

Lake Michigan Citizen Fishery Advisory Committee

April 26, 2011

Lansing, Michigan

**Randy Claramunt-Red Flags Analysis**

Randy said it is refreshing to hear about a diverse Lake Michigan fishery even though the species interact. The diversity factor also spreads to the prey fish populations. Red Flags is a joint effort to monitor making progress towards fish community objectives.

Information for recommendations exists on a Level 1 /level 2 scenario (one year trend and 3 of 5 year trend). Randy then presented the data from Lake Michigan predator prey community.

Triggers exist on the distribution of outcomes around a mean. This analysis provides recommendations to the Lake Committee whenever 50% or more of the parameters result in a red flag. 2009 data predicted that the 2010 prey fish levels should increase. We also predicted lower returns of predators based on available prey. Management decisions can be influenced by the salmonid working group through discussion of the data; however decision analysis and stake holder inputs also provide a major component.

Catch rates in the charter industry increased last year while the model we used predicted a decline. We experienced the lowest number of Chinook salmon returning to weirs in 2010. Natural reproduction drives the system. OTC marking and evaluation is estimating that over 50% of the Chinook salmon in Lake Michigan are wild fish, and this has been consistent now for 4 years. There is no direct relationship between number of Chinook stocked and the number caught. Alewife reproduction appears to be increasing. Maturation schedules of Chinook are not clearly understood. Growth indicators are also not changing like they have in the past.

Lake Michigan is changing rapidly. Acoustic survey and trawl survey results point in different directions. 2010 was the 2<sup>nd</sup> biggest year class in the last decade for alewife. The predators are the best prey collection method we can look at, they get fish that we do not in our sampling.

We want a lot of fish of decent size- not the radical extremes. Top down pressure is manageable (predators eating prey)—bottom up is much more difficult (mussels taking all the energy from the bottom of the food chain). Larger predators can consume a bigger prey item. Either salmon have lost efficiency at catching bigger prey —or—the amount of big prey has been reduced.

Bottom up influences. Bloaters were 15% of Salmon diet in 1990's. We see no bloaters in their diet now. The abundance of alternative prey is down—this is an example of another bottom up affect. Fish health issues are trending positive. Sick fish at weirs are at a record low. Thiamine levels are back in good ranges. Are salmon eating something other than alewives? Yes a few gobies and sculpins, but not a lot. The number of eggs produced by the salmon population is in the trillions, so high mortality due to thiamine issues still produces huge numbers of fish. Smaller prey, although less nutritious, are more numerous —so they easier to catch with less expenditure of energy. The system is clearly changing very rapidly. We have concerns that while the 2010 alewife year class will provide forage, the long-term sustainability of the system remains in question. The

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majority of the indicators have been tripped at both levels 1 and 2. It is now good timing to begin these discussions to review future strategies for stocking.

### **Jim Dexter-Structured Decision Making**

This is process that will more fully engage constituents, more so than we have done in the past. This will be an evaluation of risk and uncertainty and it will allow us to discuss and refine management objectives for Lake Michigan. This process is designed to give stakeholders more input as to the overall scope of the decision making process. The process in the past may have given the stakeholders less opportunity to provide input. We are proposing to do this to provide more transparency and opportunities for collaboration. Stakeholders will hopefully build ownership in the process. We are starting with this meeting here with our invited guests from Indiana. The next meeting will be June 2 in Wisconsin and Illinois with their respective lake representatives. In the fall select representatives will meet in Indiana on Nov 5 for a full day workshop to learn more about the issues and they will report back on what they have learned. Denny Grinold will represent MCBA / LMCFAC. Dennis Eade will represent Michigan Steelheaders, John Robertson MUCC.

### **Mike Jones-Decision Analysis-Structured Decision Making.**

Mike introduced Iyob Tsehaye who has contributed much to the modeling effort.

The right decision to stock in Lake Michigan is no simple matter.

Chinook stocking numbers have ranged over an 8 fold variation over the last 40 years.

There are two reasons to stock –control alewife population to help reduce negative effects on native fishes (predation) and to provide for a sports fishery.

Chinook stocked versus alewife biomass produced a negative relationship in the early days. The data clearly shows no relationship between the number of salmon stocked and alewife biomass. The data also clearly shows that stocking more salmon did not result in catching more salmon. The management tools that we have available, or the levers we have available to pull and manipulate, include stocking, sea lamprey control, and harvest regulations.

All three management tools are “pretty darn blunt instruments”. Natural reproduction has a large influence on the outcome. Decisions are made in a real world using system models. For example, if I do something, make some decision, and then I expect something to happen. Observation models rate the consequences of prior actions. 1). what do we hope to achieve—2) what choices do we have—3) we build systems models as a basis for making predictions about future scenarios that we may choose as management options. However, we need to be very careful about uncertainty. Fishery science is more difficult than rocket science, there is much more uncertainty in what we do because we do not know everything and how the system behaves in its entirety. Our goal for using this structured decision making process is to bring constituents into the decision making process. Assumptions can change the game and change our future management actions.

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In 2000 and 2001 we started decision analysis work for Lake Michigan salmon stocking.

In 2005 we presented the results of that effort to the LMC. Iyob has been working on updating the modeling and connecting those efforts with the stakeholder process.

Technical work and stakeholder engagement are both very important to the process.

The committee then engaged in discussions regarding what they wanted from the fishery:

***Management Goals of stocking salmon:***

Preserve sport fishery

Maintain ecosystem balance

Maximize harvest and rates (catch per effort or CPE)

Limit catches

Maximize sport fish potential

Diversity of opportunity (species and types of activity)

Balance sport, commercial, tribal

Maximize sustainable benefits

Consistent management objectives

Protection of forage bio-mass

Maximize use of natural reproduction

Avoid loss of native species

Minimize collapse

***Management Objectives and Options for stocking salmon:***

Stocking (more or less)

Fish—quality of stocked fish

Species composition – (what is stocked)

Restoration activities – (habitat)

Where stocked fish go – (where, which species, when)

Maximize reproduction thru protection of wild fish

Optimize species/ seasonal opportunity- (drowned river mouths)

“Feedback policies” in the model can be very important— we call these triggers and they could be numerous and varied. A trigger we used last time was that if salmon weight dropped to a pre-determined number in the modeling predictions that stocking strategies would be immediately adjusted to account for that change.

We have an incredible data set that is available for over the last 40 years. We feed data into the model and look forward in time. This is both introspective and prospective. Alewife recruitment continues to decline. How good are predators at finding prey? Search rates (how easy or difficult is it for a predator to find prey) appear to be lower than we originally thought. We are faced with the same number of predators that want to eat a declining prey base.

Natural reproduction is influenced by alewife biomass. We have very limited evidence of density dependency issues. When the model is run a whole series of mathematical calculations determine a scenario, or an outcome, of different model run outputs. The

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models run thousands of times to determine outcomes that are probability based. No matter what possibility you choose there are probabilities of bad outcome. That is undeniable. Feedback policies tend to make more sense and can give us some small amount of control.

Our intention at the November meeting is to present more technical detail and engage the participants in refinement of goals and objectives for Lake Michigan.

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“There is no silver bullet here for this fishery that insulates you from risk.”-(M.Jones)

Jim Dexter-Lake Michigan and Lake Huron are no longer viewed as one lake for fishery management purposes. Lake Huron is moving forward with stocking discussions this year, a year ahead of Lake Michigan. Please do not read anything into Lake Michigan's future based on outcomes from the Lake Huron discussions.