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Working paper for the
Danube River Basin

Assessment of the restoration potential along the Danube and main tributaries

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Cover photo: Danube River near Calarasi/Silistra with large agricultural polders (photo credit: GoogleEarth 2010)

Preface:

Over the last century, floodplains of the Danube and its tributaries were subject to major human interventions which caused significant changes in the hydromorphology of the river-floodplain ecosystem and losses of natural values and processes.

The reduction and degradation of floodplains causes the loss of large water retention areas that originally mitigated flood risks, the loss of functional wetlands and their resources and services they typically provide, e.g. groundwater replenishment, nutrient reduction, water purification and the loss of other riparian ecosystems critical for the conservation of key species and habitats (in particular pioneer habitats and soft- and hardwood forests).

However, the political changes in Central and Eastern Europe and respective EU policies (Water Framework Directive, Flood Directive as well as FFH and Bird Directives) are fostering efforts to re-establish the lateral connectivity of floodplains along the Danube and its major tributaries through restoration projects. Also the Ramsar Convention on Wetlands supports the conservation and restoration of floodplains. Since about 20 years restoration projects have been under planning and implementation in various sizes and with different purposes and levels of success.

The assessment of the restoration potential of floodplains is necessary to support and stimulate restoration projects. Beyond an inventory of already existing projects, such an approach should enable the proposal of new restoration sites. Finally a prioritisation of projects is necessary. This working paper proposes a framework for such a floodplain inventory, assessment and prioritization for the Danube basin and presents first results.

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List of Acronyms

AT	Austria
BA	Bosnia and Herzegovina
BG	Bulgaria
DCPO	WWF Danube-Carpathian-Programme Office
DEM	Digital Elevation Model
DRB	Danube River Basin
DE	Germany
EU	European Union
FD	Floods Directive
FFH-D	Flora Fauna Habitat Directive (Natura2000 network)
GIS	Geographical Information Systems
HU	Hungary
ICPDR	International Commission for the Protection of the Danube River
JDS 2	Joint Danube Survey 2, 2007
MD	Moldova
NGO	Non Governmental Organisation
RO	Romania
RKM	River Kilometer
RS	Serbia
SK	Slovak Republic
UA	Ukraine
WFD	EU Water Framework Directive

Glossary of selected terms

Aggradation	The building up of sediments occuring when there is a supply of sediment and changes in slope and flow velocity.
Active floodplain	Floodplain area between current flood defenses (dikes) often designed for the 100 year flood return interval; it includes usually all water bodies, but for very large rivers such as the Danube the main channel surface will be calculated separately.
Channel incision	Riverbed deepening and drop of water tables due to lack of sediment supply (dams upstream) often in combination with river straightening and increased shear stress on the river bottom.
Former floodplain	Floodplain outside the flood defences that could be potentially flooded (morphological floodplain minus active floodplain).
Hydromorphology	The science of the physical characterisation of riverine habitats based on hydrologic, hydraulic and morphologic parameters including the channel, the banks and the floodplain.
Morphological floodplain	Potentially flooded area without flood defences, e.g. along postglacial terrace systems.

Executive Summary

This working paper "Assessment of the restoration potential along the Danube and main tributaries", commissioned by the WWF International Danube-Carpathian Programme, comprises a floodplain inventory, an assessment of proposed potential restoration sites and a recommendation on how to prioritise the sites.

This study focus on new restoration sites outside the existing flood protection dikes, and emphasises the need for protection of remaining near-natural floodplains as well as improvements of existing altered floodplain areas, especially along main and side channels.

Floodplain delineation (balance) and typology

Many studies (e.g. DPRP 1999, Schwarz et al. 2006, BfN 2009) indicate the substantial loss of active floodplains (some 70-80% in Germany and in the DRB). There is a significant differentiation into a) strongly altered rivers or river stretches with 90-100% loss of floodplains in intensively-used landscapes, and b) still intact reaches. This also highlights the loss of biodiversity and intactness of the remaining 20-30% of floodplains. The overall hydromorphological situation of many rivers in Europe has decreased dramatically, but in the case of the Danube more than one-third of the river has been classified in the second (good) class according to the JDS 2 (ICPDR 2008). In particular this includes parts of the free-flowing middle and lower courses of the Danube and the Delta, which are in a better condition.

For the first time, the delineation of floodplain areas in the Danube River Basin in this study includes not only the Danube and several major tributaries with its lower courses, but also many upper courses of major rivers and lower courses of smaller tributaries.

First, floodplains along the Danube and main tributaries were delineated into the morphological floodplain (defined by post-glacial terraces) and the active floodplain (within the current flood protection dikes). Most of the proposed restoration areas are located in the resulting former floodplain, i.e. the portion of the morphological floodplain outside the dikes.

Originally Danube floodplains would cover an area of approximately 26,633 km², which is equal to about 3.3% of the total Danube catchment area. The total size of the morphological floodplain, including the Drava, Sava and Tisza floodplain, would be 79,406 km², which equals almost 10% of the basin or nearly the entire territorial surface of Austria (the remaining active floodplain has in total 15,542 km²). Along the Danube only 8,561 km² of floodplain remain (out of this the Danube covers a water surface of approx. 1,724 km², meaning the terrestrial part of the active floodplain is even smaller). The total floodplain area for the Danube was reduced by 68% (80% for all assessed rivers) with differences for upper (75%), middle (79%) and lower (73%) Danube stretches. The Delta floodplain area was reduced by 35% (see Table 1 on the next page).

Second, the still-remaining active floodplain was sub-divided into four functional types: a) near-natural floodplains, those floodplain areas with strongly reduced connectivity by floodplain aggradation ("elevated floodplains"), b) floodplains along impounded stretches (located mostly along the upper Danube), c) and finally flood polders, which are flooded only during major flood events. The entire former floodplain was defined as an additional functional type (d). The sub-division allows for a better assessment of the actual remaining near-natural floodplains – the loss is nearly 92% (upper), 90% (middle), 75% (lower) and 48% (Delta) – and furthermore it allows for a better estimation of the restoration potential for the other types of active floodplains, such as the improvement of residual water (ecological flooding) in hydrologically altered areas, e.g. backwater reaches along impounded stretches typical in Germany and Austria.

Table 1: Floodplain area comparison for the Danube

	Size of floodplain		Floodplain loss
	Morphological floodplain [km²][1]	Active floodplain, incl. main channel[2] [km²]	[%]
Upper Danube 950 km (DE, AT)	2,831	707	75
Middle Danube 900 km (SK, HU, HR, RS, RO)	10,369	2,143	79
Lower Danube 850 km (RO, BG, MD, UA)	8,033	2,208	73
Danube Delta 100 km (RO, UA)	5,400	3,503	35
Danube total 2,845 km	26,633	8,561	68

Finally, a bio-geographical floodplain typology similar to the WFD typology for rivers would complete the basic characterisation of floodplains in the DRB, therefore first suggestions are given in the study.

Assessment and proposal of potential restoration sites

After floodplain delineation and general characterisation into type, the ideal next step would be to assess services that floodplain ecosystems provide, such as flood protection, groundwater replenishment, sediment and nutrient retention, water purification, resilience and recovery of river ecosystems after accidents, biodiversity/habitat, river-floodplain products (wood, fish, game, reed), cultural values, recreation and tourism, and climate change buffering capacity. Due to the exorbitant time requirements to asses these ecosystem services – based on experience and results of earlier studies for the Danube (DPRP 1999 and BfN 2009) – the author skipped this step in favor of assessing the proposed restoration sites only by basic data. However some overall indicators were calculated continuously, such as the overlap of floodplains and protected areas (73% of active and 39% of morphological Danube

[1] Including the active floodplain (morphological floodplain minus active floodplain is the “former” floodplain)
[2] Due to the fact that all channels are integral part of the river-floodplain ecosystem the channels are included in the calculation. However in heavily altered river reaches the real size of active (semi- and terrestrial habitats) floodplains can have only half the size or even less than the main channel, in particularly along the large lower Danube when the channel reaches some 1-2 km in width)

floodplains are already protected, mostly by Natura2000, as compared to active German floodplains which are protected by about 50%).

The pragmatic selection of potential restoration sites is based on already existing governmental and non-governmental projects and proposals. In addition, new areas are proposed iteratively from the upper Danube to the Delta based on continuously available data including: land use and habitats (settlements are "no go" areas), spatial configuration (size/length/width/position), hydromorphological intactness, overlapping protected areas, and floodplain function/purpose (e.g. tributary confluences can act as stepping stones in biological corridors or have high floodwater retention capacity). In addition socio-economic indicators, such as land ownership, usage concepts for specific areas and feasibility of projects (costs, legal framework, and administration), were collected and recorded, if available, in a database along with the previous mentioned data. The database also includes information such as adjacent WFD waterbodies (e.g. with their hydromorphology assessments) or existing management plans to directly link proposed areas to the ongoing planning of the respective target fields (WFD, FFH-D and FD). The applied approach identifies large scale restoration projects (>500 ha) but this does not necessarily mean that additional smaller areas or sections of the proposed areas are not also suitable for restoration.

In total 439 areas of a total size of 1.38 million ha with major existing, planned and proposed restoration projects were collected and analysed (see Table 2). 196 areas are identified for the Danube amounting to 810,228 ha in total for the Danube (about 560,000 ha are already officially planned according to ICPDR 2010). 179,708 ha of this total are in the active floodplain and 630,520 ha are located in the former floodplain. Some 8% of the areas of the Danube lay in "near-natural" floodplains, including large project sites in the Danube Floodplain National Park (AT) and Gemenc (HU), which are already partially restored). About 2% of the Danube areas are in strongly altered floodplains ("elevated floodplains"), 3% in "backwater reaches/tributary confluences along impoundments", 10% in technical polders and the remaining 77% is in the former floodplain. Compared to the overall loss of Danube floodplains at 68%, about 24% of the former floodplain could be restored according to this study. Finally the overall loss of floodplains could be reduced by 44% of their original extent, however not equally distributed along the river's entire course. The largest restoration potential is in Romania.

Table 2: Potential restoration area comparison

	Number of restoration sites	Total area size [km²] (ha)
Upper Danube 950 km (DE, AT)	47	532 (53,179)
Middle Danube 900 km (SK, HU, HR, RS, RO)	45	1,562 (156,229)
Lower Danube 850 km (RO, BG, MD, UA)	79	5,038 (503,790)
Danube Delta 100 km (RO, UA)	25	970 (97,030)
Danube Total	196	8,102 (810,228)

Total: Danube and tributaries	439	13,855 (1,385,481)

Prioritisation

As previously mentioned, the initial prioritisation of the proposed restoration sites is even more complicated due to lack of detailed data. Therefore the approach must fit to the available continuous data requirements, which in turn implicate the limitation of results. The pragmatic pre-selection of potential sites cannot substitute for national approaches.

The potential restoration sites vary in size, configuration and feasibility of implementation. Respecting the different purposes of floodplain restoration, such as flood protection, biodiversity, nutrient reduction, groundwater exchange, forestry, recreation etc, the assessment initially focused on “floodplain functioning” or in other words the “intactness” of the floodplain ecosystem in relation to hydromorphological criteria (mostly flood regime and dynamics) to support most of the ecosystem services listed above. Only parameters with sufficient data coverage, e.g. overall hydromorphological intactness of adjacent river stretch, functional floodplain type, land use (percentage of agriculture as an indicator for the intensity of land use), protection status and coverage, and area size (in relation to retention capacity and hydromorphological dynamics) were analysed. An initial assessment matrix indicates priority level for each proposed site.

Of the planned and proposed areas for the Danube, 33 (19%) receive a “very high” restoration potential rating, 98 (56%) a “high” rating and the remaining 45 (25%) only a “moderate” restoration potential rating. This first comparison of areas is based on commonly available parameters and can be used to further discuss and develop restoration prioritisation.

Conclusions

Some “action plans” and “implementation strategies” provide a framework for floodplain restoration. However, using the example of the “Programmes of Measures (PoM” of the WFD, such plans often include only a few proposals (with exception of RO in the PoM) and implementation schedules in later management cycles towards 2026. A short term goal therefore must be the definition and clear planning of one large scale pilot restoration project per country by the next cycle of WFD management planning in 2013.

If all sites proposed in this study were implemented over the long-term, e.g. in the third WFD planning cycle by 2026 and beyond 2032, this would mean that 1% of the proposed sites should be restored per year, with other words it would be necessary to restore 28,000 ha each year, or 2,150 ha per country (not considering the distribution of projects nationally). Based on past experiences of pilot projects, achieving this number would require strong and clear political direction and funding for implementation. Estimating that it costs about 500,000 €/km² for restoration across the basin, the overall investment needed to restore all sites proposed in this study would amount to more than 6 billion € (see Chapter 5.2 for more information).

Further general conclusions are:

- It is necessary to increase trans-boundary knowledge of DRB floodplains overall, and to extend continuous floodplain assessment based on floodplain segments by country, e,g, like what was done in Germany (BfN 2009).
- The tools and approaches applied in this study (in particular prioritization) should be further developed in line with FFH-D, WFD and FD plans within the WFD planning cycle timelines. A database to share experiences and development would support the further work.
- Type-specific and adaptive restoration strategies are needed. Protection and improvement (restoration) of existing floodplains is important (only about 10% remain under near-natural conditions along upper and middle Danube!).
- The availability of land (ownership is often most critical), but also of other data, in particular hydraulic models for ecological planning, is very important to ensure successful restoration.
- Protected areas and their management must go hand-in-hand with restoration efforts. Floodplains are very dynamic systems that host a variety of habitats and species within close vicinity. For example, the reconnection and re-dynamisation of protected oxbows are also important for the river-floodplain system, and restoration of both floodplain and oxbow should coexist in the limited given space for river development.
- Favorable legal frameworks, e.g. clear protection of still-existing retention areas (no-go areas for further land development in floodplains), strong spatial planning instruments and tight administrative and political structures that allow for transparent public participation are requirements for successful restoration projects.
- Clear impact assessments of the project on local, regional and international levels regarding floods, ecology and other ecosystem services is necessary for successful restoration.
- Prioritisation approaches must be further developed, but should not be overloaded with pre-justifications regarding ecological or technical outcomes; ultimately the local feasibility conditions will shape (and reduce) the list of potential sites.
- Requirements for local planning and approval by authorities (e.g. influence on local flood levels, water quality and so on) must be considered from the beginning.
- Broad stakeholder involvement and interdisciplinary planning work is a pre-condition for successful restoration.

1. Introduction

Over ten years has passed since the first assessment of restoration potential in the Danube basin and assessments of restoration projects (DPRP 1999, ZÖCKLER 2000, ECRR 2001). Also, within the last decade, only a limited number and size of floodplain areas were restored. On the other hand the knowledge and experience of restoration increased considerably and many new projects are under planning (at least for smaller areas regarding longitudinal continuity, such as the removal of migration obstacles and river stretches focusing on channel improvements, and even a few larger floodplain areas).

Considering EU Directives such as the WFD and FD, the pressure on countries to increase their restoration activity is evident and first results of implementation should be achieved until 2013 and 2015, respectively. The aim of this assessment is, therefore, to support further floodplain restoration in the DRB and to discuss and propose basic methodologies on how to define and prioritize future projects.

The main part of this working paper focuses on the physical determination and the assessment of potential floodplain restoration sites, and supports the further selection of proposed sites (chapters 2-4). It should provide the framework for the assessment, and finally prioritisation, of restoration projects focussing on the lateral connectivity of river-floodplain ecosystems.

From the beginning it was clear that “feasibility” of restoration projects, such as the legal framework, local usage concepts for floodplains, land ownership, data availability or cost calculations, often determinates which projects are feasible or not (even much more than any pre-selection methodology). Therefore this important topic is introduced at the end (chapter 5).

2. Floodplain delineation

2.1 Methodology

Earlier studies evaluate the total size of floodplains of the Danube and its major lowland floodplains (DPRP 1999). In this study, the delineation of active and morphological floodplains along the Danube and major tributaries was completely revised and extended to further tributaries with important floodplains; this gives a rather good approximation of the extent of potentially flooded areas. Comparable approaches can be found for the German Floodplain Balance (BfN 2009). In a few years, the current EU "Danube Floodrisk" project should be able to refine these figures based on high resolution DEM and hydrodynamic modelling.

Today's floodplains are not thinkable without lateral flood protection dikes and/or influencing dams. Therefore from the beginning of this study, information on those major hydraulic structures was collected separately. Starting along the upper Danube in Germany and Austria, a widespread type of dike can be defined along river impoundments with an artificial water regime (they are usually only flooded in case of high floods or by smaller tributaries). The largest examples of these floodplains are the Tullnerfeld in Austria and the Szigetköz in Hungary, as well as parts of the Sava floodplain downstream of Zagreb. In addition, pure technical flood polders exist in the upper catchments, but also, e.g. on the Körös tributary in HU. New huge polders are planned along the Hungarian Tisza and partially along the lower Danube in RO. Those floodplains must be assessed separately from permanently connected floodplains.

Even in still active floodplains along free-flowing river sections, the changes over the past century have been substantial. The most important factor causing these changes is a decrease in flood dynamic (duration and magnitude of flooding and sediment dynamics). This has caused changes in the ecological conditions of floodplains on most of the rivers due to water stored in upstream reservoirs, i.e. altered discharge regime (e.g. by flood protection measures). Another important issue affecting ecological conditions is the aggradation (fine sediment deposition) in floodplains caused by river regulation (narrowing of the river-floodplain cross section by dikes, deepening of channels) and short flood peaks with often very high suspended load concentrations (due to the changed hydrological regime and land-use practices).

Floodplain types assessed in this study applicable for the Danube are (see Figure 1):

1) Active floodplains with still more or less typical habitat conditions (near-natural), side-channels with pioneer stands, floodplain forests and pastures, wetlands and oxbows.
2) Active elevated floodplains, strongly altered due to substantial aggradation (sedimentation) and mostly used for agriculture; but still potentially flooded during major flood events.
3) Active floodplains along impounded reaches/backwaters (often disconnected laterally from the main channel) still flooded regularly by tributary confluences and during major flood events (from 5-10 year flood events and upwards).
4) Polder (technical structures) completely surrounded by dikes, but opened in case of catastrophic floods (steered or un-steered, mostly operated without ecological flooding).

5) Former floodplains (within the morphological floodplain) as the maximum potential floodplain area defined by the postglacial lower terraces and natural floodplain delineation, e.g. in valley breakthroughs.

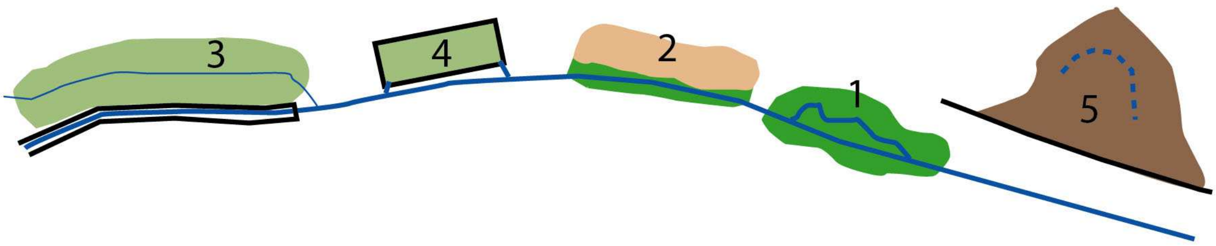


Fig. 1: Floodplain types defined for this study (visualized from left to right in order as they mostly occur along the Danube). Active floodplain: 3. along impounded reaches/backwaters or tributary confluences, 4. flood polder, 2. floodplain elevated by aggradation, 1. near-natural, 5. former floodplain (disconnected by dikes and dams, shown by black lines)

The floodplain delineation (compare Fig. 2 on next page) is based on DEM /SRTM and Aster DEM data (30x30 m horizontal ground resolution, vertical resolution depending on vegetation cover of max. 5-10 m in lowlands) combined with high resolution satellite data - such as Google - and definition of terraces by a combination of Aster raster data with satellite data and physical riparian landscape features, i.e. former side channels, oxbows, meander loops riffles and pools (mostly indicated by moisture and vegetation, even visible in agricultural land; for test reasons radar sat images were also used for calibration).

