

Establishment of semi-natural litter meadows at a Natura 2000 site in the Enns valley

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Introduction

Nature-conservation areas of high-value (High Nature Value Farmland - HN VF) are valuable capital for the maintenance and promotion of biodiversity. About 15 to 25% of the areas used for agriculture in Europe are to be counted within this category (Planta Europa 2008). But only a small share of these HN VF areas are also designated as protected (EEA 2007). The maintenance and at least local (re-)spreading, of such areas is therefore seen as being of great political importance.

Extensive fields and meadows are grassland areas dominated by grasses or herbs, which compared to intensively used agricultural areas are characterised by a lack of nutrition and the implementation of extensive care or cultivation measures (e.g. annual or biannual mowing). The substrate conditions in such areas generally lie in the damp to wet or dry to very dry sphere. The nature-conservation value of these areas is given on the one hand by their rarity in an area of nature, but also by the biodiversity within the area as well as the occurrence of rare or protected species of animals or plants.

The objective of the creation of high-quality nature-conservation grassland areas lies in the establishment of ecologically valuable plant societies of site-specific origin (Blaschka, Krautzer and Graiss, 2007). Suitable and usable restoration procedures are of great importance for the maintenance and safeguarding of the genetic diversity through the transfer of local species and plant societies as well as geographical breeds, subspecies and small species. An essential prerequisite lies in the careful selection of suitable donor areas of the greatest possible ecological value.

AREC Raumberg-Gumpenstein has been active for more than 15 years in the development of differing restoration techniques for the establishment and maintenance of high-quality nature-conservation areas of grassland. Differing problems concerning the winning, reproduction and use of diaspore material, and for the establishment of the resulting growth of vegetation from semi-dry grassland to the damp valley floor of the Enns Valley's characteristic litter meadows (so-called iris meadows), were a part of the research work in recent years undertaken by the Department of Vegetation Management in the Alps (ÖAG 2000, Graiss 2004, Krautzer et al., 2006, Krautzer, Blaschka and Graiss, 2007).

Prevailing in the German- and English-speaking world is a Babylonian confusion of tongues (Zerbe et al., 2009) in respect of terms and definitions (e.g. near natural, semi-natural, site-specific, native, local, regional, indigenous ...),

for which reason some of the terms used in this presentation are defined as follows:

Ecological restoration: this is the process of assisting the recovery of an ecosystem that has been degraded, damaged, or destroyed. (SER, 2004)

Non-local provenance: wild species which are not found on open terrain in the area concerned or which have not been found there for more than 100 years (Kirmer and Tischew, 2006)

Natural area: an area that is uniform and individual in its overall physical character (geology, climate, vegetation), which can be demarcated against and differentiated from the neighbouring areas (Kirmer and Tischew, 2006).

Site-specific vegetation (ÖAG, 2000): A plant society is site-specific when it is generally and permanently self-supporting or self-stabilising following extensive use, or non-use, and when among such plant societies agricultural production is not in the foreground. With the exception of production or development cultivation, or possible further extensive use, this vegetation requires no further cultivation measures. Further differentiation is given in respect of site specificity. Vegetation created by humans is then site-specific in a stricter sense when the three following criteria are fulfilled:

- 1) The ecological amplitudes (the 'needs') of the plant species applied are appropriate to the characteristics of the site.
- 2) The plant species used are considered 'indigenous' because in the geographic region (e.g. the Inn Valley, Hohe Tauern) in which restoration measures take place, but at least in the same natural area, they exist or have existed in relevant uncultivated sites within nature.
- 3) On the one hand seeds or plant material are used that originate from the immediate vicinity of the project area, and on the other are won in habitats appropriate in their essential site parameters for the type of vegetation to be produced. This means that not only value is placed on the use of proper, well-established and site-specific matching species during restoration, but local ecological types and small families of the respective plant species are also used.

Creation of litter meadows in the central Enns Valley

The project running from 2007 to 2010, as introduced in the following, is a rare but good example of what was finally

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the successful linking of the interests of nature-conservation activists and the recreation industry.

The Enns Valley is seen as one of the few still intact hatching areas of the corn crake (*Crex crex*), a species of bird threatened with extinction in Austria and the numbers of which are considered endangered worldwide. The Rosswiesen corn crake conservation area is on the edge of a golf course. A prolonged conflict between the golf-course operators and nature-conservation experts took place during an extension of the golf terrain from a nine-hole to an 18-hole course. After many years fraught with discussion to find an acceptable balance to meet all interests and optimum protection for the corn crake, a compromise acknowledged by all sides was found in 2006. The Enns Valley GLC was obligated to reinstate about five hectares of area previously used as fairways to create a cultural landscape suitable for the corn crake. As a countermove the operators were offered the possibility of extending the golf course to a modern 18-hole course through leasing in nearby areas. All of the measures within the sphere of reconstruction were given expert support by AREC Raumberg-Gumpenstein. Through research- and monitoring undertaken for many years, well-founded evidence was gained concerning the technique of harvesting donor areas, the preparation of seed, the application technique and necessary preparation of the recipient areas and the development of the vegetation created from these seed mixtures, but also a tolerable nature-conservation solution to any problems arising through the appearance of undesired, but dominant plants.

An initial mutual plan of measures was drawn up by the golf-course operators, nature-conservation experts and HBLFA Raumberg-Gumpenstein restoration experts. Based on the research results of the last 15 years, the successful creation of high-quality nature-conservation litter meadows of differing botanical characteristics could be subsequently demonstrated. One prerequisite was the availability of suitable donor areas. These Natura 2000 areas could be harvested in agreement with the responsible specialised department of the Province of Styria and consideration given to the existing cultivation stipulations. The material thus won (hay thresh) showed very good quality. The share of clean seed in roughly cleaned threshed material was between 26 and 79%.

The numerous frost germinators (e.g. Siberian iris) contained in the site in late autumn enabled sufficient stimulation despite an extremely warm winter. Seeding was undertaken with hung-out sowing tubes and then lightly brushed in. Due to the already beginning winter, re-stabilisation of the soil was unnecessary. A relatively slight amount of seed (3g/m² thresh material) is useful for making sufficient space available to the slowly developing seedlings. Germination of the seed took place in the following spring. In 2008, the areas already showed a satisfying vegetation cover in the autumn of the first vegetation year, containing a high number of target species from the hay threshing used. Due to the quality of the typical seedling index species from the donor area (e.g. *Molinia* sp., *Iris sibirica*), the success of the diaspore transfer could already be shown.

A special problem, which is no wonder on areas previously used as maize fields or grassland, was the scattered, explo-

sive spreading of undesired plants, such as *Cirsium arvense*, *Rorippa sylvestris* and *Rumex obtusifolius*. Control with herbicides was neither ecologically justifiable nor useful due to their unspecific effect. A cleansing cut at the beginning of June already caused clear decline of the creeping thistle. Due to previous experience, it can be assumed that under the given site- and exploitation conditions (no further fertilisation, annual cutting at the end of August/beginning of September) the weeds that were dominant in the first year will play a secondary role in two to three years.

Together with the above-described weeds many typical grassland species, such as *Plantago lanceolata*, *Ranunculus acris* or *Trifolium hybridum*, also still have a large share. But especially on the lean, partially damp areas, the typical species of the herb-rich litter meadows will become dominant within a few years. On the better nutrition-supplied drier areas, on which maize was previously cultivated, this process will take longer. But it can also be deduced here from older, artificially created litter meadows that these areas will be seen as little different from old semi-natural meadows in 10-15 years.

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