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The Danube at Dürnstein (picture: © Katrin Teubner)

Content

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The IDES Project – Improving water quality by integrative floodplain management based on ecosystem services

Extended Summary of the IDES Manual and the IDES Strategy

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Abstract

What contribution can floodplains along the Danube provide to water quality and how can their management take into account a wide range of interests across national borders? These questions were investigated by a European Union-funded consortium led by the Floodplain Institute Neuburg of the Catholic University of Eichstätt-Ingolstadt in the IDES project (Improving water quality in the Danube River and its tributaries by integrative floodplain management based on Ecosystem Services). The results of the project have been published in two main publications: The *IDES Manual* (Stäps et al. 2022) and the *IDES Strategy* (Vizi et al. 2022). While the *IDES Manual* presents the *IDES Tool* as a recommended method for the consistent valuation of ecosystem services (ES) in floodplains, the *IDES Strategy* describes the perspectives for the use of the *IDES Tool* in water management and spatial planning and for a better integration of the ecosystem services approach in legislation and programmes.

Introduction

The Danube River Basin covers more than 800,000 km^2 – 10% of continental Europe – and extends over the territory of 19 countries. Seven of these countries (Austria, Bulgaria, Germany, Hungary, Romania, Serbia, Slovenia) were partners in the project IDES.

Quality of human life depends on the functioning of ecosystems through the services they provide (provisioning, maintenance and regulation, and cultural). Healthy rivers and floodplains offer many of these ES and do so in large quantities. However, pressures from agriculture (changes in land use, excessive use of fertilisers and pesticides as well as soil degradation) and other sectors (energy, transport and tourism) have modified and degraded these ecosystems. As a result, human activities had direct negative impacts on these services.

Until now, these uses have been managed at a very sectoral level (e.g., water management, nature conservation, agriculture), mostly without consideration of water quality or interactions between sectors. At the same time, the Danube countries and governments have set themselves the goal of significantly reducing the nutrients transported by the Danube and thus improving the ecological status of the river. This challenge of reducing the eutrophication of the Danube and its tributaries, and thus the Black Sea, can only be met through transnational cooperation.

The ES-based River Ecosystem Service Index (RESI) already implemented in Germany (Pusch et al. 2018) has shown that water management can be significantly improved by identifying synergies between different ES reflecting diverse sectoral interests and objectives (Stammel et al. 2021). However, this concept has not yet been used in the Danube region to manage different activities in a proactive and holistic way.

The IDES project has developed, based on existing assessment methods, a transnational integrative ES approach, the *IDES Tool* for water quality improvement, which can be applied to floodplains throughout the Danube catchment. In the future, this approach should enable the main actors in the field of water quality management to identify particularly sustainable measures without neglecting the needs of other sectors.

The *IDES Manual* (Stäps et al. 2022) and the IDES Strategy (Vizi et al. 2022) present this approach in detail and outline its potential use in water management and spatial planning. These two project results can be downloaded from the IDES website (https://www.interreg-danube.eu/approved-projects/ides).

What are ecosystem services? ES are defined as the direct and indirect contributions of ecosystems to human well-being (TEEB 2010) and have an impact on our survival and quality of life. Currently, the standard in categorisation of the manifold ES at European level is the Common International Classification of ES (CICES, Haines-Young & Potschin 2018). Accordingly, ES can be divided into the following three main categories:

Provisioning ES: the ability of ecosystems to supply various material resources (e.g., timber production, drinking water and arable crop production)

Regulation and Maintenance ES: the capacity of ecosystems to affect and regulate natural processes (e.g., local climate regulation, nutrient retention, air purification, flood retention and sediment regulation)

Cultural ES: the capacity of ecosystems to provide aesthetic, recreational, historical, educational, or spiritual values (e.g., cultural and natural heritage, water-related activities [canoeing, swimming] and non-water related activities [birdwatching, cycling, hiking])

