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Protected Areas – potentials and measures for green and blue infrastructure, agriculture and local recreation

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Summary

The Middle Styrian Enns Valley is one of the most important wetland habitats with a variety of highly endangered plant and animal species. Particularly noteworthy is the corncrake (*Crex crex*), listed in Annex I of the EU Birds Directive and known as a leading species for this region. The large number of protected plant and animal species with their corresponding habitats were the basis for the designation of these valley floors, shaped by the Enns River, as Natura 2000 sites „Ennsaltarme bei Niederstuttern" (Mayer, Plank, 2017). The agricultural use of the areas has increased due to the river straightening of the Enns since the middle of the 19th century. These areas are characterized by major flooding, as was the case most recently in 2013. The expansion of linear (rail, road, renewal of overhead power lines) infrastructures and land consumption for settlements, commercial and industrial enterprises are characteristic for the current development. The pressure of use on grassland areas, justified by private and public interest, does not stop at the borders of Natura 2000 sites and corresponding buffer zones are also becoming smaller. Today, regulation measures along the Enns River as well as the preservation and restoration of wetland habitats are being renaturalized through appropriate measures. Programmes and initiatives for adapted ecological land use are being implemented.

The diverse use of land and its effects in and at the edge of Natura 2000 sites are shown by means of examples and analysed with the new challenges to land use management for multifunctional areas.

Keywords

Land use development, green and blue infrastructure, integral land use concepts and site adapted measures, multifunctional areas

Introduction

Due to the current situation and discussion about food security and expansion of the use of green areas for arable farming, the proposal of the EU Commission for a new regulation on nature restoration (European Commission, 2022) is being discussed very controversially.

In summary, the "green infrastructure" consists of green and open areas with different functions. These include, for example Natura 2000 sites and surrounding areas with similar character, stepping stone biotopes, green corridors, landscape elements, riparian strips or parks and landscapes for local recreation. In this paper, we define blue infrastructure for flood retention areas, which are normally used as agrarian land. According to the definition in §6(1) of the Austrian Forestry Act 1975 as amended, the functions for green and blue infrastructure can be divided e.g. into use (agriculture), protection (against flooding, against erosion, loss, destruction), welfare (purification of water and air) and recreation, whereby several functions are usually affected at the same time. When a particular land use can fulfil several functions at the same time, we speak of synergies or multifunctionality (Schönhart, M. 2020).

To ensure the conservation of protected species and habitats, specific coordinated management measures are necessary, which must be in harmony with the habitat requirements of the respective protected

species and habitat types. In practice, however, this means walking a tightrope between Natura 2000 objectives and the interests of land users, the needs for a healthy living and recreational space, safety demands from natural hazards and regional resource availability in connection with climate change and other unpredictable potential hazards.

Due to the late involvement of the land managers, the designation of the Natura 2000 sites in the Middle Styrian Enns Valley was very conflictual. However, the fact that land use, landscape- and nature conservation and protection against floods are not an obstacle has already been demonstrated in different projects and initiatives.

Methods

GAP analysis as a basis for targeted management

In the project BeNatur (Better Management of Natura 2000 sites, INTERREG SEE), the areas of legal and institutional framework conditions for the implementation process of Natura 2000 sites, management and organisational structures as well as ecological assessment (monitoring of protected areas) were assessed. In a "GAP analysis" corresponding recommendations were elaborated on a country-specific basis (Kirchmeir, H., Köstl, T., Getzner, M., Zak, D. 2014). In the region of the "Middle Styrian Ennsvalley", the recommendations were very well accepted and implemented with all relevant stakeholders.

CAMARO-D Best practice Manual (BPM) for spatial planning in catchment areas and along rivers

From the point of view of flood protection, flood risk management is oriented towards giving more space to watercourses or also creating natural retention areas. The increasing importance of land use for flood risk management is in line with CAMARO-D objectives. The project discussed on a transnational level how the principle of Green Infrastructure as protection and enhancement of nature and natural processes, as benefits for society (EU Commission. 2013), should be implemented in spatial planning and territorial development. Flood events do not stop at administrative boundaries (e.g. municipality boundaries), so regional approaches in spatial planning make sense. In particular, the targeted handling of upstream-downstream relationships requires the coordination of land use claims at the level of catchments or river sections. This BPM presents two planning options for this purpose: regional planning as a regulatory planning instrument and voluntary cooperation of planning actors (administrative authorities, experts at federal and federal state level) at catchment level.

Measures:

- Establish a legal framework for the conservation of flood runoff and flood retention areas in regional planning or in regional water management programmes.
- Creation of financial and organisational incentives for voluntary cooperation between actors for flood risk management in catchments and river sections.
- Compensation measures, i.e. a financial transfer between municipalities for flood risk management and municipalities that benefit from these measures.
- Inclusion of regional planning and voluntary cooperation in flood risk management plans (Seher, W. 2019).

