



# MDNRE



## CHARLEVOIX FISHERIES RESEARCH STATION 2009 FIELD SEASON NEWSLETTER

January 2010

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The Charlevoix Fisheries Research Station (CFRS) staff and research vessels are employed to provide information, models and advice to make possible science-based management of Michigan's fishery resources. CFRS is responsible for MDNRE Fisheries Division research needs for the Lake Michigan basin. This first annual newsletter is designed to summarize most of the field and lab activities completed during the last year by the CFRS staff. *[Note: Sample processing and data analysis are incomplete for some 2009 sampling activities. In those cases, complete results for 2008 surveys are presented.]*

### **CODED WIRE TAGGING**

CFRS staff who run the Coded Wire Tag (CWT) program have continued to mark fish in the 2009 year. Approximately 305,000 Chinook salmon and 60,000 rainbow trout were marked with a CWT and adipose fin clip in 2009. In addition, over 1,700 lake sturgeon were also marked with a CWT before being planted into the Black Lake system. For the third consecutive year, the 2009 budget cuts reduced the effort in

collecting heads from sport fishermen. "Headhunters" (seasonal employees specializing in tag collection) who are strategically placed through Lakes Michigan and Huron to collect CWT heads were not hired. CFRS staff and other fisheries personnel managed to attend five tournaments in 2009; this allowed for observation of >6,000 trout and salmon, from which 330 CWT fish heads were collected.



In regards to CWT head sampling and processing, the 2008/09 samples were collected from the following sources: DNRE/Tribal assessment samples (5%), sport fisheries (60%), and harvest weirs (35%). The total number of fish processed in 2008/09 (2,800) was lower than the average for the period 1990–2007. All CWT fish heads were checked for tags and, when present, tags were removed, read, and recorded in a database. This data was then provided to other researchers and managers (both within and outside the MDNRE) for

additional analysis and modeling applications, as requested. Data is also posted for public access on the MDNRE internet site ([www.michigan.gov/taggedfish](http://www.michigan.gov/taggedfish)).

### CHARTER BOAT SURVEY

The objective of the state-wide Charter Boat Program is to obtain a continuous annual record of charter boat fishing effort, harvest, and harvest rate of the major sport fish in the Michigan waters of the Great Lakes.



In 2008, a total of 59,840 charter anglers participated in 14,226 excursions on the Michigan waters of Lakes Michigan, Huron, Erie, Superior, and the St. Clair system (including the major tributaries), and spent 336,465 angler hours fishing. Charter operators reported 151,612 fish harvested from the Michigan waters of the Great Lakes with the following harvest by species: Chinook salmon (68,906), walleye (23,065), lake trout (22,811), yellow perch (17,092), rainbow trout (7,707), coho salmon (6,643), and brown trout (580). In comparison to 2007, both effort and harvest were down slightly. Detailed charter fishing results for the 2009 season are available on the MDNRE internet site ([http://www.michigan.gov/dnr/0,1607,7-153-10364\\_52261\\_47568---,00.html](http://www.michigan.gov/dnr/0,1607,7-153-10364_52261_47568---,00.html)).

Also in 2009, CFRS personnel made presentations explaining charter survey results at Michigan Sea Grant workshops, Michigan Charter Boat Association meetings, fisheries workshops, MDNRE Citizen's Advisory Meetings, and other public and agency meetings.

### MICHIGAN STATEWIDE ANGLER PROGRAM

The objective of the Statewide Angler Survey Program (SASP) is to obtain a continuous record of sport fishing effort, harvest, catch and harvest rates, and species catch composition for key Great Lakes, tributary, and inland fisheries for the State of Michigan. Although many CFRS staff devote their time to managing this program, it requires much more effort from Fisheries Division personnel statewide. In fiscal year 2009, the SASP conducted winter surveys at 26 discrete sites (9 inland and 17 on the Great Lakes and Great Lakes tributaries) and summer surveys at 76 discrete sites (8 inland and 68 on the Great Lakes and Great Lakes tributaries). Field oversight and quality assurance/quality control (QA/QC) occurred at three levels: supervisors and lead workers reviewed clerk performance in the field, data were received and reviewed every two weeks by personnel at the Institute for Fisheries Research in Ann Arbor, and program supervision and oversight occurred from Ann Arbor, Lansing, and Charlevoix.



