Minutes of the
Lake Superior Technical Committee Meeting
Bay Mills Resort and Casino
Brimley, Michigan
August 1-2, 2000

Attendees:
Ken Gebhardt, Scott Koproski - Bay Mills Indian Community
Trent Sutton - Lake Superior State University
Mike Petzold, Jeff Black - Ontario Ministry of Natural Resources
Gary Klar, Henry Quinlan, Chuck Bronte, Jessica Doemel, John Johnston - United States Fish and Wildlife Service
Owen Gorman, Michael Hoff, Roger Bergstedt, Mary Fabrizio - United States Geological Survey
Shawn Sitar, Steve Scott - Michigan Dept. of Natural Resources
Don Schreiner - Minnesota Dept. of Natural Resources
Rick Huber - Bad River Band of Lake Superior Tribe of Chippewa Indians
Steven Schram - Wisconsin Dept. of Natural Resources
Bill Mattes, Kory Groetch - Great Lakes Indian Fish and Wildlife Commission
Marc Tuchman - U. S. Environmental Protection Agency
Greg Fischer - Red Cliff Fisheries Dept.
Mike Wilberg - limbo
Mike Hansen, Brian Linton, Jennifer Devine, Kevin Kapuscinski - University of Wisconsin Stevens Point
Mike Donofrio - Keweenaw Bay Indian Community
Ron Kinnunen - Michigan Sea Grant
Doug Belanger - Batchewana First Nation
Sean Cox, Chris Harvey - University of Wisconsin Madison
Mike Jones, John Netto - Michigan State University
Mark Ebener - Chippewa/Ottawa Treaty Fishery Management Authority

Agenda Item 1 - Mark and Recapture of Sea Lampreys

Gary Klar briefly updated the LSTC regarding sea lamprey control activities on Lake Superior. John Heinrich is writing the case history paper of sea lamprey control on Lake Superior for the upcoming SLIS 2 symposium. The Army Corps will start a study to evaluate placement of a barrier on the Bad River. The control agents are going to chemically treat the eight sterile-male study streams with two different treatment effects; a lower treatment concentration similar to the sturgeon protocol, and a higher treatment concentration similar to the normal treatments. Large larval sea lampreys that were likely to undergo metamorphosis were marked with coded-wire tags and released into selected tributaries to the lake two years ago, and these marked lampreys were recaptured for the first time in 2000 as part of the lakewide spawning-phase trapping efforts. A total of 33 cwt-marked lampreys were caught and only nine of the 33 were captured in the basin into which they were released. The principal movement appears to be from Canada into the western basin, and from the western basin into the eastern basin. Basically there is considerable mixing of sea lampreys on a lakewide basis.

Agenda Item 2 - Lake Sturgeon

Henry Quinlan provided a brief summary of the Great Lakes Fishery Trust lake sturgeon workshop held in June of 2000. The purpose of the workshop was to understand the nature of ongoing sturgeon research, and to coordinate research throughout the Great Lakes. The Trust is willing to fund sturgeon research on any lake, but the research proposals must have a tie-in to Lake Michigan. The Trust is also willing to standardize assessments techniques throughout the Great Lakes. Pit tags and coded-wire tags are routinely used to mark sturgeon in the Great Lakes right now, but these tags do not identify agency that marked the fish. USFWS is seeking money to develop a database of mark-recapture information from sturgeon. The LSTC suggested to Henry that the database include all recaptures so the database could be used to understand movements at some later point in time.

Agenda Item 3 Aquatic Committee and LaMP for Lake Superior

Ebener briefly described the status of the Lake Superior LaMP and Aquatic Committee. The Aquatic Committee now wants to focus it efforts on lower trophic levels and develop linkages between the Aquatic Committee and the LSTC and researchers involved in lower trophic work with zooplankton and benthos.

Agenda Item 4 - Lakewide Prey Fish Survey

Owen Gorman and Mike Hoff gave a brief overview of the lakewide survey forage survey conducted in 2000. Owen provided an overview of the Kiyi in operation. Mike Hoff provided a handout summarizing trawl catches in 1999 and 2000 in MI-4 to MI-8 as an example of lakewide trawling. The trawl survey measured another poor year-class of lake herring produced in 1999. Whitefish continue to be abundant primarily in the Apostle Islands, and both smelt and sculpin abundance remained low in 2000.