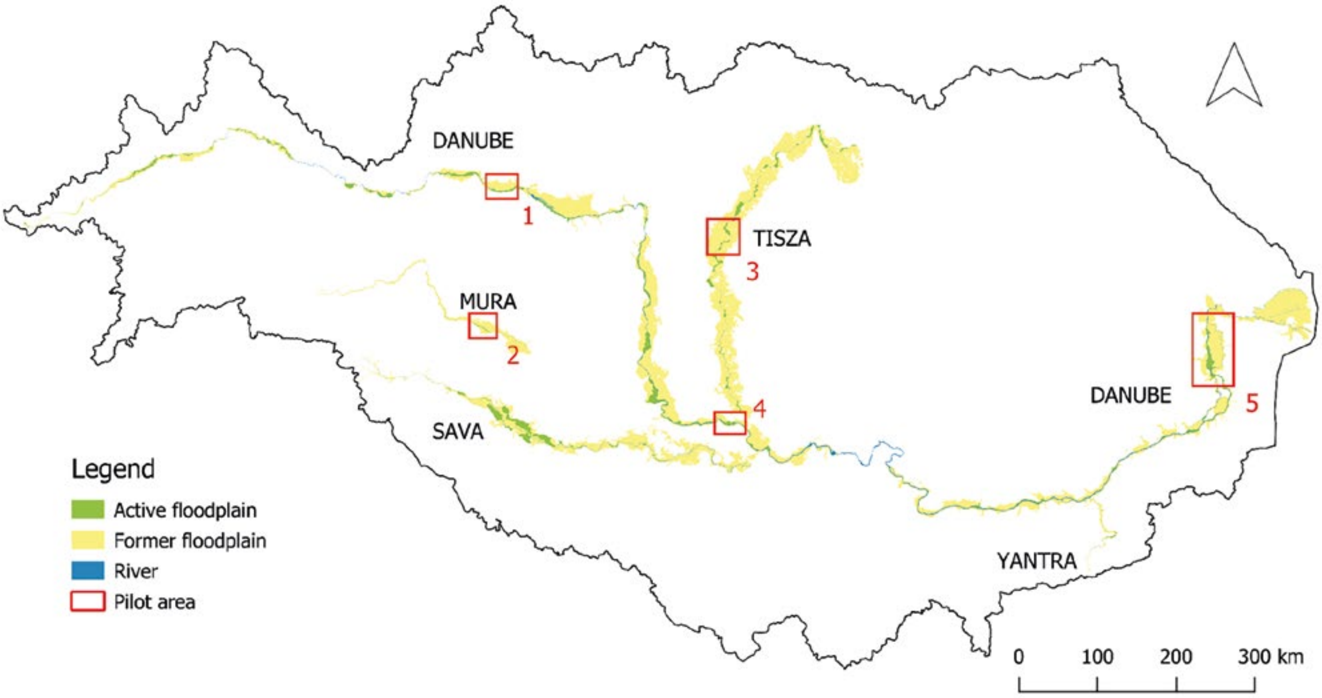

Figure 1. Location of the five pilot areas: 1) The Donau-Auen National Park, Austria; 2) Mura River, Slovenia; 3) Tisza River Floodplain near Szolnok, Hungary; 4) Koviljsko Petrovaradinski Rit Special Nature Reserve, Serbia; 5) Brăila Islands, Romania

At the same time, both documents have been summarised in brochures in seven different national languages of the Danube Region. Some extracts are presented below.

The IDES Tool

The *IDES Tool* has been developed to evaluate different management measures in river floodplains, such as dike relocation, land-use changes, dynamisation measures, with a holistic view of the needs of society. The different ES represent different interests and sectors. Their consistent assessment can lead to effective decision-making. At the same time, the objective valuation of ES can also promote communication between different stakeholders and raise awareness of the diversity of ES provided. The *IDES Tool* thus represents a methodological approach to standardise the valuation of ES in floodplains and to establish a clear link to water quality improvement. Although developed and implemented in the Danube River Basin, the concept is certainly transferable to other areas.

Five steps are required to value floodplain ES and water quality:

Step I: Delineation of floodplains and classification into river, active and former floodplain

Step II: Selection of ES relevant in the area out of a list 26 ES

Step III: Evaluation of ES for single floodplain segments (1 or 10 km wide) with a 5-level scale

Step IV: Prioritisation of areas with high potential for water quality functions

Step V: Visualisation of the results for status quo and scenarios

Implementation of the IDES tool in pilot areas

Five pilot areas (*fig. 1*) in Austria, Hungary, Romania, Serbia and Slovenia were selected to test, calibrate and improve the *IDES Tool* under different natural and socio-economic conditions. In addition to higher accuracy of data in the pilot areas, many stakeholders were involved in co-creating optimal scenarios to improve water quality in their areas. Several meetings and two workshops in each pilot area ensured that stakeholder perspectives were included in the early development of the tool. From the list of 26 ES, stakeholders individually selected and prioritised only those ES they considered important in their area. In the end, a common list of the ten most important ES was created and agreed upon. From a pre-defined list of 30 pressures, the stakeholders selected the pressures that have a (negative) impact on the ES present in the pilot areas. They selected and prioritised a list of five pressures. This step reflects the status quo, the state of the ES and the pressures in the pilot area. Possible actions were introduced in the co-creation process to identify scenarios to improve the state of the ES and ultimately the water quality in the area. Stakeholders discussed the most appropriate actions to reduce specific pressures and agreed on a list of five actions. Based on the Drivers-Pressures-State-Impact-Response (DPSIR) approach, the three elements: 'ecosystem services', 'pressures' and 'measures' and their interrelationships were the basis for a Fuzzy Cognitive Model (FCM) for each pilot area, reflecting the synergies and trade-offs between ES, pressures and measures. All relevant stakeholders in each pilot area co-developed and mapped such a model, showing their agreed perception of the status quo in their area. By changing the intensity of the pressures, different scenarios were created: 'business as usual', 'ideal' (reduction of all pressures to a minimum) and 'optimal' (actions jointly agreed by stakeholders). In this way, stakeholders were able to see how pressures affect different ES and how the absence of one or all pressures will improve the status of the ES. The application of the *IDES Tool* in the Romanian pilot area 'Brăila Islands' is described in more detail below.