Monthly estimates were made for species-specific fishing effort, harvest, harvest rate, catch, and catch rate for all sites surveyed in 2008. These measures are used by fisheries managers and researchers to monitor angling trends, identify potential management issues, supplement data on fish population trends, and help manage sport fisheries. SASP data can be obtained by contacting the CFRS.

## WEIR HARVEST

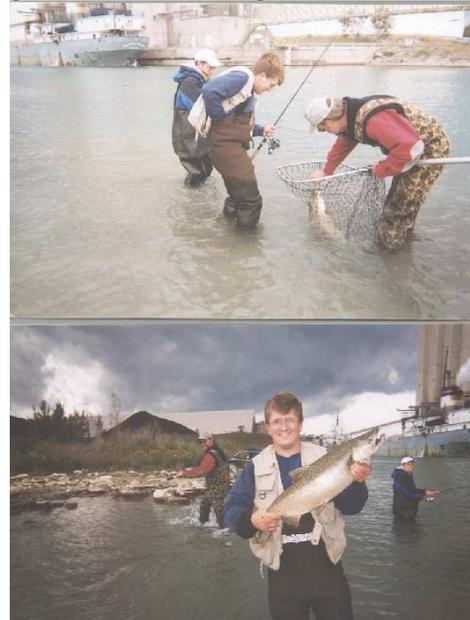
Every year the CFRS staff assists in the harvest, bio-sampling and evaluation of salmonid returns to weirs in Michigan's waters of the Great Lakes. The objective is to annually monitor and record returns of Chinook salmon, coho salmon, and steelhead trout to Michigan weir operation facilities, provide annual estimates of size-at-age, collect data and report on contracted salmon harvest operations and to provide annual data summaries of weir returns to be used in Management Unit reports, Great Lakes Fishery Commission (GLFC) reports, MDNRE web site updates, and for distribution to interested researchers and the public.

Returns of Chinook salmon to Lake Michigan and Lake Huron harvest facilities were well below the long-term average. Returns of coho salmon to Lake Michigan weirs in 2008 were lower than in 2007 and more similar to those in 2006, which was the lowest recorded during the 1983–2008 time series. Data collection for 2009 weir returns is still being analyzed.

The Medusa weir, which is managed by CFRS staff, is primarily a harvest weir that is operated by the salmon harvest contractor (currently American Canadian Fisheries, Bellingham WA). Chinook

and coho salmon found in the Great Lakes will die once becoming sexually mature. This is why it is vital to have a collection process that will utilize these thousands of salmon that will be dead within weeks.

In years when salmon returns to our primary egg take facilities are reduced, Chinook salmon eggs have been taken from the Medusa weir to help supplement hatchery stocks. Typically during the salmon run, harvests are conducted every two to three days all the while fishermen converge to the Charlevoix area to participate in the great salmon fishing.



Fortunately, because of our proximity to the Medusa facility, CFRS staff can do much of the bio-sampling (i.e.; collecting CWT heads, OTC tail samples) needed right here in Charlevoix, saving time of staff collecting bio-samples at the weir processing facility. Area school groups make regular visits to tour the weir facility and learn about the life cycle of the Chinook salmon (see photo below).



In addition to the fall harvest, the Medusa weir in Charlevoix plays a vital roll in the spring, when hundreds of thousands of four-inch Chinook salmon “smolts” are acclimated to the lake system for about three weeks. Twice a day, staff head down to the weir to inspect and feed these fish. Just after Memorial Day, the fish are released at night and start their two to three year growth spree before returning as mature salmon.



**SMALL VESSEL ACTIVITIES**



*Spring Larval Sampling.* The schedule for the CFRS small boat *R/V Pimephales* started shortly after ice out. Both larval neuston and conical netting were completed in Elk Rapids, followed by

Charlevoix. The objective in Elk Rapids was to determine peak hatch and abundance of coregonus (whitefish) species. For the last two years, peak hatch has occurred between the first and second week of May.



Larval Whitefish and Yellow Perch



As the spring progresses we move our larval sampling up to the Charlevoix area. For the past two years, CFRS staff have been trying to determine the potential contributions that drowned river-mouths such as Lake Charlevoix have had on the Lake Michigan yellow perch population. The objectives are to document peak hatching, which has occurred between mid and late June, and evaluate movement of larval fish between Lake Charlevoix and Lake Michigan.

