Attendees:

Introduction:
Frank Krist introduced DNR Fisheries staff, current and retired, in attendance. Special thanks to Bryan Darland, Manager at Jay’s Sporting Goods and member of the Lake Huron Committee, for making arrangements and setting up the meeting area.

Denny Grinold had the group do a brief introduction around the room, no reports due to time constraints.

Jay Wesley addressed the group and discussed the focus of today’s meeting, to move forward from the discussion at April’s meeting regarding Chinook Salmon stocking and introduced the first presenters, Chuck Bronte (USFWS) and Matthew Kornis (USFWS).

Chinook Salmon and Lake Trout Mass Marking Study – Chuck Bronte and Matt Kornis (USFWS):

Overview of the Program: The following presentation is based on 4 years of coded wire tag recovery data including 75,000 fish from open-water angling. Chuck clarified that the information in this presentation was from fish collected from individual anglers. Fish collected from Sport Fishing organizations will be presented at a later date.

Directly after this meeting, Chuck is going to visit the EPA and emphasize how important continued funding for this program is. The budget was reviewed from 2008-2016 and the program funding has been cut yearly since 2014 with additional funding cuts proposed for 2017 and 2018. Chuck’s visit to the EPA will be crucial for obtaining the needed funds for the continuation of the program.
Dr. Matthew Kornis provided an overview of the Mass Marking Chinook salmon and lake trout results. The primary objectives of the program are to determine the amount of wild reproduction and to evaluate factors contributing to movement and survival of Chinook salmon and lake trout.

Mass Marking of Great Lakes Chinook Salmon and Lake Trout

Joint Lake Huron and Lake Michigan Citizens Fishery Advisory Committee Meeting, June 22, 2016

Chinook Salmon Results

% Wild Chinook salmon by stat district
All ages, 2015 collections

Lake-wide averages
Lake Michigan = 69%
Lake Huron = 46%
Origin of Chinook Salmon Captured in Lake Michigan

- Pooled data from 2014 and 2015
- Based on catch corrected for effort

Origin of Chinook Salmon Captured in Lake Huron

- Pooled data from 2014 and 2015
- Based on catch corrected for effort
How much do Lake Huron-stocked Chinook salmon contribute to the Lake Michigan Fishery?

- Map shows average percent of **stocked** Chinook salmon comprised of fish from Lake Huron by capture district. 15% overall average.
- **Once wild fish are considered**, average lake-wide contribution is about 5% (see pie chart).
- All data are effort-corrected.

Index of Chinook salmon Survival – Lake Michigan


**Speculation on Possible Reasons for Pattern**

- Temperature cooler on western shore
- More alewives on western shore
- More substrate for invertebrates on western shore
- More competition with wild recruits on eastern shore
Chinook salmon stocked along Wisconsin generally have greater survival.

**Lake Trout Results**

**% Wild lake trout by stat district**

All ages, 2015 collections

**Lake-wide averages**

Lake Michigan = 17%
Lake Huron = 53%

**Colored Shapes** are refuges with substantial lake trout stocking.

Lake trout stocked from 1985-2004 in the orange, red, and green areas had high returns, corresponding with areas with high recovery of wild lake trout in 2015.

**Movement of lake trout stocked offshore to nearshore areas**

Map shows recoveries of lake trout stocked in the Southern Refuge on the Mid-Lake Reef Complex (dashed black oval).

Dot size is proportional to the number of recoveries.

Over half of the recoveries occurred nearshore, where the lake trout would be accessible to angling.
Stable Isotope Diet Analysis of Trout and Salmon

The use of the stable isotopes Carbon 13 and Nitrogen 15 can provide an assessment of a fish diet often covering several weeks of feeding. These methods have been used in aquatic ecology for many decades and there are several tools for comparing niches and estimating diets. Technicians that are examining fish and collecting heads obtain flesh samples that are used in the analysis.

The results show which species of fish are eating the same food items. There is a large overlap in diets between Chinook salmon, steelhead and coho salmon. These 3 species feed heavily on pelagic prey like alewife when this forage species is available. Even though the diet overlap of Chinook salmon with lake trout and brown trout is less, both lake trout and brown trout eat alewives when encountered.

If anyone has comments or questions about the above topics Matt would be happy to discuss them with you. Matt’s contact information is below.

