

Lake Superior Technical Committee

**Minutes of the
Lake Superior Technical Committee
Hotel Chequamegon
Ashland, Wisconsin
January 11-12, 2000**

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Attendees:

Chippewa/Ottawa Treaty Fishery Management Authority - Mark Ebener
Bay Mills Indian Community – Ken Gebhardt
Wisconsin Dept. of Natural Resources - Stephen Schram, Bill Horns
University of Wisconsin - Antony Scott, Chris Harvey
Ontario Ministry of Natural Resources – Ken Cullis, Mike Petzold, Tim Johnson, Bryan Henderson,
Laura Hartt
University of Minnesota - Nigel Watrus
Great Lakes Indian Fish and Wildlife Commission - Bill Mattes, Kory Groetsch
Keweenaw Bay Indian Community - Mike Donofrio
Red Cliff Fisheries Dept. – Mike Gallinat
Bad River Band – Rick Huber
United States Fish and Wildlife Service - Gary Klar, Henry Quinlan, Dale Bast
Michigan Dept. of Natural Resources – Steven Scott, Jim Peck, Shawn Sitar
University of Wisconsin-Superior - Larry Brooke
Great Lakes Fishery Commission - Gavin Christie
University of Wisconsin Stevens Point- Mike Hansen, Jessica Doemel, Mike Wilberg
Michigan Sea Grant - Ron Kinnunen
Minnesota Dept. of Natural Resources - Don Schreiner
United States Geological Service Biological Services Division – Mike Hoff, Owen Gorman

Agenda Item 1 - Support for Wild Fish Health Survey

Greg Wright, a member of the GLFC fish Health Committee, has asked the LSTC to support increased fish health testing as part of the wild fish health survey being conducted by the LaCrosse Fish Health Center. Greg has asked that the LSTC to write a letter of support for the wild fish health survey. Ebener distributed an e-mail message from Greg Wright requesting the LSTC write a letter of support. Ebener will write a letter of support for the LSTC, but first needs to obtain further clarification on the project from Charley Wooley and William Knapp.

Agenda Item 2 - GLIFWC Contaminant Study

Kory Groetsch gave a presentation summarizing the results of contaminant monitoring conducted by GLIFWC on lean and siscowet lake trout, and whitefish from Wisconsin and Michigan waters of Lake Superior.

Objectives of the study were to determine current concentrations of mercury, PCB, organochlorine pesticides, Mirex, and other contaminants in composite samples of 22-24 inch whitefish, 25-26 and 27-28 inch lake trout, 15-17 inch herring and siscowet fillets from 24.5-25.5 inch fish. Fish were collected in 1998 and 1999 from the Apostle Island to Marquette in management unit WI-2, MI-2, MI-3, MI-4, and MI-5. Fish were collected from commercial fisheries and agency assessments. Tribal commercial fishermen were used to fillet the fish and the fishermen removed the fatty tissue from the dorsal and ventral sides of the fillets plus the skin. The fillets were weighed and as well the tissues removed from the fish were weighed. Fish of a specific size were processed together into a composite sample. Kory reported that they used 7-12 samples of a given tissue type.

Lipid levels were determined for each of the tissues sampled; belly fat, skin, and fillet. The proportion of lipids in the each of the tissues from whitefish was 27% in the belly fat, 18% in the skin, and only 5% in the fillet. In lean lake trout the proportions were 31% in the belly fat, 15% in the skin, and 8% in the fillet. For siscowet the proportions were 33% in the belly fat, 14% in the skin, and 17% in the fillet. Removing the belly fat and skin did not reduce the levels of lipids in the siscowet fillets because there is so much fat embedded in the muscle tissue.

Analysis of all the tissues samples have not been completed, but in the samples that were processed concentrations of almost all contaminants were below U. S. FDA guidelines. Initial results from study are as follows:

PCB - Concentrations of PCB's were less than 0.2 ppm in whitefish from MI-4. PCB concentrations from lean lake trout composite samples were less than 1.0 ppm, while PCB levels in siscowets averaged just slightly more than 1.0 ppm.

