

International symposium
23-25. September 2008
Maribor, Slovenia

DRAVA
RIVER
VISION

***“Is the Drava River
Basin management sustainable
and well on the way?”***

**International Symposium
“DRAVA RIVER VISION”**

23. - 25. September 2008
Maribor, Slovenia

Report

Special Edition for ICPDR Ordinary Meeting 2008

MIT UNTERSTÜTZUNG VON
EUROPÄISCHE UNION



INSTITUT
ZA VODE
REPUBLIKE
SLOVENIJE

Institute
for Water of
the Republic
of Slovenia



The International Symposium Drava River Vision is a part of the LIFE Project »Life Vein Upper Drava River«.

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„Is the Drava River Basin management sustainable and well on the way?“

Dear Madam, dear Sir,

The International Symposium „Drava River Vision“

took place in Maribor, Slovenia on the 23rd and 24th of September 2008, finishing with excursion field trip on the 25th of September 2008.

The Symposium was a part of the LIFE Project »Life Vein Upper Drau River«, organized by the Institute for Water of the Republic of Slovenia and the Government of Carinthia, Department of Water Management, Klagenfurt, Austria, with assistance of the Environmental Agency of the Republic of Slovenia, Section Drava River Sub-Basin, and with support from the Ministry of the Environment and Spatial Planning of the Republic of Slovenia, the Municipality of Maribor and the Austrian Ministry for Agriculture and Forestry, Environment and Water Management, Vienna.

About »Drava River Vision«

The common European legislation, in particular the Habitat Directive, the Birds Directive, the Water Framework Directive, the Renewable Energy Sources Directive and the Flood Directive, gives a framework to develop process and practices for sustainable River management. The transboundary cooperation and knowledge-transfer among the countries in the transboundary river basins – such as Drava River Basin – is a challenge.

More than 110 representatives and professionals on nature protection, water management, hydro-power and land use planning from the Drava River riparian states Italy, Austria, Slovenia, Croatia and Hungary discussed at the International Symposium „Drava River Vision“ in Slovenia for the first time about the question, how it is possible to sustainably manage Drava River Basin, that is on one side among one of the most energetically used rivers, and on the other side the region with exceptional biodiversity. Exchanges of good practices and possible solutions to the recognized problems with the emphasis on potential synergies were suggested and discussed during the symposium.

Proposed directions of common transboundary work of the nature conservation, energy sector and water management sector in the international Drava River Basin are:

- solutions for enhanced flood protection, low water and drought management with non structural adaptation measures within the international Drava River Basin,
- development of criteria for sustainable use of renewable resources utilisation within the international Drava River Basin and
- development of the communication strategy of authorities, educational institutions and business sector within the international Drava River Basin.

Drava River Vision Declaration

The final outcome of the international symposium Drava River Vision resulted in a „Drava River Vision Declaration“. It will give a framework for nature protection, hydropower and water management institutions and individual professionals to effectively implement best practices and activities that will contribute to achieving the sustainability goals.

The „Declaration on common access in the spheres of water management, protection against floods, usage of water energy and the preservation of biodiversity in Drava river basin“ was signed by four heads of delegations at ICPDR (International Commission for the Protection of the Danube River) and the representative of the Republic of Italy: Richard Stadler, head of Austrian delegation at ICPDR, Željko Ostojić, Head of Croatian delegation at ICPDR, Gyula Holló, Head of Hungarian delegation at ICPDR, Dr. Mitja Bricelj, Head of Slovene delegation at ICPDR and Rudolf Pollinger, representative of the Republic of Italy. The Signatories of declaration, as well as other participants of symposium, that were able to symbolically accede to the signing, engaged themselves to respect and stimulate ecological integrity of river basin especially on the fields that most visibly form and influence on Drava River Basin management: protecting biodiversity of water habitats, hydro energetic use and assurance of flood protection.



The Declaration on common access in the spheres of water management, protection against floods, usage of water energy and the preservation of biodiversity in Drava river basin is focused to ten essential aims:

- To promote the Drava River as a model for integrated implementation of EU policies on water and nature protection;
- To enhance flood protection through the improvement of flood warning systems and through increased information exchange;
- To enhance flood protection through protection and restoration of water retention areas along the Drava River;
- To continue and further develop restoration of the Drava River and its floodplains;
- To maintain and further develop the Drava River as an „ecological backbone“;
- To re-establish the ecological connectivity of the Drava River for migratory fish;
- To establish the Drava River as a cross-border recreation area;
- To use opportunities for the Drava River to be a connecting lifeline for different nations;
- To undertake integrated river basin management rather than fragmented sectoral measures;
- To undertake further development of the Drava River area in partnership with its resident human populations.

(Details see Cap. Declaration).

