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Fish Sampling Methods in a Lake

In order to sample the fish population of a lake, there is certain background data that should be collected first. A temperature/ O_2 profile should be taken to determine where the hypolimnion and epilimnion is in the particular lake. A rough idea of the bottom of the lake is needed in case there are deep holes or sills which may influence where the fish live. A water chemistry survey should be done to determine the acidity or alkalinity of the lake. Fish tolerate certain degrees of acidity or alkalinity. Other nutrient levels, like phosphate and nitrate can be measured to determine the nutrient quality of the water. A plankton count should be made to determine what the base of the food chain consists of and how much is available. The size of the plankton population can serve to limit the fish population if it is small. This information will be needed in order to properly analyze the fish population itself.

Nets of several kinds must be set in several places in the lake in order to get a qualitative and quantitative sample of all the different fish present in the lake. When you have found out where the deep holes are in the lake, an experimental gill net, with different size meshes, should be set horizontally along the bottom and vertically from the surface to the bottom. Floats and weights should be used on each end. From these nets, fish of different species and different year classes will be caught in the deep holes as they move into or out of the holes. At least 2 experimental

gill nets should be placed near shore stretching towards deeper water to catch fish that inhabit the littoral zone or come there to feed. Depending on the lake, if there is a sill or a cove, then a net should be placed there as well.

Gill nets tend to be species selective so some other types of nets should be set. A fyke net placed near shore will trap larger fish that may not be caught in the gill nets. The gill nets and fyke nets should be run in the morning and evening to collect the fish, because some fish will be more active in the day and some in the night.

Seining should also be done, at least once, such as a purse seine or drag seine, to catch a cross-section of the population. An additional sampling method, the trot line—a long line of baited hooks, could be set. The more sampling methods used, the more accurate the results will be because each method favors some species or ages over another.

When the fish are collected the length (fork, ^{standard}caudal, and total) and the weight should be recorded. Each species will need to be keyed out and a gut analysis performed on several members of each species and year class.

Any species that has approximately 50 fish caught, can have a length-frequency graph made. This will tell you where the different year classes are by the peaks in the graph. This can be compared to data taken from aging-by-scales. The ages taken from scales of fish of certain lengths should correspond to the year classes

good point, with limits.

shown on the length/frequency table. An additional calculation should be made called the K value, which compares the length to the weight. The K value can be compared to standard values found in a table. In this way, one can tell if the fish are average, stunted, or over-sized.

From the data taken, certain conclusions can be made. It can be seen if different species are increasing or decreasing, and if their K values are normal or stunted. From the gut analysis, the diet of the fishes can be determined. One can tell if the species or year classes are competing for the same food source. Research should be done in reference books to see what each species generally eats and where it lives. If the pH is very low or very high, this will have to be taken into account as well. Also, the O_2 profile of the epilimnion and hypolimnion will tell you if there is sufficient oxygen for the fish. It is necessary to know if the lake is turning over yearly and recycling the O_2 .

After looking at all the above data, one can tell which species are favored by the present conditions. Further, it should be possible to make some predictions about the future for the various fish species in the lake.