

Report to the Stapledon Memorial Trust

**Exploring management practices of calcareous grasslands in central Germany to inform UK management recommendations**

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The award of a travel fellowship from the Stapledon Memorial Trust enabled me to spend four weeks working with the Agroecology Group of Professor Teja Tschardt at Georg-August University Göttingen, Germany, on the Kalkmagerrasen Projekt (Calcareous Grassland Project). Working with researchers on the project enable me to:

- Visit 31 calcareous grassland sites in central Germany, examining how management practices differ between Germany and the UK.
- Share research findings and conservation practices from UK calcareous grasslands as part of the research group's seminar series.
- Explore aspects of flora and fauna in German calcareous grasslands of varying sizes and management conditions.

The visit provided an excellent opportunity for knowledge exchange and helped me to gain a much greater understanding of conservation issues in continental Europe as well as an appreciation of the unique aspects of upland calcareous grassland in the UK. The trip provided an excellent opportunity to develop collaboration with researchers in Germany and contributed to my development as an early career researcher.

Following the visit I have been able to disseminate knowledge gained from the trip with academics and conservation practitioners at the Grassland Conservation Conference and Upland Calcareous Grassland Workshop (14<sup>th</sup>-15<sup>th</sup> August 2017).

Further, the trip formed the basis of an example of calcareous grassland management outside of the UK in the *Upland Calcareous Grassland Management Recommendations* document produced by researchers from Edge Hill University (<https://www.edgehill.ac.uk/biology/upland-calcareous-grassland-management/>).

## Background

With an exceptional diversity of plants and invertebrates calcareous grassland is considered among the most species rich and diverse habitats in Europe (Roesch *et al.* 2013; Wallis de Vries *et al.* 2002) and as such they are of great conservation concern (Poschlod and Wallis de Vries, 2002). However, following post 1950s agricultural intensification they underwent large scale loss and degradation due to changes in management practices such as increased use of fertilisers, greater stocking densities and occasionally abandonment (Fischer and Stocklin, 1997; Poschlod *et al.* 2005; Roesch *et al.* 2013; Wallis de Vries *et al.* 2002). This resulted in a dramatic decline in plant and invertebrate species richness (Bourn and Thomas, 2002; Poschlod and Wallis de Vries, 2002). Consequently, they are included in Annex I of the EU Habitats Directive, with an estimated 595 973 ha protected in the Natura 2000 network across EU member states (Calaciura & Spinelli, 2008).

In Britain calcareous grassland did not escape agricultural intensification, with high stocking densities of sheep implicated as a major cause of habitat deterioration and the decline of associated plants, invertebrates and birds in upland regions (Dennis *et al.* 2008; Fuller and Gough, 1999). Indeed, increased grazing pressure between the 1960s and 1990s coincided with the 37% loss of upland calcareous grassland in England between 1960 and 2013 (Ridding *et al.* 2015) which now covers just 0.1% (22000-25000ha) of total UK land cover (calculated from Maddock, 2008; DEFRA, 2013).

In an attempt to conserve the characteristic vegetation of this habitat there has been a reduction in stocking levels within the last two decades. This typically involved a shift from grazing with high numbers of sheep to a lower stocking density of cattle, though occasionally lower stocking densities of sheep or no grazing occur. These conservation grazing regimes are based on suggested appropriate annual stocking rates of 0.25 LU ha<sup>-1</sup> yr<sup>-1</sup> for maintaining biodiversity (Backshall *et al.* 2001). However, the impacts of these established low stocking conservation grazing regimes on invertebrates, and to some extent plants, were unknown.

## The First Evidence

The PhD project titled *The impacts of contrasting grazing management on biodiversity in upland calcareous grasslands* provided the first evidence of the impacts of a range of grazing management regimes on plants, carabid beetles and spiders in upland calcareous grasslands. Further, the project provided the basis for the first evidence based management recommendations for conserving spider and carabid beetle communities in upland calcareous grasslands.

Acknowledging that the lack of accessibility of applied research to conservation practitioners/land managers (either as articles in scientific journals often require expensive subscription or are too technical) often hinders recommendations being implemented in conservation management, the final aim of the project was to produce a formal document of management recommendations that was accessible and useful to conservation practitioners

and land managers. Producing such a document presented the opportunity to examine how calcareous grasslands are managed elsewhere across Europe and explore if any of these management techniques could be used in British calcareous grasslands.

The final management recommendations document can be found here:

<https://www.edgehill.ac.uk/biology/upland-calcareous-grassland-management/>.

### **Lessons from Calcareous Grasslands in Germany**

With an estimated 31, 079 ha, the amount of calcareous grassland in Germany is comparable to that found in the UK (33, 419 ha) (Calaciura and Spinelli 2008). However, whilst the total amount of calcareous grassland found in the UK is spread over just 62 sites, in Germany it is spread over 924 sites (Calaciura and Spinelli 2008). The greater spread of calcareous grassland in Germany results in small, more fragmented and isolated patches than in the UK. Consequently the impacts of the surrounding landscape, intensification and abandonment are greater and as such pose a more immediate threat to biodiversity in German calcareous grasslands.

Though these sites are part of the NATURA 2000 network and protected under European law resources for their conservation are sparse (including lack of sheep, insufficient subsidies, low numbers of conservation practitioners etc.). This results in many sites less than 1 ha being left without the intervention on which they depend in order to prevent their succession to woodland, thus accelerating habitat degradation and loss.

Whilst the highlighted difficulties of calcareous grassland conservation faced in Germany are not currently as problematic in the UK, it is noted that in order to prevent such issues in the future, long term conservation must be protected in these areas. This is particularly important to emphasise given the uncertainty of environmental protection laws and conservation funding following the UK government's decision to exit the European Union.

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