The selection of Ecosystem Services and Pressures at Brăila Islands, Romania

During a face-to-face workshop, 19 relevant stakeholders from local, regional and national authorities, research institutions and NGOs selected the Brăila Islands ES. The stakeholders identified the regulating and maintaining group of ES as the most important. The following five ES were selected: 1) habitat provision; 2) air pollution reduction; 3) local temperature regulation/cooling; 4) water purification/quality improvement; 5) flood risk regulation. Among the provisioning ES, stakeholders identified the following three ES as being of high importance in the pilot area: commercial fishing, drinking/water for animals and water for cooling or irrigation (domestic or industrial). Stakeholders identified two cultural ES as important for the area: contribution to research and education and opportunities for water-related activities (fishing, swimming and boating). They also identified the following pressures from different economic activities with negative impacts on ES: intensive fishing, solid waste (plastics, dredging waste), nutrient inputs, agricultural intensification and wastewater.

Matching the stakeholders view with ES mapping

The evaluation of the Brăila Islands pilot area with the IDES Tool (*fig. 2*) showed that the potential for flood risk regulation has decreased due to the conversion of natural land to agricultural land. Thus, the area now has a medium potential for flood risk regulation. In addition, the Big Island of Brăila has a very low potential for habitat provisioning, while the Small Island of Brăila has a high to very high potential. The Big Island of Brăila offers few cultural ES, but the presence of several Natura 2000 sites on the surrounding Danube arms increases its cultural ES potential to mostly high and very high.

