**Title:** Ecological theory and application

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**Entry requirements:**

Ecological theory and applications builds on knowledge from Ecology and Experiments.

**Study path:**

Ecological theory and applications is a core course of the Ecology and Wildlife Management study path. It provides good preparation for Biodiversity and Landscapes, Microbial Ecology

**Learning objectives:**

The central theme of this course is how ecological theory informs and is applied in conservation, management, and policy of socio-ecological systems. At the end of the course students are expected to:

1. Understand fundamental ecological theory and how humans interact with these theories
2. Understand the role of theoretical modeling in ecological research
3. Formulate and modify simple theoretical models in R
4. Situationally apply ecological theory and synthesize across theories for conservation, management, or policy
5. Conceptualize, develop, and present a group project applying ecological theory to an urban ecosystem

**Skills:**

* Using R for theoretical modeling
* Collecting observational data
* Processing and analyzing data in R
* Critically evaluating statistical output
* Basic plant identification of important plant families in the Netherlands
* Independently searching literature for relevant articles
* Working together in small groups on relevant ecological topics
* Giving and receiving feedback with peers
* Creating content that is targeted to a specific stakeholder group

**Contents and teaching methods:**

Ecological theory and application explores the major pathways of ecological theory from competition between individual species to global ecosystems. Each week, we will explore an ecological theory and then examine how that ecological theory is applied in practice through a specific case study. These case studies include examining human interactions through the lens of competition theory, conservation policy in desert systems, water management and rewilding in important Dutch ecosystems, ecological restoration across landscapes, and global climate policy. These case studies examine the consequences of ecological theory across stakeholders, systems, and scales. These case studies include two field trips by bike as well as a small experiment and will include digital guest lectures from researchers around the world. The final project for the course will examine humans as drivers of ecological processes in urban/suburban ecosystems. The course will generally take a hybrid approach with course activities occurring both in person and online.

**Assessment:**

Objectives 1-4 will be assessed both through four modeling exercises (40%) designed to be completed during course time and through an exam (30%). Objective 5 will be assessed with the final presentation (30%) during a mini-symposium at the beginning of the final week of the course.

**Study material:**

A practical guide to Ecological Modeling by Karline Soetaert and Peter M.J. Herman

Course materials