More information

The present booklet contains abstracts of most of the presentations. For more information you are kindly invited to visit www.life-drau.at. On this website you can find all the Power Point Presentations for download.

We strongly believe that sustainable water management of transboundary river basins could be achieved only by seeking for common understanding and sharing good practices. Therefore, „Drava River Vision“ was an important step to achieve future developments in Drava River Basin.

Norbert Sereinig, LIFE Project »Lebensader Obere Drau« Project Manager,
Government of Carinthia, Department of Water Management, Klagenfurt, Austria

Dr. Aleš Bizjak, Symposium Project Committee coordinator,
Institute for Water of the Republic of Slovenia, Ljubljana, Slovenia

The LIFE-Project „Life vein Upper Drau River



What is Natura2000?

Natura 2000 is a network of nature conservation sites for the 21st century. In May 1992 European Union (EU) governments brought in a new law to protect the most seriously threatened habitats and species across Europe. The EU law is known as the 'Habitats Directive' and it works with the earlier 'Birds Directive' which was introduced in 1979. At the heart of these Directives is the creation of a network of EU-wide protected sites. These sites comprise both Special Protection Areas (SPAs) for birds identified under the Birds Directive and Special Areas of Conservation (SACs) for habitats and species under the Habitats Directive. Some Natura sites can be both SPA and SAC.

Meanwhile about 25.000 Natura 2000 areas are registered in the EU. Together they cover about 20% (!) of the EU land area.



What is LIFE?

LIFE is the EU's financial instrument supporting environmental and nature conservation projects throughout the EU, as well as in some candidate, acceding and neighbouring countries. Since 1992, LIFE has co-financed some 2,750 projects, contributing approximately €1.35 billion to the protection of the environment.

<http://ec.europa.eu/environment/life/index.htm>

The project area – situated between Oberdrauburg and Spittal in Carinthia (Austria) - contains the last free-flowing stretch within the alpine river section of the Drau. In this section, the river has not been altered through dams, and its adjacent floodplain forests, which are the largest ones in Austria.

Objectives

The project follows the LIFE project "Restoration of the wetland and riparian area at the Upper Drau river", which terminated 2003 after a successful implementation period. It aims at several goals:

- Continuing the successful measures in river revitalisation, in order to sustainably establish the Upper Drau as a „Life vein“ for the region Upper Drau Valley; the efforts are focused on habitats which are typical for alpine rivers and their adjacent floodplains
- Extending the revitalisation measures on the Natura 2000 area, which has been enlarged by 470 hectares to a total of 977 hectares along a river section of 68,5 km.
- Defining innovative management solutions to solve the problems, that have been recognised, but not solved yet as part of the first LIFE project, such as:
 - Reducing the impacts from swell
 - Increasing the input of bed load material to stabilise the river bed and the groundwater level
 - Consistent continuation of management measures for the biotope system
 - Improving visitor information and developing visitor strategies on site
 - Co-operation with specialist agencies from countries bordering on the Drau
- The Upper Drau will serve as a pilot study area: The LIFE project will propose – as required under the Water Framework Directive as well – cross-boarder strategies to solve water management tasks and ecological problems at the Drau river.

Actions and means involved

In total 3,8 million € should be invested in a substantial package of measures:

- Developing detailed studies and plans (concept for bed load management, visitor strategy)
- Purchase of 13,3 hectares of private land for river revitalisation measures
- Implementation of 3 large scale river bed extension projects over a total length of 5 km
- Modifying a debris retention dam to increase the input of bed load material
- Continuing and extending the public relations efforts: e.g. DRAVA RIVER VISION Symposium.

In selecting the set of measures there was a strong focus on feasibility. The proposed start of the project was 01/09/2006. Due to the extent of the management programme the implementation would take place within a 5 year term. Several measures have been already realized (see next page).

Expected results

- Stabilised river bed of the Drau and improved groundwater level as a prerequisite for the conservation of the floodplain forests
- Around 20 hectares of additional alpine river habitats including dynamic gravel banks, Tamarisk- and Willow pioneer communities and floodplain forests; improved spawning reserves for animal and plant species of community interest.
- Approximately 1 hectare of new water bodies in the floodplains as additional elements of the biotope system for amphibians amongst other species
- Exchange of experiences across borders, proposing the Upper Drau as a model for nature- orientated water management in the states bordering the Drau river
- 2 new visitor management zones and extensive information and education
- Further improvement of acceptance of the Natura 2000 area through public relations efforts and economical stimulus for the economically weak region (model for alpine areas).