GUIDER – Guidance for sustainable land use planning

River basins and wetlands provide a variety of services as described. The CAMARO project developed a guidebook of policies and procedures for sustainable land use planning in an integrated approach. The GUIDER is an experience-based action catalog and best practices /toolbox for water and land use planners (Siegel, H., et.al. 2019, p.29, 30).

Contractual Nature Conservation Programme

As example, the Natura 2000 Contractual Nature Conservation Programme only concerns the Styrian European protected areas and, if necessary, direct border areas, for nature conservation reasons. In the case of measures or abandonment of management, for the favourable conservation status, the managers are supported flexibly. (Amt der Steiermärkischen Landesregierung, 2022).

Awareness-raising activities

Awareness-raising activities and training are important to motivate for the implementation of measures. It is evident from the projects that cross-age participation has the greatest success and working groups/advisory boards with different stakeholder groups support land managers and institutions for voluntary activities (municipalities, schools, NGOs, public bodies such as the "Steiermärkische Berg- und Naturwacht" with its operating locations).

Project implementation through the multiple use of land

Selected projects explain how the multiple use of protected areas and their marginal land in and at the edge of Natura 2000 areas in the Middle Styrian Enns Valley works. The international exchange of experiences and best practice examples enables a discussion process on the instruments for sustainable land use planning.

Results

The field tested approaches are summarised as followed:

The **Life Project "Middle Enns Valley - Wörschach Moor** (1999-2004) in cooperation with Enns Valley land managers, the Bird Watching Association "Die Vogelwarte", the Styrian Nature Conservation Association, experts from the HBLFA Raumberg-Gumpenstein and decision-makers (Bohner, Buchgraber, 2005). The area around the Wörschacher Moor with the "Rosswiesen" is one of the most important wetland habitats of the Enns Valley and has therefore been designated as NATURA 2000 site „Wörschacher Moor und ennsnahe Bereiche" (LGBI. Nr.3/2007). Leasing contracts with management conditions (cutting times in the core and marginal zones) were assigned with the farmers.

Other Nature protection initiatives on surrounding land, such as the re-cultivation of abandoned wet meadows for agricultural use, flood retention and biodiversity conservation, promotes green-blue infrastructure for habitat connectivity and green oases for local recreation in the **ReKult Iris Projekt** (Mayer, R., Starz, W., Plank, C. 2018). These single-cut meadows are mown around the beginning of September, depending on the weather. The hay is used as feed for ARECs organic farm Moarhof. With a current price of 300 €/ton of straw and a quantity of approx. 8,000 kg of dry matter/ha, this is a valuable own utilisation. The area is an open-air laboratory for school classes and is located directly on the international Enns cycle path. In cooperation with the Styrian Nature Conservation Association (the adjacent areas belong to the Federal State of Styria), an old hay house has been adapted into a small visitor centre which can be used as research laboratory for young people. Students from our college built an observation tower. Every year, at the End of May, there is a 2 days „*Iris sibirica green event*" with school classes and the interested population to promote these wet meadows for multiple use. The relevant institutions work together and organise various information stations. International excursions and field research on soil, water and plants is implemented.

Fig. 1-4: Trautenfelser Blühwiesen; Moarhof @ HBLFA Raumberg-Gumpenstein,

CAMARO-D Cooperating towards Advanced MAnagement ROutines for land use impacts on the water regime in the Danube river basin (INTERREG) was carried out between 2017 and 2019. The Agricultural Research and Education Center Raumberg-Gumpenstein (AREC) implemented, in the Middle Styrian Enns valley, in and at the edge of Natura 2000 sites, i.e. the following interventions: wetland management, management of invasive plant species, spatial planning and flood risk management, site-specific re-cultivation, drinking water protection at alpine meadows and awareness raising activities for protection measures against floods, nature conservation and agriculture in wetlands and along riparian stripes.

Fig. 5: Flooding 2013, Provincial road L735 Crossing Öblarner Straße L734, © Mayer, M.

Fig. 6: Wetland meadows between Enns river and Grimming Mountain, left ESG 07/AT2240000 "Ennsaltarme bei Niederstuttern. @ Mayerl, M. 2022

Blooming River banks

The aims of the project was to strengthen the self-purification capacity of rivers, minimize gaps in the plant population, promote native biodiversity, maintain or expand plant corridors as habitats, prevent establishment of invasive plan species, prevent erosion damage and counteract warming of the water bodies. The target groups of the project were municipalities, landowners, corporate entities as well as the general population.

Although every system or method has its weaknesses, there are good solutions that can be shared. Consistent implementation and control are just as necessary as regular adaptation to new challenges and the provision of sufficient resources and transferability. These field-tested approaches need to be integrated into a land use development plan that considers ecosystem services and impacts and makes the watershed, which extends beyond municipal boundaries, resilient to unpredictable and calculable risks. This will require not only adjusting the funding landscape accordingly but need to elevate land use planning and conservation tools to a higher level of decision-making. The implementation of regulations needs adequate funding and appropriate structures for concrete instructions. Instruments of land use planning and nature conservation at a higher level of decision-making is a possibility for integrated solutions.

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