

Protected Areas in the Middle Styrian Enns Valley – From the past to the future

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Abstract

Rare habitats and animal and plant species in the Middle Styrian Enns Valley are protected in sites belonging to the EU-wide Natura 2000 network. The area at the foot of Mount Grimming has changed considerably over the centuries. For a favourable conservation status of the protected habitats and species to be achieved, consistent measures are required. The *Rekult Iris project* shows how agriculture and nature conservation can work together to create multifunctional areas, for agriculture, local recreation, education and research, through collaboration between regional services, practitioners, and educational and other bodies.

Profile

Protected area

Natura 2000 Middle

Styrian Enns Valley

Mountain range

Alps, Austria



Figure 1 – Straightened run of the Enns starting on the left corner; wetland meadows between the Enns and Mount Grimming. The recultivation area can be seen between the railway and the main high way in the lower center of the picture (orange dot, see also Figure 3, 4 & 5). © M. Mayerl 2022

Introduction

The Middle Styrian Enns Valley (Figure 1) has been shaped by landscape changes and economic transformation for thousands of years. The Enns River with its wetlands provides different habitats for a variety of protected animal and plant species of EU interest. At the beginning of the 19th century, the population became poorer due to the decline of mining and the cattle trade, and the loss of second incomes derived from providing horse-drawn transport, timber rafting and charcoal burning. The valley floor became swampy due to the increase in flooding caused by local large-scale deforestation. The expansion of the East-

ern Alpine railway network necessitated the regulation of the Enns (1860–1960); the first cutting was made at Trautenfels Castle, in today's municipality of Stainach-Pürgg (Figures 2 and 3), in 1860. Until then, the Enns had meandered through the valley, and even moderate rainfall led to major flooding (see Figures 2 and 3).

The basis of food production, not only for the farmers' own needs but also for the regional population, was livestock breeding and fodder production. The first cattle breeding cooperative was founded in 1901 in Gröbming. In other areas, the feed conditions had already been improved by the regulation of the Enns. Livestock breeding was boosted significantly when the Gröbming cheese cooperative was established in 1902; the founding of the *Ennstal Landgenossenschaft* (rural cooperative), which included a dairy, in Stainach in 1921 was also of great importance (Güntschl 1960). Today, the cooperative is still characteristic of the region and exports of agrarian products worldwide.

Encroachment on the landscape increased significantly with the creation of commercial areas, settlements and infrastructure (the Enns valley railway line, and the Ennstal federal road B320). Litter meadows that had historically been cut only once a year and horse pastures that had never been fertilized became multi-cut meadows; maize fields for the production of cattle fodder were also created. Many sections of the Enns are now straight (Figure 1).

Today, some areas continue to be affected by large floods (approximately every 10 years, see Figure 6). The characteristic wetlands are therefore mainly used for grassland management. Arable farming preferably maize, is increasing in the less wet areas (flat hills, slopes or well-drained sites) (Mayer & Plank 2017).

However, there are still areas of near-natural fens (EU-Code 7120) and raised bogs (EU-Code 7230), and extensively used litter meadows that have not been converted to species-poor fertilized meadows (LGBI 3/2007). The characteristic species of the Middle Sty-



Figure 2 – Map of the regulation of the Enns, from Niederstuttern to Wörschach (Styrian Provincial Building Directorate, Graz 1859). Black line – regulated Enns; Blue – oxbow lakes, tributaries and lake; Brown line – roads; red numbers: river cuttings, see Figure 3.

