Danube Flood Risk Management Plan

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International Commission for the Protection of the Danube River

Internationale Kommission zum Schutz der Donau

Igor Liska
ICPDR

Danube River Protection Convention (DRPC)

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signed 29 June 1994, Sofia (Bulgaria)

Protection of water & ecological resources

Sustainable use of water

Reduce nutrients & hazardous

Manage floods & ice hazards

ICPDR coordinates implementation of EU Water Framework Directive & EU Floods Directive on basin-wide level

Contracting Parties

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Germany


Austria


Czech Republic


Slovakia


Hungary


Slovenia

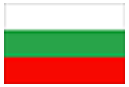

Croatia


Bosnia & Herzegovina


Serbia


Montenegro


Romania


Bulgaria


Rep. of Moldova


Ukraine


European Union

Stakeholder Involvement: 23 Observers

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ICPDR
Delegations of
15 Contracting Parties

ICPDR PS
Permanent Secretariat

Expert Groups

FP EG
Flood Protection

APC EG
Accident Prevention & Control

PP EG
Public Participation

IMGIS EG
Information Management & GIS

S EG
ad-hoc Strategic EG

MA EG
Monitoring & Assessment

PM EG
Pressures & Measures

RBM EG
River Basin Management

Task Groups

GROUNDWATER TG

NUTRIENTS TG

ECONOMICS TG

HYDROMORPHOLOGY TG

Recent catastrophic floods

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2002 2005 2006 2010 2013 2014

ICPDR response to floods:
Flood Action Programme

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Action Programme on Sustainable Flood Protection in the Danube River Basin adopted in 2004

Action plans for sub-basins

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17 flood action plans for the sub-basins prepared in 2009;

First comprehensive overview of hundreds of measures to reduce flood risks ever prepared in DRB.

Danube Declaration 2010

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- ⇨ Adopted by the Danube ministers;
- ⇨ Flood protection is not short-term task but permanent task of highest priority;
- ⇨ Commitment to implement FD and develop flood risk management plan(s) for DRBD.

EU Floods Directive

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Three steps of flood risk management:

a) Preliminary flood risk assessment (PFRA),
b) Flood risk and flood hazard maps
c) Flood risk management plans.

PFRA & hazard and risk maps

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- PFRA completed by 22/12/2011;
- Layout of maps was agreed by the FP EG:
  - map of hazard and flooding scenarios;
  - map on risk and population;
  - map on risk and economic activity;
  - map on risk and IPPC installations;
  - two maps on WFD protected areas;
- Flood hazard areas were submitted via DanubeGIS and data for risk maps were collected by an Excel template: deadline 22/12/2013.

PFRA & hazard and risk maps

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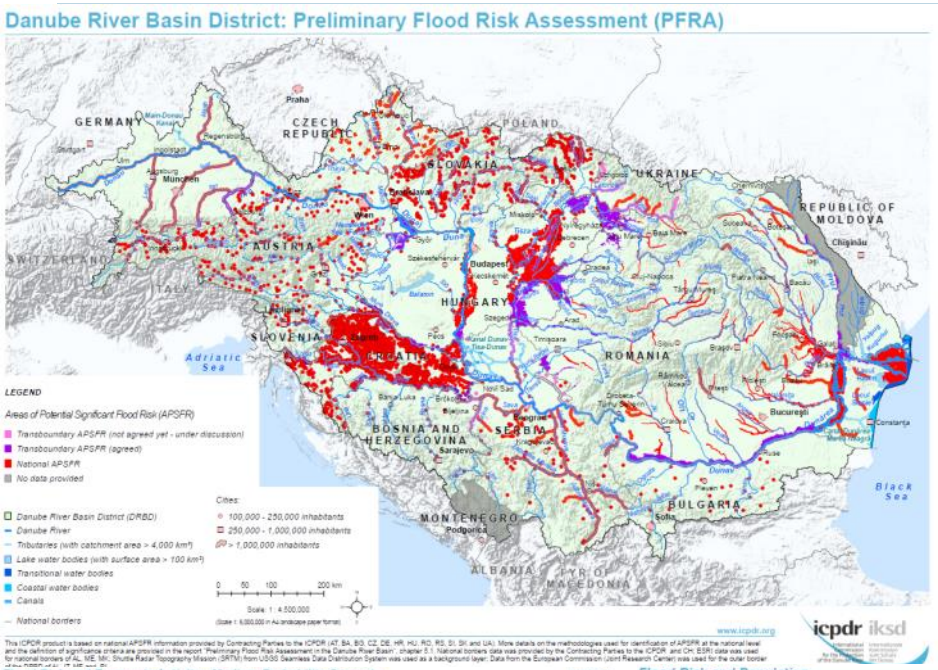