The floodplain delineation was substantially amended for the lowlands in comparison to similar earlier approaches (large scale hydrological modelling using discharges from representative gauging stations across transboundary catchments and extracted cross sections from seamless DEM data to determinate which floodplains should be introduced in future approaches). Within the next years, countries will undertake a lot of efforts to increase the accuracy of flood maps required under the FD (such as the EU Danube flood risk project), hence helping to improve the raw delineations within this study.

Entry data:

- DEM data (Aster, errors where substituted by SRTM data) and basic hydrological data (peak discharges, flow regime, not for modelling but for basic verification)
- Landuse data (CORINE, PELCOM and other available classifications often lacking spatial resolution, therefore overlaid and extracted from high resolution satellite images such as Google Earth)
- Diverse maps (historical topographic maps, thematic maps, incl. online services) such as geomorphological and soil maps but also flood risk maps; as well as corresponding vector data (for rivers, dams and flood protection dikes)

Floodplains were also underwent a basic assessment for the JDS (ICPDR Joint Danube Survey 2 in 2007) along Danube river stretches of an average of 40 km. Further studies, such as the DPRP 1999, were used as a basic reference.

There is still no systematic floodplain inventory (such as for Austria, SCHWARZ et al. 2010) or even floodplain typology for the DRB (such as for Germany, KOENZEN 2005), however restoration proposals like this should consider the wide range of floodplain types from high alpine to huge lowland floodplains. From Austria (which hosts a great variety of floodplains) we know from red lists of habitats that floodplains can be seen as biodiversity hotspots that are highly endangered regardless of type and characteristic.

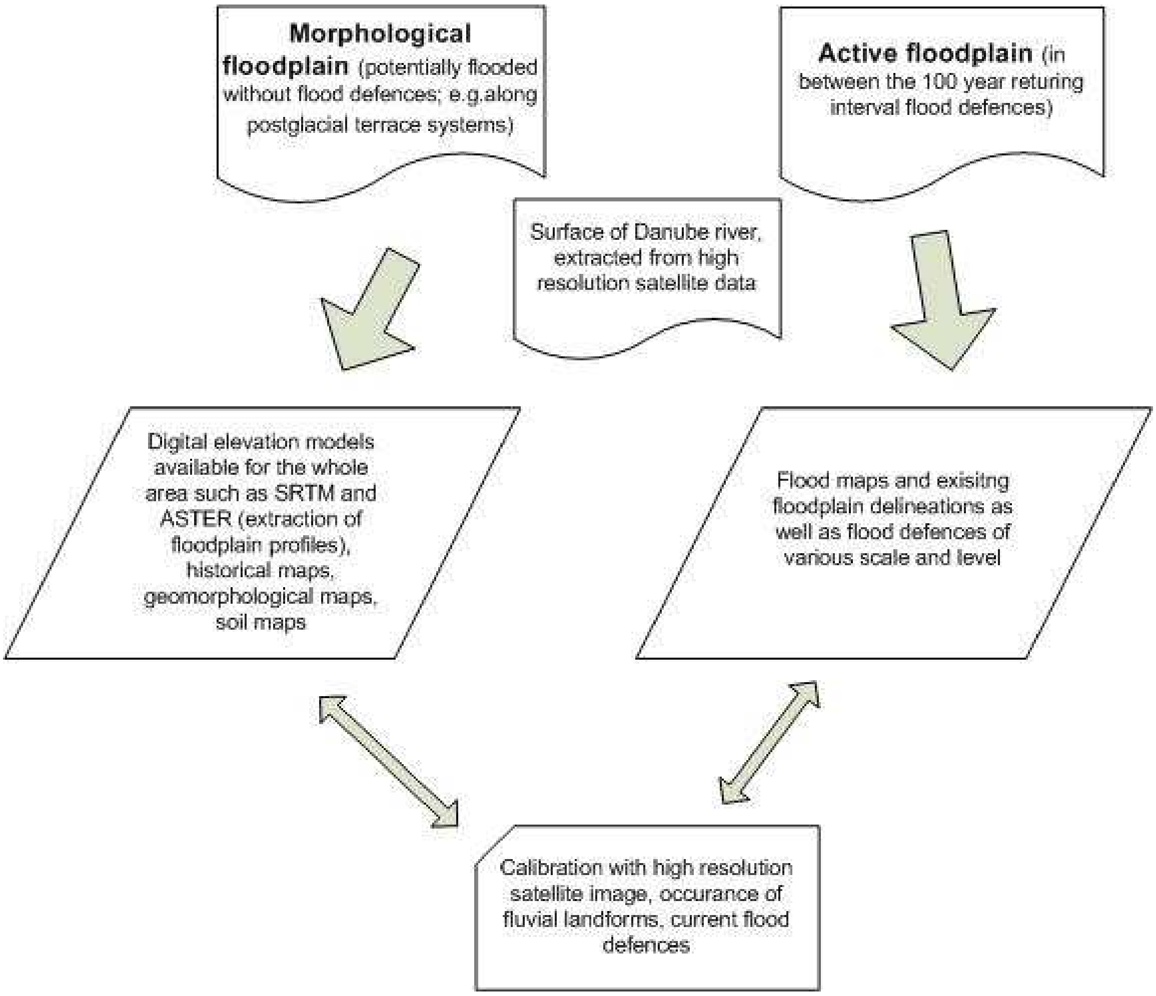


Fig 2: Floodplain delineation approach

A basic floodplain system and typology should be developed (e.g. KOENZEN 2005). As a basic introduction the parameters of altitude and size of rivers (upstream-downstream) should serve as a framework (such a simple classification would already include major aspects of biodiversity of the azonal floodplain vegetation), like:

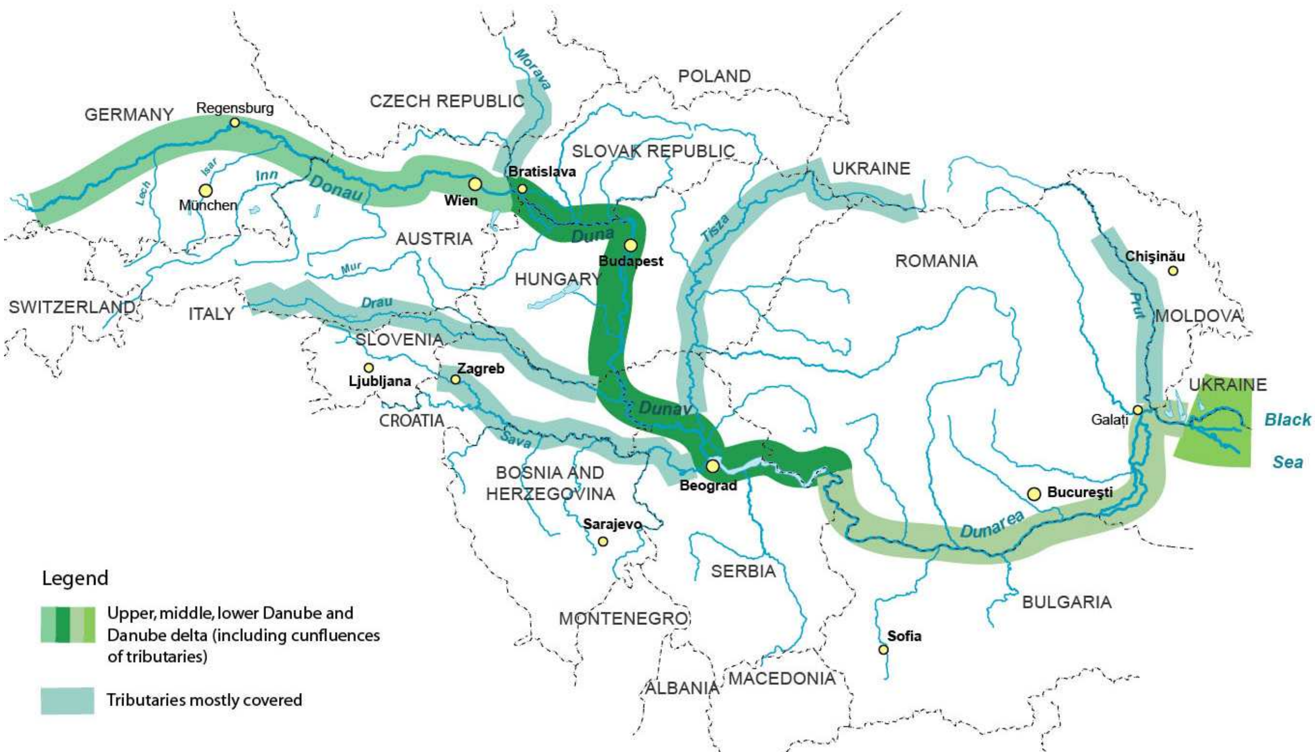
1. Flooded areas downstream of glaciers
2. High alpine floodplains (in the Alps, Carpathians and Balkan ridges)
3. Mountainous floodplains (above 500 m altitude)
4. Floodplains of foothills (when major rivers enter the plains)
5. Floodplains of hills and plains (100-500 m altitude)
6. Floodplains of lowlands and coastal areas

Another option would be to extend the (national) WFD typology for rivers (such a basin-wide typology is under preparation for the DRB). Proposed restoration projects should at least be allocated to those types (and should be all covered in a conservation-restoration strategy); further delineation and inventories as well as method development of the individual projects would then still be necessary.

2.2 Results

The following map gives an overview of the main Danube reaches analysed: the alpine driven upper reach, the pannonian middle reach, the lower Danube and its delta. It also shows the main tributaries covered by this study.

Map 1: Overview of surveyed Danube reaches and tributaries



Map 1: Overview showing the surveyed Danube reaches (upper, middle, lower, delta) including tributary confluences as well as mostly covered tributaries

Including the assessed tributaries (details see Table 5 further below), the floodplain loss in total can be estimated at 80%, which is more than for Danube River itself with 68% (compare to Table 4 on next page). The total size of the morphological floodplain is about 10% of the entire Danube river basin.

Table 3: Floodplain area comparison for the Danube and tributaries*

	Size of floodplain		
	Morpho-logical floodplain [km²]	Active floodplain, [km²]	Floodplain loss [%]
Danube and tributaries	79,406	15,542	80

*Drava and Mura total length, Tisza 95%, Prut, Sava and Mures about 80-90% - only headwaters are missing, Bodrog 60%, Latorica 30%, Traun (50%), Morava-Dyje (each 50%), Vah (30%), Raba (50%), Sio (50%), Sajo 30%, Körös and three main tributaries 50%, Timis 30%, Somes 90%, Bosna, Vrbas, Drina, Kolumbara each 20%, Veliki Morava 50%, Timok 50%, Russenski Lom 50%, Jiu, Olt, Vedea, Arges, Ialomita, Siret 20% confluences only: Hron, Ipel, Una, Lom, Ogosta, Iskar, Yantra.

Upper Danube

The strongly alpine influenced German and Austrian floodplains was strongly altered by river regulation and dams with their impoundments; alpine floodplains have strong hydromorphological gradients (flood peak within the vegetation period, hydrological amplitude and magnitude of floods, coarse sediments), long travel distances of plants settling on gravel bars (e.g. tamarisk), and typical azonal floodplain vegetation. However larger floodplain areas still exist locally (75% loss), but are most strongly altered by impoundments and changed hydrological regime; they fall mostly in floodplain categories 3, and sometimes, 2 (compare with Figure 1). Hence the total loss of type 1 “near natural floodplains” is nearly 92%. The construction of flood protection dikes (and therefore the disconnection of floodplains) originated between 1870 and 1950. This information is important for the physical conditions (lateral connectivity, altitude differences, completely changed habitats and vegetation cover) of the disconnected former floodplain for restoration potential.

Table 4: Floodplain area comparison for the Danube

	Size of floodplain			
	Morpho-logical floodplain [km²][3]	Active floodplain, incl. main channel[4] [km²]	Main channel [5] Km²]	Floodplain loss [%]
Upper Danube 950 km (DE, AT)	2,831	707	166	75
Middle Danube 900 km (SK, HU, HR, RS, RO)	10,369	2,143	656	79
Lower Danube 850 km (RO, BG, MD, UA)	8,033	2,208	786	73
Danube Delta 100 km (RO, UA)	5,400	3,503	116	35
Danube total 2,845 km	26,633	8,561	1,724	68

Middle Danube

In SK, HU, HR and RS the river is free-flowing, however the loss of active floodplain in general is high (79%), particularly in SK and HU, and less in HR and RS. Downstream strongly modified stretches, such as the Hungarian Danube downstream from Budapest, many type 2 floodplains can be observed that could be potentially flooded,

[3] Including the active floodplain
[4] Due to the fact that all channels are integral part of the river-floodplain ecosystem the channels are included in the calculation. However in heavily altered river reaches the real size of active (semi- and terrestrial habitats) floodplains can have only half the size or even less than the main channel, in particularly along the large lower Danube when the channel reaches some 1-2 km in width)
[5] Main channel and major permanent side channels, no oxbows and backwaters in the floodplain

but are elevated by aggradation and are intensively used by agriculture (the local channel incision is >2 m, floodplain aggradations reach an additional 1-2 m). These unfavourable conditions should be mitigated by (international) sediment management activities; restoration will be not easy for those areas. Downstream from Gemenc (HU) and even more from the Kopacki Rit and Drava confluence, the floodplains exhibit better conditions (also less river modification can be observed as the river flows along a high loess terrace). Only the strong poplar plantations turn most of the stands into monotonous cultures.

Regarding the whole middle Danube the loss of class 1 floodplains is comparable with the upper Danube (90%) taking into consideration the relative total size of floodplains (5 times larger floodplains than on the upper course, compare Table 4 and Fig. 3). The cut-off of floodplains for different purposes (drainage, agriculture, flood protection) was implemented between 1890 and 1970.

Lower Danube

The floodplain and wetland areas along the lower Danube were disconnected systematically from the main channel after 1960; originally the floodplain was some 5-10 km wide along the RO-BG stretch, but has been limited to only a few 100 meters. This leads to large losses (73%, as the Danube itself has a width of 1-2 km, on average the loss without the channel waterbody is some 84%). Due to the spatially limited floodplain along the RO-BG reach (high terraces) the overall loss is not as significant as for the Danube in Hungary south of Budapest, in Serbia, or along the Tisza (with a morphological floodplain width of up to 10-20 km). Due to the rather “young” disconnection compared with western European countries and the rather good hydromorphologcial conditions (with the exception of a sediment budget altered by the Iron Gate dams that increases incision and instability of banks and the hydrological regime), the restoration potential is still high, i.e. there is no strong floodplain aggradation so far. Together with some of the numerous islands without any or less intensive forestry, the small Braila Island is one of the largest and most intact remaining floodplain areas along the entire lower Danube.

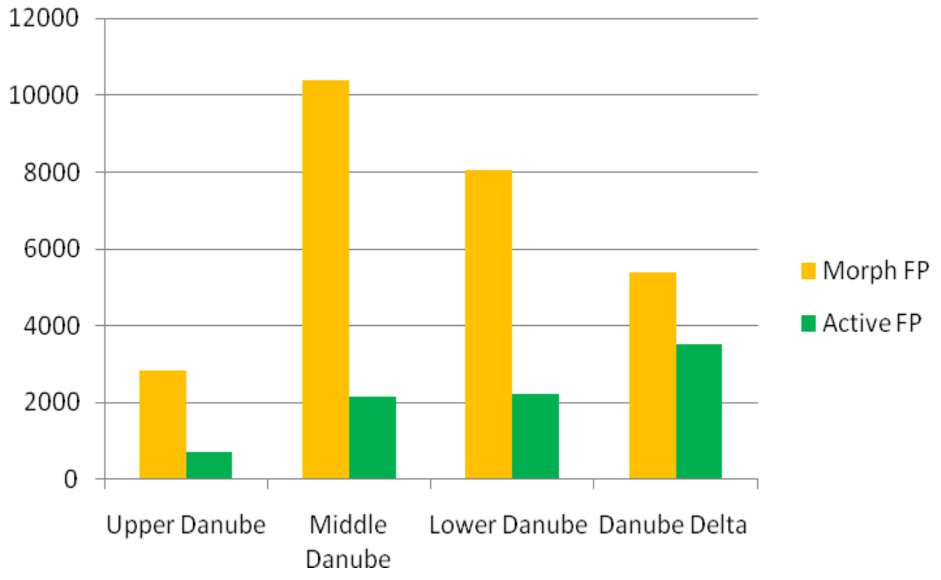


Fig. 3: Floodplain loss in km² for the different Danube reaches.

Danube Delta

By far the Danube Delta still hosts the largest and most pristine floodplain ecosystems along the entire Danube. But several river modification works for navigation (a network of small canals built over the past 100 years) and in particularly for agriculture (polders) after 1970 changed larger areas in the Delta. However, these areas all have a very high potential for restoration due to their low altitude. The loss of only 35% of floodplains (45% of which near-natural areas) is significantly less than for all other river reaches.

Other tributaries

Table 5 shows the floodplain delineation for the Tisza and Drava rivers. It is evident that for some tributaries of the Danube, the loss is even higher along lowland rivers such as the Tisza where large parts of the floodplains were cut from the river (in parallel the river length was shortened from about 1,400 rkm to 900 rkm). The Drava and Sava have lost much of their floodplains, however along the lower courses there are still some major important floodplains. And the Sava still hosts the second largest active floodplains (1,900 km²) after the Danube (without the Delta some 5,000 km²).

Table 5: Floodplain area comparison for the Tisza and Drava

	Size of floodplain		
	Morpho-logical floodplain [km²]	**Active floodplain, [km²]**	**Floodplain loss [%]**
Tisza[6] 950 km (UA, RO, HU, RS)	14,083	1,643	88
Drava[7] 750 km (IT, AT, SI, HR, HU)	2,809	652	77
Sava 945 km (SI, HR, BA, RS)	8,592	1,901	78

[6] The morphological floodplain of the Tisza is difficult to delineate and comprises large areas flooded by surface and groundwater, including backwater of tributaries and canals such as the Hortobagy-Berettyo system.

[7] Active floodplain of Kopacki Rit area at confluence (some 8,000 ha or 80 km²) was calculated for the Danube.

3. Floodplain assessment for restoration potential

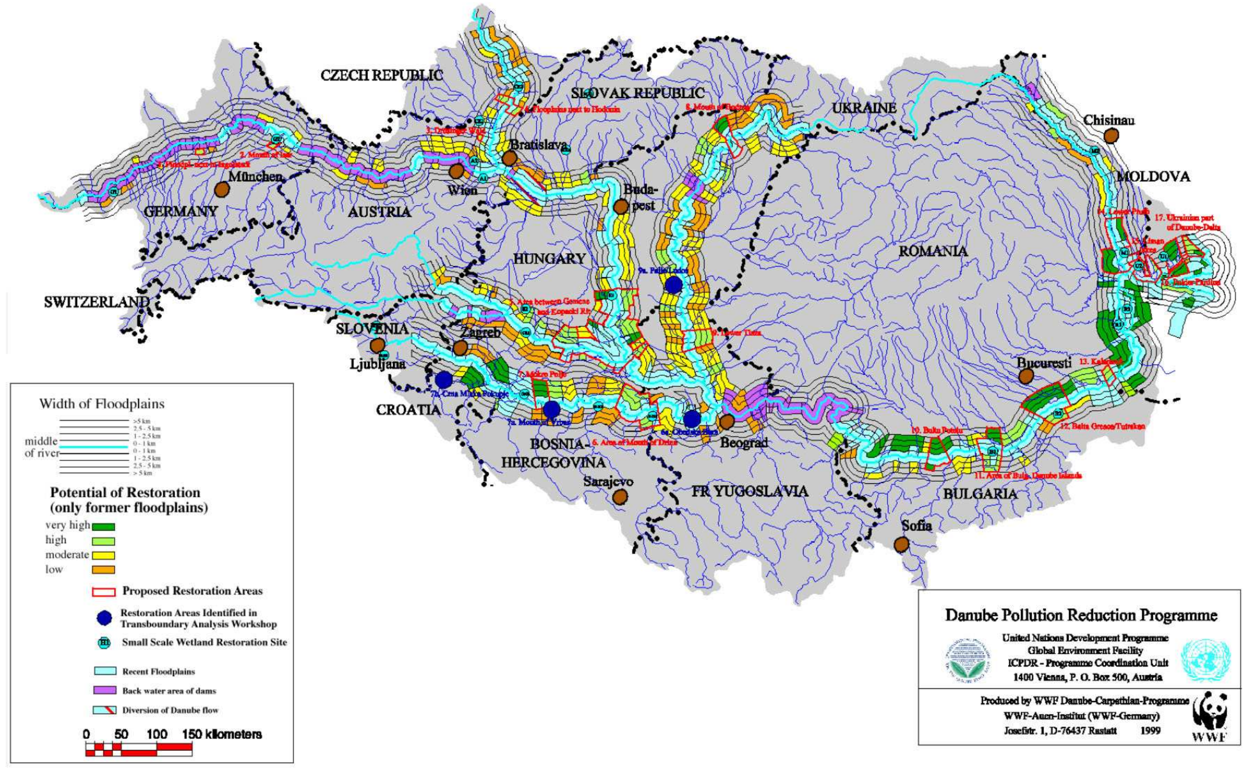
3.1 Methodology

The studies introduced in the second chapter (DPRP 1999, HULSE 2004 and the recently published German floodplain balance and assessment, BfN 2009) try to assess the ecological value and potential based on schematic floodplain segments (see Map 2 on next page). These assessments are mostly based on landuse, width/size, hydromorphological structures (intactness), and the protection status of remaining floodplains. Recent research projects such as the “German National Floodplain project” evaluate floodplain functions for flood retention, sediment retention (depending on roughness), purification functions, CO_2 retention (e.g. carbon stocks of some 400 t/ha in hardwood vegetation according to CIERJACKS et al. 2010), and biodiversity and habitat functions.