Mike Hoff reported on the difference in area swept with the same size trawls by the various USGS vessels used to trawl on Lake Superior. The area swept is based on Scanmar readings and is 6 m wide from the Siscowet, 7 m wide from the Grayling, and 8 m wide with the Kiyi. The Kiyi is running at its lowest speed possible and still trawls a wider area than the other vessels. The LSTC recognized that USGS needs to do further studies to understand the changes in catchability with the same gear among the vessels. There was agreement among the LSTC that the comparison needs to be a sizable effort.

Action Item: Ebener will write the LSC and outline the process and suggest that the LSC have the USGS conduct the paired comparison of trawl catches among the three vessels. State in letter that is a basin wide problem that needs to be addressed.

Agenda Item 5 - Acoustic Project

Mike Hoff updated the LSTC on the status of the acoustics project funded by the USFWS Restoration Act. Mike provided a copy of the acoustic proposal to the LSTC members. This study will be used to estimate target strength and species relationships for Lake Superior. USGS is using the Canadian funds as a match to the federal funds. The project will take in the Apostle Island region and start in 2001 and end in 2002.

Agenda Item 6 - Agenda Item - GLIFWC Contaminant Study

Kory Groetsch from GLIFWC gave a presentation summarizing the study of chemical contaminates in commercially caught fish from Lake Superior. They collected leans, siscowets, whitefish, and lake herring from M-2 through MI-5 and WI-2. A total of 48 fish per species per length range were collected, the fish were sorted into age groups, and the samples were analyzed for contaminants in fat, skin, and fillets. Each species was grouped into composite samples and each composite contained 12 fish.

Concentrations of Mirex, dieldrin, DDT, BHC and Heptachlor were tested and found to be in low concentrations in all the species. Trimming the fat from fish reduced concentrations of PCB in fish by about 20%. Trimming did not reduce concentrations of methyl mercury. Only Chlordane and Mercury from large siscowets were found to be in high enough concentration to prohibit commercial sale. Chlordane is used in the southern U. S. as a pesticide to control terminates and fire ants. How much water was in the samples had a large effect on the chemical contaminant concentrations. The lower moisture content typically increased chemical concentrations, so Kory cautioned agencies to report moisture content of samples when they report contaminant levels.

Summary: fillets from lake trout, lake whitefish, and lake herring can be sold according to FDA guidelines, agencies need to report moisture content, and composite samples produced reasonable results.

Agenda Item 7 - EPA Open Water Sampling Program

Marc Tuchman of the U. S. EPA Great Lakes National Program Office (GLNPO) in Chicago gave a presentation on the EPA lakewide sampling program for phytoplankton, zooplankton, and benthic communities in Lake Superior. Marc first reported that PCB trends in lake trout from Lake Superior are leveling off at 0.5 nanograms per microgram. Total PCB concentrations in all the Great Lakes are converging at about 0.2 nanograms per microgram.

Marc reported that the EPA monitoring program began in 1983 on the Great Lakes, but Superior was not added until 1993, it was then dropped in 1994 and 1995, and pickup again in 1997. Two surveys are conducted each year, one in spring when the lake is completely mixed and another in summer when the lake is stratified. All plankton stations are located offshore, whereas benthos samples are collected primarily from 45 m. Marc's presentation focused on offshore waters and he examined the phytoplankton, crustacean, rotifer, and benthos communities based on the 1998 surveys where there were 19 plankton stations and 9 benthos stations. Phytoplankton samples are composites from roughly the upper 20 m, and in the summer an additional sample is taken at the depth of the maximum chlorophyll layer. Zooplankton and crustaceans are enumerated from 100 m tows using a 53 um mesh; nauplii and rotifers from 20 tows with a 63 um mesh.