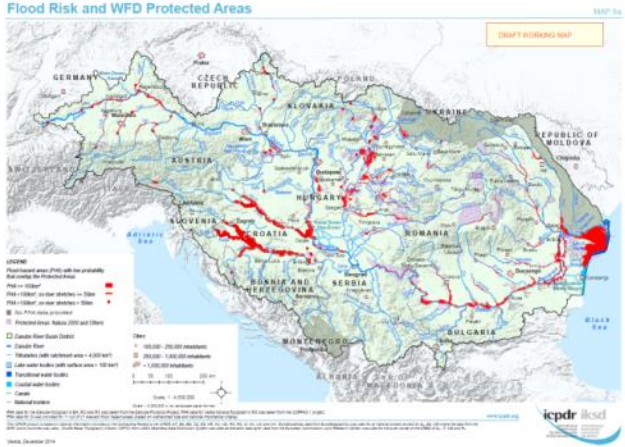

Danube flood risk management plan

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1. Introduction
2. Conclusions of the preliminary flood risk assessment
3. Flood hazard maps and flood risk maps
4. Objectives
5. Measures
6. Water retention
7. Cost-benefit analysis
8. Coordination with WFD
9. Impacts of climate change
10. International coordination
11. Solidarity principle
12. Public information and consultation
13. Conclusions and next steps.

Danube flood risk management plan

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Annexes:

1. Flood hazard and risk maps
2. FRMP measures
3. List Competent Authorities
4. Bilateral Agreements
5. Resource Document "Economics and the Floods Directive"

- General threshold for sub-basin appearance > 4.000 km^2

FRMP – agreeing objectives

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Basin-wide objectives of FRMP - they are linked to the respective measures:

- ✓ Avoidance of new risks
- ✓ Reduction of existing risks
- ✓ Strengthening resilience
- ✓ Raising awareness
- ✓ Solidarity principle

FRMP - measures

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- ICPDR agreed that only the **strategic level measures** shall be presented in DFRMP (it would not make sense to duplicate reporting on all national measures on the level A);
- Key priority at the basin-wide level given to:

  Measures with downstream effect (natural water retention, warning systems, reduction of risk from contaminated sites in floodplain areas, exchange of information);

  Measures applicable in more countries of the basin (awareness rising, warning systems or ice protection measures);

Annex 2: Measures & projects supporting DFRMP

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Strategic level measures listed per objective, type & country.

16 projects or project proposals/ideas were developed by the ICPDR and/or EUSDR PA5 and they shall i.a.:

- Reflect the objectives and priorities set in the Danube Flood Risk Management Plan;
- Have a transboundary character;
- Help to implement the needs listed i.a. in the Annex 2;
- There is no ranking or prioritization of these projects, they are all considered as supportive to the implementation of the Danube Flood Risk Management Plan.

Best practice examples

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SERBIA

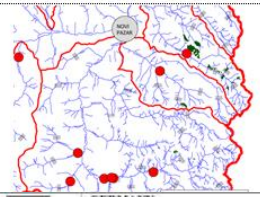
Status: Implemented

Target area: South-western Serbia (the area of Novi Pazar city)

Project: Erosion and torrent control measures

A number of torrents endanger the area of the Novi Pazar city, inducing damages on houses and infrastructure after every rain episode. The designed system for erosion and torrent control includes construction of 13 check dams, and afforestation of degraded areas on about 300ha.

Construction of 8 check dams was finished in 2013 and in early spring of 2014. The total investment was only 400,000€. The system of dams had a major role in May 2014, when it prevented disaster caused by extreme rainfalls.



GERMANY

Status: Under implementation

Wertach / Donauwörth

Project: Wertach vital

The Wertach, formerly a widely branched wild river was straightened in the second half of the 19th century. The so constricted river dug deep into his bed. Thus the groundwater level sank, bridges and bank reinforcements were undermined by water. The lack of flood plains intensified additionally the flood hazard. In the lowland forest were hardly any natural habitats, numerous barrages prevented the fish on their passage in the river.