Mirex – Concentrations from all species were below U. S. EPA guidelines. The highest concentrations of Mirex were found in siscowets.

DDT - Siscowets had higher levels of DDT than other species, but all samples were below detection limits.

Toxaphene – Cory reported that there seems to be in higher concentrations of Toxaphene in Lake Superior than in the other Great Lakes, and these sources appear to be due to atmospheric deposition. Siscowets have very high levels of Toxaphene and there concentrations exceeded acceptable levels in established by Ontario.

Chlordane – Concentrations of Chlordane in siscowets exceeded U. S. FDA guidelines of 300 ppb. Most of chlordane concentration in siscowets is in the lipid. Taking out skin and lipids from fillet did not reduce concentration enough to lower the levels to below U. S. FDA guidelines because lipids make up so much of the mussel.

Mercury - All samples from all species were below the U. S. FDA guidelines. The larger the siscowets the more the mercury concentrations. Cory reported that length was a better predictor of mercury concentrations than age of fish.

In summary all species and contaminants, with the exception of chlordane in siscowets, were below U. S. FDA guidelines. Length is better predictor of total mercury than age.

Agenda Item 3 - Multi-beam Acoustics Mapping

Nigel Wattrus from the large lakes observatory at UMD provided the LSTC with a presentation on the habitat-mapping project he is proposing to conduct in Lake Superior. The objective of his presentation is to describe what multi-beam sonar is and how it works, and how to use it in fisheries research and management.

Multi-beam is an echo sounder with a suite of beams that project a traverse beam perpendicular to the direction of the boat. The multi-beam system can use up to 100 beams. Multi-beam provides both side-scan images and the shape of lake floor, whereas side-scan sonar does not give shape information. Multi-beam was originally used in deepwater, but has evolved to the point where it can also be used in shallow water.

Vessel dynamics and refraction are the two factors which affect the interpretation of the multi-beam sonar signals. Vessel dynamics are heave, roll, pitch, and yaw. Refraction is the bending of sonar rays due to variations in speed of sound in the water column. In Lake Superior the only issue will be with temperature effects on the beam, unless there is a large amount of suspended material. The researcher needs to make a series of velocity measures to adjust for refraction.

Nigel provided two examples of the use of multi-beam in Lake Superior. One example was a substrate map at Silver Bay in deep water, and the other example was from shallow water along the Wisconsin south shore. Space between individual beams was 10 meters at the Silver Bay site.

Lake bottom classification is measured with a Roxann or QTC view. QTC measures up to 160 different parameters, whereas Roxann provides only two parameters. Both of these systems can be fitted to a multi-beam sounder. Backscatter from the sounder is a function of composition of the lake bottom, shape of the bottom, and roughness of the substrates. Composition of the lake bottom is an integrated response of the surface and subsurface.

Nigel is proposing to submit a proposal to the National Sea Grant on fisheries research in the Apostle Islands region. The objective of the study would be to characterize the physical properties that produce good spawning and nursery areas for lake trout. The potential outcomes are tools for wide area surveys, and suitability index of the habitat. Parameters to measure are; bathymetry, composition, currents, temperature, suspended sediments, water chemistry. The multi-beam survey will be coordinated with netting and egg traps, videos, and hydroacoustics surveys. The data will be integrated and model formulation in a GIS environment.

The LSTC agreed to support Nigel's proposal by a letter from the LSTC chairman.

Agenda Item 4 - EcoPath/Ecosim Paper

Kitchell et al. has prepared a paper on the sustainability of the Lake Superior fish community. Chris Harvey provided the LSTC with an overview of the paper titled "Sustainability of the Lake Superior Fish Community: analysis of interactions in a food web context." The paper uses a model called ECOPATH/ECOSIM to measure the response of the Lake Superior fish community to different fishery management strategies. ECOPATH is a software program use to study the steady-state food web of an ecosystem. ECOSIM is a dynamic version of ECOPATH. The model works on a whole lake scale, not different spatial scales. The paper is being published fairly quickly to fit in with an issue of the journal

Ecosystems that is being published to address “fast” and “slow” processes in ecosystems. The slow system of the model is the native predators and coregonines, whereas the fast system is exotic salmon and smelt.

