

The beginning of helophytes applications in bioengineering in Europe

Alster Lake-Hamburg 1984-2008

**Location:** 10°0' 32.83" W ; 53°33' 33.54" S

The Alster River was dammed in the 18th century thus forming the "Aussenalster" and "Binnenalster" two smaller, but contiguous, lakes in the center of the City of Hamburg. Over time, a dense reed border developed on the banks with a great variety of hydrophilic species. At a point in time it was decided to remove some of the wetland vegetation in order to provide pedestrians with an open view to the lake. The reed border was removed where possible and the embankment was armored with symmetrical stone blocks. The results were disastrous. The reed community vanished along with a great deal of the associated organisms of flora and fauna. Along with other human impacts, the self-purifying functions of the natural ecosystem declined and the water quality deteriorated. In the early 1990's, with more recognition of the value of natural processes, a different approach was desired.

**Objectives**

The former reed community was to be restored where ever possible. In addition, the stone blocks were to be removed. At an appropriate distance from the shoreline 7 to 10 rock-filled berms where installed to act as breakwaters 10 to 20 cm above water level. Coarse stone material and mud collected from the lake bottom was placed in the open area of now relative calm water, between the berm and the shoreline. The area was built up to 0.2 m below water level. Approximately 50% of the area was then planted with "Vegetation Pallets" in accordance with the system developed by Lothar Bestmann. Based on experience with comparable projects, the unplanted areas between the pallets were expected to become naturally vegetated within a very short period of time. It was necessary to protect the new plantings from the sides and top against browsing by waterfowl.

CONDITIONS BEFORE TREATMENT

1984



**The beginning of helophytes applications in bioengineering in Europe**



## The beginning of helophytes applications in bioengineering in Europe



### Result of the Restoration

In many areas, hardy stands of *Phragmites* have developed. It is notable that communities of other species such as *Typha angustifolia* or *Scoenoplectus lacustris* are rarely found. *Carex spp.*, *Iris pseudacorus*, *Glyceria maxima* and some other species are occasionally found fringing the banks. It is apparent that the development of plant communities is slowed considerably in the absence of effective breakwaters and fencing. Lakeside colonization and spreading of the reed community could not be found.

### Conclusion

A very high price was paid for former misunderstandings. The fencing is necessary, but is obtrusive in an otherwise natural landscape. In many cases the breakwater where built too high above the water level thus allowing the growth of massive stands of nitrogen loving plants. Excessive numbers of waterfowl, disproportionate to the lake size, are harming the plant communities, especially swans. Alster Lake today, although still providing a beautiful natural landscape in an otherwise urban setting, must be considered a eutrophic / hypertrophic lake with all negative conditions.

The beginning of helophytes applications in bioengineering in Europe

CONDITIONS IN 2008

24 YEARS LATER