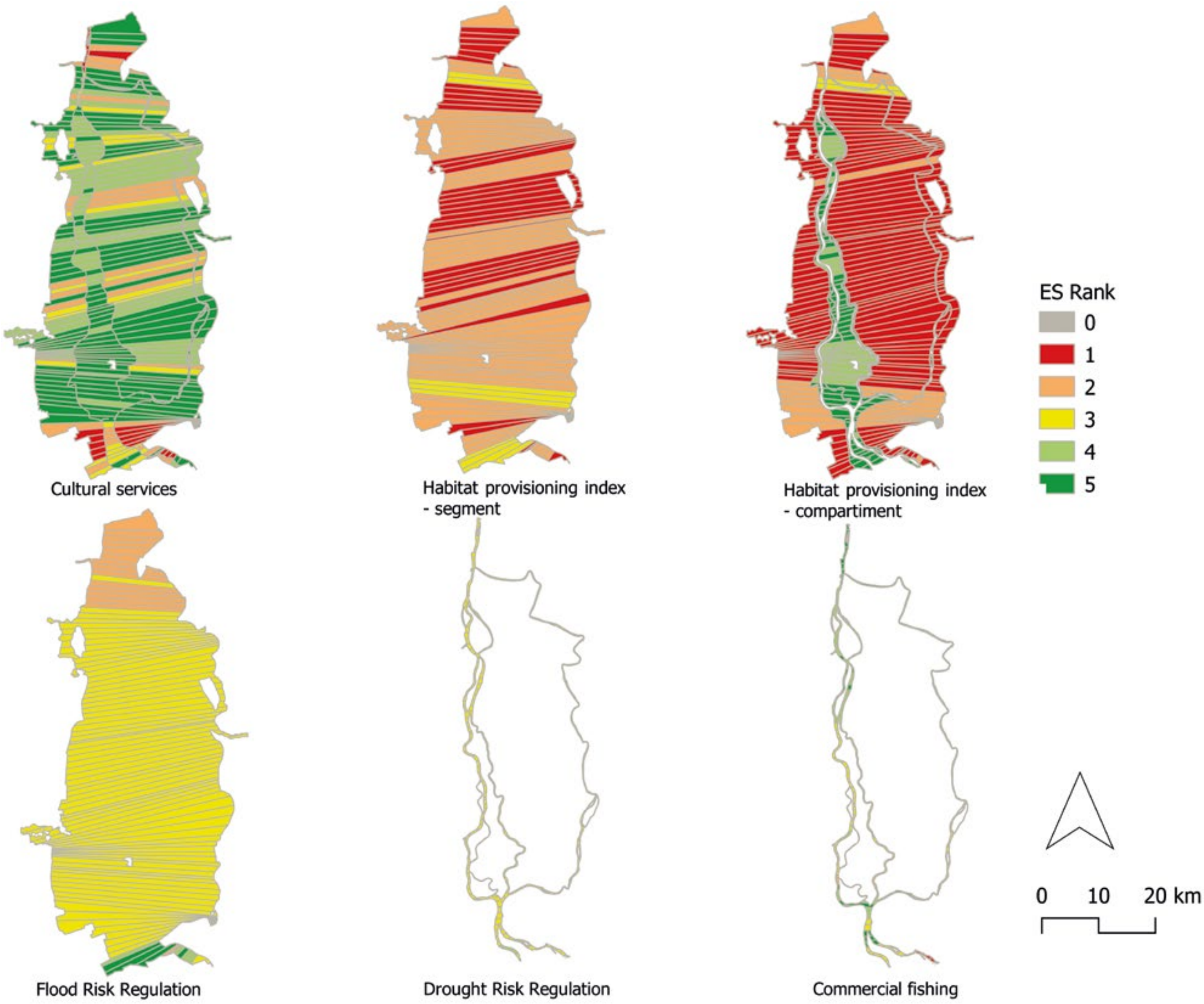

Figure 2. Selection of ES evaluated with the IDES Tool for Brăila Islands. The evaluation classes range from 0 (= no ES provision) to 5 (= very high ES provision)

Figure 3. Status quo (left) and 'optimal' scenario (right) for the cultural services in Braila Islands.

The small island of Brăila has a very high potential to provide cultural ES. As a further consequence of the conversion to agricultural land, the Big Island of Brăila provides higher provisioning services to human communities. Even if the primary production of the small island of Brăila is constant, this service is not fully available to the human population but is rather consumed within the system. It maintains a high level of biodiversity and various ecological processes that allow other groups of ES to be maintained (e.g. regulating ES such as carbon sequestration, nutrient and sediment retention, flood regulation, and cultural and habitat provisioning).

Optimal scenario for the Brăila Islands pilot area

The local stakeholders agreed on and recommended a set of five measures as management options. Discussions on the optimal scenario for the Brăila Islands focused on reducing the use of nutrients, anticipating an increase in intensive agriculture in the near future. In order to make this scenario more concrete, additional tailor-made measures were proposed by the stakeholders: promotion/stimulation of nitrogen-fixing crops (soya, peas, beans, alfalfa), adapted crop rotation, cover crops to reduce the use of mineral fertilisers, use of organic fertilisers, bio-herbicides, permaculture, use of new technologies, improvement of curricula in universities and vocational schools, change of consumption habits. Stakeholders also agreed that simply complying with waste and wastewater legislation would reduce the impact on water quality. Given the current situation, upgrading existing wastewater treatment plants is also needed to improve water quality. By applying all the steps of the IDES Tool, it is possible to visualise the changes in the values of the ES between the 'status quo' and the 'optimal scenario' (*fig. 3*).

Conclusions from Brăila Islands pilot area

The use of pilot areas facilitated a better harmonisation of conflicting societal interests and led to the development of a conceptual framework (management options, ideas, values, visions) that was co-created with local stakeholders. The IDES project has shown that different communities in the Danube catchment, regardless of country, have the same understanding of ES, but the relative importance of ES varies from place to place. The level of importance of an ES is mostly considered based on the interest of the local communities. Thus, even if the pressures are the same throughout the Danube river basin, the specificity of the values that local communities place on ES is locally defined.

Recommendation for an ES-based integrative floodplain management

The improvement of the Danube's water quality in recent years has shown that it is possible to reverse (under certain limits) the negative impacts of human activity. Nature-based solutions such as restoring a morphologically diverse river channel, reconnecting floodplains, or managing more sustainably areas adjacent to the water offer the opportunity to not only targeting a singular issue, (e.g. water quality), but also to look for solutions integrating several societal demands. Thus, these types of solutions aim at improving the ecological status of rivers and floodplains and at the same time enhancing services the ecosystem provides for human well-being. In this regard, the IDES Tool has shown in the pilot areas that the functional approach of ES assessment facilitates integrating the various interests in a multidimensional view. This enables stakeholders to better understand and appreciate the perception of others, and to jointly develop site-specific integrative concepts. Availability of a new, common assessment procedure, as it is the IDES Tool that takes almost all relevant ES into account, is favouring incorporating the ES concept into spatial and socio-economic planning and decision-making. The IDES approach harmonised between the Danube river basin countries will enable water managers and planers of different levels designing ES based, integrative and transparent decision-making processes. This will foster the application of the ES approach and result in multipurpose and sustainable solutions. At the local and regional levels, where water management projects are realised, the detailed assessment of ES based on the available local data may help to convince land users and land owners as well as all relevant stakeholders to apply measures in order to increase the ES availability in their floodplain territories. Chances for a successful implementation of restoration projects increase when stakeholders and their ideas and perceptions are integrated into the planning process. At the national or basin-wide level the assessment of ES and the multifunctionality of floodplains will serve more the conceptual and strategic planning, by identifying potentials and deficits and comparing scenarios. The IDES Tool may be effectively implemented to adapt river-floodplain systems that formerly had been modified to maximise one or a few societal benefits to the more sustainable and more diverse societal requests and legal requirements of the 21st century. For that purpose, we recommend here to implement the IDES Tool also at Danube-wide and national levels in addition to the positive experiences at local level.