These approaches will be applied to floodplain segments and can therefore be quantified for entire river stretches. However, this can be problematic if the averaged parameters do not reflect reality and different parameters strongly influence others resulting in under- or overestimations. Habitat functions (aggregated functions) can be estimated (by scoring and comparison) based on the available coverage of Natura2000 and other protected areas with its typical habitats for floodplains, as well as the intensity of landuse, which can be obtained by remote sensing or land use classifications.

For the present study this very time consuming step was skipped in favour of only assessing the proposed sites by basic, but commonly available, parameters.

Restoration potential of former floodplains in the Danube River Basin



Map 2 shows the resulting "restoration potential" map of the DRPR project in 1999, one source for already planned and proposed restoration areas in the Danube basin.

Selection:

River restoration started in Europe in the early 1990s as a reaction to the permanent loss of the integrity of natural rivers and floodplains. In the meantime many smaller river restoration projects were developed in the Danube basin. Typical projects as these are often side-channel reconnections, channel widening and bank revetment removal. Real enlargement of floodplains by reconnecting former floodplains is still underrepresented (limited to the lower Danube and Danube Delta).

This survey considered many documents related to restoration projects within the Danube basin, including proposals and official documents related to the WFD and its corresponding programmes and measures (e.g. ICPDR 2010, SCHWARZ 2008). After an evaluation phase of collected material and the project targets, an Access database was developed. For each restoration area, basic parameters such as name, size, configuration, land use/habitats, ownership, nature protection and spatial planning was collected where possible. The potential restoration areas were assigned unique identifiers and were spatially separated in GIS into active and former floodplain sections for sites spreading over different floodplain types (according to Fig. 1).

In a first phase those already-existing projects and proposals were stored in the database. The following Figure 4 shows the Access database form view:

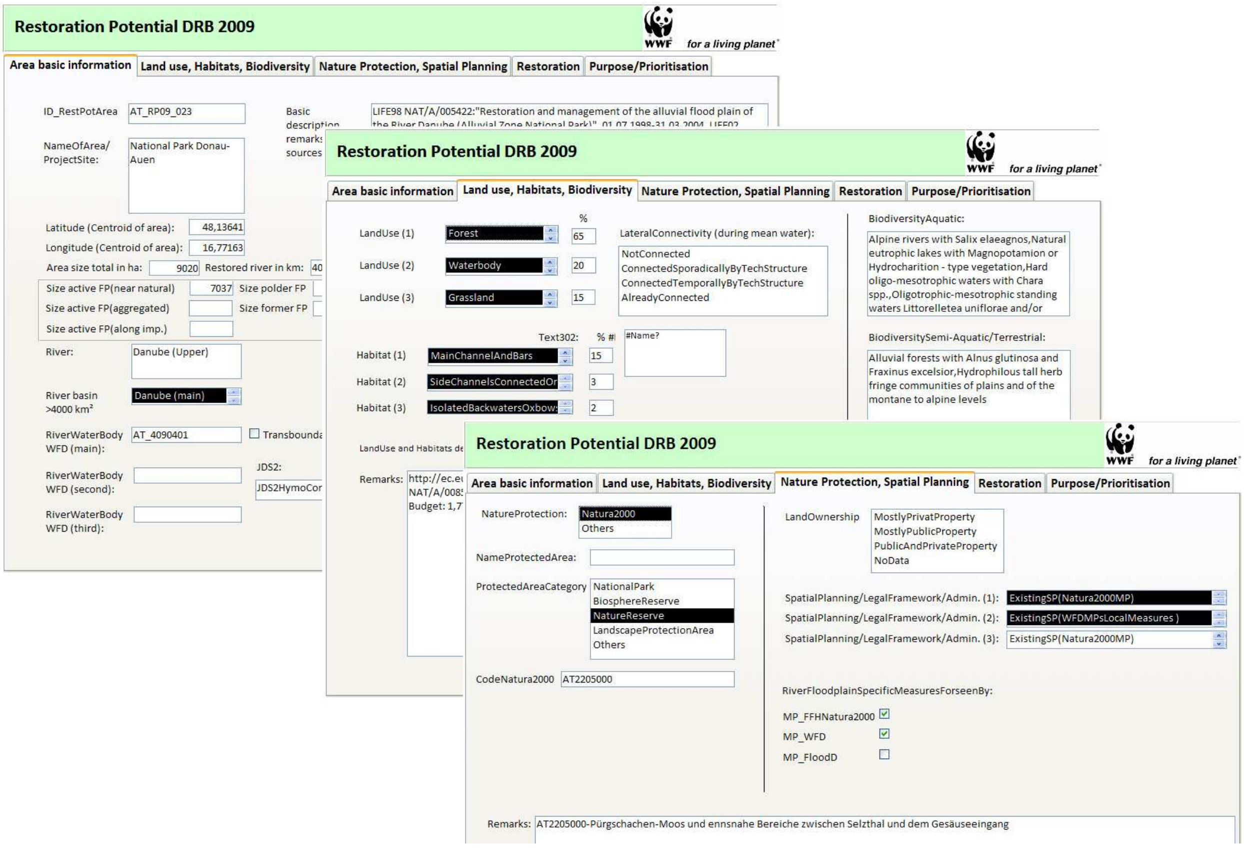


Fig. 4: Database form view with examples from different areas

The following parameters were collected:

- ID_RestPotArea
- Name of locality
- Latitude and longitude
- Size in ha total and size in ha for different floodplain types (see Fig. 1)
- Length in rkm of restored river (in the case of projects spreading over a longer river stretch, in particular for already existing projects)
- River basin > 4000km² (yes or no)
- RiverWaterBodyWFD
- JDS2 evaluation stretch and attached assessment for channel, banks and floodplains (by 40 rkm long evaluation stretches)
- Transboundary (if the area is transboundary, yes or no)
- Land use: the main three land use classes for the area summing up to 100%
- Habitat: the main riparian habitat areas in percent, not summing up to 100% (e.g. 3% water bodies, 5% softwood and 3% meadows)
- Biodiversity (aquatic/semi-aquatic/terrestrial), text description and links to ecological data sources
- Lateral connectivity in different classes
- Ownership
- Spatial planning
- NatureProtection with name and category of e.g. NP and code of Natura2000 area
- Link to existing management plan of FFH, WFD and FD

- RetentionCapacity (estimated by area size and by an average flood level of 1.5 m)
- Project status (proposed, planned, implemented)
- Restoration types (e.g dike removal)
- Restoration purposes (if specifically mentioned for existing projects)
- Data (hydrodynamic modeling, biodiversity, forestry)
- Prioritisation

The database is still not fully complete. Most of the fields so far remain empty (see Chapter 5 for more details). The focus of this study was collect and set up the basic information, including landuse and nature protection.

No area size limit was set for the initial restoration project database (500 ha was used as significance criteria for the new proposals). E.g. along the Inn River in Austria several very small projects are under implementation totalling not more than 7-8 ha. Some rivers such as the Isar were not covered in full detail; however the Isar 2020 Plan is an ambitious restoration program covering almost 1/3 of the entire river.

New areas were added in a second database phase, Potential restoration areas were selected iteratively from the upper Danube to the Delta (respecting the different floodplain types and the position along the river) based on the following criteria that focuses on the former floodplain (see Fig. 5):

1. Landuse in the potential restoration areas and associated ownership (settled areas are “no go” areas).
2. Hydromorphological features and intactness of potential areas (former channels, typical floodplain relief with still existing potential connections to the active floodplain).
3. Configuration, (size/width/length), important also under hydraulic aspects and flood retention, as well as spatial position function/purpose (e.g. on tributary confluences, as stepping stones in the biotope network or with high retention capacity).
4. Overlay with protected areas.

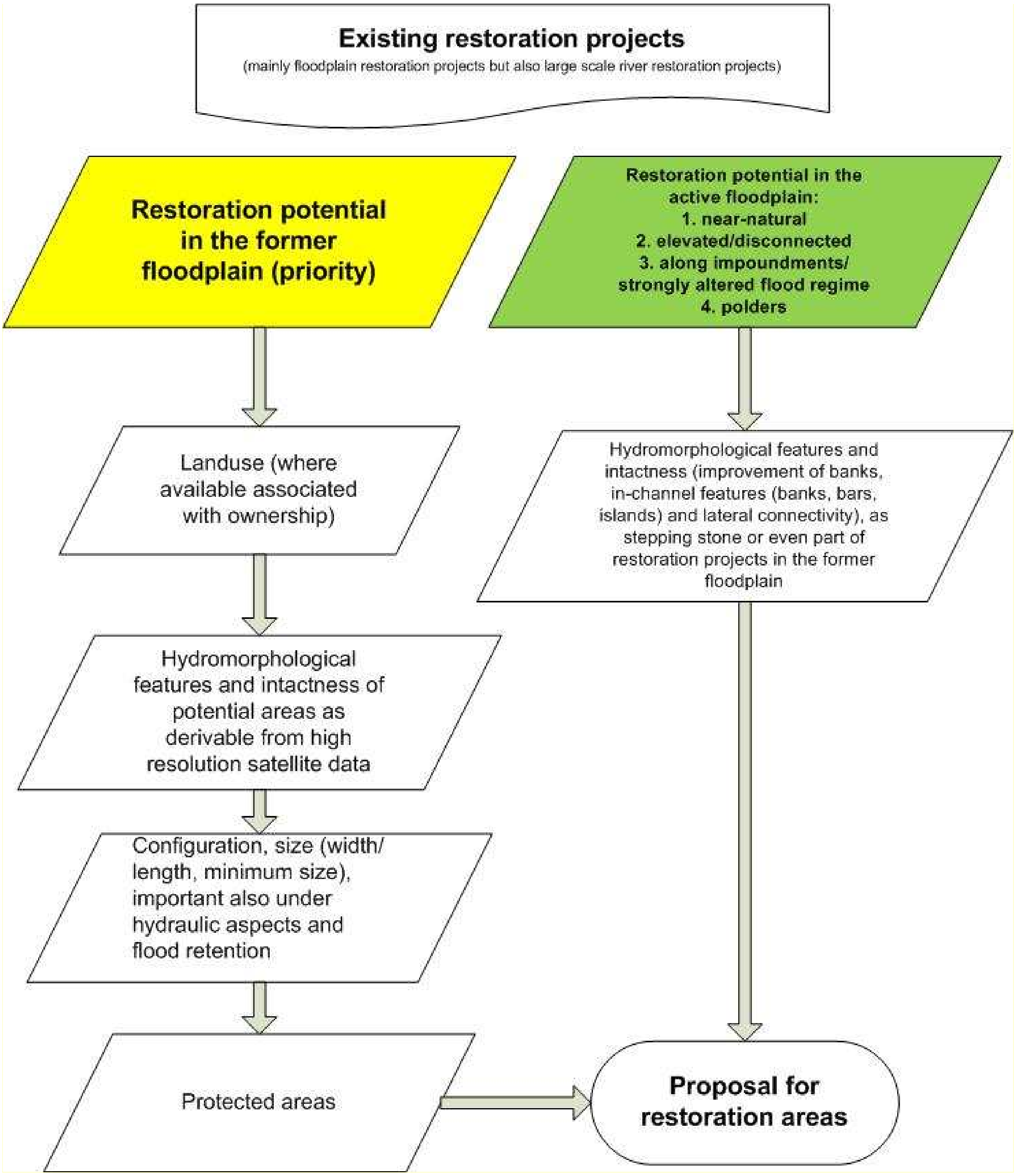


Fig. 5: Proposal of new potential restoration areas

3.2 Results

3.2.1 Already achieved restoration projects

Many restoration projects started to take place first in the upper basin in DE and AT after 1990. Existing projects significantly increases the knowledge of restoration implementation, e.g. on the reaction of the natural system and the success of certain types of measures. One example is the projects carried out in the Danube Floodplain National Park east of Vienna (funded mostly by EU LIFE) over the past ten to fifteen years. There is a clear shift in quality and extension of those projects beginning with very small technical measures (e.g. slightly improved technical inlet structures to improve the discharge in side-channel branches by lowering cross dikes to connect areas during mean water, and the removal of bank revetment over several kilometers). Unfortunately dike relocations or removal of dikes is limited to very small projects in the DRB (large scale projects are under implementation along the German Elbe River and in the Netherlands).

In total about 55,000 ha floodplain area projects where carried out, including the Danube National Park in Austria, the National Park Gemenc Beda in Hungary, plus parts of Kopacki Rit Nature Park (HR) and the Biosphere Reserve of the Danube Delta (UA and RO). Out of this 55,000 ha only a very minor area was actually reconnected by some 5,000 ha (along the lower Danube and in the Delta). In DE and AT for example only about 500 ha were actually reconnected; all other projects were in the already active floodplain.

Other projects, such as the (technical) stabilization of the lower Salzach or the proposed compensation measures for the river engineering of the upper Danube in Bavaria (Straubing-Vilshofen) for flood protection reasons, are projects with basic positive influences on the floodplains, but must be critically analysed (in particular flood protection projects that often do not improve the direct lateral connection between the main channel and the floodplain).

3.2.2 Potential areas for restoration

In total 439 areas have been recorded in this study with a total size of about 1,385,481 ha; 355,950 ha in the active floodplain (with all sub-types) and 1,029,531 ha in the former floodplain (including agricultural polders on lower Danube). Out of the 439 sites, 58 are already implemented (122,710 ha; out of this nearly 50,000 ha fall into the Lonjsko Polje area along the Sava), 105 are under official planning (662,910 ha) and the remaining 276 are only proposed (590,195 ha). The list is still incomplete, e.g. in Germany on the Isar and smaller tributaries several additional projects have been carried out. Also the current project status is subject to change (e.g. from officially planned to implemented), but basically the most important and largest projects have been covered accordingly.

The paradigm in water management/flood protection has changed over the years, meaning new flood protection projects are planned to be “ecologically sound” and include ecological measures, and an increase of passive flood protection, i.e. retention where possible or by flood polders, and possible relocation of flood protection dikes.

The mean size of individual potential restoration areas for the Danube is about 3,700 ha (see Fig. 13) which varies from about 1,100 ha on the upper Danube to 6,400 ha for the lower Danube. This reflects the very large areas along the lower Danube (the largest site is 70,925 ha at Insula Mare a Brailei, which could be of course sub-divided in smaller portions).

196 potential restoration sites with a total size of 810,228 ha were defined for the Danube (compare Figures 6 and 7), however a certain amount of these areas are well known from previous projects. The DRBMP (ICPDR 2010) officially proposes a total area of approximately 560,000 ha within the Danube floodplain (mostly the huge agricultural polders along lower Danube at ca. 400,000 ha). The overall official proposal (including tributaries >4,000 km² basin) for improvement measures comprises 612,745 ha. Therefore, the coverage developed under this study is not far from the official proposals. in particular for Romania.

Out of the 196 Danube areas (810,228 ha), 179,708 ha are located in the active floodplain and 630,520 ha in the former floodplain. Some 8% of the areas lie in "near-natural" floodplains (including large project sites in the Danube National Park (AT) and Gemenc (HU), which are already partially implemented). About 2% lie in strongly altered floodplains ("elevated floodplains"), 3% in "backwater reaches/tributary confluences along impoundments", 10% in technical polders and the remaining 77% in the former floodplain.

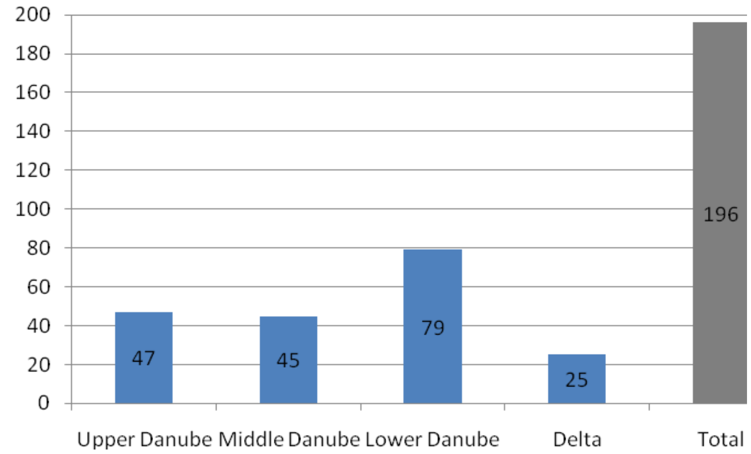


Figure 6: Number of restoration sites along the Danube

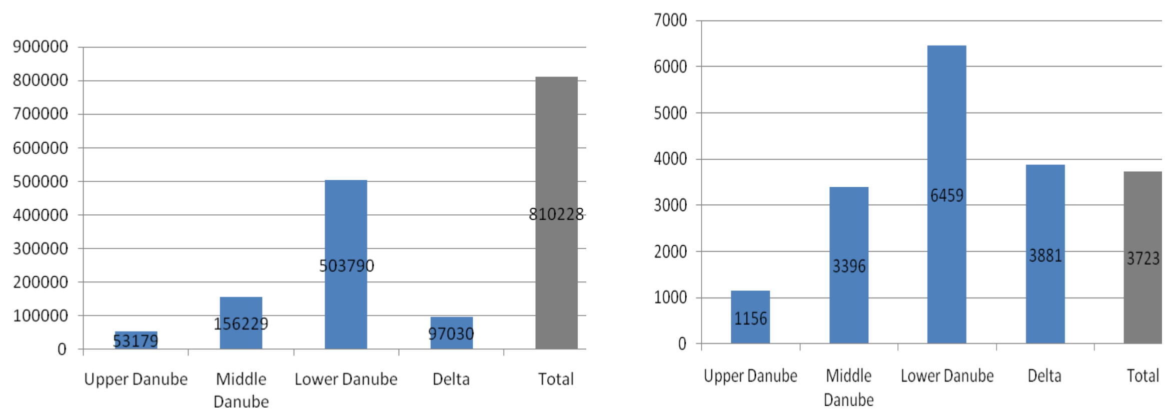


Figure 7: Total area (left) and mean area size (right) in ha

The following Figures 8 and 9 indicate the floodplain types covered by the restoration areas. On the upper Danube mostly type 3 floodplains (altered backwater stretches) are available for restoration, whereas large scale restoration of the former floodplains is still possible on the lower Danube (in the Delta even ¾ of all areas are already polders and can easily be reconnected).

