# OC07 - Factors shaping macrophyte communities in peri-urban ponds: The influence of propagule banks and waterfowl

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Aquatic vegetation in man-made but valuable peri-urban ponds has been studied in order to determine biotic (n=14) and abiotic (n=13) factors significantly affecting the occurrence and composition of macrophytes. We tested the effect of environmental, phytoplankton and zooplankton indicators, as well as the spring macrophyte propagule bank and the impact of herbivorous waterbirds, in 16 (hyper) eutrophic ponds over two consecutive years. Propagules were sampled using sediment cores and germinated under greenhouse conditions, with a distinction between top and sub sediment layers. Avifauna data were retrieved from a database compiled with citizen observations and converted to herbivorous biomass densities.

Abundance-based similarity between propagule bank layers and between vegetation in two consecutive years was generally strong, but highly variable between propagule banks and expressed vegetation. A number of ponds did contain high propagule densities but lacked abundant submerged macrophytes. Ponds containing an impoverished propagule bank did not develop extensive submerged vegetation. Overall, generalized linear modelling showed the ecological status of ponds only partly mirrored the propagule bank potential.

Five common waterfowl species comprised the bulk of herbivorous avifauna biomass, two of which are non-native to Belgium. In decreasing order of importance, these were *Cygnus olor* (Mute swan), *Branta canadensis* (Canada goose, non-native), *Alopochen aegyptiacus* (Egyptian goose, non-native), *Anas platyrhynchos* (Mallard) and *Fulica atra* (Eurasian coot).

Multivariate forward selection retained five significant contributors to macrophyte community composition recorded in both years: increased phytoplankton biovolume, herbivorous waterfowl pressure during summertime as well as conductivity were associated with low abundance or absence of aquatic vegetation, while pH and angiosperm propagule density in the top sediment layer were positively associated with relatively species-rich macrophyte assemblages.

In conclusion, eutrophic, peri-urban ponds seem dependent on the propagule bank for extensive macrophyte recruitment, while other factors, including the summer density of herbivorous birds, help shape the structure of the macrophyte communities.