Excursion

to the “Wörschach Bog”

SALVERE

Semi-natural grassland as a source of biodiversity improvement

International Workshop

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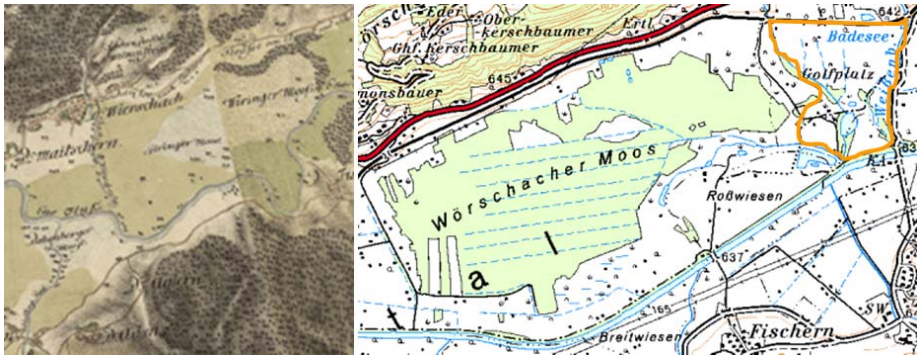
Agricultural Research and Education Centre
(AREC) Raumberg-Gumpenstein



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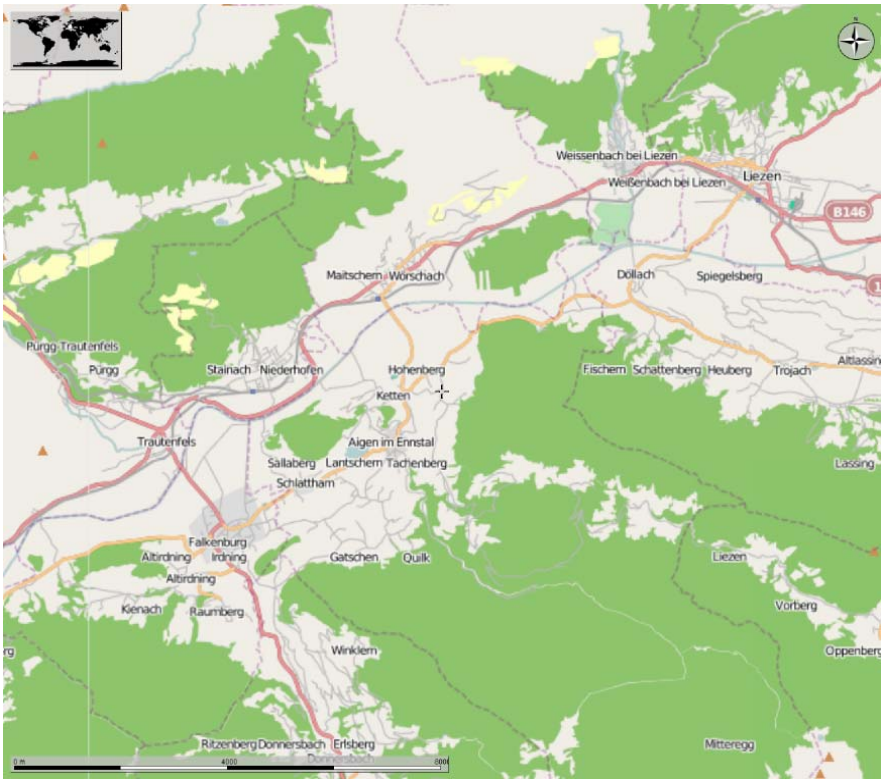
Introduction

