SCIENCES & BIOENGINEERING SCIENCES

The Research Group
Ecology, Evolution & Genetics

has the honor to invite you to the public defence of the PhD thesis of

Lisa Partoens

to obtain the degree of Doctor of Sciences

Title of the PhD thesis:

Evaluating the connectivity of wetland networks and the effectiveness of wetland restoration for waterbirds in the Western Palearctic

Supervisors:

Prof. dr. Bram Vanschoenwinkel
(VUB/University of the Free State, ZA)

Em. prof. dr. Nico Koedam
(ULB/UHasselt/UGent)

The defence will take place on

Tuesday, April 22, 2025 at 4 p.m.

VUB Etterbeek campus, Pleinlaan 2, Elsene, auditorium I.0.02

Members of the jury

Prof. dr. Iris Stiers (VUB, chair)
Prof. dr. Thomas Merckx (VUB, secretary)
Dr. Rosemarie Kentie (NIOZ/Universiteit van Amsterdam, NL)
Kris Decleer (INBO)

Curriculum vitae

Lisa obtained her Master in Biology at KU Leuven in 2018 and Bachelor in Biology at the University of Hasselt in 2016. In 2018, she began her PhD research at the VUB's Department of Biology. Her PhD focused on wetland connectivity and its impact on waterbird populations, as well as assessing the effectiveness of wetland restoration and creation programmes.
Lisa has published one article as a joint first author, one as first author currently under review and contributed to one article as co-author in peer-reviewed journals. In her teaching role, she assisted in several courses and field excursions, and supervised eight bachelor's and four master's thesis students.

Abstract of the PhD research

Wetlands are crucial ecosystems globally, providing vital habitats for a wide range of species, including migratory and resident waterbirds. These birds rely on well-connected, high-quality wetlands for feeding, breeding, and resting. Unfortunately, wetlands are under threat worldwide, making wetland restoration and creation programs essential tools for halting their decline and protecting waterbird populations.

In the first chapter, the connectivity of four major Palearctic-Afrotropical flyways was quantified, considering the protection level of wetlands along these routes. This first study demonstrated notable variation in flyway connectivity, with a limited number of large, strategically positioned wetlands supporting overall connectivity within these flyways. A second chapter revealed how 22 waterbird species use these flyways and showed that their flyway use is affected by their habitat requirements.

In the third chapter, the seasonal variability of wetlands across the Western Palearctic was examined using high-resolution satellite imagery. This study revealed that surface water availability, and its importance to different species of waterbirds, fluctuates seasonally and geographically. These findings provide a basis for prioritising regions where water availability may limit waterbird populations, highlighting potential targets for wetland restoration or creation.

In the fourth and fifth chapter, the effectiveness of wetland restoration and creation efforts was investigated. A first study focused on the foraging quality of wetlands created under the Flemish Sigmaplan and showed that newly created wetlands can become valuable feeding grounds quickly after creation, although there is substantial variation across different macroinvertebrate prey groups. A second study assessed waterbird populations in wetlands restored or created through the EU LIFE programme. We showed that the effect of wetland restoration and creation is mixed and that some bird species benefit while other species experience decreasing bird counts due to habitat transformation. These findings underscore the need to evaluate restoration programmes and to optimise habitat resources for waterbird species, including the availability of prey resources and overall habitat quality.

This research provides valuable insights for large-scale flyway management and informs conservation strategies aimed at protecting waterbirds and restoring wetlands across flyways.