

PROGRAMME

09:30 – 10:00	REGISTRATION AND COFFEE / TEA
10:00 – 10:20	WELCOME AND INTRODUCTION BY CHAIRS (Jetske de Boer, Netherlands Institute of Ecology / Kenneth Rijdsdijk, University of Amsterdam)
10:20 – 11:00	CHALLENGES AND CHANCES IN RESTORING BIODIVERSITY IN THE RURAL LANDSCAPE (Hans de Kroon, Radboud University/NERN)
11:00 – 11:30	COFFEE / TEA
11:30 – 12:10	EVOLUTIONARY POTENTIAL IN THE ANTHROPOCENE WITH AN EMPHASIS ON LANDSCAPE GENETICS (Joscha Beninde, Vrije University)
12:10 – 12:50	QUANTIFYING ECOLOGICAL STRUCTURE AND ECOSYSTEM SERVICES (Emily Poppenborg Martin, Justus Liebig University, Germany)
12:50 – 14:00	LUNCH
14:00 – 14:40	OPTIMISING ECOLOGICAL STRUCTURES TO ENHANCE BIODIVERSITY (Flavia Aschi, Utrecht University)
14:40 – 15:20	SOCIO-ECOLOGICAL NETWORKS AND LANDSCAPE GOVERNANCE (Judith Westerink, Wageningen University)
15:20 – 15:50	COFFEE / TEA
15:50 – 16:30	“WHOSE LANDSCAPES ARE THESE ANYWAY?” BIODIVERSITY RESTORATION FROM AN SOCIO-ECOLOGICAL PERSPECTIVE (Noelle Aarts, Radboud University)
16:30 – 17:30	PLENARY DISCUSSION FOLLOWED BY WRAP-UP OF THE DAY (with Louise Vet, Hans de Kroon, Emily Poppenborg Martin, and Judith Westerink)
17:00 – 18:00	Farewell drinks

Optimizing ecological structures in agricultural landscapes to enhance biodiversity

Friday 17 November 2023

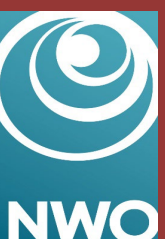
De Werelt, Lunteren

ORGANISERS:

Jetske de Boer (Netherlands Institute of Ecology)
Kenneth Rijdsdijk (University of Amsterdam)
Claudius van de Vijver (NERN)
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SUPPORTED BY:

Netherlands Ecological Research Network (NERN)
Nederlandse Organisatie voor Wetenschappelijk Onderzoek (NWO)



ABSTRACTS

10:20 CHALLENGES AND CHANCES IN RESTORING BIODIVERSITY IN THE RURAL LANDSCAPE

Hans de Kroon, Radboud University/NERN

One lesson learned from the overall decline in biodiversity in protected areas is that we cannot reverse the trend without acting in the rural landscape. Increasing landscape complexity by a network of hedgerows, flower strips and broadened field margins provides favourable habitat for wild plants, insects, and vertebrate species. The Ooijpolder is one of such areas where these landscape elements have successfully been restored. I will mirror these achievements to the results of some recently published studies. I will examine how a network of natural elements can contribute to but also distract from a sustainable recovery of biodiversity. Finally, I will emphasize the need for collaborative governance of the landscape and the research required to support it.

11:30 EVOLUTIONARY POTENTIAL IN THE ANTHROPOCENE WITH AN EMPHASIS ON LANDSCAPE GENETICS

Joscha Beninde, Vrije University

Maintaining the evolutionary potential of species is a prerequisite for their resilience to environmental change. Yet, in plain truth, we do not know how the evolutionary potential of the vast majority of plant and animal species across the globe is impacted by anthropogenic land uses. Based on my work in urban ecosystems, I will demonstrate how assembling vast datasets is now possible by leveraging exponentially growing species occurrence data for thousands of species (e.g., iNaturalist/Waarneming). This allows quantifying habitat suitability and connectivity of populations within a given spatial context, e.g., by using Maxent/Random Forest and current flow modeling frameworks, respectively. Pairing the resulting data with estimates of population genetic diversity and differentiation provides the next step toward comprehensively evaluating the impacts of anthropogenic land uses on the evolutionary potential of species. Jointly, this will provide the knowledge necessary for a data-driven evaluation of conservation measures and can inform decision-making processes aiming to maximize the impact of conservation efforts.