Have found nearly 180 taxa of phytoplankton that averages about 60 per sample. About 50% of the biomass is contributed by 10 species; 90% by about 38 species. Find much less rotifers and crustaceans and not more than 20 taxa of each type. Not much variation in number of taxa from one site to another in the lake. Species richness of zooplankton is

similar to other upper lakes. Only found 6-8 benthos species in the samples and these are comprised of primarily a couple of species. The number of crustaceans and rotifers increases from the spring to summer samples. Not many large blue-green algae in Lake Superior.

Phytoplankton results. In spring, the biomass of phytoplankton in Lake Superior is very low compared to the other Great Lakes averaging only 0.085 grams per cubic meter and the biomass is uniform across the lakes. Biomass in Lake Michigan is 0.26 grams per cubic meter and 0.52 grams per cubic meter in lakes Erie and Ontario, respectively. A mix of Cryptophytes, diatoms, and some blue greens and chrysophytes dominate the community. Diatoms account for 1/3 of the biomass, whereas in the other Great Lakes diatoms dominate the phytoplankton biomass in the spring. In summer in Lake Superior the biomass of phytoplankton increase and is homogeneous, while in the other Great Lakes the biomass declines in summer. The summer community sees an increase in chrysophyte biomass; diatoms are about the same percent as in spring, but decrease in lakes, so Superior has relatively higher diatoms biomass than the other lakes. This is probably due to slower development, and consequent higher dissolved silicon concentrations in summer compared to other lakes.

Lake Superior has a deep chlorophyll layer at nearly every station and it is deeper than in the other Great Lakes. Typically, the maximum concentration of chlorophyll resides below the epilimnion during summer. This chlorophyll is measured in terms of live cells so measurement of the layer is affected by the shape and position of the chloroplast. There is a fair amount of variability in the position and configuration of the deep chlorophyll layer in the lakes because is found between 20 and 40 m at the base of the metalimnion and top of hypolimnion. This is very deep. In Lake Michigan the deep chlorophyll layer is shallower between 24 and 26 m. The deep chlorophyll layer tends to be more highly developed where temperatures are more clearly stratified. In Lake Superior get actual increase in chlorophyll at the deeper layer, get increase in biomass, and have more phosphorus in deeper chlorophyll layer. Due to both shade adaptation and real increase in biomass. Is more nutrients at lower depths of Lake Superior.

Phytoplankton conclusions are:

- in spring there is a mixed community of diatioms, cryptophytes, cyanophytes and diatoms are less dominant than in other Great Lakes
- in summer there is an increase in diatoms, and chrysophytes are important as in other lakes
- the biomass of Lake Superior is low relative to the other Great Lakes and lower in spring than summer
- there is a very deep chlorophyll layer in Lake Superior due to shade adaption and a real increase in biomass
- phytoplankton at depth exhibit improved nutrient status
- due to higher nutrient concentrations at depth there is high transparency

Zooplankton Community: The spring zooplankton community is dominated by both adult and immature calanoid copepods. There is also a relatively high number of cyclopods which distinguishes Lake Superior from Michigan and Huron. The species of calanoids are also different between Superior and Michigan and Huron. In Superior have large, cold/deep water forms like *Leptodiaptomus sicilis* and *Limnocalanus macrurus*, wheres in Michigan and Huron have smaller epilimnetic forms like L. *minutus* and L. *ashlandi*. Marc suggested that the dominance of larger calanoids in Superior may be indicative of low predation pressure. Very weak species richness in Lake Superior, found only four taxa in spring 1998. In summer 1998 found some cladocerans. In spring zooplankton density is 5 per cubic meter and in summer is 15-20 per cubic meter. Biomass increased from spring to fall. Bio mass low compared to other lakes and not variable. Percent contribution of cladocerans is low in Superior compared to other Great Lakes. There is no real spatial pattern in abundance or species composition in Lake Superior.

Zooplankton conclusions:

- in spring the community is made up of large, deep-living calanoid copepods and cyclopoid copepods are also abundant
- in summer immature copepods are dominant and the percentage of cladocerans is lowest of the Great Lakes
- biomass of Lake Superior is low relative to other Great Lakes
- there is no marked spatial heterogeneity

Benthic Community: The benthos is dominated by *Diporeia*, the oligocheates *Stylodrilus* and *Heterotrissocladius* and a some spaeriid clams. This association of four species is the standard profundal community in the Great Lakes. Found six species in summer 1998 that ranged from 1-324 per meter. Saw decline in *Diporeia* from 1997 to 1998 at all sites except one, but that was no true in 1999. It appears that 1998 was a bad year for amphidpods.