Seven management strategies were performed with the model. Each manipulation was started after 10 yr., lasted for 10 years and the time scale for evaluating all scenarios was typically 50 yr. Each manipulation was performed basically within the context of lean lake trout restoration. The first scenario involved eliminating all forms of fishing on lean lake trout and the response was that lean lake trout biomass increased 50%, smelt biomass declined 25%, and Pacific salmon declined substantially and took a long time to recover. Increasing fishing pressure on siscowets results in a decline in lean lake trout abundance after the reduction in siscowet biomass primarily because the model indicates that we get a big increase in burbot and chubs with eat smelt or compete with smelt for food, respectively.

Some conclusions from the simulations were that:

- We could only increase lean lake trout biomass by 50% in any simulations,
- Pacific salmon have little impact on the food web on a whole-lake scale, that maybe different on a smaller spatial scale, and
- Slow vs. fast interactions are overwhelmed by biomass differences between Pacific salmon and lake trout forms because the lake trout are so much more abundant than Pacific salmon.

The take home messages are that lean lake trout are linked to herring, siscowets, and burbot, salmon are linked to smelt and leans, and the current model structure suggests that there is limited opportunity for native fish restoration primarily because of the presence of non-indigenous species.

Chris indicated that the future direction of the modeling process is to 1) use longer manipulations greater than 10 years, and 2) develop spatially explicit models using ECOSPACE.

Agenda Item 5 - LSTC Fish Ageing Workshop

Mike Hoff provided a summary of the lake trout age precision experiment conducted by the LSTC. The experiment involved paired scale impressions and otoliths sections from 67 Lake Superior lake trout aged by 11 different people. The agers represented most of the Lake Superior fishery management and research agencies. Ages from scale impressions were typically lower than from otoliths sections. Age-length keys were developed from each fish-ager and structure, and were applied to a catch of 581 lake trout collected from Michigan waters. Total annual mortality rates generated from catch curves of ages 7-11 were estimated for each ager. Mortality rates from scales ranged from 0 to 89% with a mean of 42%, whereas the otoliths mortality was 2 to 51%. Variation was lower for otoliths ages.

Don Schreiner and Stephen Schram lead a discussion on the need for a coordinated fish-ageing workshop. Don and Steve held a mini workshop during the summer of 1999, and that workshop proved to be very useful and Don and Steve believe the LSTC could benefit from a larger scale workshop involving the entire LSTC and its participants. The outcome from the workshop would be a folder provided to each agency on ageing of Lake Superior fishes. The hope is that the manual could be used to train new people as technicians come and go and biologists retire. Don and Steve asked each agency to provide them with some idea of the number of species each agency is concerned about, the number of people that would attend from each agency, etc. They passed out a sign-up and information sheet to everyone that each agency should return to them as soon as possible.

The LSTC agreed that we should seek a small grant from the GLFC for conducting this workshop. No one assumed responsibility of writing the proposal.

Agenda Item 6 - GLIFWC Fish Ageing Equipment

Bill Mattes provided the LSTC with a demonstration of his system for ageing lake trout otoliths using hardware and software that project images onto a computer and store them for later reference.

Agenda Item 7 - Lake Trout Compensatory Growth Model

Tim Johnson and Laura Hartt updated the LSTC on the compensatory growth analysis they are conducting in Lake Superior with money from the GLFC coordination. They will be fitting vonB growth coefficients for lake trout in WI-2 to length and weight at age data to study the constraints to lake trout growth. The process involves: 1) constructing length-weight regressions based on individuals within each cohort to obtain predicted weights, and 2) finding the mean length and weight of the 10 longest individuals that are at least 10 yr. of age to find L-infinity and W-infinity because Laura could not get convergence for the vonB analysis. She used either ages 4-10 or ages 4-7 to estimate the vonB parameters, the solved for k and t_0 . They used the cohorts from 1975 to 1989 for this analysis. There appears to be a

substantial decline in both L-infinity and W-infinity in WI-2. They will be attempting to relate estimates of k to water temperature at various depth strata.

