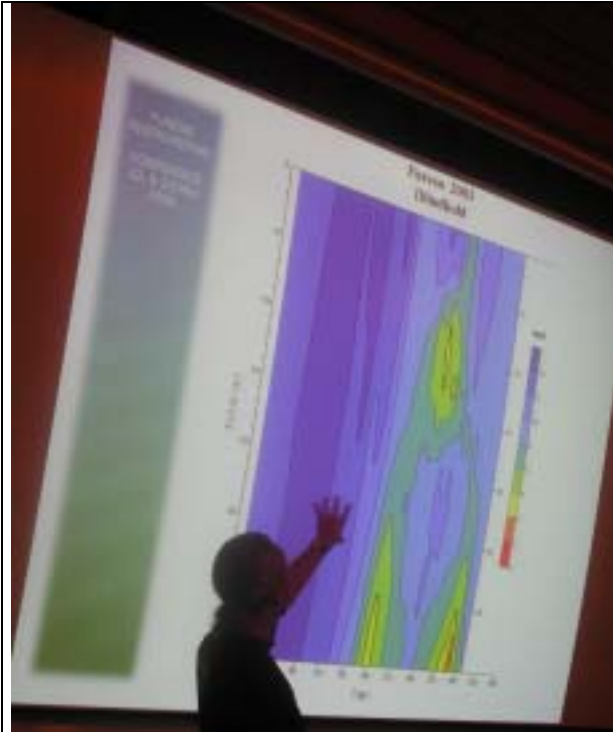


Restoration of Lake Fure

... a EU LIFE-Nature project



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Resume and
conclusions for the
period 2003-2006

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Nutrient loading

The annual external phosphorus loading to Lake Fure has decreased remarkably during the last 30 years: From app. 37 tons in 1969 to app. 5 tons in 1975 after diversion and improved treatment of sewage and it is 1.5-2.0 tons in 2005. The reduced loading has had an obvious effect on the conditions in the lake. The biomass of phytoplankton has declined, the water has become clearer, and submerged macrophyte species grow deeper and have increased in number.

It is essential that a further reduction of external phosphorus loading to the lake from storm water discharges is carried out. This action is probably the most important task for further improvement in lake water quality.

Phosphorus in the lake sediment is mainly bound to organic matter, calcium and ferric iron. The bond to calcium is important, although the bond to ferric iron is not insignificant as the phosphorus exchange

from the sediment to the water is three times less in periods with oxygen in the water relative to no oxygen.

Macrophytes

The number of macrophyte species in the lake dropped from 35 in 1910 to 10-12 in 1970-1980 but has subsequently increased to 25 species in 2005. Stoneworts, mosses and small slow growing elodeid plants were reduced or disappeared while more competitive large fast-growing elodeid plants survived. Pollution tolerant macroalgae (e.g. *Enteromorpha* sp and *Cladophora* sp.) immigrated and became dominant. They replaced stoneworts in the deepest parts of the littoral zone. Although the maximum depth of submerged macrophytes has increased the dominance of green macroalgae relative to stoneworts has persisted.

The maximum depth for submerged macrophyte growth and the total area colonized by plants have changed in accordance with the improved light conditions. In 2005 some species grow at the same depth as recorded in 1910, while other species still have a lower maximum depth of colonisation. The average Secchi depth today is lower than in 1910 suggesting that maximum depth of colonization was underestimated in the old studies, where plants were sampled with a rake compared to contemporary studies, where plants are sampled by scuba diving.

Benthic fauna

Due to longer periods during the summer with oxygen deficiency in the hypolimnion the previously rich invertebrate fauna has declined in the profundal zone. This decline particularly affected mussels and snails. The profundal fauna has moved upwards into the littoral zone.

Since the start of the oxygenation of the bottom water in 2003 many of the typical profundal species have re-inhabited the profundal zone, and due to the improved food availability more fish are present in the deep waters of the lake. It is assumed that the improved oxygen conditions have benefited the two species of relict crustaceans.

Phytoplankton and zooplankton

The composition and dominance of phytoplankton have changed noticeably during the the last few years. There are some changes from one year to another, but changes are more profound between clusters of years. In contrast to submerged macrophytes, the phytoplankton community shows rapid and significant changes, although cyanobacteria remain a significant part of the phytoplankton.

The composition and dominance of zooplankton have not changed distinctively during the last few years. Zooplankton abundance in the main basin is primarily regulated by food supply, while predation by planktivorous fish might influence the community more in Store Kalv. Further studies are needed to clarify the issue.

Fish stock

The fish stock in the lake has varied greatly for many years. During the last few years, the stock in the main basin has been more stable and dominated by Perch. In Store Kalv, there is still a large amount of Bream and Roach, but it seems as if the stock of Bream is declining.

During the three years of fish manipulation app. 200 tons of planktivorous fish have been removed from the lake. However, there is no sign of improved transparency in Store Kalv.