Partners and organisation

Austrian Ministry for Agriculture, Forestry, Environment and Water Management, Departments VII 5 and II 4 Government of Carinthia, Department of Water Management, Austria; project manager: Norbert Sereinig Forest technical service in torrent and avalanche control, Carinthia Government of Carinthia, Department 20 - Spatial planning / Nature protection, Klagenfurt, Austria Coordination: Klaus Michor, Revital-ZT- GmbH

For more information visit www.life-drau.at (homepage ist open until 2011)

PROGRAMME

international symposium
23 - 25 September 2008
Maribor, Slovenia



FINAL SYMPOSIUM PROGRAMME

Day 1 – 23 September 2008

11.00 Reception desk

13.00 Opening of the Symposium

- Welcome by Ministry of the Environment and Spatial Planning, Slovenia, Dr. Mitja Bricelj, State Secretary
- Welcome by Federal Ministry of Agriculture, Forestry, Environment and Water Management, Austria, Richard Stadler, Division International Water Management
- Welcome by European Commission, Belgium, Philip Owen, Head of Division Life
- Dr. Aleš Bizjak, Institute for Water of the Republic of Slovenia, Slovenia: Introduction to the Symposium and Importance of the Drava River Vision Declaration

13.40 Importance of sustainable river basin management in transboundary context

Chair: Mag. Nevenka Colnarič, Environmental Agency of the Republic of Slovenia, Section Drava River Sub-Basin, Slovenia

- Introduction to the topic, chair
- Philip Owen, European Commission: European sustainable river basin management and LIFE+
- Dr. Gerhard Sigmund-Schwach, Federal Ministry of Agriculture, Forestry, Environment and Water Management, Austria: Global view on sustainable river basin management and biodiversity conservation
- Dr. Giorgio Andrian, UNESCO Brescia: From vision to action towards a transboundary Danube-Drava-Mura Biosphere Reserve
- Philip Weller, ICPDR: Synergies among ICPDR activities and regional transboundary initiatives
- Discussion
- Announcement: Dr. Ulrich Schwarz, Fluvius, Austria: Hydro-morphological inventory of the lower Drava and Mura Rivers. IAD Pilot Study

14.45 Coffee break

- Poster presentation: Dr. Ulrich Schwarz, Fluvius, Austria: Hydromorphological inventory of the lower Drava and Mura Rivers. IAD Pilot Study
- Trailer of LIFE Drava Video Projection

15.15 "Is the Drava River Basin management sustainable and well on the way?"

Chair: Arno Mohl, WWF Austria, Austria

- Introduction to the topic, chair
- Dr. Rudolf Pollinger, Autonomous Province of Bolzano - South Tyrol, Department of Hydraulic Engineering, Italy
- Norbert Sereinig, Government of Carinthia, Department of Water Management, Austria
- Mag. Nevenka Colnarič, Environmental Agency of the Republic of Slovenia, Section Drava River Sub-Basin, Slovenia
- Dr. Danko Biondić, Croatian Waters, Croatia
- András Tálos, South-Transdanubian Environment Protection and Water Management Directorate, Hungary
- Discussion

16.50 Thomas Miklautsch, New World Spirit film creation, Carinthia: Life Vein Upper Drau River; world video projection premiere with introducing statement

17.30 End of day 1

18.30 Symposium dinner



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PROGRAMME

International symposium
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Maribor, Slovenia

DRAVA
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VISION

Day 2 – 24 September 2008

9.00 Introduction into the working sessions

9.15 Session 1: Nature Conservation Challenges in the Drava River Basin

- A) Status of protected areas in the Drava River Basin
- B) Future development of protected area network in the Drava River Basin

Chair: Dr. Gordana Beltram, Ministry of the Environment and Spatial Planning, Slovenia

Co-chair: Dr. Gerhard Sigmund-Schwach, Federal Ministry of Agriculture, Forestry, Environment and Water Management, Austria

- Introduction to the topic, chair
- Arno Mohl, WWF Austria: The future of the Drava and Mura Rivers
- Dr. Reinhold Turk, Government of Styria, Department for Nature Protection, Austria: Natura 2000 obligations and their implementation in the Drava River Basin including an European overview
- Dr. Darij Krajčič, Simona Kaligarič, Institute of the Republic of Slovenia for Nature Conservation, Slovenia: Management of Drava River in the frame of Natura 2000
- Neven Trenc, State Institute for Nature Protection, Croatia: Ecological network and Natura 2000 along the Drava and Mura Rivers
- Discussion

10.30 Coffee break

11.00 Session 2: Hydropower challenges in the Drava River Basin

- A) Existing hydropower infrastructure in the Drava River Basin
- B) Future hydropower infrastructure developments in the Drava River Basin

Chair: Dr. Veronika Koller-Kreimel, Federal Ministry of Agriculture, Forestry, Environment and Water Management, Division Water Management, Austria