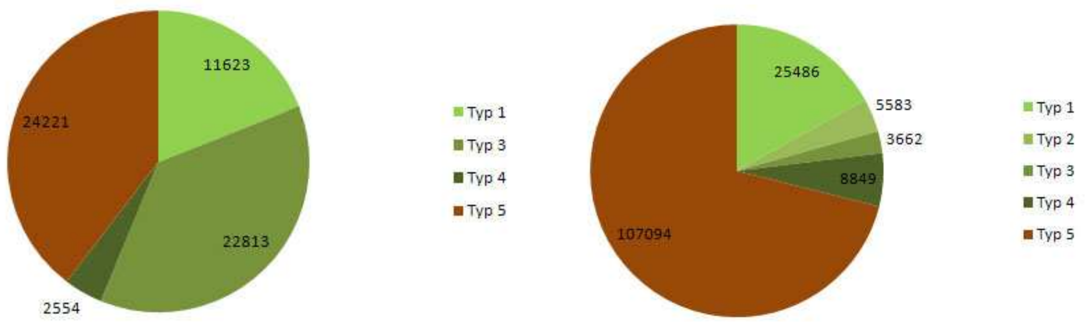


Figure 8: Upper and middle Danube (Type 1 near-natural FP, Type 2 elevated FP, Type 3 backwater/tributaries, Type 4 polders, Type 5 former floodplain)

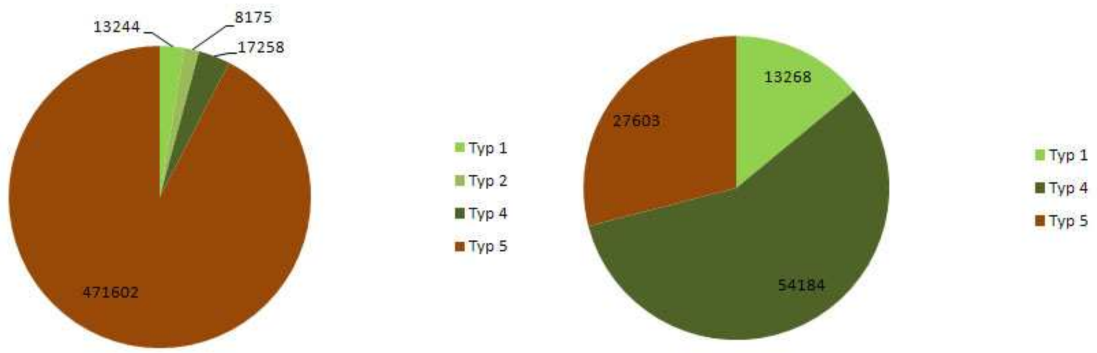


Figure 9: Lower Danube (Type 1 near-natural FP, Type 2 elevated FP, Type 4 polders, and Type 5 former floodplain). Explanation: the lower Danube agricultural polders were not define as pure technical polders as these are dikes beginning and ending along the terrace (a polder as defined in this study is completely encircled by dikes and is regularly flooded during major floods).

The following Table 6 presents the total coverage of protected areas, which is 73% for the active floodplain. This is very significant and highlights the importance of the international biological corridor function of the middle and lower Danube. The proposed restoration sites reflect the value of the morphological floodplains at about 39%.

Table 6: Protected area coverage for the Danube

	Protected area	
	Portion of protected areas Active FP [%]	Portion of protected areas Morphological FP [%]
Danube total	73	39

3.2.3 Maps

On the following pages the maps will be shown in decreasing scale order (zoom in) as follows:

1. DRB overview map showing all restoration sites.
2. Overviews for upper, middle, lower Danube and Delta with automatic labels.
3. Zoom maps showing the floodplain delineation and areas with automatic name labeling - an attached high resolution PDF file shows this map as one with full labels (identifier and full name, for a printable version the font would be too small).

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Floodplain restoration areas (implemented, planned, proposed) along the Danube and major tributaries

Legend

Floodplain restoration areas (0-500 ha, 500-3,000 ha, 3-10.000 ha, 10-25.000 ha, 25-50.000 ha, >50.000 ha):

- Already implemented
- Officially planned
- Proposed
- Danube River basin
- Rivers and lakes
- Border
- Metropolis > 1 million inhabitatns
- Other important cities

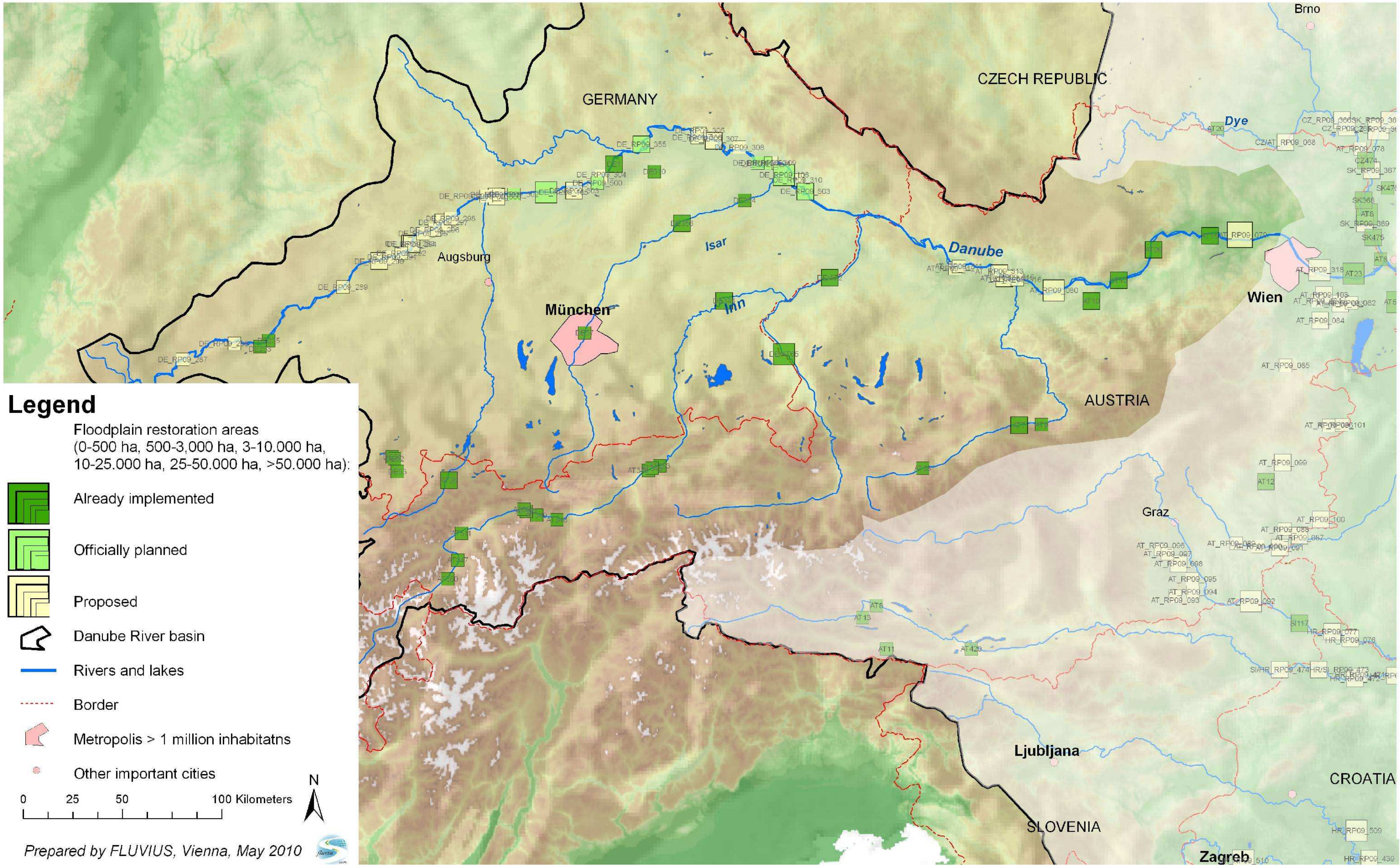
0 75 150 300 Kilometers

N

Prepared by FLUVIUS, Vienna, May 2010

WWF for a living planet

Floodplain restoration areas (implemented, planned, proposed) along the upper Danube and major tributaries



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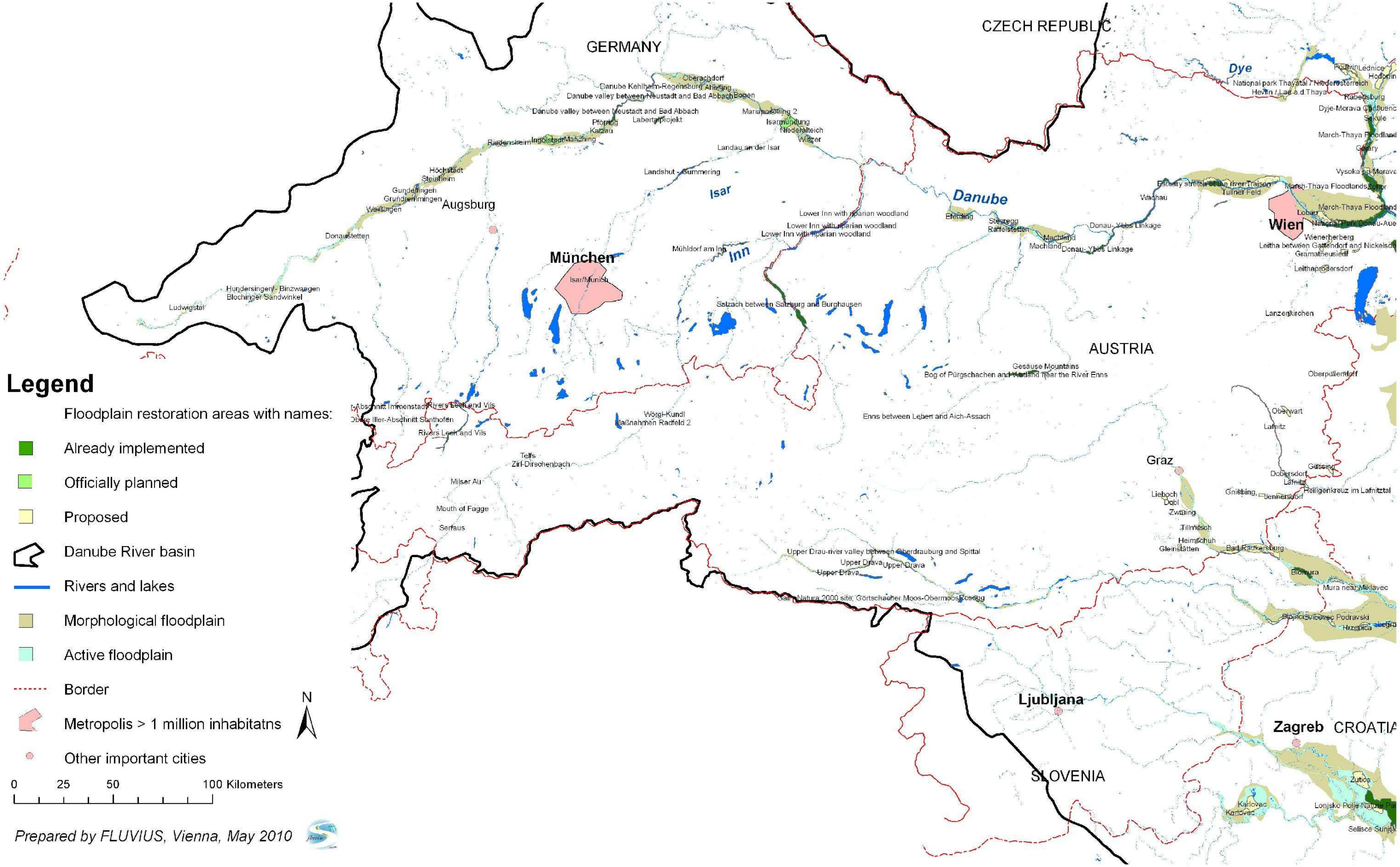
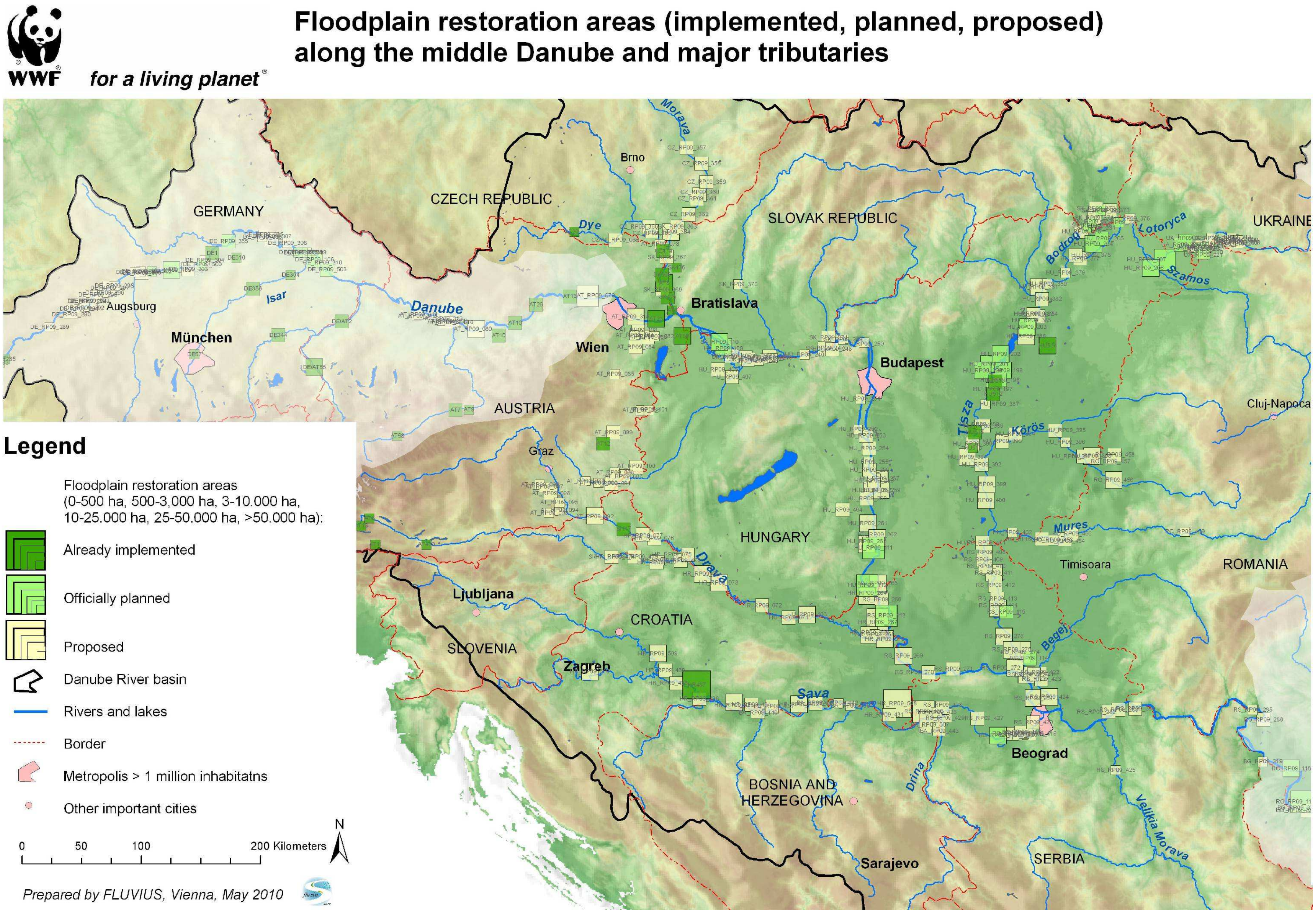
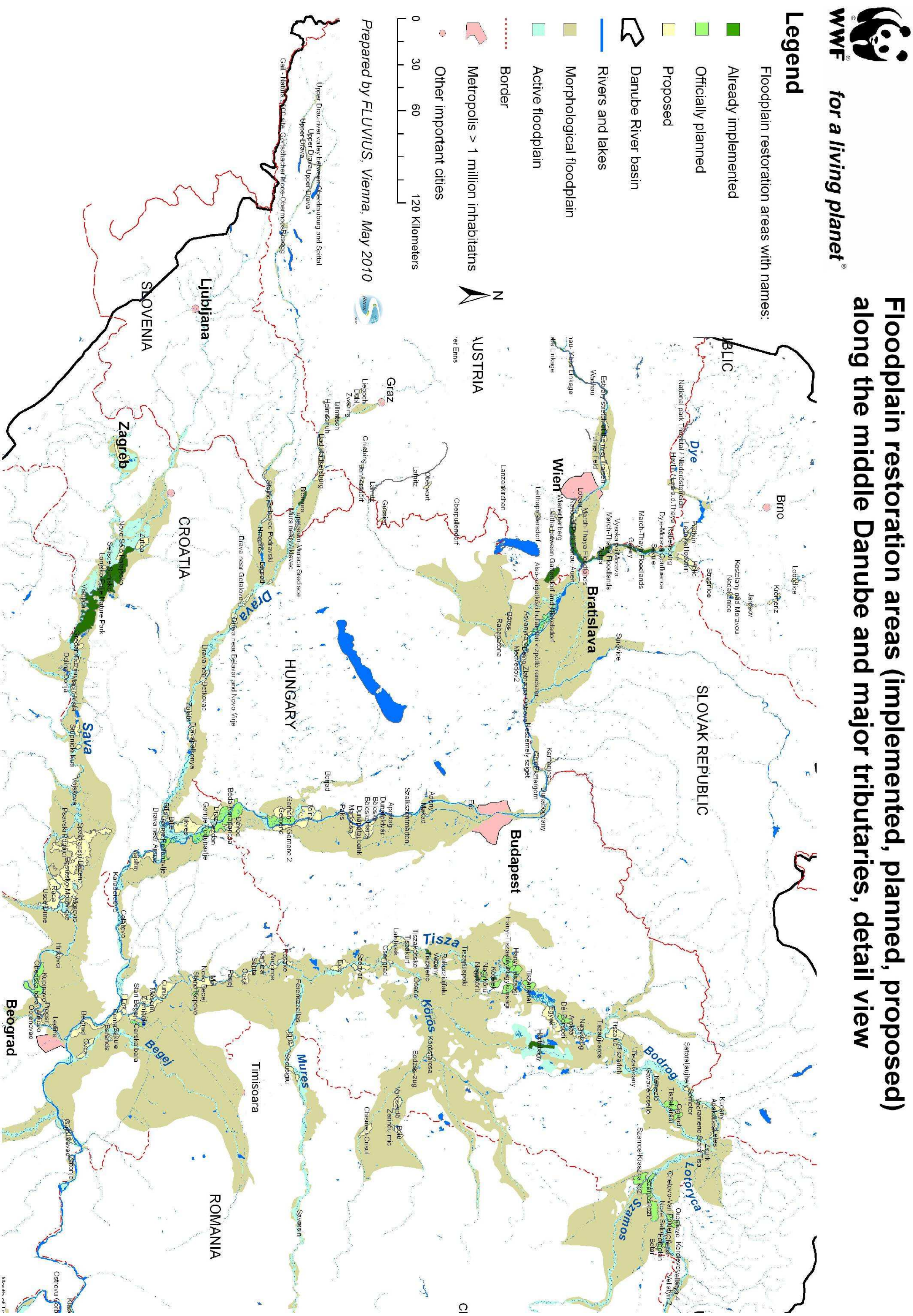
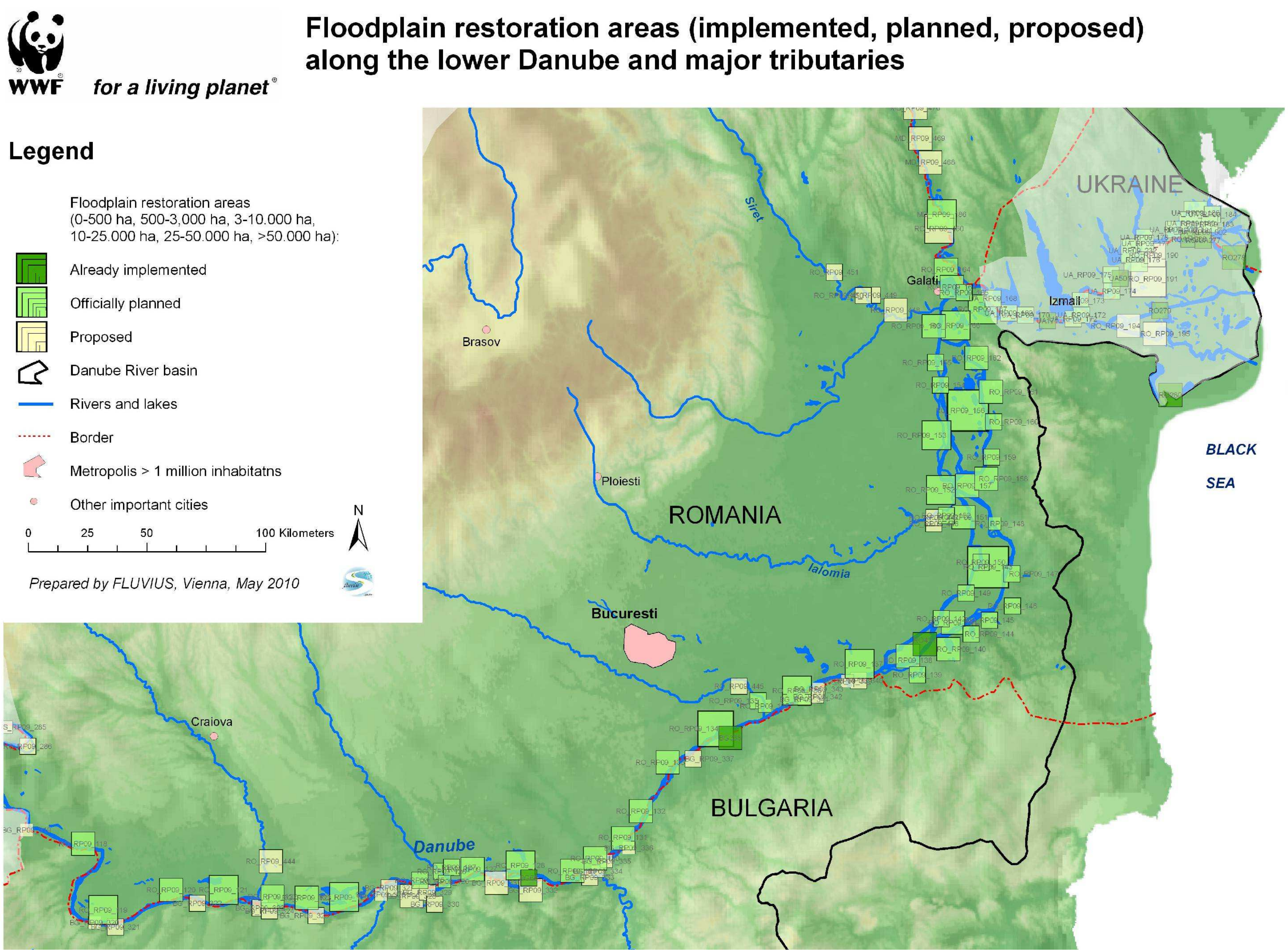
Floodplain restoration areas (implemented, planned, proposed) along the upper Danube and major tributaries, detail view