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Aboveground biomass and carbon stock of the riparian vegetation in the Danube Delta

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Abstract

Intact wetlands can act as carbon sinks and mitigate increased amounts of greenhouse gases in the atmosphere following climate change. In addition to organic soils, the riparian vegetation plays an important role in carbon storage and cycling within wetlands.

In the context of the project 'EDAPHIC-BLOOM Danube', the riparian vegetation in the Danube Delta was investigated. Preliminary results show differences in aboveground biomass and carbon content between softwood and hardwood riparian forests and artificial poplar plantations. The aboveground biomass in the reed beds is much lower per plot, but due to their huge extension, they are very important for carbon storage.

Introduction

In terms of climate change, the mitigation of greenhouse gas (GHG) emissions is very important. Hereby, carbon dioxide is considered the most important GHG among anthropogenic emissions. Ecologically intact wetlands and floodplains can act as carbon sinks and mitigate increased amounts of carbon dioxide in the atmosphere following climate change (Cierjacks et al. 2010). In addition to the organic soils (Wilson et al. 2016) for example in reed beds, floodplain forests play an important role in the carbon storage within wetlands.

RESEARCH

In this context, the project EDAPHIC-BLOOM Danube ('Ecological resizing through urban and rural actions & dialogues for GHG mitigation in the Lower Danube Floodplain & Danube Delta') was initiated. In the project, actions for GHG mitigation as well as dialogues with authorities and stakeholders in the Lower Danube region in Romania are developed. The project with Romanian and German partners is part of the European Climate Initiative (EUKI) of the German Federal Ministry for the Environment, Nature Conservation and Nuclear Safety (BMU). It is managed by the Danube Delta National Institute for Research and Development (DDNI) in Romania. One aspect addressed in the project is the carbon storage capacity of floodplain vegetation.

Figure 1. A typical sequence of a channel with an associated gallery forest on the higher riverine levees and adjacent reed beds in wide areas with lower elevations (picture: G. Egger).

The Danube Delta

The Danube originates in southern Germany and crosses ten countries on its way in a predominantly south-eastern direction. After about 2,850 km it flows into the Black Sea in Romania where its average discharge is about 6,500 m^3/s. Its catchment has a size of 817,000 km^2 (Jungwirth et al. 2014).

Close to the river mouth, the Danube divides into three branches (Chilia, Sulina, and Sf. Gheorghe branch) that encompass the area of the Danube Delta (Kahl 2018). The total area of the Biosphere Reserve 'Danube Delta' is about 5800 km^2 in Romania and 46 km^2 in Ukraine (Hanganu et al. 2002). The area is characterized by a dry continental climate. Summers are very hot with maximum temperatures up to 40 °C, while winters are very cold, even up to minus 25 °C. The annual mean temperature in Sulina City close to the Black Sea is 11 °C. The month with the highest precipitation is June, while February and March have the lowest values. The annual mean precipitation in Sulina City is 350 mm (Kahl 2018).

The complex interplay between various morphodynamic processes of fluvial and marine origin led and still leads to continuously evolving landscapes in the delta. It contains a mosaic of different habitats such as channels, lakes, reed beds, dune fields, and lagoons (Niculescu et al. 2015). The aquatic and marshy vegetation make up most of the Danube Delta. The reed beds cover about 44% and are mostly dominated by the Common Reed *(Phragmites australis)*. This species has a wide ecological amplitude and builds reed beds in the Danube Delta ranging from floating peat islands ('plaur') to almost permanently shallow inundated areas without a frequent supply of fresh river water to areas with high Danube water circulation and high siltation rates. The other two dominant species of the marshy areas are Reedmace (mostly the Lesser Reedmace, *Typha angustifolia)* which grows especially in the fluvial delta areas with high siltation. The marine part of the delta is dominated by Sedge marshes (*Carex* spp.; Hanganu et al. 2002).

Floodplain forests cover about 6% of the Danube Delta. The larger part (about 5%) is covered by softwood floodplain forests that occur on the natural riverine levees and artificial dikes alongside the main Danube branches and smaller channels (*fig. 1*). The most important softwood forest types are White Willow *(Salix alba)* floodplain forest, Common Alder *(Alnus glutinosa)* floodplain forest and artificial Poplar plantation. Between the fluvial and the fluvial-maritime part of the Danube Delta on the former seashore area, sand dune areas developed due to an interplay of fluvial and aeolian processes. In the two areas of Letea and Caraorman, hardwood floodplain forests on the sand dunes cover about 1% of the delta area (Hanganu et al. 2002; Gâştescu 2009). The dominant species of these sand dune forests are *Quercus pedunculiflora, Fraxinus angustifolia,* and *Fraxinus pallisiae.* The woody vegetation types also comprise small stripes of shrub vegetation along the seashore, for example with *Elaeagnus angustifolia, Tamarix ramosissima,* and *Hippophae rhamnoides* (Hanganu et al. 2002).