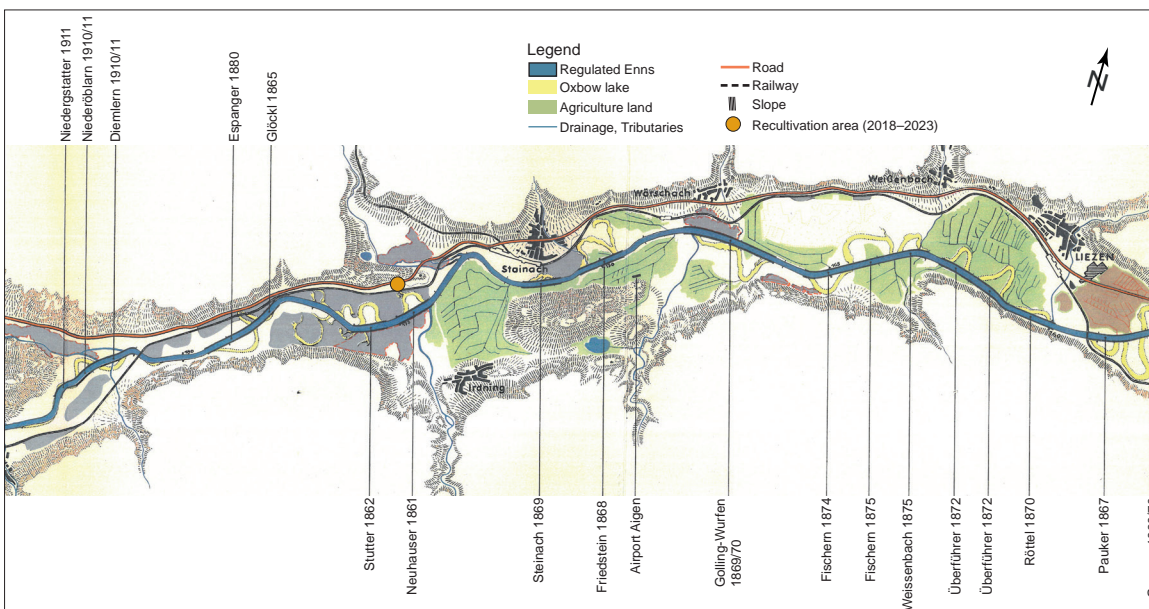


Figure 3 – Map showing cuttings and drainage areas along the Enns (Güntschl 1960: 136–137). In regulating the Enns, large areas were drained to create new agricultural land, and land consolidation made mechanical farming possible.

ian Enns Valley, the corncrake (*Crex crex*) (Figure 7) and the Siberian Iris (*Iris sibirica*) (Figure 8), must be preserved along with many other rare plant and animal species, and their habitats maintained (Mayer & Plank 2017). The relevant areas of the Enns valley floor are now Natura 2000 sites, belonging to the European network of protected areas under the Flora-Fauna-

Habitat (FFH) and Birds Directives, see Table 1 and Figure 4.

Conflicts of interest

The designation of these partly overlapping areas was not without conflicts between land-use and na-

Table 1 – Relevant protected areas. The objects of protection are described in the regulations of the Federal State of Styria.

Protected area	Provincial law gazette	Designation	Identification code according to Styria and EU
Oxbows along the river Enns near Niederstuttern (<i>Ennsaltarme bei Niederstuttern</i>)	LGBl Nr. 86/2006	2006	ESG 7: Natura 2000 AT2240000: designated under the Flora-Fauna-Habitat (FFH) Directive
Enns valley between Liezen and Niederstuttern (<i>Ennstal zwischen Liezen und Niederstuttern</i>)	LGBl Nr. 85/2006	2006	ESG 41: Natura 2000 AT 2229002: designated under the Birds Directive
Dachstein-Salzammergut	LGBl. Nr. 49/1997	1997	LSG - 14a: Landscape conservation area / <i>Landchaftsschutzgebiet</i>
Enns valley from Ardnig to Pruggern (<i>Ennstal von Ardnig nach Pruggern</i>)	LGBl. Nr. 14/2007	2007	LSG - 43: Landscape conservation area / <i>Landchaftsschutzgebiet</i>