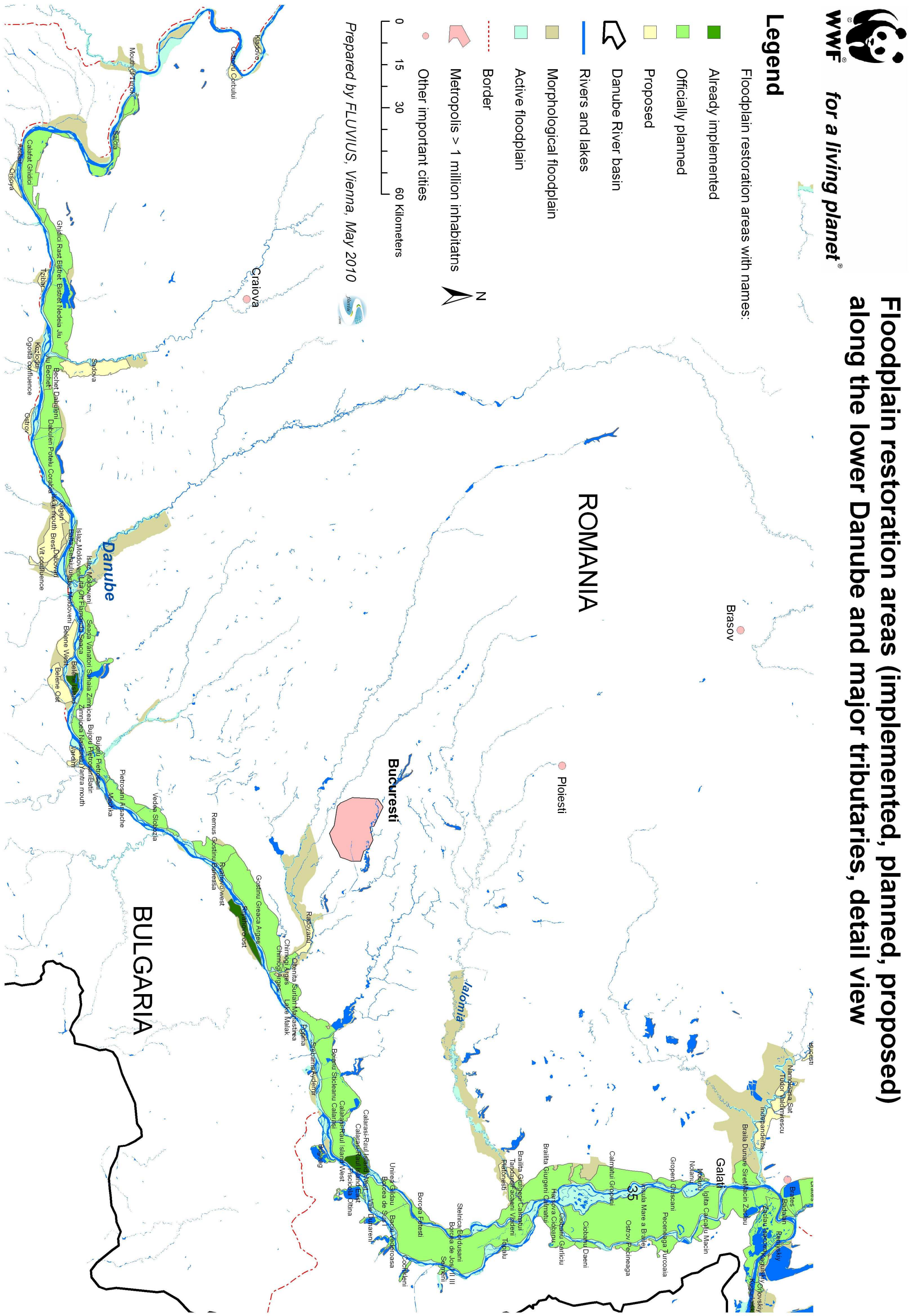


Floodplain restoration areas (implemented, planned, proposed) along the middle Danube and major tributaries



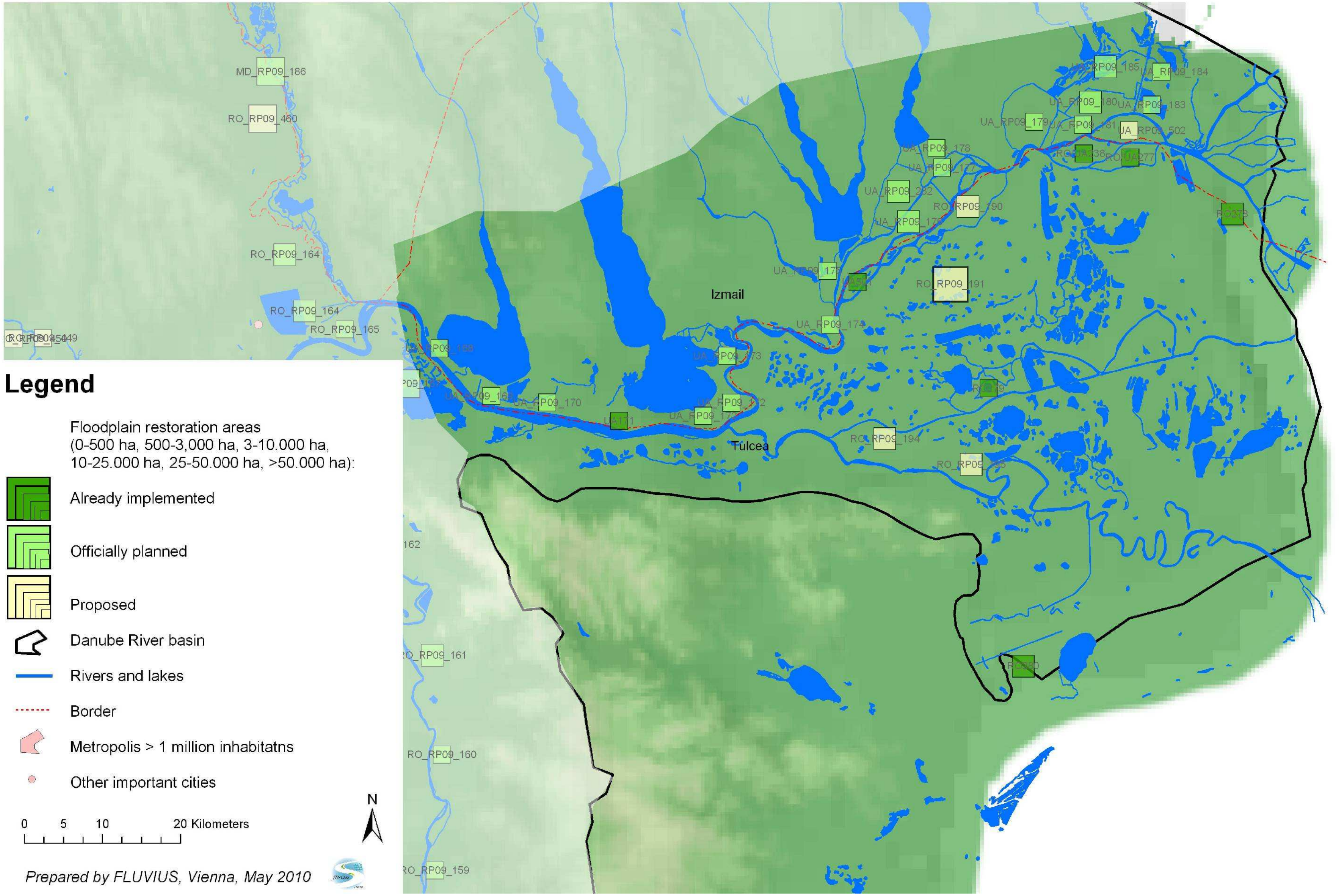

Floodplain restoration areas (implemented, planned, proposed) along the middle Danube and major tributaries, detail view
WWF for a living planet
Legend
Floodplain restoration areas with names:
Already implemented
Officially planned
Proposed
Danube River basin
Rivers and lakes
Morphological floodplain
Active floodplain
Border
Metropolis > 1 million inhabitatns
Other important cities
0 30 60 120 Kilometers
N
Prepared by FLUVIUS, Vienna, May 2010
SLOVAK REPUBLIC
AUSTRIA
HUNGARY
SLOVENIA
CROATIA
ROMANIA
Brno
Wien
Bratislava
Budapest
Graz
Ljubljana
Zagreb
Beograd
Timisoara
Dye
Drava
Sava
Tisza
Körös
Mures
Begej
Bodrog
Latorytsa
Szamos


WWF
for a living planet
Floodplain restoration areas (implemented, planned, proposed) along the lower Danube and major tributaries
Legend
Floodplain restoration areas
(0-500 ha, 500-3,000 ha, 3-10.000 ha, 10-25.000 ha, 25-50.000 ha, >50.000 ha):
Already implemented
Officially planned
Proposed
Danube River basin
Rivers and lakes
Border
Metropolis > 1 million inhabitatns
Other important cities
0 25 50 100 Kilometers
N
Prepared by FLUVIUS, Vienna, May 2010
UKRAINE
ROMANIA
BULGARIA
BLACK SEA
Brasov
Ploiesti
Bucuresti
Craiova
Galati
Izmail
Siret
Ialomia
Danube


Floodplain restoration areas (implemented, planned, proposed) along the lower Danube and major tributaries, detail view
WWF for a living planet
Legend
Floodplain restoration areas with names:
Already implemented
Officially planned
Proposed
Danube River basin
Rivers and lakes
Morphological floodplain
Active floodplain
Border
Metropolis > 1 million inhabitatns
Other important cities
0 15 30 60 Kilometers
Prepared by FLUVIUS, Vienna, May 2010
ROMANIA
BULGARIA
Danube
Ialomita
Bucuresti
Craiova
Brasov
Ploiesti
Galati

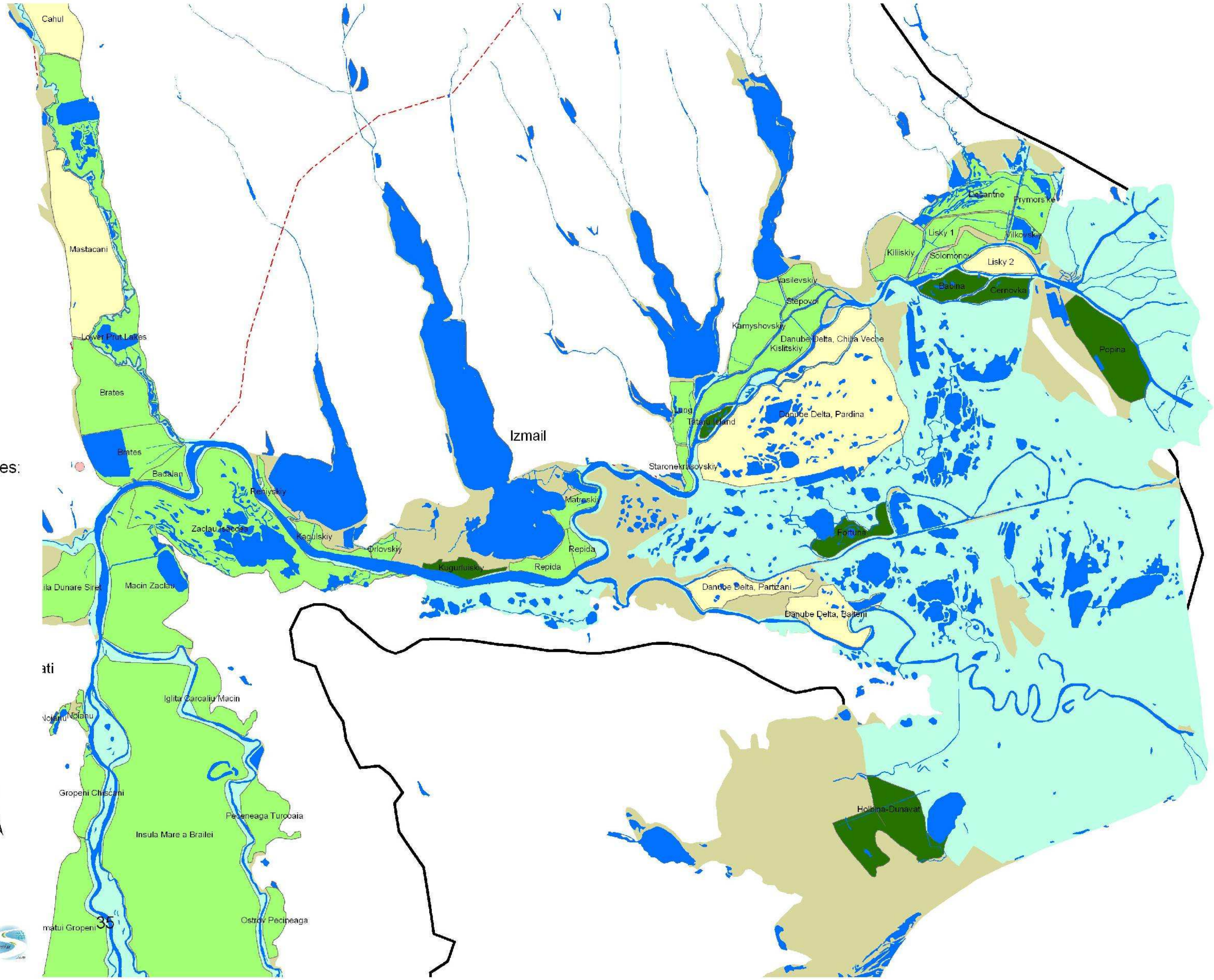
WWF for a living planet®

Floodplain restoration areas (implemented, planned, proposed) in the Danube delta



![WWF for a living planet]

Floodplain restoration areas (implemented, planned, proposed) in the Danube delta, detail view



Legend

Floodplain restoration areas with names:

- Already implemented
- Officially planned
- Proposed
- Danube River basin
- Rivers and lakes
- Morphological floodplain
- Active floodplain
- Border
- Metropolis > 1 million inhabitatns
- Other important cities

0 5 10 20 Kilometers

N

Prepared by FLUVIUS, Vienna, May 2010

4. Prioritisation approach

The potential sites vary in size, configuration, and feasibility for restoration. Respecting the different purposes of floodplain restoration such as flood protection, biodiversity, nutrient reduction, groundwater exchange, forestry, recreation and so on, the assessment initially focused on the “floodplain functioning” or better the “intactness” of the floodplain ecosystem regarding hydromorphological criteria (mostly flood regime and dynamics) supporting most of the ecosystem services listed above. Only parameters with sufficient data coverage, such as functional floodplain type (regarding the hydromorphological intactness, i.e. potential restoration sites along free-flowing stretches have basically more priority than sites along impounded reaches), land use (percentage of agriculture), protection status, overall hydromorphological conditions as well as area size (flood retention capacity) were analysed.

The initial assessment is based on:

1. JDS overall Hydromorphology category (for class 1-2 the restoration potential is estimated with “very high (1)”, for class 3 “high (2)” and for 4-5 with “low (3)”).
2. Absolute land use coverage: <30% agriculture “very high (1)”, 30-60% agriculture “high (2)” and > 60% agriculture “low (3)”.
3. Protection status: Overlap >60% “very high (1)”, 30-60% “high (2)” and <30% “low (3)”.
4. Size class: >5,000 ha “very high (1)”, 1,000- 5,000 ha “high (2)”, <1,000 ha “low (3)”.

The results can be calculated by a simple mean value of the four parameters with arithmetic classes: 1-1.6 will result in a “very high”, 1.7-2.3 in “high” and 2.4-3.0 in “low” restoration potential. This is a very pragmatic approach that must be specified, e.g. by factors of retention volume, ownership, data availability or facilitation.

Results for the Danube:
33 (19%) of the 176[8] planned and proposed areas for the Danube would be rated with a “very high” restoration potential (15 areas are already implemented or under implementation), 98 (56%) at “high” and the remaining 45 (25%) only at “moderate” restoration potential. Additional information per country will be given in Chapter 5 regarding ownership and feasibility.

Table 7: Planned and proposed restoration sites with priorities

ID_RestPotArea	Name	Size in ha	River	Priority
DE_RP09_105	Ingolstadt	3,030	Danube	High
DE_RP09_287	Ludwigstal	20	Danube	Low
DE_RP09_288	Laiz	20	Danube	Low
DE_RP09_289	Donaustetten	180	Danube	Low
DE_RP09_290	Weißingen	630	Danube	High
DE_RP09_291	Günzburg	290	Danube	Low

[8] The table contains only 176 areas (out of the originally 181 planned (77) and proposed (104) due to combination of adjaceant areas.