Therefore in 1997 the water management office Donauwörth launched the project "Wertach vital". The plan is to transform the Wertach on the 14 kilometers from the mouth of the Lech river ecologically. At the already completed sections dikes protect the residents against flooding. Stone ramps, in some areas open ground protection, prevent the river from further erosion. In the broadened sections, the Wertach can shape their bank multivariously, fish have again free passage and in the flood plains develop numerous habitats. In some sections new dikes have been moved back from the Wertach to create additional retention area. With these measures Wertach vital combines the goals of Water Framework Directive and the EU Flood Directive. Even as a recreational area the river is now attractive again.

ROMANIA

Status:

Prut River

Project: Ciobariciu Wetland Restoration

In the valley of the Prut river, the objectives were to create 250ha of wetland by raising the w of deep spots with deep water. The project was implemented by a Romanian regional water a Dutch partners and it served as a good experience in the field of ecological restoration, involv participatory planning and cooperation with other organizations. It was evaluated at the end period of five years by the project team and by a Romanian University.

AUSTRIA

Status: Implemented

Austrian Danube

Project: Floodplain evaluation matrix (FEM): An interdisciplinary method for evaluating river floodplains in the context of integrated flood risk management

During last decades, river floods accounted for enormous damages especially in highly developed and/or densely populated regions worldwide. Moreover, due to anthropogenic alterations of hydrology and river morphology (climate change, land use changes in the catchment, channelling and constricting rivers) and due to the ongoing accumulation of values (such as settlements, infrastructure facilities, etc.) in flood prone areas, this amount of damages is likely to rise in future. Integrated flood risk management is legally in force and aims at reducing the negative effects of floods by combining structural and non-structural flood protection measures. Non-structural measures such as the preservation or restoration of floodplains are considered by the EU Floods Directive as an effective tool for reducing flood risks. For most of the rivers, however, very little is known about the effectiveness of floodplains in regard to hydrological and hydraulical flood hazard reduction. This lack in knowledge often obstructs the integration of these natural flood retention processes into the concepts of integrated flood risk management. In the present study, the Austrian Danube was investigated along its entire 350 km length, determining reaches and floodplains with high relevance for flood water retention and thus for reducing flood hazards downstream. A novel analysis based on one-dimensional and two-dimensional hydrodynamic-numerical modelling, using hydrological and hydraulic parameters defined under the so-called floodplain evaluation matrix method (FEM; Habersack et al. in Nat Hazards, in print, 2013), was carried out to evaluate retention effectiveness on various spatial scales. The results illustrate the magnitude and the variability of flood retention and hydraulic parameters with respect to different hydrological settings (flood wave shape, recurrence probability).

Peak wave reduction:

AUSTRIA, SLOVAKIA, HUNGARY

Status: Implemented

Target area: AT, SK, HU

Project: SONDAR (Soil Strategy Network in the Danube Region)

Sustainable soil management has its impacts on managing flood risks. If it is done properly soil management can slow and retain floodwaters in the opposite case the soil management can contribute to floods by increasing run-off or silting rivers.

Lower Austria and its neighbouring countries Czech Republic, Slovakia and Hungary cooperated in three bilateral European Territorial Cooperation projects from 2010 to 2014. The main aim of these projects under the framework of SONDAR was to establish a network of increasing responsibility for soil: between science and practice, between administration and users of land, between education, arts and the entire population. One of the issues in the focus of the project was to explore the potential of soil as an indicator of flood occurrences. Soils have a long-term memory, and they store the history of their formation like an archive. This stored information can be used in order to deduce the occurrence of rare historical floodings. Therefore soils can be used for localizing potential flooding areas. The project aimed at preparation of soil maps as an instrument of forecasting and sensitization and for creation of awareness.

Another key aspect of the project was improving quality of soil by raising soil awareness. Soil is the starting point for all life on Earth, and it provides for more than 90% of our food but it is endangered by multiple impacts. Soils can only perform their functions within the ecosystem if their qualities are largely intact. The awareness of population about this fact is decreasing. A sustainable cultivation of land in the Danube region can significantly contribute to soil fertility, preventive flood protection, and to the use of soils as carbon storage tanks – and thus to climate protection.

Further information www.sondar.eu

HUNGARY

Status: Ongoing

Tisza River

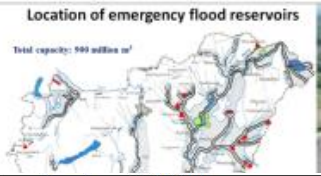
Project: New VÁSÁRHELYI Plan (VTT)

VTT is expected to raise the level of flood safety along the Tisza in harmony with the overall flood control improvements in Hungary by focusing on two problems, increasing the conveying capacity of the flood bed and the use of emergency reservoirs. The studies on increasing the conveying capacity of the flood bed have succeeded in identifying the potential and necessary measures needed to lower the flood peaks to the necessary extent. In the program of implementation the following key measures have been envisaged: removing the obstacles from, and keeping clear of, the flood conveying channel, proposal on retaining, relocation or complete demolition of summer dykes, solving the problems associated with parallel bars, river training works, realignment of the main defences (where unavoidable).

