Urbanization alters our globe at a troublesome rate. As a result, nature conservation should try to maximize the ecological value of green and blue urban space. In this PhD, drivers of establishment and reproductive traits of submerged macrophytes (macroalgae and plants evolved to live an underwater life) were investigated in peri-urban ponds (mainly situated in the Brussels-Capital Region, Belgium), together with the development of an integrated biomonitoring scheme.

In a first stage, we studied the reproductive fitness of the macroalgae *Chara globularis* in response to duckweed cover. Shading stress resulted in decreased biomass and density of reproductive organs, impacting potential oospore release. Next, deposition rates and accumulation of propagules in vegetation communities were quantified using a novel approach of collection near the sediment, which indicated large within-species differences and the absence of a relation between macrophyte abundance and reproductive output.

On a pond-scale level, the dominant stressor acting on submerged macrophytes was phytoplankton-induced turbidity, followed by waterfowl grazing pressure. In addition, low densities of specialized propagules stored in the sediment seemed to be a bottleneck for restoration of turbid ponds.

Finally, a methodology was developed to allow efficient biomonitoring of ponds in function of European directives and cyanobacterial surveillance. Two aquatic habitat types of the Habitats Directive were found to occur in the Brussels-Capital Region – albeit in a degraded or ephemeral state.

In summary, submerged vegetation in peri-urban ponds is significantly affected by autotrophic stressors, attraction of birds and reduced propagule availability, making a case for continued efforts of nutrient and fish reduction, waterfowl control and sufficient biomonitoring to identify challenges and opportunities.