The committee and Dr. Tuchman agreed that it was in the best interest of both EPA and the LSTC to expand the working relationship between the groups. Marc agreed to participate in the State of the Lake Report to the LSC in March 2002 in Duluth.

Agenda Item 8 -Thermal Habitat Use by Lake Trout or Other Species

Roger Bergstedt from the USGS Hammond Bay Biological Station gave a presentation on the use of thermal tags and their applicability to studying thermal habits of fish in Lake Superior. The high sea lamprey marking of siscowets observed on Lake Superior raises the question of the impacts of lampreys on them. Roger illustrated the use of thermal tags for understanding temperature usage by lake trout in Lake Huron. Roger, Ray Argyle, and Gary Curtis have placed thermal archival tags in roughly 200 lake trout in Lake Huron since the fall of 1998. Large-sized lake trout have had the tags surgically implanted and these tags record both internal body temperature and external water temperature. There seems to be a substantial difference in thermal preference of Marquette strain lake trout versus Seneca strain fish. Returns have been encouraging and several fish have been recovered that were extant for 14 months.

The group discussed the use of different archival tags for understanding thermal habits of various fish in Lake Superior. Roger stated that the conventional archival tags are probably not feasible for siscowets because exploitation is too low to get any number of returns back. Chat tags are available and these are tags that are located with telemetry equipment and the data is downloaded through an acoustic link. Unfortunately, miniaturization of these chat tags has not taken place. Another tag is the pop-up tag that automatically disengages from the fish, floats to the surface, then can be located because it gives off an signal. Pop-up tags might cost $1000 per tag and we would probably need to order quite a few to be profitable for the company, thus making the study costly.

Action Item: The LSTC agreed that this sort of project is worth pursuing. A working group of individuals will meet at the Midwest Fish and Wildlife Conference in Minneapolis to scope-out a proposal for implanting various fish species with thermal sensors in Lake Superior. Bill Mattes has agreed to take the lead in writing the proposal.

Agenda Item 9 - Lake Trout Survival

Mary Fabrizio from the USGS Great Lakes Science Center discussed her proposal to analyze lake trout survival in Lake Superior based on mark-recapture data collected from lake trout at Gull Island Shoal since 1969. WiDNR has tagged about 2,000 fish per year during the spawning season. Annual return rates have ranged from 3 to 11% since 1984. Mary and Steve Schram have already looked at double-tagging studies to infer tag loss, estimation of heterogeneous tag shedding, longevity of fish, and growth rates of lake trout from Gull Island Shoal. Tag shedding is a function of aspects of the experiment such as time at large, tag age, tag type, tagging operator, and features of the individual fish such as size, sex, and other factors.

In the double tagging experiment Mary used a conditional binomial probability model to estimate tag shedding. With this analysis, declines in the number of recaptured fish through time is not critical, and standard post-hoc methods to adjust survival rates with estimates of tag shedding rates do not work when recaptures rates are low and survival rates are high. Retention of anchor tags by lake trout is fairly high, but may be much lower in the first year.

Mary proposes to study lake trout survival rates using Cormack-Jolly-Serber Models of tag recapture data. Her objective is to develop a model to estimate survival rates, investigate sources of variation, and incorporate shedding rates from previous studies. Her approach is to adjust the SURVIV program to permit survival estimates over more than 20 years, determine conditional likelihood using SURVIV, and include tag loss. The expected output is a series of survival models, some nested, others not, that will estimate annual survival rates for lake trout by sub-population (males, females, etc.). Mary proposes to seek money from the Great Lakes Fishery Commission Coordination funds to support a graduate student to work with other researchers to update the SURVIV model.

Action Item: The LSTC asked Mary to submit a written proposal at our January 2001 meeting before we decide to support the proposal and recommend it to the LSC.