Thank you for your attention and support

Contact Matt: matthew_kornis@fws.gov

Acknowledgements

- Federal/state hatchery staffs
- Bio-technicians
- Creel clerks
- Lake committees
- Lake trout and salmonid working groups
- Anglers and charter captains

**Question** – Are less fish caught on Michigan’s side of Lake Michigan than on the Wisconsin’s side?

**Response** – The catch of fish is fairly equal from April through August, however, more Wisconsin fish are caught on the Michigan side. Between 70 to 80% of fish caught in the fall on MI side are wild, only 30-40% are wild on the Wisconsin side.
• **Question** – Does the Little Manistee Weir have very low Chinook salmon returns?
  o **Response** – Yes, Swan Weir has better return rates, a lot of wild Chinook are coming out of Little Manistee.

• **Question** – There was poor recruitment in 2013 of wild Chinook due to unfavorable spawning conditions, will that happen again this year as the age 3 year class may not produce as well again, could this be a 3 year pattern?
  o **Response** – Hard to determine, depends on spawning conditions, may see the opposite if conditions are good.

### Chinook Salmon Movement between Lake Huron and Lake Michigan – Rick Clark (MSU-Quantitative Fisheries Center):

Rick presented his data on the movement of fish between the lakes. The presentation co-authors included Randy Claramunt, John Clevenger, Jim Johnson, Matt Kornis, Chuck Bronte, Chuck Madenjian, Ed Roseman, Jim Bence, and Renee Reilly. Rick noted that the connecting waters between Lakes Huron and Michigan are very unique in that there is no real division between the waters. In the Straits where the two lakes meet, the current goes both ways. Hydrologically speaking, it is one big lake.

The 5,045 coded wire tag recoveries used in this study met the sampling criteria from the Medusa Creek and Swan Weir. The State of Michigan had the best recovery program at the time in 1990s and the study attempted to isolate spawning and feeding data. The conclusions from the data are below.

During the 1990s, Chinook salmon stocked at Medusa Creek in Lake Michigan and at Swan Weir in Lake Huron mostly stayed in their lake to feed and returned to their own stocking sites at spawning time. Only a few Lake Huron fish fed in Lake Michigan. Starting around 2000 and about 3 years before the alewife crashed in Lake Huron, the Chinook salmon stocked in northern Lake Huron moved in large numbers to Lake Michigan to probably feed on the more abundant alewife. The Chinook salmon stocked in Lake Michigan continued to remain in Lake Michigan to feed and spawn. Movement varied by age, with one year olds not moving as much as the 3 year olds.

- **Question** – Were the 1 year old Chinook too small to feed on alewife?
  o **Response** – Small Chinook will feed on smaller alewife from the time they are smolts.

- **Question** – What is the forage base now from Rogers City to the Bridge?
  o **Response** – The forage base consists of a lot of gobies and chubs, with some smelt but very few alewives.

- **Question** – There is an estimated 14 million Chinook Smolts from Georgian Bay, how do we know Lake Michigan wild Chinook from those originating in Georgian Bay?
  o **Response** – There is an ongoing study of the Chinook otoliths to determine origin. The high estimate of 14 million Chinook smolts being produced annually was before the alewife crashed.

### Important management implications

1. The change in the Chinook salmon movement pattern we observed was equivalent to increasing the stocking rate of Lake Michigan by 37%.
2. The total recruitment increase (stocked and wild) was about 1 million smolts per year.
3. There should be an effort to determine the number of Ontario stocked and wild Chinook and where the fish are moving.
Comment A hypothesis is that the Chinook die in Lake Huron and that alters the outcome.
  o Response – Not according to the data.

Question – Are the Chinook that are being planted moving out of state to Wisconsin, Illinois and Indiana?
  o Response – Probably some do.

Question – Are the Chinook moving into Canadian waters?
  o Response – Their catch rates are declining also so that is unlikely.

Catch and Harvest Data for Each Lake – Jay Wesley (DNR):

Lake Michigan Advisory Committee looked at the data in April; the Chinook population in both Lake Huron and Lake Michigan is down since 2003. Lake Trout has increased and Chinook continues to drop. The General Public fishing effort has decreased significantly in both lakes. The last peak for Chinook in Lake Michigan was 2012 and the population has continued to decline since then.

Chinook Salmon Stocking Discussions and Updates for Lakes Superior, Michigan, and Huron – Jay Wesley (DNR) and Todd Grischke (DNR):

In March, at the State of the Lake meeting in Milwaukee, the conversation was started in regards to reducing Chinook stocking in Lake Michigan. In addition, the Lake Superior group proposed to stop all Chinook salmon stocking in Lake Superior since less than 1% of the Chinook salmon caught are hatchery fish.