*Juvenile Whitefish/Cisco Sampling.* From May through July, staff head down to Elk Rapids on a weekly basis to sample juvenile lake whitefish and cisco (herring). The sampling techniques used are mini-fyke nets and seines. At this

time of year, the juvenile fish are growing at a rapid rate and are a significant component of the near shore fish community. The objectives of this sampling are to determine lake whitefish and cisco population numbers, and to evaluate interactions with other near-shore Lake Michigan fish, including predators.

*Lake Trout Sampling in Elk Lake.* In an attempt to sample lake trout for a potential future movement study, CFRS staff sampled Elk Lake during the spring, summer and fall of 2009. Once funded, the objective of the study will be to determine the preferred habitat of lake trout in this inland lake, including spawning substrate. To track these fish, we will need to live trap as many as 100 lake trout and implant sonic tags before releasing them.

For our 2009 sampling, the goal was to determine the best sampling techniques to capture live lake trout. We were very surprised to find out we could not live capture more than a two or three lake trout in the spring using different size trap nets. Even though they were occasionally spotted cruising the shallow water after ice out.

Next, we returned the first week of June in an attempt to locate the fish using bottom and suspended gill nets. Because our goal has always been to catch these fish alive and in condition to be released, we set our nets at night and retrieved them after only one to two hours. It was determined that, with the catch of only a few lake trout and the fact that water temperatures were starting to climb, it would be a bad time of the year to sample for a tagging study.

Finally, we returned in the fall when the temperature was dropping and during lake trout spawning, thinking we could catch the fish in shallow water. We used overnight sets of monofilament, 4.5 inch gill nets that were six feet high by 1,000 feet long. Once again, we were amazed to find we only caught lake trout in deep (60-125 feet) water. However, due to the lower water temperatures, the fish appeared to be in good condition. In total, we collected 16 fish in two, 1,000 foot overnight sets. The majority of the fish were ripe and appeared as though they could be spawning in deep water.



*Small Boat Bottom Trawls.* The CFRS staff, with assistance from area DNRE fisheries personnel, conducts annual yellow perch assessments according to established multi-agency lake-wide assessment protocols. While catch of age-0 yellow perch in 2009 was slightly greater than that observed in 2007/08 in some areas of Lake Michigan, recruitment in 2009 was relatively low (weak) in most areas of the lake, in comparison to long-term averages. Recruitment in all areas of the lake was significantly less than that observed in 2005, when young-of-year production was the highest observed in at least 16 years for all areas of the lake.

On an annual basis, we attempt to sample for two nights during dusk and dark at the following ports: South Haven, Grand Haven, Pentwater and Charlevoix/Petoskey. The trawl we use has a 15 foot wide by one foot high opening. The net is designed to stay open by using “doors” which work much

the same way as a planer board, except that the doors sink the net to the bottom. The fish that are not fast enough to escape the moving net are then herded toward the back by the force of water. Once the trawl is retrieved to the boat, the back end of the net (which is called the “cod” end) is then opened and the fish are dumped out.

*Lake Trout Egg Abundance Project.* In the fall of 2000 the CFRS staff (MDNRE), Little Traverse Bay Bands of Odawa Indians (LTBB), the Department of Fisheries and Oceans (Canada) and the University of Vermont were funded to study Lake Trout spawning behaviors on multiple spawning sites in Lakes Michigan, Champlain and Huron (Georgian Bay). This study documented things like adult spawning abundance, egg deposition, egg predator abundance, and substrate quality.



Since the completion of this project, CFRS, LTBB and Grand Traverse Bay Band staffs have continued to sample four near-shore lake trout spawning sites. Thirty egg nets are buried annually at each site in September (prior to spawning activity) and then retrieved after spawning in mid-November. The work-up of the egg nets then occurs, keeping track of all eggs and egg predators (i.e.-gobies and crayfish). In 2009, we saw a slight drop in the number of lake trout eggs present while

the number of potential egg predators was on a slight increase.

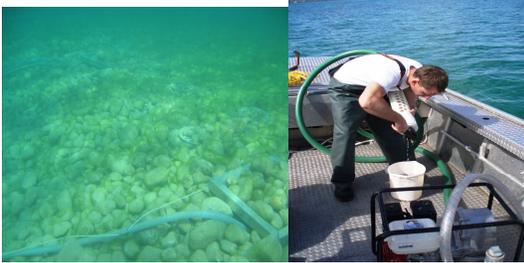
*Cisco Project, Elk Rapids.* Over the past few years, CFRS staff have come to realize the extremely active spawning grounds just outside the port of Elk Rapids in Grand Traverse Bay. This discovery, especially of the remnant stock of cisco (lake herring), has prompted researchers from CFRS to join a multiple agency project that is investigating cisco in Lakes Huron, Michigan and Superior.