Agenda Item 8 - Analysis of Historic Lake Trout and Siscowet Abundance

Mike Wilberg presented his updated analysis of lean and siscowet abundance data that he has completed as part of his MS work. Mike is using commercial catch and effort data records from the Michigan fishery from 1929-1961. Pounds of fish caught, type and amount of gear, location, gear, and depth were used in the analysis. Catches shallower than 65 m were considered to be all lean lake trout, whereas catches deeper than 65 m were considered siscowets. All CPUE values were set to one night. Appeared that trends in abundance of leans and siscowets were following similar patterns suggesting that they were being affected by the same stresses.

Second objective was to quantify the effects of fishing effort limiting recruitment of lean lake trout. Five of the eight areas in Michigan found areas that were negatively affected by fishing effort. Found density dependent effect on recruitment in some management units. In MI-1 found negative effect from gill net effort but no density dependent effects on recruitment. In MI-2 and inverse relationship with gill net effort. In MI-3 there is a significant negative affect from gill net effort and direct relationship of recruitment with stock size. In MI-4 there was significant density dependent effect on recruitment and a negative effect of gill net effort on recruitment. In MI-5 there was an negative effect of gill net effort on recruitment and density dependent effects on recruitment. In MI-6 there was strong density dependent effect and negative effect of gill net effort. In MI-7 there was density dependent effect on recruitment but no effect of gill net effort on recruitment. In MI-8 there was no effect of gill net effort on recruitment and was no density dependent effect on recruitment. They would like to incorporate sea lamprey abundance data into the analysis.

Agenda Item 9 - Feeding costs for Leans and Siscowets

Bryan Henderson will update the LSTC on his analysis comparing energy costs of lean lake trout and siscowet feeding in Lake Superior. The specific density of siscowets is lower than that of lean lake trout, therefore, the costs of swimming should be less. Bryan used cesium 137 accumulations in somatic tissue to compare the energy costs per unit of increase in somatic tissue. Bryan hypothesized that the energy of moving through the water and feeding should be greater for lean lake trout than siscowets and they attempted to prove this. Considers it difficult to compare the growth rates of leans and siscowets because the dry weight component of the siscowet is greater than lean lake trout. Based growth rates on wet weight as the estimates of metabolism. First energy content was regressed on age, second dry weight was estimated by regressing dry weight from energy content. Lastly wet weight was regressed on dry weight of leans, so that a comparable standard weight was estimated for siscowets and leans. Siscowets do grow slower than leans, but only a little less well when standardize weights to energy density. Metabolism is lower for siscowets than leans because siscowets live at colder water temperatures. Siscowet showed dramatic difference in ability to convert food into flesh. Gross conversion efficiency was nearly four times greater for siscowets than leans. Siscowets should have lower cost of feeding than lean lake trout. Bryan is suggesting that leans have and always were the less abundant form in Lake Superior and that to live deeper than 50 m a lake trout really needs to be a siscowet.

Conclusions: growth of siscowets not almost as good as leans, higher lipid content of siscowets does confer an energetic advantage is supported by empirical evidence. Allocation of lipids and protein has a genetic component to it. Superior growth of siscowets is the result of an adaptation for moving through an increased range of atmospheric pressures.

Agenda Item 10 - Lake Trout Model Development

Ebener and Sitar reviewed the status of development of lake trout models for Lake Superior. Shawn provided an overview of the Projection Model and lake trout model results from MI-5, MI-6, and MI-7.

Sea lamprey mortality is based on wounding data and functional response model developed by Mike Rutter. Ageing error matrix is also included in the current models for MI-5, MI-6, and MI-7. Have had a difficult time getting convergence with model for MI-6.

One problem with MI-7 is that was no estimate of creel harvest made for the unit, but Shawn had to make some estimate of sport harvest. Shawn compared the ratio of sport harvest in MI-5 and MI-7 from the mail harvest to develop some idea of the ratio of harvest between MI-6 and MI-7.