The excursion destination is near Wörschach, 5 km south-west of Liezen at an altitude of 640 m, at the Natura 2000 site “Wörschacher Moos” und “Ennsnahe Bereiche”. The Enns valley is an area with a high ecological value: The river and its back water, the flood plains with its forests, the extensive used fresh meadows, the complex of bogs and fens, hedges make up a diverse landscape. The area is with its origin and management deeply connected with the river and the periodical flooding. The ground water fluctuations influenced by the Enns river are the main cause for the dynamics and thus the existence of this landscape. A highly complex equilibrium of natural conditions and cultural man made influences by the traditional land use of mowing and as litter meadows, a high diversity both of plants and animals has developed.
The hot spot of the species richness lies in the fresh and wet areas, mainly at the back waters, flood plain forests and fresh meadows between the villages of Niederstuttern and Trautenfels, at the Niederhofener Backwater and the Leistenbach flood plain, the bog at Wörschach and its surroundings, additionally also around the district capital Liezen situated back waters, flood plain forests and fresh meadows.

The bog at Wörschach is the biggest in the styrian part of the Enns valley with an area of 178 ha. Situated at the northern vicinity of the river, it is a focus in the valley, between the villages of Aigen, Wörschach, Weißenbach and Liezen and can be overseen from the higher parts of the valley (Wörschachberg, Kulm and Lassinger Mitterberg). The main part of the bog is under succession towards a heath and a forest bog. The original character has been lost following drainage, except small parts which form a nature conservation area nowadays. Fens on the western parts were also lost due to meliorisation. On the edges and old peat cuttings, a mosaic of different biotopes can be found, starting with undisturbed hollows, intermediate areas, different types of fens, meadows with *Molinia caerulia*, *Iris sibirica*, different reeds, flood plain forests, mixed with still and running waters, overall there are 15 different types of biotopes.



Source: www.openstreetmap.org

Geological and morphological characteristics

The Enns valley with the NATURA 2000 area is west-east orientated. The topographical and geological properties are shaped mainly by glacial processes. Thus, a wide uniform valley bottom was formed, only with a small gradient (between Liezen and Trautenfels only 0.05%). The wide vallye bottom and the small gradient gave the Enns the possibility to build broad meanders.

The Enns valley has significant asymmetries in north-south direction: The southern slopes are mainly formed by Palaeozoic greywacke and crystalline schist, at the northern slopes (from west to east) marl, different lime stones (Dachstein lime stone, Gosau strata) and greywacke schist can be found. Worth mentioning are in the Liezen and Wörschach area Werfener strata with gypsum deposits.

Soils in the project area consist besides the dominating bogs, fens and intermediate areas of alluvial flood plain soils, as well as gley. South of the Enns on siliceous grounds brown soils can be found and in the flood plains proper brown alluvial soils, respectively.

Based on information taken from:

http://www.verwaltung.steiermark.at/cms/beitrag/10061879/2407657

Examples of botanical composition of typical litter meadows in the Natura 2000 site

Roßwiesen			
Achillea millefolium agg.	1		
Agrostis capillaris		+	2a
Alopecurus pratensis	1	1b	1a
Anthoxanthum odoratum	+	+	+
Bromus hordeaceus	1		
Caltha palustris		r	1a
Cardamine pratensis	+	+	+
Carex acuta	+	2	1a
Carex acutiformis	1	2	
Carex vesicaria			+
Carum carvi	+		
Cerastium holosteoides	+		+
Crepis biennis	+		
Dactylis glomerata	1a		
Deschampsia cespitosa	1	1a	1a
Festuca pratensis ssp. *pratensis*	2	1a	3a
Filipendula ulmaria	1	1a	+
Galium mollugo		1a	
Galium uliginosum			
Holcus lanatus	1	+	
Iris sibirica		2a	
Lathyrus pratensis	1	1	
Lychnis flos-cuculi	1a	1a	1
Lysimachia nummularia		1	+
Lysimachia vulgaris		2a	
Molinia caerulea		+	
Myosotis scorpioides	1	1	1
Persicaria bistorta	3	2	2
Phleum pratense	1	1b	1a
Phragmites australis		r	
Poa annua			r
Poa pratensis	1	2	1
Poa trivialis	2a	2a	+
Potentilla erecta		+	+
Prunella vulgaris	+		+
Ranunculus acris ssp. *acris*	1b	1	2
Ranunculus auricomus agg.	+	+	+
Ranunculus repens	1a	+	1
Rhianthus minor		r	
Rumex acetosa	1		2a
Rumex obtusifolius	+		
Sanguisorba officinalis	+	1b	+
Scirpus sylvaticus	1a	1a	1a
Serratula tinctoria		1b	
Taraxacum officinale agg.	1		+
Trifolium hybridum	+		2a
Trifolium pratense	1		2a
Trifolium repens	1a		1a
Trisetum flavescens	2a		
Veronica arvensis	+		+
Vicia cracca	1	2a	

