CHARLEVOIX FISHERIES RESEARCH STATION

2015 FIELD SEASON NEWSLETTER

Produced by Nathan Skop and Patrick O'Neill

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 MDNR Fisheries Division research needs in the Lake Michigan basin. This annual newsletter is designed to summarize the field and lab activities completed during the past year by CFRS staff. *[Note: Sample processing and data analysis are incomplete for some 2015 sampling activities. In those cases, complete results for 2014 surveys are presented.]*

Feature Story: <u>If you build a reef, the fish will come</u>. For several years, CFRS, The Nature Conservancy (TNC), and Central Michigan University (CMU) have been monitoring the complex life cycles and species interactions on spawning reefs located in East Grand Traverse Bay near Elk Rapids. The goal was to someday restore a degraded reef area back to a viable spawning reef. In 2015, this goal became reality when all the partners involved worked together to add approximately 450 tons of specially selected rocks onto the degraded dock reef site.

450 tons of rock waiting to be loaded on a barge.

Barge in place next to the dock reef.

Degraded dock reef site.

Restored dock reef site.

The rehabilitated reef will hopefully provide the interstitial (voids in between the rock) spaces fish eggs need to escape predation and adverse environmental conditions until hatched. This in turn will hopefully increase population numbers for lake whitefish, lake trout, and especially lake herring. Lake herring populations have been depressed for many years due to overfishing and habit loss, but in recent years have shown an increase in abundance in Lake Michigan.

The team will measure the success of the reef by seeing how many eggs are deposited on the reef during the fall spawning season, how many eggs survive, and how many adults return to spawn each year. This monitoring will be achieved by using egg bags and funnels to collect eggs as they fall onto the reef. Additionally, spawning adults will be observed by using GoPro cameras with time lapse capabilities.

Lake trout checking out the newly restored reef.

In addition to the reef rehabilitation, there is an ongoing effort to control egg predators such as round gobies and rusty crayfish which have been found to increase in abundance during fish spawning. The discovery of this coinciding egg predator migration and fish spawning have indicated that egg predator suppression and reef rehabilitation together could be the key to a successful reef.

The partners will be using this reef to gain experience on both fighting invasive species and restoring reef habitats that they can apply to future reef projects. To learn more about the reef restoration project please visit The Nature Conservancy link below:
http://www.nature.org/ourinitiatives/regions/northamerica/unitedstates/michigan/explore/grand-traverse-bay.xml

LARGE VESSEL ACTIVITIES

S/V Steelhead tied to the dock in Ludington.

Lake-wide Assessment Plan (LWAP): Each spring the CFRS vessel *S/V Steelhead* conducts a survey of the Lake Michigan fish community. The main goal is to determine relative abundance of lake trout, lake whitefish, burbot, and yellow perch. Fish are collected from 8 locations (St. Joseph, South Haven, Saugatuck, Grand Haven, Arcadia, Leland, Elk Rapids, and Charlevoix) using 6 foot-high, graded mesh (1.5" to 6") bottom gill nets.


Deploying bottom gill net during the spring survey.

In 2015, the *S/V Steelhead* departed from Charlevoix on April 27th in route to southern Lake Michigan to begin the LWAP survey. Overall the 2015 spring survey went really well, the weather was good, water temperatures were normal, and the catch of fish was about average. From the time the first net was set on May 4th until the last net was lifted on June 30th, a total of 1,509 lake trout were collected. In 2015, we collected 118 "No Clip" (NC) lake trout which is more than any year previous; this could be a sign of increased natural reproduction. Lake whitefish catch totaled 522, which was more than double the catch in 2014. The yellow perch catch was up from 2014; a total of 917 perch were collected.

Acoustic Survey: The acoustic survey was conducted between August 10th and 28th at 10 predetermined transects from northern Lake Michigan to St. Joseph. The goal of the survey is to estimate prey fish distribution, abundance, and biomass. As fisheries managers deal with declining salmon fisheries due to low alewife abundance, the acoustic survey has become extremely important.


Mid-water trawl collection of age-zero alewives and a lake whitefish.

The results from the survey showed that the abundance of the 2015 alewife year class was higher than in 2013 and 2014 but is likely below the long-term average, based on the relatively restricted lake wide distribution that was observed in 2015. Young-of-the-year alewives were less prevalent in the north and more prevalent in the southern portion of the lake. Fewer adult alewives were observed, with only a few areas of the lake having an abundant adult presence. The 2015 bloater year class is likely above average in abundance; however, rainbow smelt continue to be present at low densities in Lake Michigan waters. Young-of-the-year yellow perch were observed at relatively high densities and capture of this species offshore is indicative of abundance that is higher than average.