Agenda Item 10 - Isle Royale Lake Trout Survey

USGS had agreed to submit a proposal on conducting a spring lake trout assessment around Isle Royale through USGS channels. The subcommittee of Donofrio, Mattes, Peck, Bronte, and Oelfke was first going to review the draft proposal written by Bronte, edit it, then submit the proposal to USGS for internal review. Owen Gorman reported to the LSTC that he has submitted the proposal through the USGS system, and is waiting for review and approval.

Action Item: Ebener should write to the Great Lakes Science Center to stress that the survey should be conducted.

Agenda Item 11 - Lake Trout Model Development

Ebener distributed copies of AD Model Builder and Microsoft C++ to those agencies with representation on the LSTC; GLIFWC, WiDNR, MnDNR, OMNR, and UWSP. Both software packages were purchased with GLFC and USFWS Restoration Act funds provide to Ebener and Christie.

Agenda Item 12 - ECOPATH/ECOSIM

Chris Harvey and Sean Cox provided an update on the future direction of ECOPATH/ECOSIM work being conducted at UW-Madison. The first chapter of Chris's dissertation has been published in CJAFS just recently. The ECOPATH/ECOSIM paper has been accepted for publication and is in the "In Press" stage. ECOPATH describes the food web relationships in an aquatic ecosystem, while ECOSIM is a dynamic simulation process that uses ECOPATH inputs. The paper evaluates various management scenario such as eliminating fishing mortality on lake trout and seeing what happens to the rest of the community. The Madison folks are now trying to use a spatially explicit form of ECOSIM and apply this to Lake Superior. The researchers will need more data for this spatially explicit model such as; dispersal and movement rates among species, localized diet information, and local fishing pressure.

Sean Cox described his background and experience with ECOSIM. Sean will be needing information on fish abundance and mortality in Lake Superior from 1950 to the present. Sean is also looking for life history and movement data for each of the species.

Action Items: Ebener make sure that get the commercial harvest and effort data consolidated for SCOL to Sean.

Agenda Item 13 - Calculation of Spawning Stock Biomass per Recruit

Shawn Sitar lead a discussion on calculation of lake trout spawning stock biomass per recruit and how it is used to calculate total allowable catches. First Shawn discussed the statistical catch-at-age models being developed. The final product of the model is estimates for various population and fishery parameters; abundance at age, mortality at age, stock-recruitment, selectivity, catchability, etc.

Because selectivity changes with size, and some age classes experience greater fishing mortality than other ages, applying the standard mortality rates of 40% across all age-class would produce mortality rates in excess of the target for some ages. Instead the concept of spawning stock biomass per recruit (SSBR) was used, which is the biomass of spawning females for every recruit that enters the population. There are three SSBRs; SSBR, SSBR_Base, and SSBR_Target. SSBR is the current value under existing growth, mortality, and maturity schedules. SSBR_Base is the value that exits in the unexploited state. SSBR_Target is the value under the target mortality rate which also is expressed as spawning potential reduction (SPR). SPR is a reference used in marine stock assessments and is estimated by dividing SSBR divided by SSBR-Base.

Shawn reported that total allowable catch calculations are made using the following:

- set recruitment to average of last three years of model
- assume constant M
- assume sea lamprey mortality is average of last three years of model
- TAC is based on the estimated F that would produce estimated SSBR_Target

SSBR values are used to adjust fishing effort by calculating the change in SSBR at various relative changes from the status quo fishing rates.

Agenda Item 14 - Lake Trout Habitat Modeling

John Netto and Mike Jones lead a discussion on the lake trout habitat modeling they are conducting in Lake Superior. John and Mike are trying to develop models that link lake trout life history and population parameters to habitat features of the lake. Their objectives are to develop tools to evaluate habitat-based limitations to fish community goals, and to build a model that links each of these. John and Mike are using the Minnesota north shore as the area of study to understand how habitat features affect rate of rehabilitation. They decided to study the problem in Minnesota waters because the habitat maps had already been produced for the Minnesota shoreline based on the Roxanne mapping study. Various submodels have been produced, but John discussed only the spawning sub-model. The total number of eggs is determined by the substrate, depth, fish origin, and fetch of the lake. These are used to produce a habitat unit. They produce an upper limit to the number of females that can use a specific habitat bin. Egg incubation and emergence is determined by wind events, sedimentation, and substrate. Habitat selection values were different for wild and hatchery fish. Conclusions were that selection of spawning units can effect egg survival, that egg survival is dependent on location, the surrounding habitat is important for spawning success, and egg survival is variable among spatial units.