Source: Sobotik, M., Bohner, A., 2003: Landwirtschaft und Naturschutz am Beispiel des LIFE-Projektes “Mittleres Ennstal – Wörschacher Moor”. Internal Report for the Project BAL 992213, Agricultural Research and Education Centre Raumberg-Gumpenstein

Comparison of seed material from different plant communities

Site description
• 3 donor areas and receptor areas
• Inclination: plain
• Date of harvesting the donor areas: September, 5, 2006
• Date of set up the restoration areas: November 2006

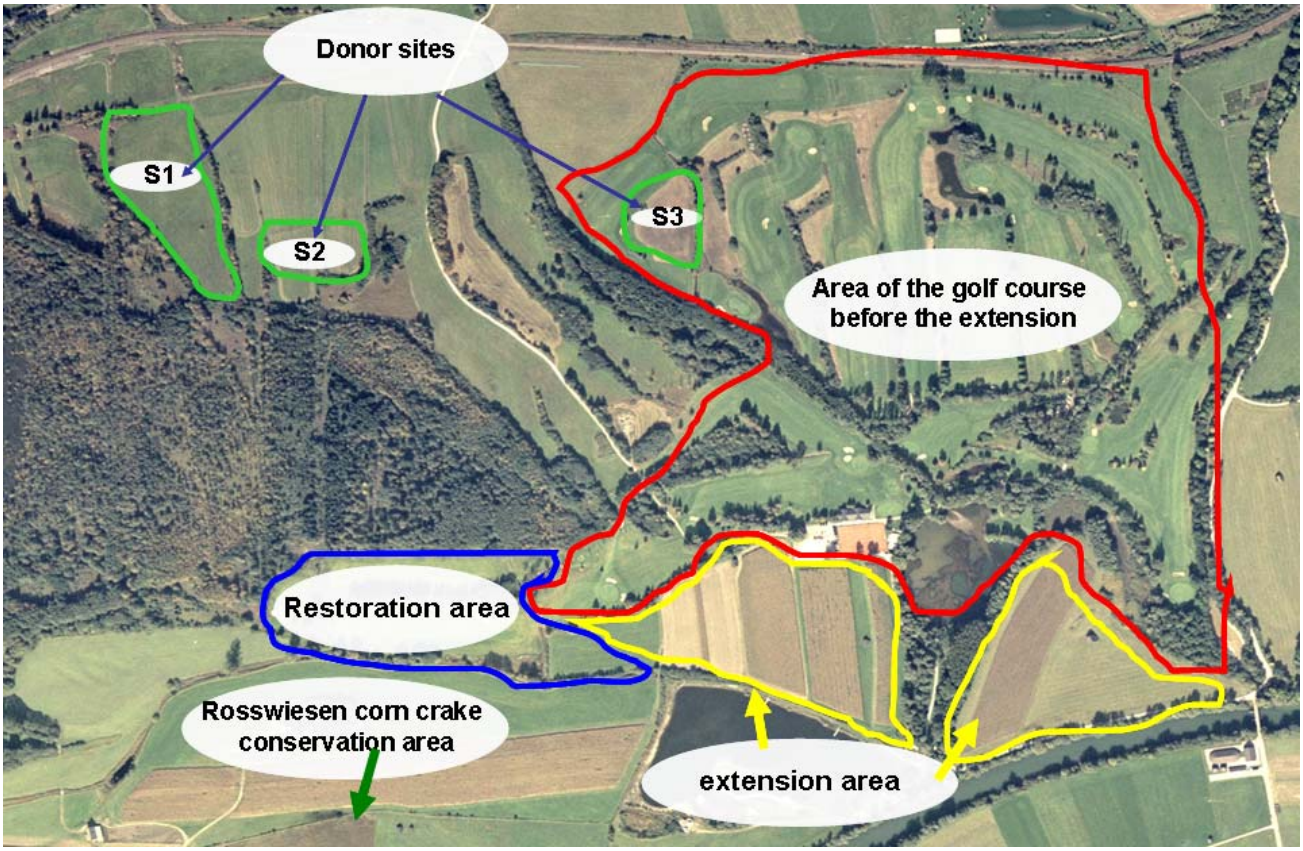
Soil parameters
• pH of receptor areas: 5.9 – 6.9