Methods

In three field campaigns in 2021 and 2022, we collected vegetation data in plots that were distributed over the Romanian part of the Danube Delta (*fig. 2*). In addition, samples of organic soils were taken in the plot surroundings to analyse soil organic carbon and related parameters (Nichersu et al. 2022).

For the floodplain forests and shrub vegetation, tree and bush individuals were measured in nested plots. In the 25 on 25 m plots, all tree and shrub individuals with a diameter at breast height (DBH) above 10 cm were recorded with the species, individual height, and DBH. In three smaller nested plots with 5 on 5 m size, this information was gathered for all woody species with a DBH of 1 to 10 cm. Additionally, tree core samples were taken from the main tree species to perform a year-to-year growth analysis. Besides, vegetation and habitat parameters such as vegetation type, vegetation cover in different layers, grain size, and estimates on flooding and morphodynamics were recorded. In total, woody species in 36 plots were measured. Using the field data, the aboveground woody biomass (AGWB) of the trees and shrubs was calculated using the species-specific allometric formula of Cannell (1984). The carbon content was estimated using 50% of the AGWB (Clark et al. 2001; Malhi et al. 2004).

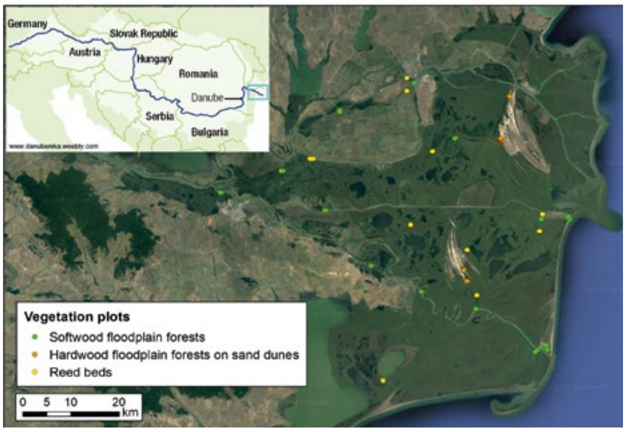

Figure 2. Plots for the different main vegetation types in the Danube Delta (picture: G. Egger).

The reed beds were sampled using a plot design at the end of the vegetation period (September and October 2021). Again, general vegetation and habitat parameters such as vegetation type, grain size, and inundation in plots of 5 on 5 m size were recorded. In total, 28 plots in different reed vegetation types were documented. In each plot, the aboveground reed biomass together with the litter was harvested on 0.5 on 0.5 m, weighed and 10% of the homogenised sample was dried and the dry weight was determined. To measure the carbon content, the dried samples were ground and the carbon and nitrogen determined using a Euro EA Element Analyzer. As no Carex-dominated plots were measured, they were assumed to be one third of the reed biomass. The field and laboratory results were used together with a vegetation map of the Danube Delta (Hanganu et al. 2002) to upscale the findings on the whole delta area.

Results

The main tree species recorded in the floodplain forests were *Quercus robur, Quercus pedunculiflora, Fraxinus angustifolia, Fraxinus pallisiae, Populus canescens, Populus x canadensis, Salix alba,* and *Alnus glutinosa.*

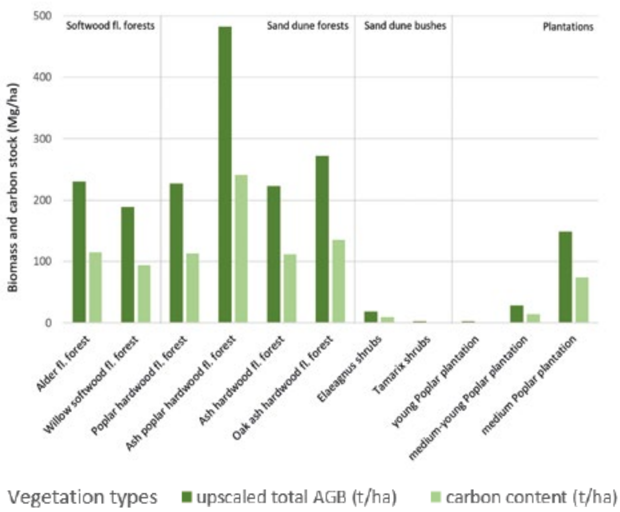

Figure 3. Aboveground woody biomass and carbon stock (in Mg/ha) of the different woody vegetation types in the Danube Delta.