In Lake Michigan it has been a long process from 2011-2012, to determine stocking directives. After that, a policy was created to determine stocking levels based on scientific data. There has been a complete review of predator/prey data in Lake Michigan in regards to Chinook/Alewife. The recommendation from the Lake Michigan Committee of the Great Lakes Fishery Commission at this point is to go to level 4 by reducing the number of Chinook stocked from 1.8 million to 690,000. The various lake committees, tribes, and states are in agreement.

After review of the alewife population and fish return in Lake Huron in 2012, it was decided to stop stocking all ports south of Roger City. The Swan Weir has been maintained as it is a good back up for brood stock. Nunns Creek is under a consent decree that does not end until 2020 so stocking must continue. Cheboygan still sees a good fall return despite the low alewife population. Nunns Creek will continue to be stocked, but the Swan Weir and Cheboygan are up for discussion.

  • Question – Are the Chinook following the prey, or are they imprinted as eggs and returning to where the eggs are taken from?
    o Response – There was never an issue in the past with imprinting so currently it is unlikely it is an imprint issue since fish movement has more to do with the fish following the food source as indicated in the previous presentation. The Chinook returned to their stocked area to spawn, regardless of the alewife population.

  • Question – Are we looking at other food sources for Chinook?
    o Response – Starting in 2018 USFWS may stock cisco in Lake Huron, but it is unlikely it would be a great prey for Chinook as they feed mainly on alewife. In Lake Michigan the cisco are already expanding.

Comments and questions:
Comment: On behalf of the Michigan Steelheaders, we are concerned that the alewife population cannot support Chinook. We would like to see the best science guide the management decisions.

Comment: Would like to see the current level 3 maintained as we had a mild winter and the alewife population may be higher than projected/expected.

Comment: There are a lot of Lake Trout, why do we continue to stock so many? Are they eating the smaller Chinook since they are opportunistic feeders? I do not feel that lowering the Chinook stocking levels will help the fishery and that the Chinook population will continue to decline.

Comment: Has fished Salmon since first run and has been in the industry for 38 years. I do not believe that the biomass went down as much as the DNR is reporting. It is too hard to predict what is there or what will be there. Currently I am seeing a lot of Alewives in the Ludington area. The Lake Trout fishery has improved and anglers are targeting them. I do not believe that the wild Chinook numbers are that great, if you cut the number of stocked fish, the percentage of wild Chinook in comparison will increase, so how many wild Chinook are really out there? I do not believe that the Chinook stocking numbers should be lowered. I am speaking on behalf of Charter Captains, general angler, and the future generations.

Comment: I feel the fishery needs more time to assess the situation and alewife population, continue stocking at the current level.

Question: I know that there is not 100% approval within the division, if DNR Fisheries cannot all agree, how can they make the recommendation to cut stocking – sentiment stated by several attendees.

  Response – Chief Dexter – As a staff, the Fisheries Division is like this group, there will never be 100% agreement and there will always be the need for discussion and the use of a decision making process that includes looking at all the available data and making the best decision as a collective group. Each position is taken into consideration, but the Division has to move forward with one clear path.

Comment: I believe the Lake Trout and Cisco are hurting the Chinook Fishery. Both species eat alewives.

Comment: I have been a Charter Captain for 20 years and the Mayor of Harrisville, we need not to forget the economics of the industry and its effect on small communities. In the past, the DNR boat launch in his community was filled to capacity, and now there are very few to none. The marina has been supplemented with City dollars due to the economic loss from losing the Chinook fishery. *additional comment later in the meeting – You guys have great ideas, but I would like to see that coupled with the economics so we don’t kill an industry. We developed ports up and down the coast and those need to be factored in to how they can become viable again whether that is Coho or Atlantics.

Question: Years ago there was a meeting with DNR where they discussed planting Cisco. Do the Chinook not eat them?

  Response – It would provide more diversity in the prey base for other predators. They are not a great food source for the Chinook, at least they are not a replacement to Alewife.

Question: 690,000 Chinook will be stocked in all of Lake Michigan, what is Michigan stocking and how will they be allocated?