Variant S1 - *Molinia caerulea* rich litter meadow
• Seed application rate: 2.5 g/m²
• Application technique: sown by seeder
• Monitoring plot: 1 – 4 (36m² per plot)

Variant S 2 – Litter meadow with tall sedges
• Seed application rate: 2.0 g/m²
• Application technique: sown by seeder
• Monitoring plot: 5 – 8 (36m² per plot)

Variant S 3 - *Iris sibirica* rich litter meadow
• Seed application rate: 3.5 g/m²
• Application technique: sown by seeder
• Monitoring plot: 9 (36m² per plot)

Figure 1: **View of the project area**



S1 - Donor site 1: *Molinia caerulea* rich litter meadow (Naturschutzschlag 12, Alleewiese) harvesting 2006, week 35 and 37.

Botanical composition („Agentur OIKOS“):

Achillea millefolium agg.
Alchemilla sp.
Angelica sylvestris
Betonica officinalis
Briza media
Carex aff. rostrata
Carex cf. davalliana
Carex cf. dioica
Carex flava
Carex sp.
Centaurea jacea
Cirsium oleaceum
Colchicum autumnale
Dactylis glomerata
Dactylorhiza sp.
Deschampsia cespitosa
Equisetum palustre
Eriophorum angustifolium
Eriophorum latifolium
Festuca sp.
Filipendula ulmaria
Galium boreale
Galium mollugo agg.
Galium uliginosum
Geum rivale
Iris sibirica
Juncus articulatus
Leucanthemum vulgare agg.
Lycopus europaeus
Lythrum salicaria
Mentha sp.
Molinia caerulea
Pedicularis palustris
Peucedanum palustre
Pimpinella major
Plantago lanceolata
Potentilla erecta
Primula elatior
Prunella vulgaris
Ranunculus acris
Rhinanthus sp.
Scirpus sylvaticus
Serratula tinctoria
Succisa pratensis
Thalictrum sp.
Trifolium pratense
Trifolium repens
Vicia cracca

Analysis from on site threshing:

Ranunculus acris	0,160	*Filipendula ulmaria*	1,554
Plantaga lanceolata	0,022	*Thalictrum lucidum*	4,192
Cirsium oleraceum	0,292	*Succisa pratensis*	0,310
Phleum pratense	0,020	*Lotus corniculatus*	0,140
Vicia cracca	0,680	*Iris sibirica*	5,224
Ranunculus acris	0,082	*Prunella vulgaris*	1,226
Dactylis glomerata	0,010	*Carex* sp.	25,028
Alchemilla sp.	0,696	*Carex* sp.	0,012
unknown 1	0,014	*Molinia caerulea*	18,114
unknown 2	0,010	unknown 3	0,006
unknown 4	0,004	*Angelica sylvestris*	8,416
Galium molina	0,052	*Galium uliginosum*	0,922
Centaurea jacea	1,900	*Pimpinellea major*	0,038
Inert matter	30,876		

S2 - Donor site 2: Litter meadow with tall sedges (Naturschutzschläge 8 und 9), harvesting 2006, week 35

Botanical composition („Agentur OIKOS“):

