



Limnological Survey of the Environment Protection Board

Lake Mälaren

Lake Mälaren is 115 km in length and 65 km in breadth; the maximum depth is ca 66 m. The drainage basin is 22,600 km². There are 14 lakes larger than 10 km² within this area. Lake Mälaren is covered by ice about 110 days every year.

The lake was isolated from the Baltic in the twelfth century, but it has received small influxes of brackish water down to the present time.

Around Lake Mälaren there are about 1,350,000 inhabitants. Of the active persons, ca 550,000, 40% are active in industries and 10% in agriculture. In the northwestern part of the drainage area there is a mining district. In the area metal and engineering industry, food, chemical and pulp and paper industries in limited extent occur.

The lake receives sewage water from 1,100,000 persons. After 1968 about 20 sewage plants have been equipped with chemical treatment; nearly 50 will be added in 1972.

Lake Mälaren Research

The Lake Mälaren Research Project (Mälärundersökningen) was started in July 1964 following the alarming deterioration of the waters of Lake Mälaren - the third largest lake in Sweden. The considerable population increase in the drainage basin of the lake and insufficient treatment of the communal and industrial waste draining to the lake had caused the increasing destruction of the water.

The Lake Mälaren Research was initiated and financed until June 1967 by the Natural Resources Committee of The Swedish Natural Research Council. 1967-68 it was financed by grants from The Swedish Royal Committee on Natural Resources and after that from The Research Committee of The National Swedish Environment Protection Board. In 1969 the name was changed to The Limnological Survey of The National Swedish Environment Protection Board (Naturvårdsverkets limnologiska undersökning, NLU). From the beginning the work was divided into two sections: the physico-chemical and the biological. The major part of the investigation has been performed at the Institute of Limnology, Uppsala.

The annual nutrient load on Lake Mälaren is calculated to about 90 kg nitrogen 7 kg phosphorus per hectare. These figures are the highest for Sweden's large lakes; in order the Lakes Hjälmaren, Vänern and Vättern show lower values.

The concentrations of nitrogen and phosphorus have a determining effect on the distribution and quantities of plants and animals in the lake.

As early as 1785 water bloom was reported from Lake Mälaren. It probably occurred during only a short period every year. Although our knowledge about phytoplankton in the large lakes before 1965 is limited, it seems to be a general tendency that some blue green algae and diatoms become more and more predominant.

The occurrence of different fish species and the total catch has undergone considerable changes. Salmon trout (*Salmo trutta*) was rather frequent right up to the beginning of the twentieth century; now only single specimens occur in the lake. The pike perch (*Lucioperca lucioperca*) now predominates in the western part and the vendace (*Coregonus albula*) in the central and eastern parts which are less polluted. The total catch per hectare diminished from 4.5 kg in 1964 to 2.6 kg in 1969 mainly due to the public discussions concerning the concentrations of mercury in fish.

All examples given above on the tendencies today show a picture of continues changes to worse conditions in the lake. The situation is serious and it calls for all efforts to improve the water quality.

/ Torbjörn Willén