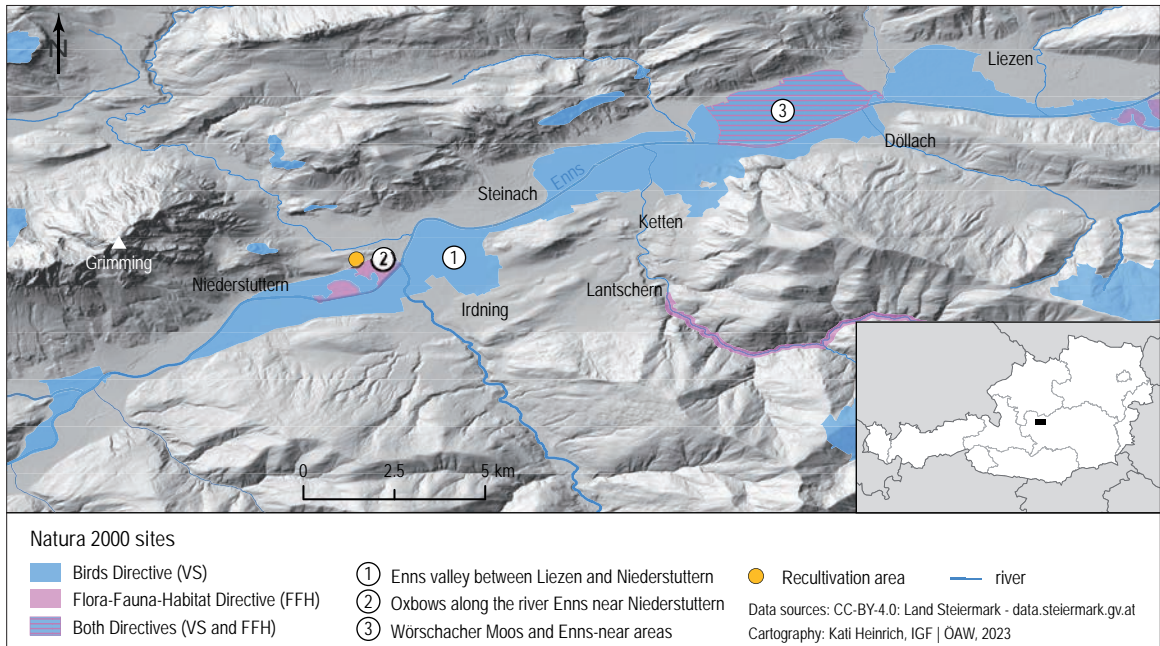


Figure 4 – Overview map of the Natura 2000 sites in the Enns valley. The map section corresponds to the section of the river presented in Figure 3.



Figure 5 – Aerial view of recultivation area (orange dot & outlined in red) next to the Natura 2000 site oxbows along the river Enns near Niederstuttern, see also markings in Figure 3 and 4. © GIS Steiermark 2019

ture conservation interests. The protection of natural habitats and wild fauna and flora is anchored in the EU's FFH Directive, while at the same time economic, social, cultural and regional requirements have to be taken into account. In each designated area, the necessary measures should be implemented in accordance with the relevant conservation objectives. However, no mandatory measures are defined in the regulations for Natura 2000 sites concerning the maintenance or restoration of a favourable conservation status of the species and habitats there. Only through contractual nature conservation (i.e. in agreement with the landowners and authorized users) can the corresponding aims and objectives be fulfilled. For this, long-term monitoring for the effects of any measures implemented needs to be in place. In addition, specific types of land use that are within the jurisdiction of the fed-

eral government (e.g. mining, rail and road transport, federal army (LGBL No. 65/2006)), are exempt from the restrictions in the Natura 2000 sites that are regulated by §9 of the Styrian Nature Conservation Act



Figure 6 – Flooding in 2013 at the Enns. © M. Mayerl 2013



Figure 7 – *Crex crex* at Natura 2000 site Enns Valley between Liezen and Niederstuttern. © K. Krimberger 2021



Figure 8 – Recultivated wetland meadow at Trautenfels, ReKult Iris project site. © W. Starz 2022



Figure 9 – Dealing with shrubs. © W. Starz 2018



Figure 10 – Clearing and reactivation of drainage ditches. © W. Starz 2018

(*Steiermärkisches Naturschutzgesetz*) from the year 2017. The protected areas and their marginal areas at the foot of Mount Grimming are confronted with precisely these conflicts of interest.