  Response – 355,000 WI, 200,000 MI, 90,000 IL, 45,000 IN. Still in the discussion phase of where the fish will be stocked

Question: What do we need to collect enough eggs?
- **Response** – We can still get required eggs from the reduced number of stocked and natural reproduction fish at Little Manistee Weir. It was noted that the Swan Weir was needed in 2015 to meet the egg quota for the Chinook salmon program.

- **Comments:** Chinook should be stocked in places where natural reproduction is lower.
- **Comments:** I am sensitive to the comments from Harrisville as he had to watch as the Alewife crashed in Lake Huron. Each port suffered dramatic declines in the fishery. Words of Wisdom – these are defining years that will determine if your Alewife will prevail. They should have stopped stocking everything to save the Alewife in Lake Huron. You have to think long term and manage for that. Manage for the worst case scenario to avoid the complete loss of Alewife and a crash in the fishery, learn from our history and the mistakes made in Lake Huron. I would cut Chinook to brood stock only and cut Coho completely. Cut the Lake Michigan predation and get out of the woods, then go back to stocking when there is a better balance again.

- **Question:** Why are we not cutting other predator species stocking?
  - **Response** – We developed a tool to determine Chinook stocking levels as they are the quickest to get feedback on due to their time in the hatchery and Lake. Lake Trout would take 7+ years to see any feedback. Changes to other predators might include increased harvest, and we will look at Lake Trout stocking numbers.

- **Comments:** I can’t believe that all are not thinking about cutting the stocking numbers for Chinook. If we don’t do something now, we will completely lose the Chinook and possibly other predator species. Cut everything out and allow the Alewives to come back.

**Statement from Dr. Howard Tanner – Retired DNR Fisheries Chief and the legendary innovator that started the salmon program in the Great Lakes:**

I hesitate to get into this as I know that you will look to me as someone who is extremely well qualified. I am not well informed, but I have an opinion. Reducing the Chinook stocking is a slam dunk and the data are irrefutable. We can manipulate the predators, but not the prey. It would be like having a farm with no grass, you will never be able to sustain a cow. The quagga mussel has taken the Alewives and we have to take steps to save what is left. Clearly cutting stocking is the thing to do. Make the cut and look at other opportunities as we move forward. You are getting the best advice you are going to get by the people best qualified to give it.

**Continued Comments and questions:**

- **Question:** The quagga mussel is one of the worst invasive species we have seen. The Salmon was not the best fish, but it evolved and became our Salmon. Some Salmon in the ocean are bottom feeders. Can our Salmon evolve and become more opportunistic feeders?
  - **Response** – We do not know yet if Chinook salmon will change genetically enough to adapt to the new conditions, but we need to make the cut now.

- **Question:** Will we continue to stock 150,000 in the Manistee Weir?
  - **Response** – It is not decided at this point.

- **Comment:** If we could still maintain some stocking at each stocking site, that would be better as the stocking sites success varies by year and it would at least provide a fall run at those sites.

- **Comment:** After the 2013 cut, 59,000 Chinook have been planted at Grand Haven and they have not had a run there in several years.

- **Comment:** I realize there is a bait fish issue, but I am seeing more alewife and healthier fish this year. How can we spread the plant out enough with such low stocking numbers? I have
been talking to local sport shops and their business in already down 75%, and the same with other businesses. Give it another year at the current stocking level before we do anything.

**Question:** Have we looked at Alewife population on the West Coast? You cannot write off the Lake Trout biomass, they will continue to deplete the Alewife population.

- **Response** – Hydroacoustics has been used to estimate the recruitment and movement of Alewives. Their distribution is patchy and the Salmon will follow them while the Lake Trout will not. The studies have shown that Lake Trout consumption of Alewives has not gone up, despite the increased Lake Trout population. It has remained at about 20% and is now close to the total consumption by Chinook due to lower Chinook numbers.

**Comment:** I Fished for a long time, the people I represents are against the cuts. I do not like to make binary decisions. I agree that the Alewife population is key, but can we find a middle ground?

**Comment:** The first cut in 1998 was rather painful, ultimately we got Lake Michigan to agree to 40-50% cut. Lake Huron refused and only took a small cut. By 2003, the fishery collapsed in Huron. If they had agreed to a larger cut would it have helped? Impossible to know now. Lake Michigan cut again in 2006 and the fishery continued along. Lake Huron has not come back. The Alewife numbers are still very low compared to what they were. We have the best data, we know what it could come to. Once it collapses, it may never come back. Look at the past and be prudent in terms of the future. Inaction is an action. Putting Chinook out there that will not survive is not a good use of budget dollars.

