



Studies on the Impact of Prescribed Burning and Sheep Grazing on Northwest German Heathland Ecosystems

Project objectives / project structure

Supported by German Federal Ministry for Education and Science (BMBF) a project has been brought into life in January 2001 in order to investigate the future importance of prescribed use of fire, sheep grazing and removal of raw humus or mowing for the development of heathland ecosystems. The project's three-year's term is lasting from January 2001 to December 2003.

The whole project is coordinated by Alfred Toepfer Academy for Nature Conservation (NNA) in Schneverdingen.

Additionally, NNA integrates GIS-based information into the project, for example maps with grazed areas in Lüneburger Heide nature reserve, maps with long-term vegetational investigation plots, or maps with the last twenty years' mechanically managed plots.

In order to simplify the input of floristic and faunistic data, an area-specific database with connection to GIS is going to be worked out.

Special focus is set on the transfer of nutrients. These transfer processes as well as the development of vegetation dynamics after prescribed burning, sheep grazing and mechanical management measures are investigated by University of Lüneburg, Institute for Ecology and Environmental Chemistry. Leachate and soil samples are analysed for Nitrogen, Phosphorus, Potassium, Calcium and Magnesium with nylon suction cups and lysimeters. Additionally, atmospheric deposition and biomass samples are analysed for their nutrient contents as well.

Since the consequences of ecological effects for nature conservation have to be considered in a socio-economic context, University of Lüneburg, Chair for Business Administration, especially Environmental Management, researches the socio-economic effects of the various management measures.

Therefore, especially two methods are used: the cost-effectiveness analysis and the cost-benefit analysis, including the research on the management measures' acceptance by various stakeholders.

Combining the results of both the ecological and the economic studies, the engineering office Dr. Kaiser – Working Group Land and Water, tries to transfer the results of the small-scale investigations to a landscape approach by finding out potential areas for prescribed burning in NW Germany using GIS. Therefore, all NW German open oligotrophic ecosystems (for example *Calluna*-dominated heathlands, oligotrophic grasslands or peat bogs) have to be identified and estimated according to their respective potential to be burnt under prescribed conditions.

A first GIS-based analysis of the Lower Saxonian-wide mapping of habitats being especially valuable for nature conservation shows, that there are 40.000 to 60.000 ha of open oligotrophic ecosystems.

Furthermore, the working group is going to find a way to integrate the project's outcomes into landscape planning methods.

In order to be able to assess the management measures according to their ecological effects, the impacts of each of the measures on the various environmental media (mankind, animals, plants, soil, water, air, climate etc.) is analysed using the project's outcomes and experiences taken out of relevant literature.

The project sets the investigation focus on areas in the Lüneburger Heide and Diepholzer Moorniederung.

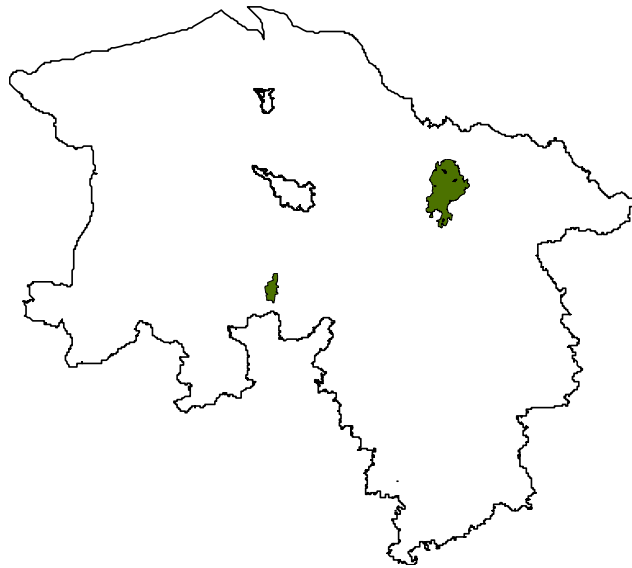


Figure 1: The project's study plots are located in Lüneburger Heide Nature Reserve (*Calluna* heathlands on mineral soils; northeast) and Neustädter Moor Nature Reserve (*Calluna* heathlands on organic substrate; southwest).



Figure 2. Different management measures in Lüneburger Heide Nature Reserve and Neustädter Moor Nature Reserve. From left to right: (1) typical *Calluna*-dominated heathland in Lüneburger Heide Nature Reserve, (2) prescribed burning in Neustädter Moor Nature Reserve; (3) grazing by Gray Horned Heath Sheep; (4 top) mowing; (4 bottom) sod-cutting (“Plaggen”).

Thus it is possible to study the impacts of prescribed burning and sheep grazing on heathland ecosystems both on mineral soils (Lüneburger Heide) and on organic substrate (degenerated peatbog areas in Neustädter Moor East of Diepholz; see respective paper).

The management measures are practically implemented by Verein Naturschutzpark (VNP) association in Lüneburger Heide Nature Reserve and by BUND - Diepholzer Moorniederung association in Neustädter Moor Nature Reserve.

Both working groups are adding data about the up to now experiences with management in practice.

In close co-operation with Veterinary University of Hannover, Institute for Animal Ecology and Cell Biology, NNA does research on the influence of various management measures on invertebrates.

The project is funded by German Federal Ministry for Education and Science (Bundesministerium für Bildung und Forschung, BMBF).

Permits

All management measures are coordinated with the regional administrative bodies, which are the appropriate authorities for nature reserves.

Practical implementation

Prescribed burning is realized in winter only (November to February).

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References:

Keienburg, T., and J. Prüter (eds.). 2004. Feuer und Beweidung als Instrumente zur Erhaltung magerer Offenlandschaften in Nordwestdeutschland. Ökonomische und sozioökonomische Grundlagen des Heidemanagements auf Sand- und Hochmoorstandorten NNA-Berichte 17 (2), Alfred-Toepfer-Akademie für Naturschutz, Schneverdingen, 221 p. (ISSN 0935-1450)