Improvement of the conveying capacity of the flood bed has been envisaged in combination with the environmental revitalisation thereof. The study on the emergency storage scheme in the Tisza Valley (flood plain revitalisation by means of controlled diversion) has revealed no obstacle to establishing the reservoirs at the proposed sites. Eleven potential reservoirs studied were found viable – with some restrictions – in the VTT. The sites were ranked by sections. The reservoirs Cigánd-Tiszakarád, Nagykunság, Hany-Tiszarolly, Tiszaroff has already in operation, the reservoirs Szamos-Kraszna, and Bereg are under construction. These reservoirs have a total capacity of 537 mil m³ + 186 mil m³.

In the event of the thousand-year flood the impact of the six emergency reservoirs identified would extend to the full length of the Hungarian Tisza section. The local and cumulated effect would lower the peak stage by the set target of 60 cm. The final plan with 11 reservoirs will be to reduce by 1,0 m the thousand-year flood, with a capacity of 1 500 mil m³.

Location of emergency flood reservoirs



SLOVENIA

Status: Implemented

Target area: Floodplains in Slovenia

Project: Preventing increase of damage potential of floodplains through conditions and limitations for constructions and activities

Besides protecting the floodplains without significant damage potential and with important effect on flood extent, an important element of a preventive flood risk management is limiting the introduction of additional damage potential on flood areas. Since 2008 Slovenia is achieving this goal through legal restrictions for public or private investments by conditioning and limiting different types of constructions and activities on flood risk areas. Also the Decree on conditions and limitations for constructions and activities on flood risk areas (Official Gazette of the RS, no. 89/08) presumes that in case of changed hydrological conditions the compensatory measure must be provided to keep the retention capacity and not to worsen the hydraulic situation downstream. This legal measure has been applied on local, municipal and national level of planning and therefore the spatial data needed are continuously provided by hydrologic and hydraulic studies which are made by investors according to the Rules on methodology to define flood risk areas and erosion areas connected to floods and classification of plots into risk classes (Official Gazette of the RS, št. 60/07). The state, municipalities and private investors are obliged to map the flood hazard classes in the process of preparation of spatial planning documents or projects for obtaining water and building permits for the area of interest being located on a floodplain.

Based on studies decisions are being made whether or under what conditions the planned construction or activity is allowed. In the period 2008-2015 over 300 hydrologic - hydraulic studies modelling water depth and speed were made and certified for more than 1000 km2 of valid result areas. Data from studies are collected in the form of polygon data layers and published in the Environmental atlas for extents Q10, Q100 and Q500, four hazard classes and three water depth classes for Q100 (gis.arso.gov.si/atlasokolja/profile.aspx?id=Atlas_Okolja_AXL@Arso).

Preparation and publication of flood hazard maps made according to the methodological rules represents also a non-structural measure raising awareness of flood hazard in the area.

Public Consultation:
4 sets of activities

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- collection of comments directly given
- stakeholder consultation workshop, 2/3 July (Zagreb)
- social media campaign (focus on Facebook)
- online questionnaires

All results published at:

www.icpdr.org/main/activities-projects/consultation-2015

Roadmap to cleaner, healthier & safer water

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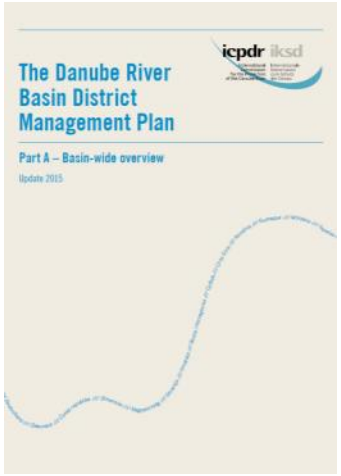
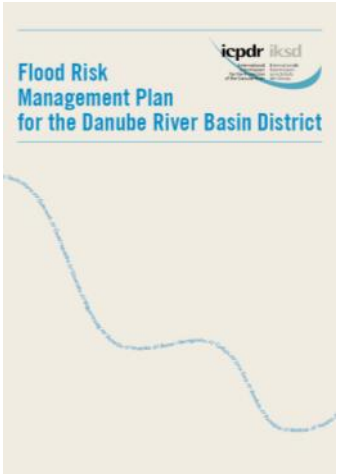
Adopted in 12/2015

Danube RBM Plan Update 2015





1st Danube Flood Risk Management Plan

Danube Declaration 2016

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Danube ministers:

⇨ Endorsed the DFRM Plan and committed to implement the measures foreseen in the DFRM Plan and in the national flood risk management plans;

⇨ Gave priority to measures with positive downstream effect.