**Statement from Jim Dexter – DNR Fisheries Chief:**
Thanks, this is a great discussion. This is a very difficult thing. We are usually doing reductions in the 11th hour. We have made great strides in the data collection and science. We have done the last three cuts just in the nick of time. It is terrible to look back at what happened in Lake Huron and we do not want to see that happen to Lake Michigan. The Chinook fishery revitalized our port communities and we need to preserve that. We developed a process where we can make decisions quicker and that is a good thing. The stocking cuts are a recommendation at this point and will be decided on as each state meets and has their discussions. Thank you again for your comments and questions.

**Statement from John Robertson – Retired DNR Fisheries Chief:**
I remember when I took over in 88 or 87, just after the first crash on Lake Michigan in 1985. The Chinook were dying like crazy and I had no data because we were not investing in data collection at that time. I turned to others to find out the cause and decided that we needed to invest more in research. We now have the best there is. It is not just the DNR, it is also the other states, tribes, and a lot of other agencies and organizations. This is not a Michigan issue; it affects every state that utilizes the Great Lakes Basin. Three reductions have not resulted in what we are looking for. Now we need to make more drastic reductions to try to save our fishery. It is now or never.

**Statement from Rick Clark – MSU Quantitative Fisheries Center**
We have run models based on all the data. The chance of an alewife collapse is 15% if it got below 100 kiloton, we are now at 37 kiloton. The lower the population goes, the better the chances for collapse.

**Statement from Frank Krist – Chair, Lake Huron Citizens Fishery Advisory Committee:**
The fishery in Lake Huron is not terrible or flushed down the toilet as mentioned earlier. If the alewives collapse in Lake Michigan there will still be an excellent diverse fishery. Naturalized species such as steelhead, Coho, and brown trout appear to be adapting to the new food web in Lake Michigan and native
species such as lake trout, yellow perch, cisco and others are rebounding. In Lake Huron, stocking only 5 million predators has prevented the alewife from rebounding and Lake Michigan stocks over 11 million. I do not believe that politically enough predator stocking could be cut to save the alewife since large numbers of all species would have to be cut to make a significant impact. We are open to cuts on Lake Huron but if the Chinook salmon stocking is reduced then those fish need to be replaced by experimenting with Coho, additional Atlantic salmon or both. Currently, 2.7 million Coho are stocked in Lake Michigan and none are stocked in Lake Huron.

Statement from Denny Grinold – Chair, Lake Michigan Citizens Fishery Advisory Committee:
Great discussion. One of the concerns is the economics and what the vision for the next 50 years will be. How much are you a risk taker? Do you want to be responsible if we put more in and it fails? Or should we use the science to prevent what happened in Huron and make sure we still have a great fishery.

Closing Statement from Howard Tanner – Retired DNR Fisheries Chief and the legendary innovator that started the salmon program in the Great Lakes:
This group is an example of public participation in government and public participation in government is just about gone. Let this be a beginning. Take Flint for example, that crisis would not have happened if there was a commission there. Recognize what this is all about, this is financial, an industry, and an economic asset. There is nowhere else that is surrounded by fresh water, take a look at what we have to work with. There is great opportunity in the midst of a very complicated situation. Think about what you can do beyond fish stocking. Look at the rules, regulations, and economics. It is all about you and you are the leaders. Move beyond these issues and continue to have strong input.

Closing Statement from Jay Wesley – DNR Lake Michigan Basin Coordinator:
Thank you for your comments and discussion. We will take into consideration what has been brought to us and look at all options. We are working on a management plan for Lake Michigan and will be going out and talking to businesses and the public at the various ports. Please contact me if you would like to be involved in this process.

Closing Statement from Todd Grischke – DNR Assistant Fisheries Chief:
I went through many of these forums regarding Lake Huron. Economics is always a part of the decision making process and is taken very seriously. There was anger from the public regarding economics at that time in that they thought that we were spending money unwisely by continuing to stock Lake Huron with fish that were dying. Lake Huron is changing and becoming a more diverse fishery. They will continue to look at economics and we need to realize invasive species are changing the Great Lakes.

Final Comment –
➢ I can see where this is going, so we need to get good PR out there about what a great fishery Lake Michigan has and get people excited about fishing the Great Lakes.

2:50 Adjourned