The objectives are to examine annual variability in larval abundance and larval production per spawner, correlate larval densities with year-class strength, and test the hypothesis that growth potential at the larval stage and not predation is the dominant factor governing recruitment variability.

In the fall of 2009, staff at the CFRS set three 1,000 foot, 4.5” mesh monofilament gill nets every other week from the first week of October until mid-December. The data gathered here have helped correlate the juvenile and adult cisco abundance on the Elk Rapids spawning reef. Also, on November 9, staff used the *R/V Pimephales* and conducted a hydro- acoustic survey just off the spawning reef to determine adult abundance.

*Spawning Site Selection, Elk Rapids.* Central Michigan University and CFRS staff have initiated a study with the objective of determining if there is an efficient way to measure egg deposition and determine if there are microhabitat variations on spawning reefs used by lake trout and whitefish. Egg nets and egg funnels were compared to determine the best egg deposition sampling gear. Funnels, if they operate as expected, will permit regular sampling of egg

deposition without the need for repeated diving operations. Then the microhabitat was evaluated by measuring substrate characteristics (e.g.; size, substrate depth, and slope), predator abundance, water depth, quantity of lake current and wave disturbance, algae coverage, zebra / quagga mussel coverage, and water temperature.



The second field season of the study occurred from the first of October until the first week of December, 2009. CFRS and CMU staff organized a sampling schedule that required weekly pumping of 15 funnels that were originally buried by divers. A total of 90 egg nets, which were also buried by divers, were retrieved on November 10<sup>th</sup> and December 7<sup>th</sup>; forty-five nets were retrieved each date. The intent was to collect the nets after lake trout spawning (November) and after whitefish spawning/freeze up (December). The pumping of the buried funnels unexpectedly produced an efficient method to collect one of the Great Lakes new invasive species, *Hemimysis anomala* (aka, “bloody-red shrimp”).



The 2009 sampling season was a dream! Weekly sampling was never postponed or eliminated due to weather. Most of the fall was warmer and calmer than usual and the winter freeze up did not occur until a week or two after we finished sampling.

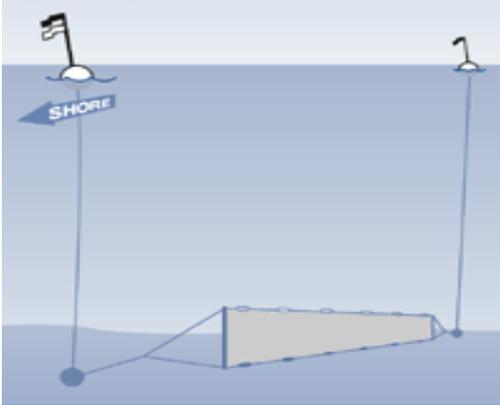
## LARGE VESSEL ACTIVITIES



*S/V Steelhead*

*Lakewide Assessment Plan.* Each spring, the CFRS vessel *S/V Steelhead* conducts a survey of the Lake Michigan fish community in a coordinated effort with other states and tribal agencies. The main goal is to determine relative abundance of lake trout, lake whitefish, burbot, and yellow perch. While achieving this goal, we also collect biological information on these species to determine growth and maturity, diet, and fish health and condition. In addition, samples from this survey are often provided to other agencies and universities; for example, in 2009 we provided samples to USGS for a predator diet analysis and to the University of Toledo for studies of yellow perch population structure (genetics). Fish are collected from 6 locations (South Haven, Saugatuck, Grand Haven, Arcadia, Leland, and Charlevoix). Net locations at these ports are randomly selected a certain distance from the piers. Two days of netting are required at each port, a day of netting north of the pier and one south of the pier. Due to reductions in our budget, Charlevoix was not sampled this year.

Sampling gear used for this survey consists of 8,000 feet of 6 feet high bottom gill nets that range from 1.5 inch mesh size (to capture small fish) to 6 inch mesh size (to capture large fish).



The S/V *Steelhead* usually leaves Charlevoix the last week of March. As you can see, in some years winter can still have a tight grip on northern Lake Michigan.