Agenda Item 15 - Lake Trout Stock-Recruitment Analysis

Jessica Doemel discussed her completed analysis of the effect of gill-net fishing on survival of wild lake trout and the possible relative contribution of wild and stocked fish on wild recruitment in Michigan waters. All stock-recruitment curves for wild fish were above the replacement line when only considered adults as the factor limiting recruitment. Jessica's conclusion is that fishing effort does not appear to be important in regulating recruitment of wild lake trout at the

current time in Lake Superior, suggesting that large mesh gill net effort is consistent with the lake trout restoration goals at the present time.

Agenda Item 16 - Analysis of the Historic Lake Trout Fishery

Mike Wilberg provided an extensive summary of his analysis of the historic lake trout fishery in Michigan waters of Lake Superior. Mike's objectives were to compare modern and historic lake trout abundance, determine when over-exploitation occurred, and to describe the spatial patterns of fishing.

Historic and Modern Abundance: Mike used historic commercial catch and effort data from catch reports of Michigan commercial fishermen from the odd years during 1929-1959. He used a cutoff of 65 m as lean vs. siscowet habitat, used only spring data, used a 2.4 lb. average size in the harvest, and used only 4 ½ to 4 ¾ as mesh sizes to analyze. He multiplied the historic catch by 2.25 to account for the conversion from cotton to multifilament nylon and he also accounted for the number of nights out. Mike compared the historic data after conversion to the present day assessment fishery from 1959-1998. After correcting the historic catch and effort data Mike found that present-day abundance is greater than during 1929-1943. Present day abundance greater in MI-1, MI-2, MI-4, MI-5, and MI-6. The variability of CPUE is greater now that historically only in MI-2 and MI-3. For the rest of the areas there was no significant difference in variability between the present and historic CPUE. After CPUE of about 5 fish, there is no relationship between CPUE and catch. Modern abundance as high as historically in five units and less than in two.

Overfishing: Mike's objectives were to quantify the importance of fishing in reducing recruitment and identifying when overfishing occurred. The Ricker stock-recruitment relationship was used to evaluate overfishing. Density dependence in the relationship was inferred to mean that overfishing did not occur, and vice versa. Mike found density dependence in MI-2, MI-4, MI-5, MI-6, and MI-7 meaning that stocks were not over-fished. In MI-3 and MI-8 it looked liked overfishing had affected populations before 1929, but after 1929 gill nets did not have effect on stock size. MI-1 was overexploited before 1929 and effort during 1929-1959 was affecting recruitment. In MI-6 lake trout were not over-fished before 1929, but recruitment was being depressed after 1937. Effort did not have effect on recruitment in MI-2 and MI-7 during 1929-59 and lake trout in these units were not overfished before 1929. Lake trout from MI-4 and MI-5 not over-exploited until after 1949.

Effect of CPUE on fishing practices: Looked at number of full time fishermen from 1929-1961. Prior to 1941 number of fisherman was stable, increased during 1940 because of World War II, then declined annually thereafter. As yield increased the number of fishermen increased later. Also looked at amount of gill net fished overtime. Nearshore effort increased more rapidly and also declined more rapidly than offshore effort. Another objective was to evaluate CPUE by depth. During 1929-41 the deeper you fished the higher the catch rate, whereas after 1951 this was not true. Also looked at changes in mesh sizes fished. 4 ½ inch gill net effort was fairly constant, whereas 4 5/8 and 4 ¾ inch mesh effort increased later in the time period. These changes may have influenced CPUE. Also looked at changes in fishing pattern over time by creating a mean fishing location. There were significant changes in fishing grounds. Mike's conclusions were that;