Most of the Natura 2000 sites continue to be used for agriculture, mainly as grassland for fodder production. Arable farming, especially in the form of maize for fodder, is also steadily increasing in these areas. In some places within the last few years, old floodplain forest trees have been cut down on privately owned land and by the federal railway, mainly for safety reasons, flood protection, and protection against fires along the railway line. However, this change has also resulted in much larger areas suitable for mechanized cultivation. It is also evident that the mechanical logging of riparian strips far beyond the edge of the river itself leads to large gaps and disruption in habitats, and invasive plant species such as Giant Goldenrod (*Solidago gigantea*), Canada Goldenrod (*Solidago canadensis*), Japanese Knotweed (*Fallopia japonica*) and Himalayan balsam (*Impatiens glandulifera*) are migrating massively into the wetland habitats along the Enns and in the surrounding wetland meadows. Due to the decrease of the surrounding farmland and the associated intensification of cultivation of the remaining grassland areas for fodder production, more slurry is applied to these areas. In conjunction with the warmer weather conditions in these valley floors, this intense fertilization of the land means that farmers can cut hay up to six times a year instead of just two or three. It is not possible to control exactly how much manure is applied to what proportion of land, but managed plots that are further away from a farm are fertilized less intensively.

However, land use, landscape and nature conservation, and protection against floods are not incompatible objectives, as is demonstrated by various projects and initiatives in and immediately next to Natura 2000 sites managed by NGOs, public corporations and support programmes (e.g. ÖPUL Natura 2000), or adjacent to other protected areas (AMA 2022).

ReKultIris Project – good practice for the re-naturation of abandoned wet meadows

The *ReKultIris project* is a nature conservancy initiative to restore abandoned wet meadows and return them to agricultural use (Figure 6). The project (2018–2023) was partly funded by *Blühendes Österreich* (Blooming Austria), and an in-kind contribution from the Agricultural Research and Education Centre (HBLFA) Raumberg-Gumpenstein. Some work (e.g. protection against invasive plant species such as Himalayan Balsam) was carried out by school classes and the *Steiermärkische Berg- und Naturwacht* (Styrian Mountain and Nature Watch), with support from municipal employees.

The site is situated between the Enns valley highway (B320) and railway; it is listed as part of the landscape conservation area *Dachstein-Salzammergut*, see

Table 1. It lies in the municipality of Stainach-Pürgg at 645 m asl and is classified biogeographically as an alpine region. The area has not been cultivated for over 40 years and has therefore lost its typical litter meadows. These meadows emerged through human influence and were mown just once a year, in the autumn. They used to be the most common type of meadow in the Middle Styrian Enns valley, characterized by the Siberian Iris (*Iris sibirica*) and Star Narcissus (*Narcissus radiiflorus*), but are now threatened by intensive land-use practices.

The recultivation area is part of the landscape conservation area *Enns valley from Ardnig to Pruggern*, next to the Natura 2000 site *Oxbows along the Enns near Niederstuttern*. It is also adjacent to the Natura 2000 site *Enns valley between Ließen and Niederstuttern* (see Table 1 and Figure 8). The recultivation area forms a green corridor between the railway and the highway.

The objective is to ensure the site's multifunctionality: agricultural benefits, natural retention areas as protection against floods, biodiversity, divers habitats for protected species, and green oases for local recreation.

Promotion of site-specific biodiversity and habitats

- Land use management in the surrounding protected areas that belong to the nature conservation association and to the federal government is carried out by the organic farm of the HBLFA Raumberg-Gumpenstein which is situated there. The management is adapted to the various habitat types, and is subject to monitoring and modification as necessary.
- Awareness raising for all ages, and visitor guidance.
- Areas are used for research/monitoring (small mammals, insects, amphibians, plants, invasive neophytes); bird monitoring has been carried out by the same team for a number of years.
- Maintenance measures incl. monitoring by volunteers, especially annual control of invasive plant species.
- The project area is a refuge site (former flood plain). The ponds which have been reactivated through minor terrain modelling are relicts of former (i.e. cut) branches of the Enns and are therefore very suitable for amphibians, including the Alpine Great Crested Newt (*Triturus carnifex*), Yellow-bellied toad (*Bombina variegata*), Pond newt (*Lissotriton vulgaris*), and Alpine newt (*Triturus alpestris*). However, the old cut-off backwaters of the Enns river are now used as fisheries, and fish such as trout predate on the protected amphibians.

Risks

- Intensification of agriculture; pollution from slurry from neighbouring areas.
- Deterioration of protection measures in the surrounding areas (because of changes in ownership, intensification of cultivation, pressure of use by recreationists, fishing).



