Restoration of plant and animal communities of dry, nutrient-poor grasslands in southern Limburg (NL)

Nina Smits [1], *Toos van Noordwijk* [2,3], *Rik Huiskes* [4], *Roland Bobbink* [1], *Jo Willems* [1], *Hans Esselink* [2,3], *Henk Siepel* [2,3], *Loek Kuiters* [4], *and Joop Schaminée* [4]

[1] Utrecht University, Utrecht. [2] Radboud University, Nijmegen. [3] Stichting Bargerveen, Nijmegen. [4] Alterra/Wageningen UR, Wageningen.

Universiteit Utrecht

Introduction

On top of many limestone-rich slopes in the southernmost part of the Netherlands (southern Limburg) acid gravel deposits occur. This results in an unique vegetation gradient with *Nardo-Galion saxatilis* on the higher parts of these slopes and *Mesobromion erecti* where chalk surfaces. Due to this gradient and it's microclimate, these grasslands used to harbour a species-rich flora and fauna. Historically these nutrient-poor grasslands were grazed by flocks of sheep, led by shepherds. These grasslands lost their role in agriculture as common grazing land for sheep in the first half of the 20th century. This resulted in a strong decline in number, size and quality of these grasslands in the Netherlands.

Figure 1. **The Netherlands with southern Limburg (green).**

In the 1980s renewed insights in nature conservation resulted in reintroduction of sheep grazing. At that time approximately 20 sites remained with a total surface area of only 20 ha[(1)]. Over the past 25 years, the floristic quality of the *Mesobromion* grassland has increased, however full restoration has not been accomplished. The *Nardo-Galion* vegetation has decreased even further[(2)]. The status of most entomofauna groups is unknown, but there is a limited amount of data on butterfly, grasshopper and snail species[(3,4,5,6)]. These data show that populations of many typical species have declined or have been lost.
The present research project (2004-2008) aims at identifying causes of degradation and possibilities for restoration of both plant and animal communities at these dry and nutrient-poor grasslands.

Radboud Universiteit Nijmegen

Stichting Bargerveen

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Figure 2. **Nature reserve the Bemelerberg, one of the best preserved sites with both mattgrass swards and chalk grassland in the Netherlands.**

Vegetation and soil

Chalk grasslands have been well studied in national as in international context, but an inventory of the adjacent *Nardo-Galion* grasslands was not carried out till 2003[(7)]. In 2005 we started with management experiments in both *Nardo-Galion* and *Mesobromion* grasslands. Sod cutting and mowing (including removal of the biomass) is combined with spreading of hay (in a factorial design) in different, formerly fertilized sites. From 2006 onwards experimental introduction of rare/disappeared species will also be studied, as well as the relation of characteristic orchids and the apparent mycorrhiza. The effect of sheep grazing, in terms of seed dispersal factor (endozoochory) and facilitation, will also be implemented.

Figure 3. ***Stachys officinalis*****, one of the characteristic species of the *Nardo-Galion*.**

Entomofauna

To establish the status of a number of entomofauna taxa in the calcareous and acidic grasslands in southern Limburg a survey was started in 2005. On seven sites, including three reference sites in Belgium and Germany, *Arachnidae, Carabidae, Isopoda, Homoptera, Heteroptera, Curculionidae* and *Formicacae* are caught using pitfall-traps. In addition *Lepidoptera, Orthoptera, Aculeata* and *Diptera* are sampled with net-catches during several fieldtrips throughout the year. The species found in this survey will be grouped into functional groups according to their life-history traits. By analyzing the distribution of these functional groups we will be able to identify bottlenecks in the current management regime.

Figure 4. **The Field cricket has disappeared from all but one of the Dutch calcareous grasslands.**

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