ID_RestPotArea	Name	Size in ha	River	Priority
DE_RP09_292	Riedwirtshausen	220	Danube	Low
DE_RP09_293	Gundelfingen	620	Danube	High
DE_RP09_294	Grundremmingen	600	Danube	High
DE_RP09_295	Dillingen	230	Danube	Low
DE_RP09_296	Steinheim	360	Danube	High
DE_RP09_297	Höchstädt	600	Danube	Low
DE_RP09_298	Joasschwaige	70	Danube	Low
DE_RP09_299	Lechsend	200	Danube	Low
DE_RP09_300	Niederschönenfeld	570	Danube	High
DE_RP09_301	Marxheim	350	Danube	Low
DE_RP09_302	Riedensheim	220	Danube	Low
DE_RP09_303	Manching	570	Danube	Low
DE_RP09_304	Pförring	150	Danube	Low
DE_RP09_305 and _306	Oberachdorf and Pfatter	530	Danube	High
DE_RP09_307	Aholfing	590	Danube	Low
DE_RP09_308	Bogen	250	Danube	Low
DE_RP09_309	Bergham	390	Danube	Low
DE_RP09_310	Niederalteich	220	Danube	Low
DE_RP09_355	Danube Kehlheim-Regensburg	980	Danube	High
DE_RP09_106	Isarmündung	3,309	Danube/Isar	Very high
DE_RP09_500	Katzau	470	Danube	Low
DE_RP09_503	Winzer	600	Danube	Low
DE_RP09_504	Mariaposching 2	120	Danube	Low
DE_RP09_505	Mariaposching 1	110	Danube	Low
AT_RP09_311	Goldwörth	380	Danube	Low
AT_RP09_312	Eferding	390	Danube	Low
AT_RP09_313	Steyregg	520	Danube	High
AT_RP09_314	Raffelstetten	640	Danube	High
AT_RP09_315	Gusen	100	Danube	Low
AT_RP09_316	Enns	110	Danube	Low
AT_RP09_318	Lobau	3,190	Danube	High
AT_RP09_079	Tullner Feld	13,150	Danube	Very high
AT_RP09_080	Machland	3,360	Danube	High
AT_RP09_023	Marchfeld, Fadenbach (as part of the National Park Donau-Auen)	1,920	Danube	Very high
SK_RP09_110	Ramenná sústava starého koryta Dunaja	3,690	Danube	High
SK_RP09_241	Medvedov	1,080	Danube	Very high
SK_RP09_242	Devinj	1,170	Danube	High
SK_RP09_244	Velky Lel	80	Danube	High
SK_RP09_245	Zlatna na Ostrove	700	Danube	Low
SK_RP09_247	Obid	1,550	Danube	High

ID_RestPotArea	Name	Size in ha	River	Priority
SK_RP09_249	Ipel confluence	200	Danube	High
HU_RP09_109	Alsó-szigetközi hullámtéri vízpótló rendszer (Szigetköz)	6,540	Danube	Very high
HU_RP09_111	Gemenc	10,339	Danube	Very high
HU_RP09_112	Béda-Karapancsa	14,860	Danube	Very high
HU_RP09_239	Bölcske	1,180	Danube	High
HU_RP09_240	Neszemely sziget	200	Danube	High
HU_RP09_243	Nagy Erebe island	140	Danube	High
HU_RP09_246	Conco sziget	20	Danube	High
HU_RP09_248	Esztergom	630	Danube	High
HU_RP09_250	Dunabogdany	450	Danube	High
HU_RP09_251	Erd	90	Danube	High
HU_RP09_252	Adony	260	Danube	High
HU_RP09_253	Makad	830	Danube	High
HU_RP09_254	Szalkszentmarton	870	Danube	Low
HU_RP09_255	Apostag	180	Danube	Low
HU_RP09_256	Dunaföldvár	690	Danube	High
HU_RP09_257	Harta	6,650	Danube	Low
HU_RP09_258	Madocsa	3,100	Danube	Low
HU_RP09_259	Dunapataj bank	3,350	Danube	Low
HU_RP09_260	Paks	610	Danube	High
HU_RP09_261	Tolna	9,650	Danube	Low
HU_RP09_262	Gemenc 2	6,230	Danube	High
HU_RP09_263	Gemenc 1	7,190	Danube	High
HU_RP09_265	Davod	4,150	Danube	High
HU_RP09_406	Asvanyraro	2,070	Danube	High
HR_RP09_264	Draz	3,500	Danube	High
HR_RP09_267	Tikves	11,350	Danube	Very high
RS_RP09_113	Gornje Podunavlje	17,100	Danube	Very high
RS_RP09_266	Bezdan	1,120	Danube	High
RS_RP09_269	Vajska	7,920	Danube	High
RS_RP09_270	Karadordevo	930	Danube	Low
RS_RP09_271	Celarevo	1,510	Danube	High
RS_RP09_272	Lok	4,040	Danube	High
RS_RP09_273	Centa	5,180	Danube	High
RS_RP09_281	Belgrad	7,230	Danube	High
RS_RP09_282	Gaj	1,880	Danube	Low
RS_RP09_283	Klicevac	2,520	Danube	Low
RS_RP09_284	Zatonje	1,180	Danube	Low
RS_RP09_285	Kladovo	400	Danube	Low
RO_RP09_286	Ostrovu Corbului	1,620	Danube	High
RO_RP09_118	Salcia	7,600	Danube	Very high
RO_RP09_119	Calafat Ghidici	15,560	Danube	Very high

ID_RestPotArea	Name	Size in ha	River	Priority
RO_RP09_120	Ghidici Rast Bistret	9,220	Danube	High
RO_RP09_121	Bistret Nedeia Jiu	21,260	Danube	Very high
RO_RP09_122	Jiu Bechet	4,680	Danube	High
RO_RP09_123	Bechet Dabuleni	7,110	Danube	High
RO_RP09_124	Dabulen Potelu Corabia	14,990	Danube	High
RO_RP09_125	Balta Geraiului	1,790	Danube	Very high
RO_RP09_127	Lita Olt Flamanda Seaca	6,540	Danube	High
RO_RP09_128	Seaca Vanatori Suhaia Zimnicea	14,400	Danube	High
RO_RP09_129	Zimnicea Nasturelu	3,960	Danube	Low
RO_RP09_130	Bujoru Pietrosani	4,960	Danube	Very high
RO_RP09_131	Pietrosani Arsache	5,460	Danube	Very high
RO_RP09_132	Vedea Slobozia	5,560	Danube	Very high
RO_RP09_133	Remus Gostinu Baneasa	7,600	Danube	High
RO_RP09_134	Gostinu Greaca Arges	30,140	Danube	High
RO_RP09_136	Oltenita Surlari Manastirea	13,040	Danube	High
RO_RP09_137	Boianu Sticleanu Calarasi	23,920	Danube	High
RO_RP09_138	Calarasi-Raul Island West	7,980	Danube	High
RO_RP09_139	Bugeag	2,060	Danube	Very high
RO_RP09_140	Piscicola Oltina	3,110	Danube	Very high
RO_RP09_141	Borcea de Sus I	8,740	Danube	High
RO_RP09_142	Unirea Gildau	970	Danube	High
RO_RP09_143	Borcea de Jos I II III	50,320	Danube	High
RO_RP09_144	Viile Dunareni	1,180	Danube	Very high
RO_RP09_145	Baciu Vederoasa	1,810	Danube	Very high
RO_RP09_146	Cochirleni	690	Danube	High
RO_RP09_147	Seimeni	840	Danube	High
RO_RP09_148	Topalu	380	Danube	High
RO_RP09_149	Borcea Fetesti	2,270	Danube	Very high
RO_RP09_150	Stelnica Bordusani	1,880	Danube	High
RO_RP09_151	Facaeni Vladeni	4,700	Danube	High
RO_RP09_152	Brailita Giurgeni Calmatui	16,590	Danube	High
RO_RP09_153	Calmatui Gropeni	14,480	Danube	High
RO_RP09_154	Gropeni Chiscani	2,230	Danube	High
RO_RP09_155	Noianu	710	Danube	Low
RO_RP09_156	Insula Mare a Brailei	70,930	Danube	High
RO_RP09_157	Harsova Ciobanu	4,680	Danube	High
RO_RP09_158	Ciobanu Garliciu	3,850	Danube	High
RO_RP09_159	Ciobanu Daeni	1,340	Danube	High
RO_RP09_160	Ostrov Pecineaga	1,590	Danube	High
RO_RP09_161	Peceneaga Turcoaia	3,540	Danube	High
RO_RP09_162	Iglita Carcaliu Macin	3,020	Danube	High
RO_RP09_163	Braila Dunare Siret	5,370	Danube	High
RO_RP09_165	Badalan	1,530	Danube	High

ID_RestPotArea	Name	Size in ha	River	Priority
RO_RP09_166	Macin Zaclau	13,760	Danube	High
RO_RP09_167	Zaclau Isaccea	20,790	Danube	High
RO_RP09_280	Holbina-Dunavat	7,720	Danube Delta	Very high
RO_RP09_190	Danube Delta, Chilia Veche	3,230	Danube Delta, Kiliya Channel	High
RO_RP09_191	Danube Delta, Pardina	28,640	Danube Delta,Kiliya Channel	Very high
RO_RP09_194	Danube Delta, Partizani	3,940	Danube Delta, Sulina Channel	High
RO_RP09_195	Danube Delta, Balteni	4,250	Danube Delta, Gheorghe Channel	High
BG_RP09_319	Mouth of Timok	390	Danube	Low
BG_RP09_320	Archar	140	Danube	High
BG_RP09_321	Orsoya	2,050	Danube	Very high
BG_RP09_322	Tzibar	1,410	Danube	Very high
BG_RP09_323	Kozlodui	1,180	Danube	High
BG_RP09_324	Ogosta confluence	760	Danube	High
BG_RP09_325	Ostrov	1,680	Danube	High
BG_RP09_326	Iskar mouth	350	Danube	Low
BG_RP09_327	Gigen	1,880	Danube	High
BG_RP09_328	Brest	9,160	Danube	High
BG_RP09_329	Dabovan	2,400	Danube	High
BG_RP09_330	Vit confluence	1,270	Danube	High
BG_RP09_331	Belene West	5,150	Danube	Very high
BG_RP09_332	Belene Ost	6,320	Danube	High
BG_RP09_333	Vardim	1,840	Danube	High
BG_RP09_334	Yantra mouth	440	Danube	Low
BG_RP09_335	Batin	370	Danube	High
BG_RP09_336	Mechka	460	Danube	High
BG_RP09_337	Ryahovo west	1,000	Danube	High
BG_RP09_339	Srebarna	140	Danube	Very high
BG_RP09_340	Aydemir	1,310	Danube	High
BG_RP09_341	Lake Malak	50	Danube	Very high
BG_RP09_342	Garvan oxbow	30	Danube	Very high
BG_RP09_343	Popina	220	Danube	High
UA_RP09_168	Reniyskiy,	680	Danube	Low
UA_RP09_169	Kagulskiy	1,390	Danube	Low
UA_RP09_170	Orlovskiy	790	Danube	Low
UA_RP09_172	Repida	2,780	Danube Lower/Delta	High
UA_RP09_173	Matroskiy	1,700	Danube Lower/Delta, Kiliya Channel	High
UA_RP09_174	Staronekrasovskiy	590	Danube Delta,	High

ID_RestPotArea	Name	Size in ha	River	Priority
			Kiliya Channel	
UA_RP09_175	Lung	1,820	Danube Delta, Kiliya Channel	very high
UA_RP09_176	Kislitskiy	5,390	Danube Delta, Kiliya Channel	High
UA_RP09_179, _180, _183	Kiliiskiy, Lisky 1 and Vilkovskiy	6,800	Danube Delta, Kiliya Channel	High
UA_RP09_502	Lisky 2	2,140	Danube Delta, Kiliya Channel	Very high
UA_RP09_181	Solomonov	1,860	Danube Delta, Kiliya Channel	High
UA_RP09_184	Prymors'ke	2,600	Danube Delta, Kiliya Channel	Very high
UA_RP09_185	Desantne	4,660	Danube Delta, Kiliya Channel	Very high
UA_RP09_232, _177, _188	Kamyshovskiy, Stepovoi and Vasilevskiy	6,270	Danube Delta, Kiliya Channel	High

The following sup-chapters give more details on the further specification and prioritisation of potential restoration sites.

4.1 Biodiversity, nature conservation

Floodplains are biodiversity hotspots due to their transition between aquatic to terrestrial habitats, and have provided benefits to people since millenniums. As the analysis shows, larger parts of the active and former floodplain are already protected, mostly within the Natura2000 network. Restoration projects can become a higher priority if:

- Areas still include typical riparian landscapes such as oxbows, paleochannels and typical wetland/forest patches.
- The areas are already protected, even if conservation features may hamper the implementation of enhanced flood dynamics. However current habitats and species must be carefully assessed to determinate appropriate restoration measures.
- Areas that could serve as stepping stones in biological corridors today have a more intensive use (agriculture). The habitat network in the DRB is a further subject of research, but must included in future spatial planning processes, nationally as well as internationally. Even for the WFD, it is considered that local improvements can enhance the ecological status up and downstream to a certain extent, meaning for larger waterbodies the size and position of improvements (e.g. migratory species) is important.
- Restoration projects should be embedded in local and regional nature protection planning and management. It is important to provide full lateral diversity of riparian habitats, such as different side-channels, backwaters and oxbows that are built and destroyed by the natural system all the time. In other words, if isolated oxbows hosting a great biodiversity of stagnant waterbodies and succession stadiums are to be reconnected or even replaced by permanently connected side-channels (which occurs naturally), appropriate habitats should be provided in the vicinity at the same time.

In COOPS et al 2006 and ECRR 2008 several floodplain restoration projects are analysed and recommendations are given for the scaling and procedure of floodplain restoration.

4.2 Flood protection

Flood protection, and in particular passive measures like the preservation or restoration of retention areas, become more and more important in official flood risk management. Prioritisation parameters could include:

- The position of the potential restoration/retention area in relation to the catchment, river network and flood conveyance cross section.
- In particular in flood bottlenecks, e.g. town pairs often along transboundary rivers such as the lower Danube, where larger retention areas upstream or inside of the bottleneck support flood mitigation. This would also include the restoration of larger side channels (hydromorphological improvements).
- Size of retention volume (the capacity of restoration sites to retain flood water): The total proposed area would also have a certain effect on flood mitigation. Commonly mentioned areas are already used in case of catastrophic floods, such as polders in Tullnerfeld or along theTisza and particularly the Köres. Therefore from the 1.3 million ha only about 900,000 ha can be seen as actual new water retention areas. Calculating conservatively at about 1.5 m average water depth for these areas, a total capacity volume of about 13.5 billion m³ can be estimated. This is more than three times the entire remaining natural retention areas along the middle and lower Sava (incl. Lonjsko Polje, Mocro polje) or the Hungarian “Century Vazarhely Plan” to build technical polders along the Tisza with a capacity of some 5 billion m³. As a comparison, the Austrian Danube floodplains had a retention volume during the 100-year flood event in 2002 of approximately 0.6 billion m³ and substantially mitigated the flood peaks in Vienna (downstream of Tullnerfeld), Bratislava (downstream of the Austrian Floodplain National Park) and even Budapest (Szigetköz).
- The importance of large scale, freely-floodable floodplains increases along the middle and lower courses of major rivers. For most of the proposed sites technical polders should be not favored.

4.3 Feasibility, legal framework, local administration and initiative

Without the deep assessment of feasibility (see Chapter 5), most restoration projects fail from the beginning. The limited data availability and other “soft” factors are serious problems, also for assessment and prioritisation. The following list reflects some of the most important aspects for prioritisation:

- Land ownership, the most critical issues for all projects (see Table 8)
- Proposed measures and proposed costs of the restoration project
- Legal framework, not only EU legislation, but especially national regulations to keep/increase retention areas, how is compensation managed (agriculture), are there agricultural programmes in the area, the legal certainty to foster and

materialize planning and implementation steps, and political willingness (which is immeasurable).

- Involvement of local administration, local population (perception, interest in restoration projects), NGOs and other stakeholders.
- Multi-use concepts for and benefits of restoration projects (recreation, nutrient reduction, sustainable forestry/fishery), i.e. local people will participate and profit from those projects.

Furthermore, climate change also plays a role, not only in the context of an improved water balance in river valleys (buffering of floods, retention during droughts), but also directly concerning CO_2 sequestriation; natural wetlands (in particular peat lands) retain larger quantities compared to intensive agricultural areas. On the other hand, the destruction of wetlands increases the emissions.

Table 8: Legal framework and ownership (initial overview)

Country	**Legal framework**	**Ownership**
DE	Preservation of retention areas - “non-structural flood management” - is a political agreement, in Bavaria “Auenprogramm”, in B.-W. “Integrated Danube programme”, EU-Directives (FD, WFD)	Mostly private; “public water good” often limited to the land between the flood protection dikes or bank strips
AT	Preservation of retention areas, non-structural flood management is a political agreement, Program for the lower Morava, Danube Floodplain National Park, EU-Directives (FD, WFD)	Mostly private; “public water good” often limited to the land between the flood protection dikes or bank strips
SK	EU-Directives (FD, WFD)	Private and public (strong privatisation since 1990)
HU	EU-Directives (FD, WFD)	Private and public (strong privatisation since 1990)
HR	ICPDR involvement in flood management	Mostly private, but large forests in public ownership
RS	ICPDR involvement in flood management	Mostly private but large forests in public hand
RO	EU-Directives (FD, WFD)	Often still public, but licensed to privates (concessions)
BG	EU-Directives (FD, WFD)	Often public, but licensed to privates (for some Bulgarian sites the detailed property situation is known)
UA	ICPDR involvement in flood management	Public and private

5. Feasibility of restoration

Feasibility of restoration projects, as discussed several times in earlier chapters, is often the most critical factor to start successful restoration projects. Therefore this chapter should give a short introduction to feasibility.

5.1 International and national legal frameworks

- WFD (EU Water Framework Directive):
  -Restoration of lateral connectivity to improve status (achieving good status) in adjacent water bodies (there is a strong connection here as lowland floodplains of large rivers contain many waterbodies, such as side-channels, backwaters and oxbows of different size)
  -Improving groundwater connection and to preserve recharge to keep groundwater-dependant land ecosystems
- FFH (EU Flora Fauna Habitat) and Birds Directives
  - Protection of many endangered habitats and species dependant on or related to rivers and floodplains
  - Link to further international conventions such as Ramsar, Bonn, Bern
- FD (EU Flood Directive)
  - Definition of flood and retention areas, enlargement of retention capacities, no further net-loss of floodplains (preservation of retention areas by spatial planning)

National laws and structural frameworks have significant influence on restoration capabilities and success as well (see Figure 10). NGOs can also significantly support restoration (ZÖCKLER 2000).

Restoration projects should be implemented early in regional development planning, in particular after major flood events - the chances must be exploited to reach acceptance in the society.

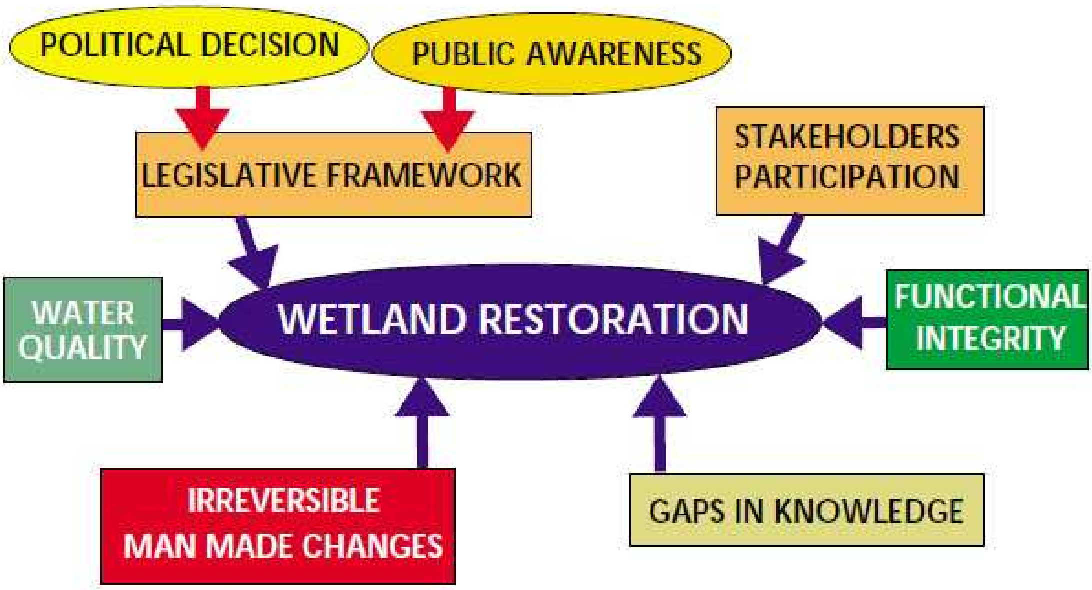


Fig. 10: Framework for restoration projects (ECRR 2001)

5.2 Restoration costs

Restoration costs can be subdivided into land purchase, planning and implementation costs, future compensation in the case of flood (if current land use and landowners remain), and maintenance and monitoring costs.

Restoration costs vary widely depending on measures in implemented. The cost differences between western EU member states and newer Member States are still evident but are closing the gap (also for non-EU states such as HR, BA and RS).