For the softwood floodplain forests, the *Alnus glutinosa* dominated type had the highest aboveground wood biomass (AGWB; usually given in megagrams (Mg) which is equivalent to tonnes (t)) with an average of 230.2 Mg/ha and a corresponding carbon stock of 115.1 Mg/ha (*fig. 3*). The seven willow dominated plots had an average AGWB of 188.9 Mg/ha, but with a large variation between plots.

For the hardwood floodplain forests in the sand dune areas, the ash-poplar-dominated plots had the highest AGWB with 481.9 Mg/ha and a corresponding carbon stock of 241.0 Mg/ha. The other sand dune forests had similar AGWB values ranging from 223.3 Mg/ha for ash-dominated forests, to 227.3 Mg/ha for poplar-dominated forests followed by 271.7 Mg/ha for oak-ash-dominated forests.

Regarding the artificial poplar plantation, the AGWB and carbon stock is highly dependent on the plants' age. The values range from 3.0 Mg/ha for about 5-year-old poplars to 149.0 Mg/ha for poplars of 20 to 35 years.

In the shrub vegetation close to the Black Sea the AGWB is about 18.6 Mg/ha for *Elaeagnus angustifolia*-dominated sites and about 2.8 Mg/ha for *Tamarix ramosissima* shrubs.

The *Phragmites australis*-dominated reed beds had a maximum of 115 kg dry aboveground reed biomass in one plot (5 on 5 m). In general, the medium dry biomass was 18.3 Mg/ha, 23.1 Mg/ha on salinised soils, and 24.8 Mg/ha in plots on plaur (peat; *tab. 1*). The medium carbon content of the *Phragmites australis* aboveground biomass was 43.2% and 0.8% of nitrogen. When combining these results with the area of each *Phragmites australis*-reed type the resulting dry biomass is 4.2 million Mg and the carbon stock is more than 1.8 million Mg in the whole Danube Delta.

The other two reed bed species had a smaller aboveground biomass with 15.6 Mg/ha for Reedmace and 5.5 Mg/ha for Sedge vegetation. The laboratory analysis revealed for Reedmace a medium aboveground carbon content of 43.3% and nitrogen of 0.5% and for Sedge a medium aboveground carbon content of 41.9% and nitrogen of 0.9%. This results for Reedmace in a total aboveground biomass of more than 215,000 Mg with more than 93,000 Mg of carbon in the Danube Delta. For the sedge vegetation, the aboveground biomass is more than 96,000 Mg and more than 40,000 Mg of carbon in the Danube Delta.

Discussion and conclusions

The forest vegetation of the Danube Delta has different roles in carbon sequestration and storage. The sand dune forests store quite high amounts of carbon in their biomass. Besides, oaks are rather long-living trees and as many old and tall individuals of *Quercus pedunculiflora* were recorded it can be said that they are important for long-term carbon sequestration (Hutschreuther 2022). In the softwood forests,

Reed type	Dry biomass (Mg/ha)	Area (ha)	Dry biomass in Danube Delta (Mg)	C stock (Mg)	N stock (Mg)	Carbon stock (Mg/ha)
Common Reed vegetation *(Phragmites australis)*	18.3	83,523	1,527 841	660,027	12,222	7.9
Common Reed vegetation on plaur	24.8	82,268	2,041 114	881,761	16,329	10.7
Common Reed vegetation on salinised soils	23.1	27,394	633,895	273,843	5,071	10.0
Sum Common Reed reed beds	22.1	193,185	4,202 850	1,815 631	33,623	9.4
Reedmace vegetation (*Typha* spp.)	15.6	13,819	215,417	93,275	1,077	6.7
Sedges vegetation (*Carex* spp.)	5.5	17,603	96,602	40,476	869	2.3
Sum reed beds	18.2	417,792	4,514 869	1,949 383	35,569	4.7

Table 1. Biomass (aboveground dry biomass) and carbon stock of the different reed bed vegetation types in the Danube Delta.

Populus canescens and *Salix alba* are important regarding the short-term storage of carbon since they sequester relatively large amounts of carbon within a relatively short period while *Fraxinus pennsylvanica* allows for more long-term carbon storage. *Alnus glutinosa* occupies an intermediate position (Mildt 2022).

The riparian vegetation of the Danube Delta will probably undergo some changes related to human impact and climate change. Trees dieback was observed especially for the sand dune forest over the last years. This vegetation type is highly dependent on the groundwater supply. The effects of climate change are increasingly exposing these forests growing on the dune formations to the two stressors of drought and artificial channel digging. Besides, the sand dune forests are grazed by feral horses (Posthoorn & Tudor 1999). This may affect the build-up of AGWB and carbon sequestration in the coming years. In the field, the rejuvenation of the main tree species could be observed. But the management and water supply will determine the future development.

