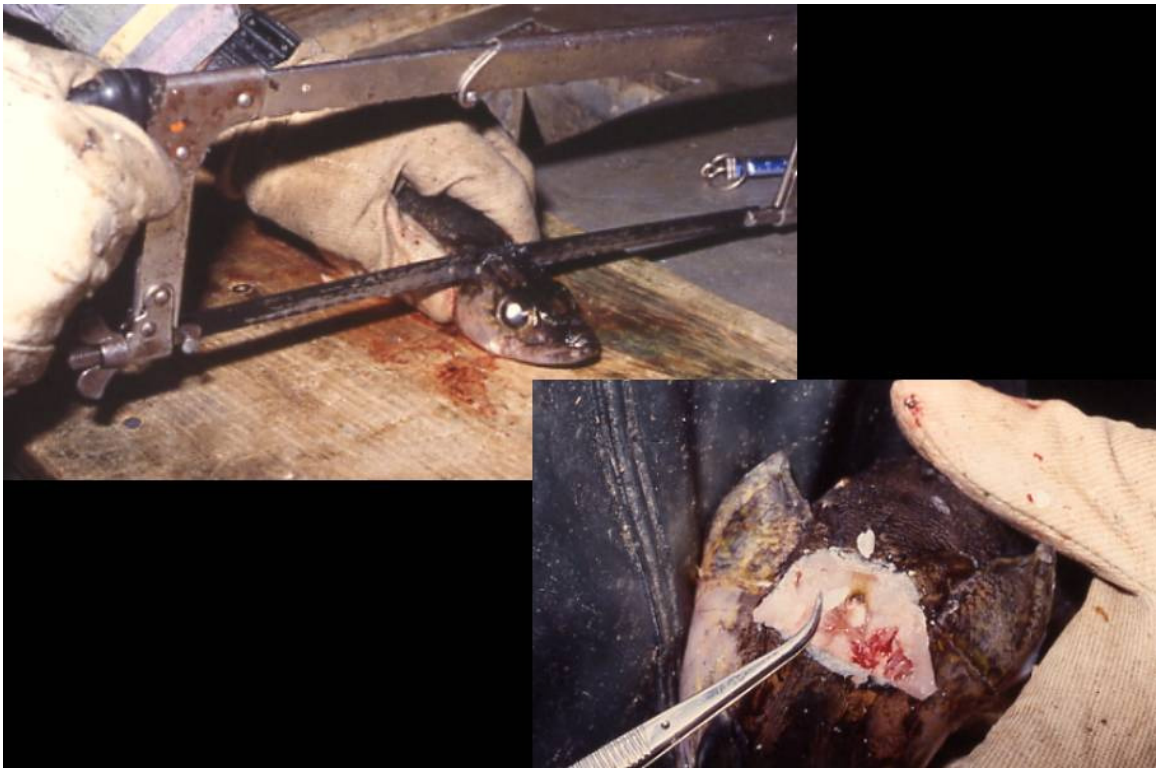


Although they are closely related, and look very similar, walleye and sauger actually have some major life history differences. Walleye grow faster, get older, and mature later than sauger. Walleye reach 12 inches in length at the end of their third growing season, while sauger do not reach that length until the end of their fourth growing season. The oldest walleye we typically sample are from age-18 to age-20, whereas the oldest sauger range from age-10 to age-14. All female walleye won't spawn until they are 8 years old, while all female sauger spawn by age-6. Even food choices vary between these species. Troutperch are a small (very few get longer than 4 inches), abundant, forage fish found in Lake of the Woods. Walleye rarely eat them, whereas sauger frequently do.

Since walleye are such an important species in Minnesota, a lot of basic research has been devoted to them. One of the outcomes of this research is that the gill net catch rate (combined with the size distribution of the sample) can be converted to a population estimate. In September 2007, the Minnesota portion of the lake held about 2.5 million walleye longer than 12 inches. About 430,000 of these walleye were also longer than 16 inches. Combining the information collected during creel surveys with these population estimates reveals that anglers harvest from 15 to 20% of all walleye longer than 12 inches, annually.

Lifting gill nets on Lake of the Woods.

Measuring the length and weight of a walleye.



Collecting otoliths, the structure used to age walleye and sauger.

Back in the lab, aging an otolith collected from a walleye.