2015 young-of-the-year and age 1 alewife.

Large vessel bottom trawling: In early September the *S/V Steelhead* conducted the annual bottom trawl survey, primarily to assess yellow perch populations. The primary yellow perch ports are South Haven, Grand Haven, Pentwater, and Petoskey. During the trawl sampling a total of 433 yellow perch were caught and used for year-class strength determination. Round gobies continue to make up a large portion of the catch, with 4,273 caught during bottom trawling in 2015.

Little Traverse Bay trawl haul.

For more information regarding the work performed aboard the *Steelhead* or any other research vessel please visit the links below.

Vessel Program Newsletter:
http://www.michigan.gov/documents/dnr/2015ResearchVesselNewsletter_512294_7.pdf

Research Vessel Fact Sheet:
http://www.michigan.gov/documents/dnr/RV-FactSheet_454641_7.pdf

CODED WIRE TAG PROGRAM

The mass-marking initiative continues to be at the forefront of the Coded-Wire Tagging (CWT) Program. However, the collections of samples are just as important. Due to the efforts of many involved in the mass marking program, including many CFRS staff, researchers have been able to conclude that more than 90% of chinook salmon stocked into Lake Huron are swimming over to Lake Michigan. In the past there was about a 10% swim over. In fact, before

the Lake Huron salmon crash of the early 2000's, it was believed that the number of salmon passing back and forth between Lake Michigan and Lake Huron cancelled each other out. Salmon management continues to be a difficult practice when you have to consider fluctuating natural reproduction and the movement between the two lakes. The only significant controls we have are stocking numbers and harvest bag limits.

DNR staff asks for your continued support in the collection of trout and salmon head samples from fish which were given an adipose clip to signify they were tagged. CWT head drop sites and data results are available at the MDNR internet site.
http://www.michigan.gov/dnr/0,4570,7-153-10364_52259_10951_11301-97831--,00.html

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. Over the past year, staff of the CFRS has been working hard to keep up with the "information age" and more importantly developing a system to get real time data to managers. This effort will continue moving forward this year with the development of an improved electronic reporting system.

Detailed charter fishing results from previous years and information on what you need to do to register as a charter captain is available on the MDNR internet site
http://www.michigan.gov/dnr/0,4570,7-153-10364_52259_47568---,00.html

SMALL VESSEL ACTIVITIES

R/V Pimephales bottom trawling

Small Boat Bottom Trawl: The bottom trawl survey is used to collect important near shore fish community information, with a primary focus on yellow perch recruitment. CFRS crews were able to sample at three ports (South Haven, Grand Haven, and Pentwater) in late summer 2015. Young-of-year yellow perch catch was about average, with 0-72 fish captured per hour of trawling. While these numbers are lower than observed in peak years of yellow perch reproduction, other indicators (e.g.; offshore trawl catch, collections in other state waters) hint at 2015 being a good year for Lake Michigan yellow perch.

In addition to providing an annual index of yellow perch reproduction, nearshore trawling data and samples are often used in collaborative research projects with universities and other agencies. In 2015, nearshore samples were shared with Grand Valley State University researchers investigating the interactions between drowned river-mouth lakes and Lake Michigan yellow perch populations.

Elk Lake Lake Trout Study: The work on Elk Lake was stepped up this year with the tagging of 14 lake trout using acoustic tags. These are tags that when pinged from a surface unit or a fixed location unit will identify the direction and possibly the depth (depending on tag type of a tagged fish). Although we struggled with fish survival after tagging, the data we gathered from the remaining fish was extremely valuable. It was determined that the lake trout in Elk Lake that are naturally reproducing are spending the majority of the year in colder temperature. This may be due to the available forge and/or oxygen levels. Although we believe lake trout are spawning in some of the deeper water of Elk Lake, we have yet to find actual eggs. However, evidence collected to date seems to indicate that Elk Lake lake trout a significantly different than the shallow water spawners found in the north end of Lake Michigan.

OTHER ACTIVITES

Asian Carp Exercise: In early August, staff traveled down to Illinois to assist the ILDNR and commercial fishermen to halt the spread of Asian Carp up the Illinois River; currently carp have been found within 20 miles of Lake Michigan. The mission was to understand the best possible removal methods and then try new methods to maximizing the exotic species removal. In the three field days on the water, the collaborating team removed over 80,000 pounds of Asian carp.

https://www.youtube.com/watch?v=Xd31bxvTAMU

Hunt Creek Sampling: In mid-October Charlevoix personnel assisted Alpena Research Station in conducting the annual Hunt Creek trout survey. Crews used electro-fishing equipment to collect fish within four sections of Hunt Creek. A total of 4.2 miles of Hunt Creek was sampled during both the mark and recapture run.