Figure 11 – Area of site for seed collection. © A. Fokter 2018

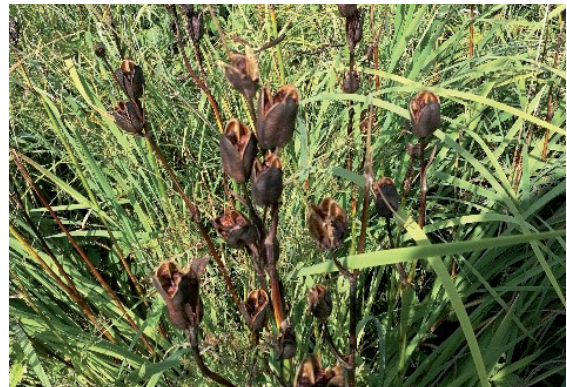


Figure 12 – Seed stands, *Iris sibirica* © A. Fokter 2018

- Loss of soil in the construction of public infrastructure (roads, deforestation along railway and road, gravel mining).
- Arrival of invasive plant species; other unforeseen contaminants.
- Climatic changes (drought); diseases.

Renaturation measures

Renaturation activities are time-consuming: it takes 5–10 years for a species-rich *Iris sibirica* meadow, used for litter, to be established. The first year of reclamation included the following steps: assessment of the area by district authorities; development of a reclamation concept; removal of woody plants (Figure 9); cleaning and creation of drainage ditches (Figure 10); neophyte control; mowing (Figure 11); seed preparation (Figure 12); soil cultivation; sowing and transfer of *Iris sibirica* plants from surrounding sites (Figure 13). Maintenance measures were necessary in the following years, including comprehensive ongoing neophyte monitoring and removal. *Iris sibirica* plants were also transplanted from Trautenfels, where meadows had to make way for the construction of a roundabout and bridge – so-called replacement planting to compensate for the loss of green areas.

Two students of the HBLFA Raumberg-Gumpenstein wrote a *Matura* (A-level) thesis on *Renaturation of an Iris Sibirica Meadow* and were involved in the project (Fokter & Hillinger 2019). A survey of the management of *Iris sibirica* meadows in the Styrian Enns Val-



Figure 12 – *Iris sibirica* meadow at the end of May © M. Mayerl 2022

ley showed that both farmers and local people are very positive about the local iris meadows. The students found that land users would expect about 1,050 € as a reasonable subsidy for the expenses of maintaining the flowering meadows. The meadows produce approximately 8 tonnes of dry matter per hectare. The current price of straw is about 300 €/tonne. The use of litter from these meadows as bedding material for the cattle barns at the HBLFA organic farm therefore reduces the need to purchase straw (Fokter & Hillinger 2019).

The biodiversity area as an outdoor lab

The project area is used as an open-air laboratory for school classes and the interested local people. It is located next to the Enns cycle path, which is well used for local recreation and promoted internationally. In cooperation with the Styrian Nature Conservation Association (*Steirischer Naturschutzbund*), an old hay barn was converted into a small visitor centre, which can be used as a research laboratory by young people. Students from the HBLFA Raumberg-Gumpenstein designed and built an observation tower. From 2017 to 2019, at the end of May, a two-day *Iris sibirica* green event was held for schools and local people to promote these wet meadows for multiple uses. Various institutions worked together and organized information stands and joint actions (HBLFA Raumberg-Gumpenstein, Austrian Federal Service for Torrent and Avalanche Control, Styrian Nature Protection Association, District offices for Water Management and Nature conservation, Styrian Mountain and Nature Watch, Water rescue service, National Park Gesäuse).

Conclusion

The management of protected areas is often considered from the economic point of view in particular. But the *Iris sibirica* meadows, calcareous fens, meadows of whip grass, lowland hay meadows, and floodplain forest relics both within and bordering on protected

sites provide many benefits, such as fodder reserves, limits on the need to purchase straw, residue-free bedding for cattle, flood protection, and preservation of the traditional cultural landscape. The meadows are also attractive to tourists. Finally, this renaturation project is an example of good practice for establishing biodiversity in agriculture, and notably for our planned restoration site on the banks of the Enns within the Natura 2000 sites *Enns valley between Liezen and Niederstuttern* and *Ennsaltarme near Niederstuttern*.

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