Mark and Shawn discussed the concept of spawning stock per recruit as a way of evaluating target mortality rates. Mark and Shawn will discuss the concept of spawning stock biomass recruitment at the next meeting of the LSTC.

Agenda Item 11 - Isle Royale Spring Assessment

Bronte informed Ebener that Donofrio, Mattes, Peck, and Oelfke should have copies of the last draft of the Isle Royale Study Plan. These guys should come to the meeting prepared to discuss the study plan! Donofrio provided the LSTC with a copy the last draft of the study plan for conducting the spring assessment at Isle Royale. The proposal is a study concept proposal that must be submitted to the Great Lakes Science Center for approval, if approved then a full blown proposal must be submitted. The LSTC would like USGS to submit the present proposal through their internal process as soon as possible. The subcommittee should first review the draft proposal, edit it, then submit it to USGS for review. The study will probably start in June of 2001.

Agenda Item 12 - Coordinated Siscowet Survey for Year 2000

The LSTC had agreed to conduct another round of siscowet surveys during June of 2000. We should take the time to prepare for the study. The suggestion is to use the August/September 1997 methodology during June. All agencies will be cooperating the study. GLIFWC will be conducting the study in July. Bryan Henderson and Chris Harvey will be contacting the agencies fairly soon about additional samples that they may want everyone to collect for them.

Agenda Item 13 - Brook Trout Fin Clip Schedule

LSC chairman Steve Scott has asked the LSTC to develop a coordinated and comprehensive fin clip schedule to cover brook trout stocking in Lake Superior. Michigan currently has an experimental stocking program taking place in the Pictured Rocks National Lake Shore and along the west side of the Keweenaw Peninsula. Michigan is using the following fin clip rotation; RP, ADLV, ADRV, and ADRP for the 2000-2004 year classes. USFWS stocking 90,000 brook trout into Siskowit Bay on Isle Royale, Red Cliff is stocking fish in WI-2, and Mike Donofrio stocking brook trout into Kelsey Creek in 1999. A coordinated schedule is called for!

There is an opinion that this applies only to coasters, not brook trout in tributaries. The LSTC had previously agreed to reserve the AD clip for coded wire tags. Those agencies currently raising brook trout are Michigan DNR, Red Cliff, and Iron River National Fish Hatchery. Ontario is not currently stocking, but they may do so in the future as well as Minnesota. Dale Bast indicated that there is a problem with fin clip regeneration in brook trout, but the adipose clip is a good one.

The LSTC is encouraging agencies to use coded-wire tags whenever possible for marking studies. The AD clip should be reserved for coded-wire marked fish clips. It appears that fin regeneration is a problem so agencies are taking a chance by stocking them. The LSTC recommends that the AD not be used in combination clips, i. e. ADRP, ADLP. These marks should be RP or LP, do not use the AD clip. The LSTC also encourages agencies to keep each other informed on clip schedules and recaptures of marked fish. We suggest that when Marg assigns a clip to an agency that she send the information to the LSTC chairman who in turn will make sure that the other agencies know of the information.

Agenda Item 14 - Protocol for Acoustic Sampling

Doran Mason and Mike Hoff wrote two proposals to develop a protocol for applying acoustic sampling to Lake Superior. The protocol should include the costs of conducting both a near-term and a long-term project. The near-term project was to be conducted in one or two localized area for the purpose of working out the bugs for a long-term integrated program. The long-term program would attempt to estimate lake-wide prey fish biomass in-concert with a bottom trawl survey.

The short-term proposal will cost \$69K per year for two years, while the long-term project will cost a total of \$650K and last four years. The short-term project is scheduled for the Apostle Islands, while the long-term project will separate the lake into four geographic zones and sampling will take place in each zone. LSTC members and participants should provide comments on the two proposal to Ebener or Hoff fairly soon since the proposals will be submitted to the USFWS Restoration Funds in March 2000.