One possibility to increase future carbon storage in the Danube Delta would be to restore drained areas that are now used for agriculture. Since carbon sequestration in soils is seen as a main means of reducing GHG emissions to the atmosphere and especially the management of agricultural soils has a huge impact on the carbon storage in the soils, adapted management or restoration measures could enhance the GHG mitigation (Nichersu et al. 2022). In addition, the preservation of the existing forests or reforestation of natural floodplain forests is important to store carbon over a long time span. Besides, since the reed beds store also considerable amounts of carbon and are important for the peat formation in wet sites and the preservation of the organic soils they should be preserved.

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Dr. Albert Scrieciu, our new Country Representative in Romania

Albert Scrieciu is an environmental geologist, with a wider interest in the fields of geo-ecology, geography and environmental sciences, a PhD in Management, a proven ability to improve working environments and a commitment to employee welfare.

Albert has been working at GeoEcoMar for eleven years and since 2016 he is coordinating the “Interdisciplinary research of fluvial environment Department”. He is also a Partner coordinator in H2020 projects REXUS, RESET, MERLIN, Stars4Water, EcoDaLLi and Restore4Life and has experience in FP7, CBC and INTERREG research projects, working also at the preparation of the ESFRI proposal for the International Centre for Advanced Studies for River-Delta-Sea systems – DANUBIUS-RI.

Albert has strengthened his ability to combine and look at problems from the perspectives of different disciplinary fields such as governance and policy at the national and European levels, water management, monitoring, ecology and simulation modelling, which he effectively combines to create sound scientific argumentations for managing and protecting natural areas.

He is analysing the interdependencies between the Water, Energy, Food and Navigation sectors, along the Danube River, in the context of continuously growing demand for resources considering the impact of climate change in order to move towards better coordination and utilisation of natural resources, taking into account existing trade-offs and progressing towards synergies.

His work experience helped Albert to gain the expertise and technical capacity to support a better understanding of the protected wetlands along the entire Danube River Basin while collaborating with relevant partners from Germany, Austria, Hungary, Serbia, Bulgaria and Romania in order to overcome the challenges and identify the best solutions.

Prof. Dr. Mateja Germ, our new Country Representative in Slovenia

Mateja Germ is employed at the University of Ljubljana, Biotechnical Faculty, Department of Biology, Chair of Ecology and Environment Conservation. About the faculty / Employees (uni-lj.si). Her main research fields are ecology and aquatic macrophytes. She is interested in the ecology of macrophytes, responses of macrophytes to environmental parameters, and assessment of the ecological status of rivers and lakes according to macrophytes. She is a member of IAD (International Association for Danube Research), and Member of the board of the LifeWatch-SI research infrastructure at UL, and Member of the Slovenian Society for Water Protection, and a Member of the Association of Watermen of Slovenia. She teaches Ecology of plants, Ecology, Environmental changes, and nature protection to students in First Cycle Study Programmes – Academic Study Programmes, and Ecology and Biodiversity Second Cycle Study Programmes – Master's Study Programmes, and Third Cycle Study Programmes – Doctoral Study Programme in Biosciences. M. Germ is a national expert for aquatic plants to implement the Water Framework Directive (Directive 2000/60/EU). She leads the national monitoring of surface waters based on macrophytes at the Biotechnical Faculty. M. Germ performs monitoring of rivers and lakes and classifies them into one of five ecological quality classes based on the presence and abundance of macrophytes. She participated in the intercalibration of methods for determining the ecological quality classes of rivers and lakes in three different geographical intercalibration groups (MED GIG, EC GIG and Alpine GIG). M. Germ leads the field work with students and visits rivers, lakes, and wetlands with her master's students. She presents her results at international conferences and publishes them in important journals.

44th IAD Conference at Karl Landsteiner University Krems

Between February 6 and 9, 2023, the 44th Conference of the International Association for Danube Research (IAD) was held at Karl Landsteiner University Krems. It was dedicated to the topic ‘Scientific cooperation in the Danube River Basin: Tackling present and future environmental challenges of a European riverscape’. A total of 101 registered participants from 12 countries of the Danube River Basin attended the four days of the conference. IAD was particularly happy to welcome five Ukrainian colleagues who participated in person at the conference as well as three colleagues from Ukraine who had sent video contributions for their topics. The participation of the Ukrainian colleagues was particularly gratifying, as the conference was originally planned in Kyiv, and due to the unacceptable war by Putin's Russia, it was taken over at short notice by the Department of Water Quality and Health at Karl Landsteiner University (ICC Water and Health), supported by IAD and the Austrian Committee of IAD. The first day of the conference was themed ‘Pollution, Global Impact & Health’, to which ICC Water & Health researchers contributed extensively. The second day dealt with biodiversity and ecology and the fourth day was dedicated to river management and renaturation.

The great importance of transboundary cooperation among scientists in our common river basin was particularly highlighted and visible. All information about the conference as well as the extensive Conference-book with all abstracts can be found on the conference website of the Austrian Committee of the IAD (https://www.oen-iad.org/congress2023/).

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Catchment of the River Danube

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