12:10 QUANTIFYING ECOLOGICAL STRUCTURE AND ECOSYSTEM SERVICES IN FARMLAND

Emily Poppenborg Martin, Justus Liebig University

In this talk, I will describe how we can assess and support the management of ecosystem services in crops through targeted increases in arthropod functional biodiversity. Various management practices can be implemented to increase biodiversity on farms, but how well do these translate into increased or more stable ecosystem services, are there tradeoffs, and what are the consequences for yields? Management of individual fields, but also the structure and composition of whole landscapes have an impact on arthropod communities and associated services. However, patterns are highly variable between studies, geographical regions, organism groups and crops. I outline elements of consensus that have recently emerged for the quantification of ecological structures in farmed landscapes and highlight gaps in our understanding of how to predict their impact on ecosystem service provision and stability across space and time.

14:00 OPTIMISING ECOLOGICAL STRUCTURES TO ENHANCE BIODIVERSITY

Flavia Aschi, Utrecht University

Protecting and increasing linear landscape elements (LLEs) in agricultural lands is regarded as a possible solution for a transition to a more biodiverse agricultural system. However, optimizing the spatial configuration of LLEs protected areas is challenging, especially given the demand for land for food production. Systematic Conservation Planning (SCP) can address this challenge, by prioritizing cost-efficient protection areas. We used a SCP approach to look at the LLEs network in the Province of Noord-Brabant in the Netherlands, identifying the possible trade-off between optimizing species conservation, costs, and the monetary values of ecosystem services (ES). For this, we defined two scenarios. One scenario focuses on achieving species conservation targets at the minimum cost, and the other focuses on achieving targets while maximizing the benefits provided by ES. For each scenario, we further developed two land-management options, namely land-sharing and land-sparing. For each solution, we tested their cost effectiveness by calculating implementation costs, economic benefits provided by ES, and cost/benefit ratios. First, our scenario analysis indicates that the economic benefits provided by ES always outweigh the implementation costs. Second, it shows that including ES as co-benefits in SCP (Maximize ES Scenario) yields more cost-efficient conservation solutions. Third, both land-sharing and land-sparing are possible cost-efficient approaches to achieve conservation targets. Our results are spatially explicit and identify crucial habitat areas for the conservation of the selected species, which represent 12–20% of the current unprotected network of LLEs. Our findings showcase net economic benefits of conserving species and LLEs, thus representing an additional reason for biodiversity conservation.

14:40 SOCIO-ECOLOGICAL NETWORKS AND LANDSCAPE GOVERNANCE

Judith Westerink, Wageningen University

A landscape can be viewed as a social-ecological network. A landscape with conditions for high biodiversity – connected habitats of sufficient quality and diversity – , requires collective action of people owning and using the land, and people benefiting from landscape services. Without collective action, the landscape will be shaped and managed for optimizing food production for economic reasons. To prioritize the delivery of landscape services and values other than food, and to adapt the ecological network in such a way that these services and values can be delivered, producers and beneficiaries of landscape services need to deliberate and reach agreement on production and coordination of, and payments for landscape services. This can be summarized as landscape governance. Although such landscape governance can be a way to ‘work around’ market failure and to enhance collaboration at the landscape level (where things actually happen), making landscape governance truly transformative remains a challenge.

15:50 “WHOSE LANDSCAPES ARE THESE ANYWAY?” BIODIVERSITY RESTORATION FROM AN SOCIO-ECOLOGICAL PERSPECTIVE

Noelle Aarts, Radboud University

The relationship between agriculture and nature is complex, characterized by many layers, paradoxes and dilemmas, and has a long history. In my contribution, I will describe this history very briefly. I will then focus on the current state of affairs and note that compared to previous agricultural traditions, the government is taking a very wait-and-see attitude. There are, nevertheless, an increasing number of regional and local initiatives experimenting with various forms of nature-inclusive agriculture. These initiatives should be stimulated, facilitated and connected with the aim to create a movement that can have serious impact on the government’s intention and ability to support the development of a nature-inclusive agriculture in a healthy landscape.