A study carried out on the lower Danube after the 2006 floods (Schwarz et al. 2006) calculate costs at about 20,000 €/ km²; this estimation does not include large technical structures, such as polder in- and outlets and compensation for land users. In comparison costs in Germany and Austria can be estimated at some 1-2 million €/km². Based on a DRB-wide average of 500,000 €/km², this all together would imply investment costs of around 6,000,000,000 € shared by 13 countries.

Large scale restoration projects can take at least 5-10 years; land procurement and planning approval can take years and therefore require well-developed administrative structures and sufficient funding. Restoration is often not limited to changes in dike lines, but requires changes in the management of the adjacent river and floodplain areas. In most cases improvements of lateral connectivity and changes in landuse (e.g. less intensive forestry, hunting or meadow management) are necessary to accelerate the reconnection and to improve the ecological conditions along the respective river stretch. Monitoring is a necessary tool to assess the restoration progress over years or decades. Restoration areas must be protected and integrated in the existing protection network. If dikes will be completely relocated, or even enlarged, up to 10% of the reconnected area is necessary to reconstruct the dike. In the best case, natural terraces will substitute the dike, like on the lower Danube.

5.3 Floodplain values and usage concepts

The (monetary) valorisation of floodplain and ecosystem services and floodplain goods has a certain tradition (e.g. within the Ramsar Convention). They should support cost-benefit analysis to decide upon usage concepts in floodplains. In the case of the lower Danube the value of restored floodplains was estimated at approximately 500 €/ha/year. Again, this value strongly differs depending on usage (and on competing uses, such as agriculture). Floodplains under a broad use concept are still not very developed. Local usage concepts can significantly accelerate and support the restoration of floodplain areas, and can also include touristic concepts.

6. Recommendations towards a restoration strategy

Based on data related to floodplain delineation and restoration potential, it is possible to compare and assess different areas to come up with more detailed restoration proposals and to formulate targets for a future strategy. The following are recommendations to achieve such a restoration strategy:

- Convince/support countries to develop realistic restoration targets. It is important that a common understanding on restoration requirements and benefits exist. Existing case studies shoule be assessed, and one large pilot restoration site in each country underway by 2015 can be used as blueprint for future efforts.
- Favorable legal frameworks, e.g. clear protection of still-existing retention areas (no-go areas for further land development in floodplains), strong spatial planning instruments and tight administrative and political structures that allow for transparent public participation are requirements for successful restoration projects.
- Develop national, or even international, floodplain inventories (e.g. SCHWARZ et al. 2010 for Austria, Bfn 2009 for Germany). It is necessary to increase trans-boundary knowledge of DRB floodplains overall, and to extend continuous floodplain assessment based on floodplain segments by country, e,g, like what was done in Germany (BfN 2009).
- The tools and approaches applied in this study (in particular prioritization) should be further developed in line with FFH-D, WFD and FD plans within the WFD planning cycle timelines. Those approaches should not be overloaded with pre-justifications regarding ecological or technical outcomes. A database to share experiences and development would support the further work.
- Type-specific and adaptive restoration strategies are needed. Protection and improvement (restoration) of existing floodplains is important (only about 10% remain under near-natural conditions along upper and middle Danube!)
- Embed river and floodplain restoration into national and international biological corridor network planning as well as spatial planning ("EU Danube Strategy").
- Protected areas and their management must go hand-in-hand with restoration efforts. Floodplains are very dynamic systems that host a variety of habitats and species within close vicinity. For example, the reconnection and re-dynamisation of protected oxbows are also important for the river-floodplain system, and restoration of both floodplain and oxbow should coexist in the limited given space for river development.
- Infrastructure projects (navigation) and hydropower development will further aggravate the ecological situation of many floodplains. Water management authorities (together with the stakeholders of hydropower, navigation and less flood protection) must offer solutions how to stop incision /bed degradation and further floodplain aggradation by fine sediments. Governments together with the "polluters" must provide the respective financial resources.

Further recommendations for successful restoration projects:

- It must be emphasised that floodplains without river restoration (hydromorphological-lateral integrity of the river-floodplain ecosystem) makes no sense.
- The availability of land (ownership is often most critical), but also of other data, in particular hydraulic models for ecological planning, is very important to ensure successful restoration.
- Clear impact assessments of the project on local, regional and international levels regarding floods, ecology and other ecosystem services is necessary for successful restoration.
- Requirements for local planning and approval by authorities (e.g. influence on local flood levels, water quality and so on) must be considered from the beginning.
- Broad stakeholder involvement and interdisciplinary planning work is a pre-condition for successful restoration.

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8. Annex

Proposed Restoration areas (ordered from upper to lower Danube countries, Danube areas are at the beginning of each country)

ID_RestPotArea	Name	Size in ha	River	Status
DE_RP09_001	Danube valley between Neustadt and Bad Abbach	1,140	**Danube**	Implementation
DE_RP09_105	Ingolstadt	3,030	**Danube**	OfficiallyPlanned
DE_RP09_233	Blochinger Sandwinkel	30	**Danube**	Implementation
DE_RP09_235	Hundersingen - Binzwangen	110	**Danube**	Implementation
DE_RP09_287	Ludwigstal	20	**Danube**	Proposed
DE_RP09_288	Laiz	20	**Danube**	Proposed
DE_RP09_289	Donaustetten	180	**Danube**	Proposed
DE_RP09_290	Weißingen	630	**Danube**	Proposed
DE_RP09_291	Günzburg	290	**Danube**	Proposed
DE_RP09_292	Riedwirtshausen	220	**Danube**	Proposed
DE_RP09_293	Gundelfingen	620	**Danube**	Proposed
DE_RP09_294	Grundremmingen	600	**Danube**	Proposed
DE_RP09_295	Dillingen	230	**Danube**	Proposed
DE_RP09_296	Steinheim	360	**Danube**	Proposed
DE_RP09_297	Höchstädt	600	**Danube**	Proposed
DE_RP09_298	Joasschwaige	70	**Danube**	Proposed
DE_RP09_299	Lechsend	200	**Danube**	Proposed
DE_RP09_300	Niederschönenfeld	570	**Danube**	Proposed
DE_RP09_301	Marxheim	350	**Danube**	Proposed
DE_RP09_302	Riedensheim	220	**Danube**	Proposed
DE_RP09_303	Manching	570	**Danube**	Proposed
DE_RP09_304	Pförring	150	**Danube**	Proposed
DE_RP09_305	Oberachdorf	320	**Danube**	Proposed
DE_RP09_306	Pfatter	210	**Danube**	Proposed
DE_RP09_307	Aholfing	590	**Danube**	Proposed
DE_RP09_308	Bogen	250	**Danube**	Proposed
DE_RP09_309	Bergham	390	**Danube**	Proposed
DE_RP09_310	Niederalteich	220	**Danube**	Proposed
DE_RP09_355	Danube Kehlheim-Regensburg	980	**Danube**	OfficiallyPlanned
DE_RP09_106	Isarmündung	3,309	**Danube/Isar**	OfficiallyPlanned
DE_RP09_500	Katzau	470	**Danube**	OfficiallyPlanned
DE_RP09_503	Winzer	600	**Danube**	OfficiallyPlanned
DE_RP09_504	Mariaposching 2	120	**Danube**	OfficiallyPlanned
DE_RP09_505	Mariaposching 1	110	**Danube**	OfficiallyPlanned
DE_RP09_052	Obere Iller- Abschnitt Blaichach	40	Iller	Implementation
DE_RP09_053	Obere Iller-Abschnitt Sonthofen	50	Iller	Implementation
DE_RP09_054	Obere Iller-Abschnitt	50	Iller	Implementation

ID_RestPotArea	Name	Size in ha	River	Status
	Immenstadt			
DE_RP09_354	Landau an der Isar	110	Isar	Implementation
DE_RP09_356	Landshut - Gummering	880	Isar	Implementation
DE_RP09_057	Isar/Munich	190	Isar	Implementation
DE_RP09_344	Mühldorf am Inn	980	Inn	Implementation
DE_RP09_510	Labertalprojekt	477	Große Laber	Implementation
DE/AT_RP09_002	Lower Inn with riparian woodland	1,310	Inn	Implementation
DE/AT_RP09_065	Salzach between Salzburg and Burghausen	4,180	Salzach	Implementation
AT_RP09_010	Donau- Ybbs Linkage	2,230	**Danube**	Implementation
AT_RP09_023	National Park Donau-Auen (includes the proposed site „Marchfeld/Fadsenbach with 1,920 ha)	9,020	**Danube**	Implementation (partially proposed)
AT_RP09_026	Wachau	2,310	**Danube**	Implementation
AT_RP09_311	Goldwörth	380	**Danube**	Proposed
AT_RP09_312	Eferding	390	**Danube**	Proposed
AT_RP09_313	Steyregg	520	**Danube**	Proposed
AT_RP09_314	Raffelstetten	640	**Danube**	Proposed
AT_RP09_315	Gusen	100	**Danube**	Proposed
AT_RP09_316	Enns	110	**Danube**	Proposed
AT_RP09_318	Lobau	3,190	**Danube**	Proposed
AT_RP09_079	Tullner Feld	13,150	**Danube**	Proposed
AT_RP09_080	Machland	3,360	**Danube**	Proposed
AT_RP09_345	Maßnahmen Radfeld 1	5	Inn	Implementation
AT_RP09_346	Maßnahmen Radfeld 2	10	Inn	Implementation
AT_RP09_347	Mouth of Fagge	10	Inn	Implementation
AT_RP09_348	Mouth Völser Gießen and Axamer Bach	10	Inn	Implementation
AT_RP09_349	Zirl-Dirschenbach	10	Inn	Implementation
AT_RP09_350	Serfaus	10	Inn	Implementation
AT_RP09_351	Telfs	5	Inn	Implementation
AT_RP09_352	Telfs-Pettnau	5	Inn	Implementation
AT_RP09_353	Wörgl-Kundl	10	Inn	Implementation
AT_RP09_028	Rivers Lech and Vils	1,430	Lech, Vils	Implementation
AT_RP09_007	Bog of Pürgschachen and Wetland near the River Enns	1,480	Enns	Implementation
AT_RP09_009	Gesäuse Mountains	210	Enns	Implementation
AT_RP09_058	Enns between Lehen and Aich-Assach	100	Enns	Implementation
AT_RP09_008	Upper Drau-river valley between Oberdrauburg and Spittal	320	Drava	Implementation
AT_RP09_013	Upper Drava	420	Drava	Implementation
AT_RP09_420	Rosegg	70	Drava	Implementation
AT_RP09_015	Estuary stretch of the river Traisen	1,530	Traisen	Implementation

ID_RestPotArea	Name	Size in ha	River	Status
AT_RP09_100	Güssing	1,310	Strem	Proposed
AT_RP09_101	Frankenau	130	Stoberbach	Proposed
AT_RP09_103	Wienerherberg	660	Fischa	Proposed
AT_RP09_104	Gramatneusiedl	430	Fischa	Proposed
AT_RP09_108	March-Thaya Floodlands	6,810	Morava	Implementation
AT_RP09_011	Gail - Natura 2000 site, Görtschacher Moos-Obermoos	100	Gail	Implementation
AT_RP09_020	National park Thayatal / Niederösterreich	170	Dyje	Implementation
AT_RP09_078	Rabensburg	280	Dyje	Proposed
AT_RP09_059	Leitha between Gattendorf and Nickelsdorf	4,980	Leitha	Implementation
AT_RP09_082	Bruck a.d. Leitha	300	Leitha	Proposed
AT_RP09_083	Trautmannsdorf a.d. Leitha	710	Leitha	Proposed
AT_RP09_084	Leithaprodersdorf	1,240	Leitha	Proposed
AT_RP09_085	Lanzenkirchen	310	Leitha	Proposed
AT_RP09_012	Lafnitz	1,460	Lafnitz	Implementation
AT_RP09_087	Heiligenkreuz im Lafnitztal	680	Lafnitz	Proposed
AT_RP09_088	Dobersdorf	200	Lafnitz	Proposed
AT_RP09_086	Oberpullendorf	220	Rabnitz	Proposed
AT_RP09_089	Gniebing	360	Raba	Proposed
AT_RP09_090	Bertholdstein	420	Raba	Proposed
AT_RP09_091	Jennersdorf	1,370	Raba	Proposed
AT_RP09_092	Bad Radkersburg	7,480	Mura	Proposed
AT_RP09_093	Gleinstätten	140	Sulm	Proposed
AT_RP09_094	Heimschuh	190	Sulm	Proposed
AT_RP09_095	Tillmitsch	150	Laßnitz	Proposed
AT_RP09_096	Lieboch	410	Kainach	Proposed
AT_RP09_097	Dobl	330	Kainach	Proposed
AT_RP09_098	Zwaring	510	Kainach	Proposed
AT_RP09_099	Oberwart	990	Pinka	Proposed
AT_RP09_511	Milser Au	39	Inn	Implementation
CZ/AT_RP09_068	Hevlín / Laa a.d.Thaya	2,889	Dyje	Proposed
CZ_RP09_357	Lobodice	930	Morava	Proposed
CZ_RP09_358	Kromeriz	1,750	Morava	Proposed
CZ_RP09_359	Jarosov	930	Morava	Proposed
CZ_RP09_360	Kostelany nad Moravou	1,010	Morava	Proposed
CZ_RP09_361	Nedakonice	670	Morava	Proposed
CZ_RP09_362	Straznice	1,050	Morava	Proposed
CZ_RP09_364	Hodonin	3,470	Morava	Proposed
CZ_RP09_365	Lednice	2,030	Dyje	Proposed
CZ_RP09_366	Podivin	2,230	Dyje	Proposed
CZ_RP09_474	Dyje-Morava Confluence	510	Dyje	Implementation
SK_RP09_110	Ramenná sústava starého koryta Dunaja	3,690	**Danube**	OfficiallyPlanned

ID_RestPotArea	Name	Size in ha	River	Status
SK_RP09_241	Medvedov2	1,080	**Danube**	Proposed
SK_RP09_242	Devinj	1,170	**Danube**	Proposed
SK_RP09_244	Velky Lel	80	**Danube**	Proposed
SK_RP09_245	Zlatna na Ostrove	700	**Danube**	Proposed
SK_RP09_247	Obid	1,550	**Danube**	Proposed
SK_RP09_249	Ipel confluence	200	**Danube**	Proposed
SK_RP09_363	Holic	1,260	Morava	Proposed
SK_RP09_367	Sekule	1,260	Morava	Proposed
SK_RP09_368	Gajary	1,010	Morava	Implementation
SK_RP09_369	Vysoka pri Morava	1,060	Morava	Proposed
SK_RP09_475	Zohor	1,480	Morava	Implementation
SK_RP09_227	rameno Stará Tisa	500	Tisza	OfficiallyPlanned
SK_RP09_228	Anakonda	340	Latorica	OfficiallyPlanned
SK_RP09_229	Vec	250	Bodrog	OfficiallyPlanned
SK_RP09_230	Somotor	280	Bodrog	OfficiallyPlanned
SK_RP09_231	Streda nad Bodrogom	180	Bodrog	OfficiallyPlanned
SK_RP09_374	Rad	640	Bodrog	Proposed
SK_RP09_476	Velke Levare	140	Rudava	Implementation
SK_RP09_370	Surovice	350	Vah	Proposed
SK_RP09_371	Kamenica	1,620	Hron	Proposed
SK_RP09_372	Kucany	1,150	Laborec	Proposed
SK_RP09_373	Leles	2,460	Latorica	Proposed
HU_RP09_109	Alsó-szigetközi hullámtéri vízpótló rendszer	6,540	**Danube**	OfficiallyPlanned
HU_RP09_111	Gemenc	10,339	**Danube**	OfficiallyPlanned
HU_RP09_112	Béda-Karapancsa	14,860	**Danube**	OfficiallyPlanned
HU_RP09_239	Bölcske	1,180	**Danube**	Proposed
HU_RP09_240	Neszemely sziget	200	**Danube**	Proposed
HU_RP09_243	Nagy Erebe island	140	**Danube**	Proposed
HU_RP09_246	Conco sziget	20	**Danube**	Proposed
HU_RP09_248	Esztergom	630	**Danube**	Proposed
HU_RP09_250	Dunabogdany	450	**Danube**	Proposed
HU_RP09_251	Erd	90	**Danube**	Proposed
HU_RP09_252	Adony	260	**Danube**	Proposed
HU_RP09_253	Makad	830	**Danube**	Proposed
HU_RP09_254	Szalkszentmarton	870	**Danube**	Proposed
HU_RP09_255	Apostag	180	**Danube**	Proposed
HU_RP09_256	Dunaföldvár	690	**Danube**	Proposed
HU_RP09_257	Harta	6,650	**Danube**	Proposed
HU_RP09_258	Madocsa	3,100	**Danube**	Proposed
HU_RP09_259	Dunapataj bank	3,350	**Danube**	Proposed
HU_RP09_260	Paks	610	**Danube**	Proposed
HU_RP09_261	Tolna	9,650	**Danube**	Proposed
HU_RP09_262	Gemenc 2	6,230	**Danube**	Proposed

ID_RestPotArea	Name	Size in ha	River	Status
HU_RP09_263	Gemenc 1	7,190	**Danube**	Proposed
HU_RP09_265	Davod	4,150	**Danube**	Proposed
HU_RP09_406	Asvanyraro	2,070	**Danube**	Proposed
HU_RP09_197	Nagykörüi	2,400	Tisza	OfficiallyPlanned
HU_RP09_198	Tiszaroffi	2,160	Tisza	OfficiallyPlanned
HU_RP09_199	Nagykunsági	3,670	Tisza	OfficiallyPlanned
HU_RP09_200	Hanyi-Tiszasülyi	4,100	Tisza	OfficiallyPlanned
HU_RP09_201	Hanyi-Jászsági	4,170	Tisza	OfficiallyPlanned
HU_RP09_202	Tiszanánai	3,090	Tisza	OfficiallyPlanned
HU_RP09_203	Dél-Borsodi	3,180	Tisza	OfficiallyPlanned
HU_RP09_204	Tiszakarádi	4,390	Tisza	OfficiallyPlanned
HU_RP09_205	Cigándi	1,910	Tisza	OfficiallyPlanned
HU_RP09_207	Szamosközi	13,340	Tisza	OfficiallyPlanned
HU_RP09_376	Zsurk	320	Tisza	Proposed
HU_RP09_377	Gavavencsellö	750	Tisza	Proposed
HU_RP09_378	Kenezlö	600	Tisza	Proposed
HU_RP09_379	Tiszaladany	500	Tisza	Proposed
HU_RP09_380	Tiszadob	480	Tisza	Proposed
HU_RP09_381	Tiszaluc	6,140	Tisza	Proposed
HU_RP09_382	Tiszaujvaros	1,350	Tisza	Proposed
HU_RP09_383	Tiszakeszi	990	Tisza	Proposed
HU_RP09_384	Nagyszög	2,670	Tisza	Proposed
HU_RP09_385	Aroktö	340	Tisza	Proposed
HU_RP09_386	Egyek	8,900	Tisza	Proposed
HU_RP09_387	Tiszapüspöki	460	Tisza	Proposed
HU_RP09_388	Rakocziujfalu	480	Tisza	Proposed
HU_RP09_389	Vezeny	730	Tisza	Proposed
HU_RP09_390	Tiszakecske	2,020	Tisza	Proposed
HU_RP09_391	Lakitelek	4,300	Tisza	Proposed
HU_RP09_392	Csongrad	1,690	Tisza	Proposed
HU_RP09_399	Szegvar	3,360	Tisza	Proposed
HU_RP09_400	Doc	4,140	Tisza	Proposed
HU_RP09_516	Hortobagy	4,150	Hortobagy-Berettyo	Implementation
HU_RP09_403	Dravapalkonya	4,590	Drava	Proposed
HU_RP09_071	Zaláta	2,960	Drava	Proposed
HU_RP09_206	Szamos-Kraszna közi	4,670	Somes,Kraszna	OfficiallyPlanned
HU_RP09_375	Satoraljaujhely	830	Bodrog	Proposed
HU_RP09_393	Öcsöd	510	Harmas-Körös	Proposed
HU_RP09_394	Pusztabanreve	1,340	Harmas-Körös	Proposed
HU_RP09_395	Köröstarcsa	1,770	Berettyo/Kettös-Körös	Proposed
HU_RP09_396	Bodzas-zug	370	Kettös-Körös	Proposed
HU_RP09_397	Szanazugi Nyaralok	550	Crisul Negru,Crisul Alb	Proposed

