Summary of the February 7, 2005 meeting of the Lake Superior Advisory Group – Predator/Prey Relationships

Sea Grant Building at 2305 East Fifth St., Monday, Feb 7, 2005, 7 to 9:30 p.m.

Don Schreiner welcomed everyone, distributed meeting agenda, and introduced the meeting topic. Stuart Sivertson was welcomed as a member of the LSAG. The schedule for the meetings was adjusted so that the next meeting will deal with anadromous species and the following month will deal with lake trout.

Stuart Sivertson presented a computer simulation model dealing primarily with lake trout, Chinook salmon, smelt and lake herring populations. Model scenarios show declining smelt and Chinook salmon populations. In the simulation presented, the smelt population exhibited the typical boom and bust cycle that many invading species demonstrate. The longer lived native lake trout and lake herring persist and eventually overtake smelt and Chinook salmon.

Dr. Tom Hrabik presented work on hydroacoustic assessment of forage fish in the western arm of Lake Superior. The assessment used both trawling and acoustic sampling. Benefits over other methods were highlighted. The technique enables biomass estimation. Density of forage is higher near the Duluth area. Depth distribution of prey species was similar for the different areas sampled. Large coregonines made up the majority of the biomass. Smelt were a much smaller part of the forage base. How the assessment could be used to estimate mortality and estimate biomass mass necessary for replacement was mentioned as potential future work.

Molly Negus gave a presentation on bioenergetics, which compared what predators eat to available forage for the Minnesota portion of Lake Superior. Estimates were preliminary and represent a snapshot in time. Compared with past estimates, predators are relying much more on coregonines than smelt. Lean lake trout consumed the majority of coregonines and smelt. It appears that siscowet lake trout are less important predators in Minnesota waters than in the lake as a whole. Predators seem to be consuming a larger percentage of available forage than in past estimates. This bioenergetics modeling suggests that the lake may be at its carrying capacity for predators.

Don Schreiner gave the Fish Community Objective goals for forage and the 1995 LSMP goals for each forage species. Lake herring status was outlined. Lake herring abundance has fluctuated greatly with sporadic strong year-classes that drive abundance and the commercial fishery. The commercial fishery was briefly described. The status of declining rainbow smelt was presented. Don suggested the large smelt decline was driven by increased predation along with the natural boom and bust cycle. Sport and commercial fishing on smelt is probably very limited and not significant in the decline. Don concluded with some thoughts for the ongoing and potential assessment and management approaches for lake herring and smelt.

There was discussion about the character of the smelt and herring populations and questions asked of the presenters. Smelt decline around the lake was talked about. Steve Dahl talked about the commercial lake herring fishery and the November closure. There was a discussion of various harvesting approaches of lake herring. Don talked about herring management around the lake and talked about the issue response forms that ask specific questions of LSAG members about the commercial lake herring fishery and smelt management. There was talk about harvesting predators to control predation on the forage base and how that might be implemented. This moved to discussion of siscowet harvesting and the problems involving marketing contaminated fish. Another question was how much the biomass estimates can change. Tom Hrabik reiterated that estimates depend on year class strength, when they are done, and how they are analyzed. Concern was expressed about declining smelt abundance, which some feel concentrates predators nearshore and drives the boat fishery. Don summarized what the catch of herring has been in the various jurisdictions around the lake in response to the question of allocating 10 percent of the biomass to commercial harvest. Historical catches and not biomass have been used as the benchmark for management and allowable catch has been adjusted according to year-class strength in the past. Black Bay herring management was discussed. A comment was made that the lake seems to be going in a direction by itself and there is little that management agencies can do to change large-scale processes like predator-prey interactions. What can realistically be done except reduce predator stocking? Stocking of smelt was discussed. The various levels of production, primary, secondary and bacterial production were talked about as well as assessment methods. Smelt as an uncontaminated food source was raised. Commercial harvest of smelt has been very small. Predation on smelt versus reproduction and the viability of stocking was talked about. Stocking smelt was ruled out as it would not achieve the desired goal and is impractical. Broad scale environmental influences probably drive year-class strength in herring. The point was raised that a specific species should be managed for. The possible ramifications of fishing down the siscowet population were discussed. Issue Response Forms were distributed to LSAG members along with last meeting's responses. The meeting was adjourned.