Metaprogram
BIOSEFAIR

DISPERSAL

PATHFINDER PROJECT

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Plant dispersal mediated by sheep pastoralism on the banks of the Loire River

Contacts
Christophe Baltzinger
christophe.baltzinger@inrae.fr
Jérôme Boucherot
jerome.boucherot@inrae.fr

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Partners
Conservatoire d'espaces naturels Centre-Val de Loire
UMR CITERES - INSA Centre-Val de Loire
Unité Biodiv'AG – University of Angers
Laboratoire d'éco-entomologie (environmental consultancy services)

Backgrounds and challenges

Sheep grazing is a nature-based solution for maintaining natural heritage habitats. The banks of the Loire River are grazed to keep the landscape open. The DispersaL project will study the effects of this practice on the spatial and temporal dynamics of flora along the grazed banks of the Loire. In particular, it will study how herds transport seeds along their grazing routes. The Pasto'Loire programme launched by the Conservatoire des Espaces Naturels Centre-Val de Loire promotes sheep pastoralism to maintain habitats classified as Natura 2000 for their floristic and faunistic diversity. This Nature-Based Solution helps to preserve the open landscapes that are emblematic of the banks of the Loire River, listed as a UNESCO World Heritage site. Sheep pastoralism perpetuates a rural activity that has shaped today's landscapes. The DispersaL Project concerns the interface between aquatic and terrestrial environments and will study how sheep pastoralism and associated ecological processes along the Loire River are affecting the spatial and temporal dynamics of native and non-native plants.

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Objectives

Some of the benefits associated with pastoralism have been well identified, but the risks linked to the spread of non-native plants are less well known. The DispersaL Project will first compare how the different stakeholders view the advantages and drawbacks of sheep pastoralism on natural habitats, flora and entomofauna within the heritage landscapes of the Val de Loire. Ecological studies concern grazing sites on the banks of the Loire River. We will be looking at the material carried by the Loire River and how it is affecting different floral compartments: the soil seed bank, the flora expressed, and the plants grazed and dispersed by sheep. We will study the coprophagous insects associated with pastoralism that are involved in the recycling of organic matter and in secondary seed dispersal. We will also assess the consequences of grazing on the endo- and epizoochorous dispersal cycle of native and non-native plants at successive grazing sites. These in situ observations will be completed by an experiment under controlled conditions designed to test the effect of animal sociality on zoochorous dispersal. Finally, the results obtained will help managers to readjust pastoral practices (residence time, composition of the sheep flock) according to the processes that determine floral diversity, flock management and economic profitability.

Approaches

The grazing sites on the banks of the Loire River are located in at Bonny sur Loire and Briare, and extend over a distance of 9 km. Heritage sites such as the Mantelot canal locks and the Briare canal-bridge are nearby. We will interview different actors in the direct vicinity of the grazing sites to clarify the local perception of the ecosystem and to identify the social and economic issues at stake.

We will carry out botanical inventories on the grazing sites to monitor the plant species present and those that are consumed. The experimental design will include pairs of 1 m² quadrats, some protected from animals (within wire cages) and others accessible, coupled with camera traps attached to a sub-sample of the wire cages to assess grazing frequency by both sheep and wild ungulates. Pitfall traps baited with sheep faeces will be used to capture dung beetles and determine the assemblages present. We will collect faeces and fleece (from shearing) from different individuals to identify and quantify the seeds dispersed via endo- and epizoochory. In addition, we will conduct an experiment to test the effect of animal sociality, in this case the composition of the group (lambs and ewes), on seed dispersal distances and seed deposition patterns.