

*The **ECOSPHERE research group** aims to study aquatic and valley ecosystems that are continuously challenged by natural and anthropogenic stressors. The research focuses on acquiring fundamental and applied knowledge at different levels of structural and functional organisation in order to underpin environmental management decisions.*

MASTER THESIS SUBJECT 2025

Biodiversity of diatom and macro-invertebrate communities in a formerly impacted nature reserve

Research group: ECOSPHERE

Hosting laboratory: Meise Botanic Garden

Promotor(s): Prof. Dr Bart Van de Vijver & Prof. Dr Lieven Bervoets

Co-promotor: Mrs Margaux Pottiez

Daily supervision: Mrs Myriam de Haan



Sampling in the nature reserve Hageven-Plateaux (@Marjel VandenBoer)

- This topic mostly contains literature study, lab work, field work, experimental work, GIS, numerical modelling, other:
- Possession of driver's license B is needed, recommended, not needed
- Possession of certificates needed: FELASA C, other:



The Hageven nature reserve is the Belgian component of the transnational heathland nature reserve Plateaux-Hageven, located on the Flemish-Dutch border near the cities of Lommel and Pelt (Prov. Limburg). The entire area encompasses about 500 ha, with 150 ha situated on Flemish soil and forms a mosaic of bog ponds, heathland, meadows and small forests. The nature reserve, under supervision of Natuurpunt, offers important habitats for a large number of insects including more than 40 species of dragonflies and the rare butterfly silver-studded blue (*Plebejus argus*). Recently, there has been an increased effort to restore the nature value of the reserve by transforming former pasture meadows into heathland and oligotrophic grasslands, cleaning up bog ponds, improving the quality of the water entering the nature reserve, and providing breeding and feeding grounds for a wide array of animals.

The area has been subject in the past to several environmental impacts. Metal deposition (cadmium, zinc and lead) from the nearby industrial activities polluted the soils and bog ponds and it is unclear whether this deposition still has an influence on the flora and fauna in the reserve. Most of the bog ponds have a more acidic, oligotrophic character but there is a significant input of water with a higher pH and higher nutrient load from the surrounding rivers and canals.

The past few years, there is a growing interest in a better assessment of the European biodiversity. As heathland areas are known to often harbour a rare fauna and flora, including many red-list species, the Hageven offers a unique possibility to study this rare biodiversity. A small project to discover the diversity in both aquatic macro-invertebrates and diatoms was set up and the preliminary results showed the presence of a highly specific diatom flora. For both groups, the species composition in the different bog ponds and wet areas in the nature reserve will be investigated in relation to a wide variety of environmental parameters including heavy metal pollution, nutrients and pH gradients.

The work will consist in 1. Inventorying the possible water bodies and their chemical and physical characteristics (including metal pollution), 2. Sample the diatom and the aquatic macro-invertebrate communities in the selected waterbodies and characterise their geochemical features, 3. Study the diatom and aquatic macro-invertebrate communities.

Several approaches (temporal, spatial) can be suggested and will be discussed together with possible candidates.

This project will be done in close collaboration with Natuurpunt, the owner of the nature reserve. They will provide assistance during the sampling and help with the interpretation of the results.

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