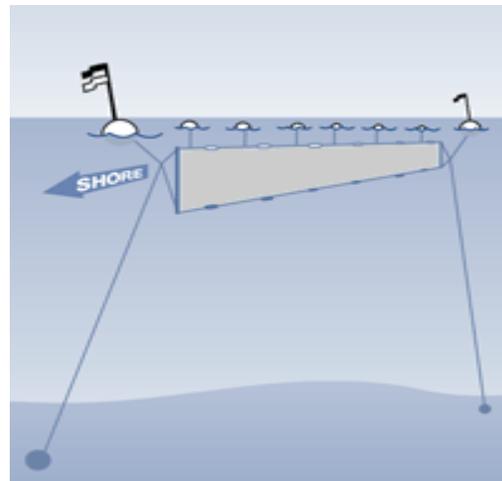


For this reason, we usually begin the survey in the southern end of the lake and work our way north. In 2009, we collected 845 lake trout; the majority of those were caught near Frankfort (339). Lake whitefish catch was 288 fish and 197 of those were caught out of South Haven. We caught 55 burbot and about 70% of those came from Leland. We had a good catch of yellow perch (1,319) this year. Most of these fish came from South Haven and Grand Haven. The yellow perch population declined dramatically in the early 1990s and recently we have seen some increases. The fishing has picked up the last few years and more people are targeting them again. Most of the yellow perch caught this year were 4 year old fish (2005 year class), and a lot of them are

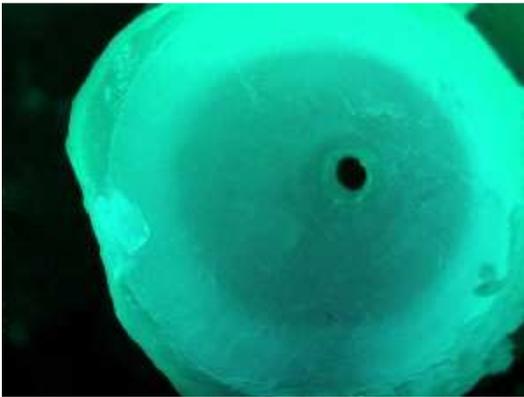
getting big enough to please Lake Michigan perch anglers (see photo, below).



*Chinook Salmon Natural Reproduction Study.* 2009 is the first year of an expanded study (in collaboration with MSU) to measure how many naturally-reproduced Chinook salmon are in Lake Michigan. Starting in 2006, every Chinook salmon that was stocked into Lake Michigan was fed an antibiotic that leaves a fluorescent mark on bony structures that can be seen using a specially-equipped microscope. To determine the ratio of naturally-reproduced fish to hatchery fish, we collected age-1 Chinook salmon during late spring using gill nets that are suspended high in the water column. The graphic below shows what our net would look like if viewed under water.



During this time of year, most young salmon are concentrated in the warmer waters in the southern end of the lake and that is where we put most of our effort. Many samples are also collected from fish captured during fishing tournaments and at weirs. To determine whether the fish is a hatchery product or was spawned naturally, we collect vertebrae from each fish and use UV light to look for a fluorescent mark. CFRS staff collected 73 samples from salmon captured during our vessel survey. Statewide, MDNRE collected about 600 samples. Samples are still being processed and results are pending. Analysis of samples from previous years indicates that almost 50% of the Lake Michigan Chinook salmon population is wild fish.



*Acoustic Survey.* A lakewide prey fish survey is conducted in collaboration with the US Geological Survey (USGS) in the late summer/early fall each year. Our research vessel collects data in the Michigan waters of Lake Michigan and the USGS collects data in the Wisconsin/Illinois/Indiana waters. Sophisticated sonar is used to collect information that is stored on a computer. Data is collected on predetermined courses/transects and the number of prey fish are counted for that area. Trawls with sensors attached let us know where the trawl is in the water column. This

allows us to deploy the trawl at the depth we are seeing fish on the sonar unit, to determine what species of fish are present. The number of fish seen on these transects is extrapolated out to get a lakewide estimate of the number and weight of prey fish by species in Lake Michigan. This work is done at night when prey fish move up in the water column to feed on various forms of plankton and invertebrates.

Acoustic transects surveyed by CFRS totaled 150 miles in length and included midwater trawling and mysid sampling at 10 offshore locations ranging from New Buffalo to the Fox Islands. Preliminary findings suggest that total prey fish biomass increased in 2009, most likely influenced by recent Chinook salmon stocking reductions. The increase in bloater chub recruitment, as indexed by the acoustic survey, appears to be continuing through 2009 and we expect to see increases in adult bloaters in the near future. This year we had a couple nights of rough seas, but for the majority of the survey we had excellent weather. Below is an example of how far out in the lake we collect information (sometimes as far as 50 miles from shore). Chicago seems like a stone's throw away!



