

# Biotic interactions control succession of emergent macrophytes



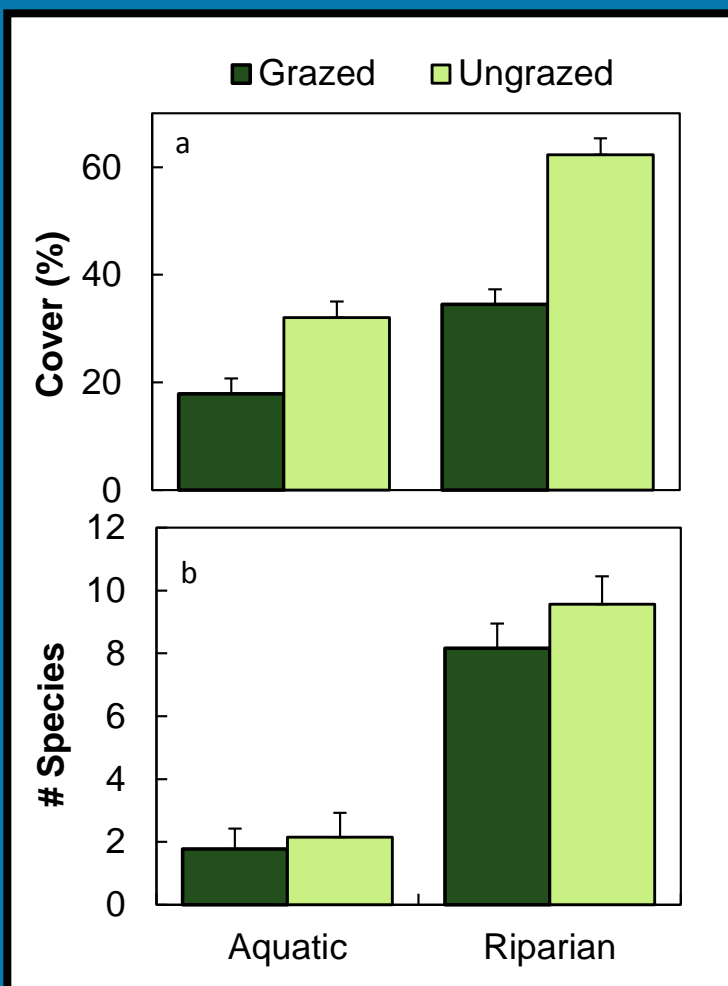
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## Aim

During succession, the riparian zone expands into the open water and gradually replaces aquatic macrophyte vegetation. However, succession is easily halted or reversed by multiple factors (Sarneel *et al.* 2010). Whereas research has mainly focused on abiotic factors, the role of aquatic herbivores remains unknown (Bakker *et al.* 2012).

## What is the effect of aquatic herbivores on the expansion of emergent macrophytes?



## Methods

in March 2011, enclosures (3 x 6 m) were built in 10 nature areas, 5 per area. A transect of riparian vegetation inside and outside the enclosures were monitored for two growing seasons.

## Conclusions

- Aquatic herbivores strongly inhibit macrophyte succession.
- This grazing effect was apparent over a wide range of environmental conditions and interacted with water depth (in water deeper than 0.75-1m the effect of grazing was little).
- Herbivores can be waterfowl, fish, muskrats and livestock, we found a negative correlation *only* between muskrat density and cover increase in the grazed plots

This implies that Aquatic herbivores may interfere with measures to improve abiotic conditions in restoration projects.



1. Bakker, ES and Sarneel, JM, et al. 2012 Restoring macrophyte diversity in shallow temperate lakes: biotic versus abiotic constraints. *Hydrobiologia* online  
2. Sarneel, et al 2011 Multiple effects of land-use changes impede the colonization of open water in fen ponds. *Journal of vegetation science* 22: 551–563