Angelica sylvestris	*Betonica officinalis*	*Centaurea jacea*
Cirsium oleaceum	*Iris sibirica*	*Plantago lanceolata*
Cirsium palustre	*Juncus articulatus* agg.	*Pleurotzium schreberi*
Colchicum autumnale	*Juncus inflexus*	*Potentilla erecta*
Dactylis glomerata	*Leontodon hispidus*	*Prunella vulgaris*
Deschampsia cespitosa	*Lotus corniculatus*	*Ranunculus acris*
Festuca sp.	*Molinia cerulea*	*Sanguisorba officinalis*
Filipendula ulmaria	*Peucedanum palustre*	*Scirpus sylvaticus*
Holcus lanatus	*Phragmites australis*	*Trifolium pratense*

Analysis from on site threshing:

Plantaga lanceolata	0,064	*Iris sibirica*	0,736
Thalictrum lucidum	7,070	*Rumex acetosa*	0,192
Ranunculus acris	0,070	*Filipendula ulmaria*	0,038
Molinia caerulea	0,042	*Dactylis glomerata*	0,008
Cirsium oleraceum	0,244	*Briza media*	0,008
Prunella vulgaris	0,120	*Phleum pratense*	10,522
Poa pratensis	0,104	*Avenula pubescens*	0,002
Myosotis sp.	0,002	*Festuca* sp.	0,118
Anthoxanthum odoratum	0,006	*Galium* sp.	0,422
Angelica sylvestris	2,790	*Rhinanthus* sp.	0,140
Persicaria bistorta	0,118	*Geranium molle*	0,020
Trifolium repens	0,616	*Trifolium pratense*	1,756
unknown	0,288	Inert matter	74,504

S3 - Donor site 3: Iris sibirica rich litter meadow (Golfplatz Weißenbach) harvesting 2006, week 35

Botanical composition (HBLFA Raumberg-Gumpenstein):

Achillea millefolium	*Aegopodium podagraria*	*Campanula patula*
Carex flava	*Centaurea jacea*	*Cerastium* sp_
Cirsium oleraceum	*Festuca pratensis*	*Festuca rubra*
Filipendula ulmaria	*Galeopsis speciosa*	*Galium mollugo*
Galium uliginosum	*Hypericum maculatum*	*Iris sibirica*
Lotus corniculatus	*Lysimachia vulgaris*	*Lythrum salicaria*
Persicaria maculosa	*Phleum pratense*	*Pimpinella major*
Plantago lanceolata	*Poa trivialis*	*Ranunculus repens*
Scrophularia nodosa	*Silene latifolia* ssp_*alba*	*Solidago canadensis*
Thalictrum lucidum	*Trifolium pratense*	*Vicia cracca*

Analysis from on site threshing:

Iris sibirica	39,092	*Rumex sp.*	0,016
Persicaria bistorta	0,218	*Rumex obtusifolius*	0,466
Plantaga lanceolata	1,004	*Galeopsis* sp.	0,122
Thalictrum lucidum	0,678	*Centaurea jacea*	0,064
Cirsium oleraceum	0,654	*Dactylis glomerata*	0,074
Filipendula ulmaria	9,370	*Festuca rubra*	0,052
Molinia caerulea	0,018	*Phleum pratense*	0,706
Achillea millefolium	0,004	unknown *1*	0,582
Galium sp.	1,736	*Inert matter*	43,974
Silene latifolia ssp. *alba*	0,028	*Silene vulgaris*	0,020
Chenopodium album	0,014	*Veronica* sp.	0,008
Trifolium repens	0,008	*Poa pratensis*	0,004
Prunella vulgaris	0,012		

Figure 2: **Overview of the restoration site (receptor site)**

S 1 = *Molinia caerulea* rich litter meadow
S 2 = Litter meadow with tall sedges
S 3 = *Iris sibirica* rich litter meadow
Areas of natural succession

Receptor Site

before restoration, October 2006

mulching, November 2006

ploughing, November 2006

levelling, November 2006

sowing, November 2006

after sowing, December 2006

May 2007

Cirsium arvense, June 2007

cutting of weeds, September 2007

May 2008

June 2008