

# Effects of the novel 'Flock & Lock' Lake restoration technique on *Daphnia* in Lake Rauwbraken (The Netherlands).

## Journal Details

**Title:** *Effects of the novel 'Flock & Lock' Lake restoration technique on *Daphnia* in Lake Rauwbraken (The Netherlands) (2010).*

**Authors:** Van Oosterhout, J.F.X. & Lürling, M.

**Journal:** *Journal of Plankton Research* (2010), 33(2), 255-263.

**Location of Research:** Wageningen University, The Netherlands.

**Results:** The "Flock & Lock" treatment was successful in rapidly reducing the chlorophyll-*a* concentration, removing phosphate from the water column and transforming the lake from one that was historically dominated by high amounts of nutrients (eutrophic) to one that was more in line with a natural aquatic environment (oligo-mesotrophic).

## Summary of Findings

An application of Phoslock and a low-dose flocculent (polyaluminium chloride) (pH buffered by the addition of 75 kg Ca(OH)<sub>2</sub>) was applied to Lake Rauwbraken, a recreational lake in The Netherlands. This dual application was termed by the authors as "Flock & Lock" and was carried out over 3 days in April 2008.

Located in the south of the Netherlands, Lake Rauwbraken is a manmade recreational lake. It was created in 1967 by sand excavation. The lake is 4 ha and has a maximum depth of 15 m deep. An increase in the frequency of cyanobacterial blooms has been recorded from the mid 1990s onwards and led to a 4 month swimming ban in 2007.

Water samples were collected for water quality and ecological investigation. The researchers studied the proliferation of the water flea, *Daphnia galeata* and observed a temporary disappearance after the application of Phoslock and polyaluminium chloride, however their population recovered within a few months. The authors suggested that this could have been due to physical effects of the aluminium flocks, grazing inhibition due to the flocks and clay in the water column, very low food concentrations in the water body after the application due to phosphate absorption, and absence of a predation refuge.

The "Flock & Lock" treatment was successful in rapidly reducing the chlorophyll-*a* concentration, removing phosphate from the water column and transforming a historically eutrophied lake into a new oligo-mesotrophic state. Since the dosage applied took the potentially bioavailable P in the top 10 cm of the sediment and groundwater inflow into consideration, it is expected by the authors that Lake Rauwbraken will remain oligo-mesotrophic for at least 10 years.