MI-1 – present abundance probably greater than historically
MI-2 – present abundance greater than historically
MI-3 – present abundance equal to historic
MI-4 and MI-5- modern abundance greater than historic
MI-6 – present abundance greater than historically
MI-7 – present abundance somewhat less than historic abundance
MI-8 – historic abundance greater than modern

Agenda Item 17 - Lake Trout Movement Study

Kevin Kapuscinski and Mike Hansen have been compiling the Wisconsin DNR lake trout tagging data and they engaged the LSTC in scoping out the remaining tagging data. The purpose of the analysis is to understand movement of lake trout among management units for the lake trout model development. Bill Mattes will shortly be providing the GLIFWC data from MI-2 to MI-5 to Mike and Kevin. Kevin and Mike also have the Michigan tag-recapture data from MI-4 to MI-6. Red Cliff Fisheries Department also has tagged lake trout during the fall in the western Apostle Islands and MI-2 in spring.

Action Item: Mike and Kevin should contact Greg Fischer and the new biologist Tom Fratt to gain access to the Red Cliff tag-recapture data.

Agenda Item 18 - Lake trout diet information

The Ashland Biological Station had maintained the Lake Superior diet database for analyzing diets of predatory fish. The database was maintained through 1996, but nothing has been done since then. Mike Petzold distributed a handout summarizing diet information collected from Ontario waters in 1997-1999.

Action Item: Each agency should provide the diet data in the format maintained at the Ashland station before the winter meeting so we can review the data at the winter meeting. Each agency should also come to the winter meeting prepared to discuss diet information they have collected through the years.

Agenda Item 19- Results from June 2000 Siscowet Survey

The LSTC briefly discussed results from the June 2000 Siscowet Survey conducted lakewide. WiDNR, GLIFWC, KBIC, COTFMA all distributed handouts. MnDNR also conducted survey in 2000 as well as 1996, 1997, and 1998. The LSTC agreed that the information that should be reported is number of fish and gill net effort by depth strata, as well as age and size composition of the catch and diet information.

Agenda Item 20- What is a Lake Trout?

Mike Petzold and Bryan Henderson took digital pictures of each of the lake trout they caught during the spring 2000 survey in eastern Ontario waters of Lake Superior. Mike distributed a handout with pictures of the various forms of lake trout caught during the OMNR survey. Mike suggested that a workshop dealing with identification or standardization of identification lake trout may be useful. The LSTC agreed with Mike after reviewing the pictures.

Action Item: The LSTC agreed to have a workshop on lake trout identification in conjunction with the summer 2001 meeting Grand Marais, MI. Michigan DNR research vessel will be there as well as COTFMA crew. Ebener will set up the meeting. Include coregonid identification also.

Agenda Item 21- LSTC Sampling Protocols

Ebener provided a draft document summarizing the LSTC protocols. Mike Hoff will provide to everyone the structure and meta-file for the coregonines database. Ebener will provide another version of the document at the winter 2001 meeting of the LSTC.

Action Item: Each agency should provide Ebener with a description of the small mesh gill net gear used in the summer survey.

Agenda Item 22 - Fish Ageing Workshop

Stephen Schram and Don Schreiner received money from the GLFC Coordination Funds to conduct a fish ageing workshop for Lake Superior. The GLFC put strings on funding for the proposal that the proceedings from the workshop should be published as a GLFC document. Structures from each agency should be provided to Don and Steve before the end of August if it is to be included in the workshop. There appears to be about 23 people attending the workshop so far.

Agenda Item 23 - Research proposals

The LSTC directed Ebener to talk to Jack Wingate about getting the protocols for proposal submitted to the USFWS Restoration Act. The research proposal the LSTC is currently entertaining are;

- Analysis of lake trout mark-recapture data from Gull Island Shoal
- Thermal tagging of Lake Superior fishes
- Zooplankton and benthic collection and processing
- Lake sturgeon tracking study
- Coaster brook trout study at Michigan Tech.

Action Item: Ebener ask Bryan Henderson if he is still interested in getting the Cesium study funded.

Agenda Item 24- Time and Place of Winter Meeting

The winter meeting of the LSTC will take place January 16-17, 2001 in Duluth. Don Schreiner will make arrangements.