ID_RestPotArea	Name	Size in ha	River	Status
HU_RP09_398	Varoserdö	3,400	Crisul Negru	Proposed
HU_RP09_402	Ferenczzallas	500	Mures	Proposed
HU_RP09_404	Borjad	620	Sio	Proposed
HU_RP09_405	Börcs	2,750	Rabca	Proposed
HU_RP09_407	Rabapatona	2,400	Raba	Proposed
HU_RP09_512	Nagykörü	984	Tisza	Implementation
HU_RP09_513	Kötelek	659	Tisza	Implementation
HU_RP09_514	Tiszajenö	623	Tisza	Implementation
HU_RP09_515	Tiszakürt	127	Tisza	Implementation
HU/RS_RP09_401	Röszke	2,870	Tisza	Proposed
SI_RP09_117	Biomura	1,500	Mura	Implementation
SI/HR_RP09_474	Stojnci	2,250	Drava	Proposed
SI/HR_RP09_473	Svibovec Podravski	2,220	Drava	Proposed
HR_RP09_264	Draz	3,500	**Danube**	Proposed
HR_RP09_267	Tikves	11,350	**Danube**	Proposed
HR_RP09_268	Bilje	3,840	Drava	Proposed
HR_RP09_470	Legrad	1,730	Drava	Proposed
HR_RP09_471	Prelog	320	Drava	Proposed
HR_RP09_472	Hrzenica	1,200	Drava	Proposed
HR_RP09_070	Drava near Ajmas	3,570	Drava	Proposed
HR_RP09_072	Drava near Detkovac	2,820	Drava	Proposed
HR_RP09_073	Drava near Bélavár and Novo Virje	3,810	Drava	Proposed
HR_RP09_074	Drava near Gotalovo	3,020	Drava	Proposed
HR_RP09_432	Stupnicki Kuti	3,800	Sava	Proposed
HR_RP09_433	Magic Mala	2,370	Sava	Proposed
HR_RP09_434	Dolnia	2,090	Sava	Proposed
HR_RP09_435	Gredani	4,220	Sava	Proposed
HR_RP09_436	Visnjica	1,040	Sava	Proposed
HR_RP09_438	Selisce Sunjsko	580	Sava	Proposed
HR_RP09_439	Novo Selo Palajecko	2,413	Sava	Proposed
HR_RP09_075	Mura near Murakeresztür	710	Mura	Proposed
HR_RP09_076	Mura near Miklavec	900	Mura	Proposed
HR_RP09_077	upstream Mursca Sredisce	840	Mura	Proposed
HR_RP09_431	Psavski Pdgajci	2,176	Sava	Proposed
HR_RP09_437	Lonjsko Polje Nature Park	49,916	Sava	Implementation
HR_RP09_510	Karlovac	5,130	Kupa	Proposed
HR_RP09_508	Spacvanski Bazen	41,050	Bosut	Proposed
HR_RP09_509	Zutica	4,438	Lonja	Proposed
BA_RP09_440	Dolina Donja	790	Sava	Proposed
BA_RP09_441	Bosanski Brod	780	Sava	Proposed
BA_RP09_442	Donji Svilaj	230	Sava	Proposed
BA_RP09_443	Madjasi	1,230	Drina	Proposed
BA_RP09_506	Vojskova	335	Bosna	Proposed

ID_RestPotArea	Name	Size in ha	River	Status
BA_RP09_507	Raca	10,316	Sava	Proposed
RS_RP09_113	Gornje Podunavlje	17,100	**Danube**	OfficiallyPlanned
RS_RP09_266	Bezdan	1,120	**Danube**	Proposed
RS_RP09_269	Vajska	7,920	**Danube**	Proposed
RS_RP09_270	Karadordevo	930	**Danube**	Proposed
RS_RP09_271	Celarevo	1,510	**Danube**	Proposed
RS_RP09_272	Lok	4,040	**Danube**	Proposed
RS_RP09_273	Centa	5,180	**Danube**	Proposed
RS_RP09_281	Belgrad	7,230	**Danube**	Proposed
RS_RP09_282	Gaj	1,880	**Danube**	Proposed
RS_RP09_283	Klicevac	2,520	**Danube**	Proposed
RS_RP09_284	Zatonje	1,180	**Danube**	Proposed
RS_RP09_285	Kladovo	400	**Danube**	Proposed
RS_RP09_115	Slano Kopovo	950	Tisza	OfficiallyPlanned
RS_RP09_274	Zrenjanin	10,140	Tisza	Proposed
RS_RP09_275	Mosorin	3,620	Tisza	Proposed
RS_RP09_276	Curug	8,080	Tisza	Proposed
RS_RP09_408	Martonos	1,650	Tisza	Proposed
RS_RP09_409	Kanjiza	1,520	Tisza	Proposed
RS_RP09_410	Senta	1,180	Tisza	Proposed
RS_RP09_411	Coka	3,180	Tisza	Proposed
RS_RP09_412	Padej	1,730	Tisza	Proposed
RS_RP09_413	Mol	1,100	Tisza	Proposed
RS_RP09_414	Novo Becej	6,700	Tisza	Proposed
RS_RP09_116	Obedska bara	9,500	Sava	OfficiallyPlanned
RS_RP09_415	Kupinovo	1,400	Sava	Proposed
RS_RP09_416	Obrenovac	410	Sava	Proposed
RS_RP09_417	Progar	1,210	Sava	Proposed
RS_RP09_418	Obrenovac2	410	Sava	Proposed
RS_RP09_419	Jakovo	1,950	Sava	Proposed
RS_RP09_420	Ledine	900	Sava	Proposed
RS_RP09_426	Bosut	413	Sava	Proposed
RS_RP09_427	Hrtkovci	990	Sava	Proposed
RS_RP09_428	Morovic	590	Sava	Proposed
RS_RP09_429	Banovo Polje	1,130	Sava	Proposed
RS_RP09_430	Bosutsko-Morovicke	21,685	Sava	Proposed
RS_RP09_421	Centa	600	Tamis	Proposed
RS_RP09_422	Sakule	850	Tamis	Proposed
RS_RP09_423	Baranda	1,050	Tamis	Proposed
RS_RP09_424	Ovca	4,350	Tamis	Proposed
RS_RP09_425	Velika Plana	150	Juzna Morava	Proposed
RS_RP09_114	Stari Begej - Carska bara	1,640	Begej	OfficiallyPlanned
RO_RP09_118	Salcia	7,600	**Danube**	OfficiallyPlanned
RO_RP09_286	Ostrovu Corbului	1,620	**Danube**	Proposed

ID_RestPotArea	Name	Size in ha	River	Status
RO_RP09_119	Calafat Ghidici	15,560	**Danube**	OfficiallyPlanned
RO_RP09_120	Ghidici Rast Bistret	9,220	**Danube**	OfficiallyPlanned
RO_RP09_121	Bistret Nedeia Jiu	21,260	**Danube**	OfficiallyPlanned
RO_RP09_122	Jiu Bechet	4,680	**Danube**	OfficiallyPlanned
RO_RP09_123	Bechet Dabuleni	7,110	**Danube**	OfficiallyPlanned
RO_RP09_124	Dabulen Potelu Corabia	14,990	**Danube**	OfficiallyPlanned
RO_RP09_125	Balta Geraiului	1,790	**Danube**	OfficiallyPlanned
RO_RP09_127	Lita Olt Flamanda Seaca	6,540	**Danube**	OfficiallyPlanned
RO_RP09_128	Seaca Vanatori Suhaia Zimnicea	14,400	**Danube**	OfficiallyPlanned
RO_RP09_129	Zimnicea Nasturelu	3,960	**Danube**	OfficiallyPlanned
RO_RP09_130	Bujoru Pietrosani	4,960	**Danube**	OfficiallyPlanned
RO_RP09_131	Pietrosani Arsache	5,460	**Danube**	OfficiallyPlanned
RO_RP09_132	Vedea Slobozia	5,560	**Danube**	OfficiallyPlanned
RO_RP09_133	Remus Gostinu Baneasa	7,600	**Danube**	OfficiallyPlanned
RO_RP09_134	Gostinu Greaca Arges	30,140	**Danube**	OfficiallyPlanned
RO_RP09_136	Oltenita Surlari Manastirea	13,040	**Danube**	OfficiallyPlanned
RO_RP09_137	Boianu Sticleanu Calarasi	23,920	**Danube**	OfficiallyPlanned
RO_RP09_138	Calarasi-Raul Island West	7,980	**Danube**	OfficiallyPlanned
RO_RP09_139	Bugeag	2,060	**Danube**	OfficiallyPlanned
RO_RP09_140	Piscicola Oltina	3,110	**Danube**	OfficiallyPlanned
RO_RP09_141	Borcea de Sus I	8,740	**Danube**	OfficiallyPlanned
RO_RP09_142	Unirea Gildau	970	**Danube**	OfficiallyPlanned
RO_RP09_143	Borcea de Jos I II III	50,320	**Danube**	OfficiallyPlanned
RO_RP09_144	Viile Dunareni	1,180	**Danube**	OfficiallyPlanned
RO_RP09_145	Baciu Vederoasa	1,810	**Danube**	OfficiallyPlanned
RO_RP09_146	Cochirleni	690	**Danube**	OfficiallyPlanned
RO_RP09_147	Seimeni	840	**Danube**	OfficiallyPlanned
RO_RP09_148	Topalu	380	**Danube**	OfficiallyPlanned
RO_RP09_149	Borcea Fetesti	2,270	**Danube**	OfficiallyPlanned
RO_RP09_150	Stelnica Bordusani	1,880	**Danube**	OfficiallyPlanned
RO_RP09_151	Facaeni Vladeni	4,700	**Danube**	OfficiallyPlanned
RO_RP09_152	Brailita Giurgeni Calmatui	16,590	**Danube**	OfficiallyPlanned
RO_RP09_153	Calmatui Gropeni	14,480	**Danube**	OfficiallyPlanned
RO_RP09_154	Gropeni Chiscani	2,230	**Danube**	OfficiallyPlanned
RO_RP09_155	Noianu	710	**Danube**	OfficiallyPlanned
RO_RP09_156	Insula Mare a Brailei	70,930	**Danube**	OfficiallyPlanned
RO_RP09_157	Harsova Ciobanu	4,680	**Danube**	OfficiallyPlanned
RO_RP09_158	Ciobanu Garliciu	3,850	**Danube**	OfficiallyPlanned
RO_RP09_159	Ciobanu Daeni	1,340	**Danube**	OfficiallyPlanned
RO_RP09_160	Ostrov Pecineaga	1,590	**Danube**	OfficiallyPlanned
RO_RP09_161	Peceneaga Turcoaia	3,540	**Danube**	OfficiallyPlanned
RO_RP09_162	Iglita Carcaliu Macin	3,020	**Danube**	OfficiallyPlanned
RO_RP09_163	Braila Dunare Siret	5,370	**Danube**	OfficiallyPlanned

ID_RestPotArea	Name	Size in ha	River	Status
RO_RP09_165	Badalan	1,530	**Danube**	OfficiallyPlanned
RO_RP09_166	Macin Zaclau	13,760	**Danube**	OfficiallyPlanned
RO_RP09_167	Zaclau Isaccea	20,790	**Danube**	OfficiallyPlanned
RO_RP09_421	Calarasi-Raul Island East	3,560	**Danube**	Implementation
RO_RP09_280	Holbina-Dunavat	7,720	**Danube Delta**	OfficiallyPlanned
RO_RP09_278	Popina	6,250	**Danube Delta, Kiliya Channel**	Implementation
RO_RP09_190	Danube Delta, Chilia Veche	3,230	**Danube Delta, Kiliya Channel**	Proposed
RO_RP09_191	Danube Delta, Pardina	28,640	**Danube Delta,Kiliya Channel**	Proposed
RO_RP09_279	Fortuna	2,340	**Danube Delta, Sulina Channel**	Implementation
RO_RP09_194	Danube Delta, Partizani	3,940	**Danube Delta, Sulina Channel**	Proposed
RO_RP09_195	Danube Delta, Balteni	4,250	**Danube Delta, Gheorghe Channel**	Proposed
RO/UA_RP09_238	Babina	1,920	**Danube Delta, Kiliya Channel**	Implementation
RO/UA_RP09_277	Cernovka	1,580	**Danube Delta, Kiliya Channel**	Implementation
RO_RP09_126	Islaz Moldoveni	2,970	Olt	OfficiallyPlanned
RO_RP09_135	Chirnogi Arges	1,720	Arges	OfficiallyPlanned
RO_RP09_445	Radovanu	2,530	Arges	Proposed
RO_RP09_444	Sadova	9,530	Jiu	Proposed
RO_RP09_164	Brates	13,530	Prut	OfficiallyPlanned
RO_RP09_460	Mastacani	11,300	Prut	Proposed
RO_RP09_461	Falciu	2,820	Prut	Proposed
RO_RP09_462	Vetrisoala	5,210	Prut	Proposed
RO_RP09_463	Cheresacosu	4,060	Prut	Proposed
RO_RP09_464	Gorban	2,090	Prut	Proposed
RO_RP09_465	Prisacani	630	Prut	Proposed
RO_RP09_466	Iasi	1,220	Prut	Proposed
RO_RP09_467	Balteni	710	Prut	Proposed
RO_RP09_452	Igris	2,830	Mures	Proposed
RO_RP09_453	Seitin	260	Mures	Proposed
RO_RP09_454	Secusigiu	1,390	Mures	Proposed
RO_RP09_455	Sanpetru Nemtesc	750	Mures	Proposed
RO_RP09_459	Savarsin	240	Mures	Proposed
RO_RP09_446	Platonesti	1,710	Ialomita	Proposed
RO_RP09_447	Tandarei	1,070	Ialomita	Proposed
RO_RP09_448	Independenta	5,100	Siret	Proposed
RO_RP09_449	Tudor Valdimirescu	2,690	Siret	Proposed
RO_RP09_450	Namoloasa Sat	1,460	Siret	Proposed
RO_RP09_451	Bucesti	1,050	Siret	Proposed
RO_RP09_456	Chisineu-Crisul	3,120	Crisul Alb	Proposed

ID_RestPotArea	Name	Size in ha	River	Status
RO_RP09_457	Zerindu mic	370	Crisul Negru	Proposed
RO_RP09_458	Boiu	1,830	Crisul Negru	Proposed
BG_RP09_319	Mouth of Timok	390	**Danube**	Proposed
BG_RP09_320	Archar	140	**Danube**	Proposed
BG_RP09_321	Orsoya	2,050	**Danube**	Proposed
BG_RP09_322	Tzibar	1,410	**Danube**	Proposed
BG_RP09_323	Kozlodui	1,180	**Danube**	Proposed
BG_RP09_324	Ogosta confluence	760	**Danube**	Proposed
BG_RP09_325	Ostrov	1,680	**Danube**	Proposed
BG_RP09_326	Iskar mouth	350	**Danube**	Proposed
BG_RP09_327	Gigen	1,880	**Danube**	Proposed
BG_RP09_328	Brest	9,160	**Danube**	Proposed
BG_RP09_329	Dabovan	2,400	**Danube**	Proposed
BG_RP09_330	Vit confluence	1,270	**Danube**	Proposed
BG_RP09_331	Belene West	5,150	**Danube**	Proposed
BG_RP09_332	Belene Ost	6,320	**Danube**	Proposed
BG_RP09_333	Vardim	1,840	**Danube**	Proposed
BG_RP09_334	Yantra mouth	440	**Danube**	Proposed
BG_RP09_335	Batin	370	**Danube**	Proposed
BG_RP09_336	Mechka	460	**Danube**	Proposed
BG_RP09_337	Ryahovo west	1,000	**Danube**	Proposed
BG_RP09_338	Rryahovo ost	4,960	**Danube**	Implementation
BG_RP09_339	Srebarna	140	**Danube**	Proposed
BG_RP09_340	Aydemir	1,310	**Danube**	Proposed
BG_RP09_341	Lake Malak	50	**Danube**	Proposed
BG_RP09_342	Garvan oxbow	30	**Danube**	Proposed
BG_RP09_343	Popina	220	**Danube**	Proposed
BG_RP09_066	Belene Island	2,030	**Danube**	Implementation
MD_RP09_186	Lower Prut Lakes	12,040	Prut	OfficiallyPlanned
MD_RP09_187	Lord's Forest	11,730	Prut	OfficiallyPlanned
MD_RP09_468	Cahul	4,610	Prut	Proposed
MD_RP09_469	Cocora	5,420	Prut	Proposed
MD_RP09_470	Flamanda	3,300	Prut	Proposed
UA_RP09_168	Reniyskiy	680	**Danube**	OfficiallyPlanned
UA_RP09_169	Kagulskiy	1,390	**Danube**	OfficiallyPlanned
UA_RP09_170	Orlovskiy	790	**Danube**	OfficiallyPlanned
UA_RP09_171	Kugurluiskiy	1,250	**Danube**	Implementation
UA_RP09_172	Repida	2,780	**Danube Lower/Delta**	OfficiallyPlanned
UA_RP09_173	Matroskiy	1,700	**Danube Lower/Delta, Kiliya Channel**	OfficiallyPlanned
UA_RP09_501	Tataru Island	550	**Danube Delta, Kiliya Channel**	Implementation
UA_RP09_174	Staronekrasovskiy	590	**Danube Delta, Kiliya Channel**	OfficiallyPlanned

ID_RestPotArea	Name	Size in ha	River	Status
UA_RP09_175	Lung	1,820	**Danube Delta, Kiliya Channel**	OfficiallyPlanned
UA_RP09_176	Kislitskiy	5,390	**Danube Delta, Kiliya Channel**	OfficiallyPlanned
UA_RP09_177	Stepovoi	750	**Danube Delta, Kiliya Channel**	OfficiallyPlanned
UA_RP09_178	Vasilevskiy	1,230	**Danube Delta, Kiliya Channel**	OfficiallyPlanned
UA_RP09_179	Kiliiskiy	2,520	**Danube Delta, Kiliya Channel**	OfficiallyPlanned
UA_RP09_180	Lisky 1	3,120	**Danube Delta, Kiliya Channel**	OfficiallyPlanned
UA_RP09_502	Lisky 2	2,140	**Danube Delta, Kiliya Channel**	Proposed
UA_RP09_181	Solomonov	1,860	**Danube Delta, Kiliya Channel**	OfficiallyPlanned
UA_RP09_183	Vilkovskiy	1,160	**Danube Delta, Kiliya Channel**	OfficiallyPlanned
UA_RP09_184	Prymors'ke	2,600	**Danube Delta, Kiliya Channel**	OfficiallyPlanned
UA_RP09_185	Desantne	4,660	**Danube Delta, Kiliya Channel**	OfficiallyPlanned
UA_RP09_232	Kamyshovskiy	4,290	**Danube Delta, Kiliya Channel**	OfficiallyPlanned
UA_RP09_208	Steblivka 1	110	Tisza	Proposed
UA_RP09_209	Steblivka 2	180	Tisza	Proposed
UA_RP09_210	Veliatyn 1	140	Tisza	Proposed
UA_RP09_211	Veliatyn 2	210	Tisza	Proposed
UA_RP09_212	Veliatyn 3	200	Tisza	Proposed
UA_RP09_213	Veliatyn 4	220	Tisza	Proposed
UA_RP09_214	Veliatyn 5	220	Tisza	Proposed
UA_RP09_215	Korolevo	160	Tisza	Proposed
UA_RP09_216	Tekovo	90	Tisza	Proposed
UA_RP09_217	Sasovo	170	Tisza	Proposed
UA_RP09_218	Chornotysiv	100	Tisza	Proposed
UA_RP09_219	Chepa	520	Tisza	OfficiallyPlanned
UA_RP09_220	Forholan	1,190	Tisza	OfficiallyPlanned
UA_RP09_221	Botar	370	Tisza	Proposed
UA_RP09_222	Drotyntsi	270	Tisza	Proposed
UA_RP09_223	Trosnyk	240	Tisza	Proposed
UA_RP09_224	Nove Selo	280	Tisza	Proposed
UA_RP09_226	Chetovo-Vari Polder	1,370	Borzava, Tisza	OfficiallyPlanned
UA_RP09_225	Orosiievo	1,800	Borzava	OfficiallyPlanned