## OTHER ACTIVITIES

*Tribal Coordination Unit Musky Project.* This spring staff assisted the MDNRE Tribal Coordination Unit, who are involved in a muskellunge movement

study with the University of Michigan. The objective is to collect, tag with a sonic transmitter, and track muskies within the Antrim Chain-of-Lakes. These sonic transmitters, which are slightly larger than a AA battery, are surgically implanted into the fish's body cavity.



In 2008, eleven muskies were tagged, of which eight were with sonic transmitters and three with jaw tags. In 2009, eleven fish were tagged with a sonic transmitter. It just so happened that the State Record musky that was caught in September of 2009 by an angler in Torch Lake was one of the fish implanted with a sonic transmitter prior to spawning (see below).



*State Wide Stocking Program.* Every year, staff from the CFRS assists in the stocking of trout and salmon from the state hatchery facilities to designated lakes and rivers. In 2009, CFRS staff delivered brown trout and rainbow trout from the Oden Hatchery (near Petoskey, MI) to the Huron River (Oakland

County) and the Spring Mill Pond (Livingston County).

*Beaver Island Smallmouth Bass Study.* CFRS staff once again assisted Central Michigan University (CMU) in conducting a smallmouth bass population and movement study in the waters around the Beaver Island Archipelago. Two weeks of trap netting and fish movement tracking was conducted in early June and late July. Smallmouth bass collected in the trap nets were measured, age structure samples were taken, and fish were given a jaw tag before being released. Any recaptured fish – fish that were tagged in previous years – were measured for individual growth comparisons. Tag numbers of all fish captured were recorded to allow calculation of population size.



In 2009, CFRS and CMU staff expanded the smallmouth bass population study to the Waugoshance Point area. Waugoshance Point and Beaver Island waters have historically had good smallmouth bass populations. It was determined that a reevaluation was needed to document how the Waugoshance Point population has changed since it was last sampled (1955!).

*Net Repair.* Each winter the vessel crew works endlessly to maintain the various nets we use, and to build new nets for upcoming projects. This year CFRS staff repaired the large midwater trawl used for the acoustic survey and 3 of the yellow perch bottom trawls. Gill net construction and repair included 7,200

feet of new Chinook salmon nets built for the natural reproduction study, 1,500 feet of cisco net repaired and ready to go for next fall, and 18,000 feet (almost 3.5 miles) of the bottom gill nets used for our spring LWAP study repaired. In addition, two large trap nets are currently under construction that will be used by the Alpena Fisheries Research Station to collect cisco in the St. Mary's River.



*VHS sampling.* By now it seems everyone has heard about or been affected by the new fish disease, Viral Hemorrhagic Septicemia (VHS). Lake Michigan is classified within the VHS Surveillance Management Area. This means it has not been clearly discovered in our waters of Lake Michigan, but could spread here, most likely from Lake Huron where it has been found. CFRS staff each year collects a number of fish species and sends either whole fish or tissue samples to the Michigan State University's Health Lab. This year we collected and sent 60 yellow perch and 60 alewife from South Haven. Tissue samples (spleen and kidney) from 60 lake whitefish were collected at Saugatuck. At Grand Haven we collected 60 yellow perch and 60 alewife, and we collected 11 whole yellow perch, 60 alewife, and 12 round

goby from Arcadia. All samples came back negative for VHS.



*Fish aging.* One of the most time consuming and important activities occurring at the CFRS during winter months is determination of the age of fish sampled in our various lake surveys. Fish are aged to provide us with important information about a fish population, such as growth rates, age-at-maturity, age composition, mortality rates, or maybe even how many times certain fish spawn. This information can be used to make better management decisions for certain lakes or certain populations of fish. CFRS staff aged approximately 1700 fish this past year.