Measures implementation level A

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Annex 2 projects supporting DFRMP:

- ⇨ Danube Sediment project;
- ⇨ FRISCO (SI/HR transboundary FRM);
- ⇨ Danube Floodplain project;
- ⇨ DAREFFORT (flood forecasting);
- ⇨ DAMWARM (Drava and Mura water and risk management).

Further information

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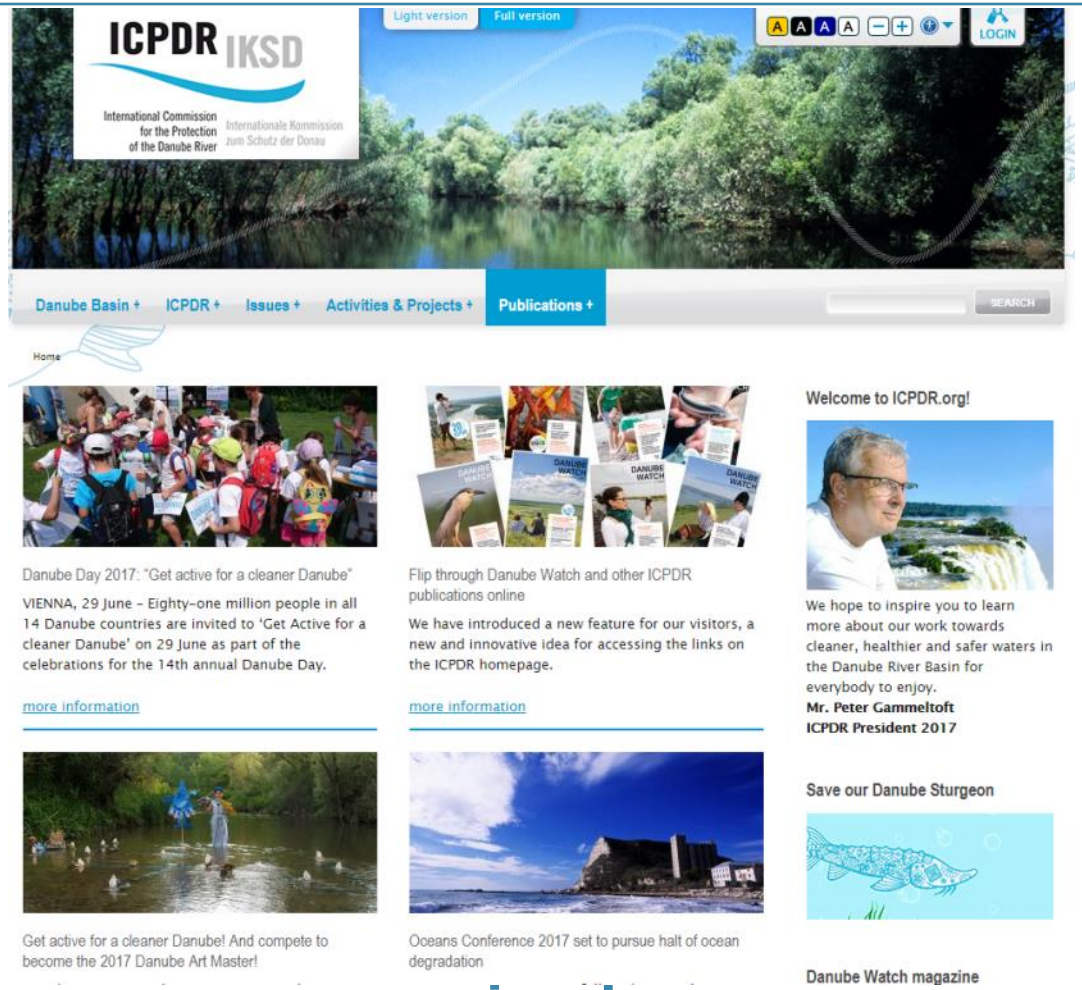

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