Hunt Creek brown trout.

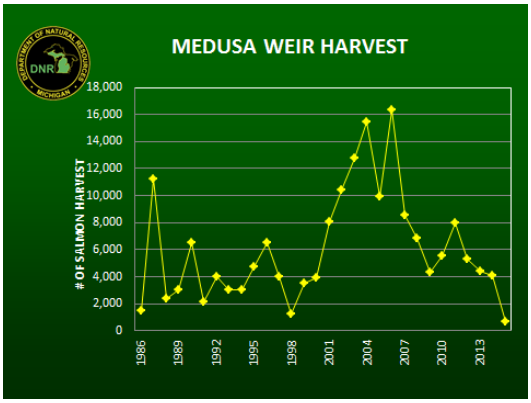
Lyons, MI Mussel Relocation: On September 23rd three DNR dive team members from Charlevoix went to Lyons, MI to assist in the relocation of mussels. A 156 year old barrier dam on the Grand River was scheduled to be removed when a thriving mussel population (including the endangered snuffbox mussel) was found below the dam. Crews lead by Central Michigan University surveyed the entire area below the dam, removing every mussel and relocating them downstream. The Charlevoix crew spent a total of five hours working in predetermined quadrants on the bottom of the Grand River fighting the current and poor water clarity. This was a valuable cross-

training opportunity that was extremely rewarding for the dive team members.

Pictured above CMU staff, Kris Snyder, Pat O'Neill, Nathan Skop, and Scott Hanshue (MDNR Grand River watershed biologist) prepare to dive.

Grand River work site: dam in the back ground, CMU staff measures and tags mussels in the foreground.

Weir Harvest: Every year CFRS staff assist 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 and Coho salmon to Michigan weir operation facilities.



The fall 2015 run of Lake Michigan salmon was the worst on record. Both the weirs and the fishermen experienced salmon runs that just trickled in. While we've seen comparable reductions in the past, the question has been asked, are we seeing a temporary downturn or a permanent reduction in the abundance of Lake Michigan salmon.

Otolith Microchemistry:

The microchemistry project, with the goal of identifying successful steelhead producing streams, has helped strengthen partnerships between CFRS, CMU, and MSU. Over the last year, MSU and the DNR have partnered to collect not only steelhead smolts but also naturally-produced Chinook and Coho salmon as well. With the success of expanding the fish sampled for identifying the natal stream markers, the next question is, can we look at non-game fish that never leave the stream. For example, can we look at the specific stream elements in dace or sculpin otoliths and then compare those results to wild adult steelhead or salmon caught in Lake Michigan. If this proves useful, the native fish could be captured year round, unlike smolting steelhead or salmon which only allow a small window for collection.

Coho smolt captured on the Jordan River.

Beaver Island Smallmouth Bass Study: Since 2006 CFRS staff has assisted the Central Lake Michigan Management unit and CMU in conducting a smallmouth bass population and movement study in the waters around the Beaver Island Archipelago, Waugoshance Point, and Grand Traverse Bay. Some interesting recent results show that the smallmouth bass living in the northeast portion of Lake Michigan have an above average growth when compared to the rest of the State. This is largely due to the changing diet over the last 10-15 years; now, the exotic species round goby and rusty crayfish are the primary food sources for Great Lakes smallmouth bass.

Volunteer Day: Each year we receive many inquiries from students looking to volunteer and gain fisheries experience at CFRS. In 2015 it was decided to hold a volunteer day in which we invited volunteers to come in for one day and experience a wide range of what types of work occurs in Charlevoix. For our first volunteer day we welcomed an East Jordan High School student and a Michigan State University law student. They were presented with the opportunities to work up gill net samples, explore fish aging, take a vessel tour, interact with station biologists, and try stream electro-fishing. It was a great success and the attendees found it very beneficial.

CFRS staff, state workers, and volunteers on the Jordan River electro-fishing for steelhead smolts.

East Jordan High School student experiencing electro-fishing.

Charlevoix Fisheries Research Station staff:

Cathy Sullivan, Station Administration
Dave Caroffino, Tribal Unit Biologist
David Clapp, Research Station Manager
Donna Wesander, Fisheries Technician Specialist
Jeff Stevens, Trades Helper
Jerry Ranville, Boat Captain
John Clevenger, Fisheries Technician
Jory Jonas, Research Biologist
Kendra Kozlauskos, Fisheries Assistant
Kris Snyder, Fisheries Technician
Marty Holtgren, Tribal Unit Biologist
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Patrick Hanchin, Tribal Unit Manager
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