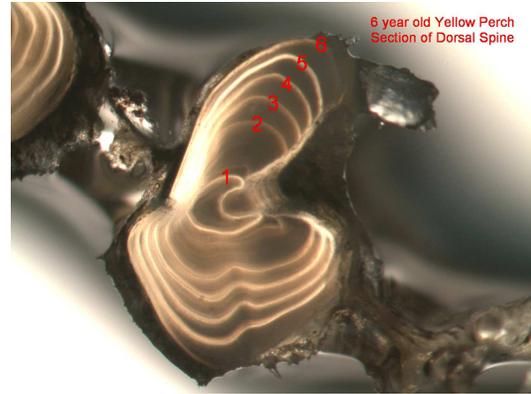
Fish can be aged using almost any bony structure. Some of the most popular are scales, spines, otoliths, and opercles. Scales and spines are advantageous because the fish doesn't have to be killed to collect the aging structure. Otoliths and opercles may be taken as well when fish will be sacrificed for other research purposes (e.g., contaminant sampling).

*-Scales:* Scales are scraped from a fish using a knife and dried in a labeled coin envelope. The most accepted method of evaluating scales is to press a number of scales onto a piece of acetate (plastic). The acetate slide is run through a roller press to obtain an impression of the

scale. The slide can then be read using a variety of magnifying tools including a microfiche reader or a microscope. When a fish grows, it forms circuli on its scales. During winter, when fish eat less and their growth slows, the circuli on the scales are close together and sometimes overlap. When spring comes, feeding and growth increase and the circuli on the scale are spaced farther apart. To determine the age of a fish, we count the annuli, which is the area where the circuli are spaced close together or overlap. So we are really counting the number of winters a fish has lived through. The image below is of a Chinook salmon scale.



*-Spines:* Spines are cut from the fish with scissors and placed in a labeled envelope to dry. The spine can then be cut using some sort of saw; we use a Dremel tool. A thin cross section is cut from a single spine and is placed under a microscope. Annuli are seen as lighter colored rings. Below is an example of a sectioned spine from a yellow perch.

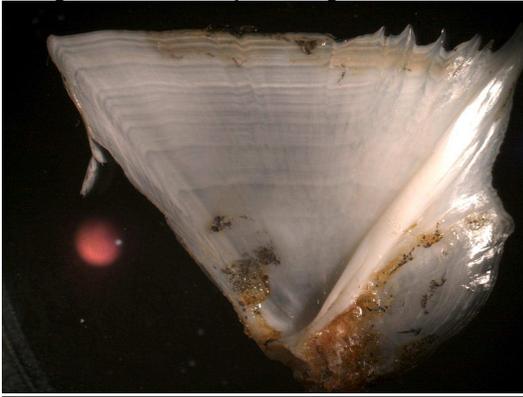


*-Otoliths:* Otoliths are small bones found in the head of all fishes. They perform similar duties to our inner ear, which is to maintain balance. Otoliths are removed from the fish and can be stored dry or in many different liquids. For most fish there are two major ways to prepare and age otoliths, the “section and mount” method and the “crack and burn” method. To begin both methods, the otolith must be broken in half through the center or focus of the otolith. To proceed with the “section and mount” method, one of the otolith halves is mounted in glue on a glass slide with the focus end down. The otolith is then sectioned until proper thickness is achieved to see the annuli. We use sandpaper to grind the otolith down until the right thickness is found. The annuli are seen as darker rings.

In the “crack and burn” method, the sectioned (focus) end of the otolith is charred by an open flame and mounted in clay with the charred end facing up. The annuli are turned a darker color and are therefore easier to see. Below is an example of a “sectioned” otolith from a yellow perch (left) and “cracked and burned” otolith from a burbot (right).



*-Opercles:* Opercles are a thin bone on the gill plate of some fishes. They are removed from the fish with a scalpel and the remaining tissue is cleaned off. Opercles are aged by magnifying the whole opercle with a microfiche reader or microscope. Annuli are seen as varying light and dark areas (depending on whether incident or background lighting is used). The picture below is of an opercle from a yellow perch.



*Public presentations.* During 2009, CFRS staff made numerous presentations to inform public groups concerning station, Division, and Department activities. These included presentations to local Kiwanis and Rotary clubs, Michigan SeaGrant workshops, and various area school groups. We also hosted groups at the station, providing tours of our facilities and of the Medusa Creek salmon harvest facility. Groups and individuals who are interested in learning more about what we do are encouraged to contact the station for information, a presentation to your group, or to arrange a tour.

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Web page:

[http://www.michigan.gov/dnr/0,1607,7-153-10364\\_52259\\_10951\\_11301---.00.html](http://www.michigan.gov/dnr/0,1607,7-153-10364_52259_10951_11301---.00.html)

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