Agenda Item 15 - Lake Herring Report

Jeff Black agreed to consolidate commercial harvest and effort data on lake herring in Lake Superior. Kinnunen and Hoff agreed to continue to analyze environmental data for evaluating it influence on year class strength of lake herring. All agencies should bring age composition data on lake herring in commercial fisheries and surveys to the meeting.

Ron Kinnunen looked at wave and wind effects on lake herring recruitment in Lake Superior based on data obtained from three NOAA weather buoys in eastern, central, and western Lake Superior in April, May, and June of 1982-1992. Ron used herring recruitment data from the entire south shore of Lake Superior. April buoy data was minimal. Found no significant relationship between recruitment and wave height/wind speed in June. Found no significant relationship with recruitment from data in the eastern basin buoy. Found a significant relationship between wind speed in May and based

on the central basin buoy. Lake herring recruitment and wave height relationship in May based on western basin buoy were also significant.

Ron was not able to produce a good predictive fit of lake herring year class strength to wind speed and wave prediction.

Mike Hoff provided a handout summarizing the results from his attempt to relate lake herring year class strength to various biological parameters. Mike's recruitment parameter is CPUE of age 1 herring in bottom trawls in the Apostle Island area of Lake Superior. His predictive parameters were such things as biomass of whitefish, lake trout, slimy sculpin, burbot, and smelt, as well as mean temperature at Bayfield in April, and spawning stock of lake herring.

Bill Mattes provided a handout on age and size composition of lake herring caught in commercial harvests from MI-4 in 1986-1998. Bill also did a comparison of otoliths age v. scale age for lake herring from MI-4 in 1998. Otoliths ages were consistently greater than scale ages.

Mike Hoff distributed a handout of age composition of lake herring caught in bottom trawls in Michigan, Wisconsin, and Minnesota waters during 1991-1999. He produced a lakewide (U. S. waters) age-length key and applied that to the length data in order to produce the age composition data. Does not have aged fish prior to 1991.

Agencies should provide their lake herring data to USGS if possible, pick up where left off. Agencies should provide summarized age composition data by fishery to Mike Hoff.

Agencies should provide their lift specific catch and effort data to Jeff Black since he has volunteered his effort to compile the commercial catch and effort data. Jeff should reiterate his data request to everyone.

Agenda Item for next meeting would be appropriate spatial scales.

Agenda Item 16 - LSTC protocols

The LSTC agreed at the August 1999 meeting that documenting the data collection protocols used by the LSTC was a worthwhile endeavor. The committee also agreed to discuss the following items at the winter meeting in regard to the protocols; geometric mean vs. arithmetic mean CPUE, design of spring assessment fishery, ageing protocol for lake herring and siscowets, summary small mesh gill net survey, and stocking.

Mike Petzold provided an handout on estimating the geometric mean of CPUE. Mike Petzold asked what the protocol for the spring assessment is beyond net types, mesh size, nights out. Mike Petzold should provide Ebener with a copy of his handout.

Agenda Item 17 - Aquatic Committee

The U. S. EPA informed the Aquatic Committee that roughly \$30,000 has been allocated to the committee. The AC is also in the process of writing the first draft of the LaMP of the aquatic community. Ebener and Cullis updated the LSTC on the AC activities.

Agenda Item 18 - LSTC Research Proposals

The LSTC currently has several ongoing research projects that are funded by either the GLFC or USFWS. In FY 2000 there will be \$475,000 available for USFWS Restoration Act Grants that could be used to implement research projects that the LSTC considers important. LSTC members should come prepared to recommend research projects for funding.

We are currently asking the USFWS Restoration Act for \$13K for the Hansen project, \$4.5K for the Ebener and Christie project, and \$140K for the acoustics project. Don and Steve are going to write a proposal on an ageing workshop.

Bryan Henderson is interested in receiving money to help out with the siscowet survey in Ontario waters. The LSTC will support Bryan's request and Ebener will provide Bryan with the names of individuals conducting the survey in U. S. waters. Bryan will provide Ebener with a copy of the proposal.

Agenda Item 19 - Sea Lamprey Control Issues

Gary Klar reported on highlights of the sea lamprey control program in 1999. Gary reported that the Corps of Engineers has agreed to do an assessment of potential site selection for a barrier on the Bad River. The Bad River Band has signed a MOE with the Corps to conduct the site selection survey. Gary also reported that they will be completing the sterile-male experiment on seven of the eight study streams in 1999, and that the seven sterile -male streams will be chemically treated

in 2000. The control agents have been implementing a coded-wire tag mark-recapture study in Lake Superior. The study involves capturing transforming larval lamprey in tributaries, marking the larvae with coded-wire tags, and releasing the transformers back into the streams. Adult sea lampreys captured in tributaries during spawning migrations are checked for the presence of a coded-wire tag. Gary reported that roughly 1,000 transformers were released in 1998, 2,000 were released in 1999, and the control agent plan to release another 2,000 transformers in 2000.

Gavin Christie reported that the estimated number of spawning sea lampreys in U. S waters of Lake Superior was larger in 1999 than any other year since treatment began. The agents are somewhat at a loss to explain the origin of all these sea lamprey. There is a suspicion that lower treatment effectiveness due to trying to protect larval lake sturgeon, and reducing chemical usage to met GLFC goals, has meant that chemical treatments leave a larger number residuals than would have been missed during a normal treatment.

Gavin also described the stream selection process for 2000. Lentic areas in Batchawana Bay and off the Gravel River were included in the cost-kill curve for the first time. Gavin reported that they now have the ability to predict the total number of transformers within the entire basin. The estimates of the number of transformers is about 320,000 during 1998 through 2000, and the control agents estimate that they will leave about 2.9% of those transformers after treatments throughout the basin, In Lake Superior, however, the control agents estimate that they will leave 8% of the estimated transformers because the Ontonagon River is not being treated. Protecting sturgeon in the Ontonagon River meant that the cost of treating the Ontonagon increased enough to drop it off the treatment schedule for 2000.

Agenda Item 20 - Reports to the LSC in March 2000

The LSTC agreed to make the following presentations to the LSC at their annual meeting. The meeting will be held in Ann Arbor, Michigan on March 21-22, 2000.

1) Report of the LSTC – Mark Ebener, COTFMA

The LSTC agreed that Ebener should discuss the Bi-National Program issues in his presentation.

2) Sea lamprey wounding of lake trout in Lake Superior in 1999 – Mark Ebener, COTFMA

3) Sea lamprey management in Lake Superior in 1999 – as of yet undetermined DFO staff member

4) Overview of lake trout model development in Lake Superior – Shawn Sitar, MiDNR

5) Lake trout compensatory growth analysis – Laura Hartt, OMNR

6) Historic lake trout CPUE in Michigan waters of Lake Superior 1929-1959 – Mike Wilberg, UWSP

7) Acoustic sampling in the western basin of Lake Superior and development of a lake-wide program – Doran Mason, GLERL

Doran should at this time describe the short-term and long-term proposals

There was a suggestion that this could possibly be include with in-common session presentation

8) Prey fish biomass estimates and lake herring recruitment model – Mike Hoff, USGS

9) Fish extraction report for 1999 – Bill Mattes, GLIFWC

10) Kiyi: the new USGS research vessel for Lake Superior – Owen Gorman, USGS

11) Rehabilitation of Devils Island Shoal using artificial turf incubator - Chuck Bronte, USGS and Stephen Schram, WiDNR

Steve Scott, LSC chairman, asked that everyone making a presentation to the LSC provide copies of their talk or report to the MDNR staff member taking minutes for the meeting.

The LSTC agreed that the selection process used to decide which streams are chemically treated each year should be made part of the LSC Executive Session.

Agenda Item 21 - Time and Place of Next Meeting

The summer meeting of the LSTC will be held in Sault Ste. Marie, Michigan on August 1-2, 2000. The meeting will begin at 1:00 PM EST. Ebener and Gebhardt will take care of the arrangements for the meeting.