Co-chair: Igor Čuš, Dravske elektrarne Maribor, Slovenia

- Introduction to the topic, chair
- Herfried Harreiter, Verbund, Austria: Implementation of WFD and sustainable electricity production - tasks, challenges and experiences in Drava River Basin
- Mag. Christian Moritz, Arge Limnologie, Austria: Masterplan for hydropower in Austria
- Jože Milič, Dravske elektrarne Maribor, Slovenia: Hydropower utilization on the Drava River in Slovenia
- Zlatko Pletikapić, Dr. Stjepan Mišetić, Željko Pavlin, Maja Kerovec Elektroprojekt, Croatia: Sustainable planning of the multipurpose hydropower schemes
- Discussion

12.15 Lunch break



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DRAVA RIVER VISION

13.30 Session 3: Flood protection challenges and river morphology in the Drava River Basin

A) Existing flood protection infrastructure in the Drava River Basin

B) Future flood protection infrastructure developments in the Drava River Basin

Chair: Dr. Danko Biondić, Croatian Waters, Croatia

Co-chair: Gyula Hollo, Ministry of Environment and Water, Hungary

- Introduction to the topic, chair
- Dr. Franci Steinman, University of Ljubljana, Slovenia: Flood hazard, flood damage potential and residual risk on the Drava River Basin
- Dr. Helmut Habersack, BOKU Vienna, Austria, Norbert Sereinig, Government of Carinthia, Department of Water Management, Austria: Sustainable flood protection on the Drava River in Carinthia
- Zoran Đuroković, Davor Haničar, Ladislav Grđan, Silvio Brezak, Croatian Waters, Croatia: Flood protection experiences on the Drava River Basin in Croatia
- Dr. László Rákóczi, Dr. János Szekeres, VITUKI, Environmental Protection and Water Management Research Institute, Hungary: Environmental effects of industrial dredging on alluvial riverbeds
- Alajos Burián, South-Transdanubian Environment Protection and Water Management Directorate, Hungary, Ladislav Grđan, Croatian Waters, Croatia: River regulation of Dráva - Mura Rivers' mouth
- Discussion

15.00 Coffee break

15.30 Recent developments on the Drava River Basin

- Mirna Bojić, Ministry of Culture, Nature Conservation Directorate, Croatia, Rozáli Érdi, Ministry of Environment and Water, Hungary: Cooperation on Nature Protection along Drava River between Croatia and Hungary

15.45 Panel discussion on the Drava River Vision Declaration and follow up actions

Chair: Dr. Aleš Bizjak

Invited to discussion: Dr. Rudolf Pollinger, Norbert Sereinig, Mag. Nevenka Colnarič, Dr. Danko Biondić, András Tálos, Arno Mohl and other symposium participants

16.30 End of Day 2

18.00 Sunset rafting on the Drava River

Day 3 – 25 September 2008

9.00 Guided excursion to Natura 2000 sites along the Drava River, vicinity of Maribor

13.00 End of Symposium



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ABSTRACTS

Richard Stadler *Greeting Words*

Austrian Federal Ministry of Agriculture,
Forestry, the Environment and Water
Management
ICPDR - Austrian Head of Delegation

for participants of the Drava River Vision Symposium



Dear Colleagues,

It's my honour and pleasure to be with you at this Symposium directed towards a river which Austria shares with four countries. As representative of the Austrian Federal Ministry of Agriculture, Forestry, the Environment and Water Management, allow me to welcome you on its behalf in the different functions which this Ministry exerts:

- as co-organiser of this Symposium,
- as competent authority for water management in Austria
- as financier for flood protection in Austria
- as national co-ordinator, promoter and Co-Financier of the EU-LIFE Programme and its Projects, and finally
- as lead of the Austrian delegation to the International Commission for the Protection of the Danube River (ICPDR).

This symposium is really a special one: For the first time representatives of water management, hydropower-generation and nature conservation from all River Drau- respective Drava riparian states are assembled together. This reflects our strongly emerging understanding that elaboration of river projects has to be done in an integrated and transparent way involving all partners concerned in the planning process. This understanding has been deepened in a couple of successful EU - LIFE-Projects, which have been implemented in the last years in Austria, located at the Danube, at the River Lech, at the River Mur and at the River in our focus, the River Drau. And the latter induced the idea to widen the project's national scope by organizing this trans-boundary Symposium as part of the Austrian Life-Project "Vein of Life-Upper Drau" and to invite representatives of all riparian States for participation.

I assume everybody present here will agree that projects along the River Drava should be shaped in such a way that they match the demands of men and nature in the best balanced way which means harmonising i.a. the interests of Flood Protection, Hydro-Power Generation, Tourism and Recreation, Fishery and Nature Protection. This Symposium shall give room for the presentation of good examples of such projects, leading to solutions of sustainable River Basin Management.

This Symposium shall also enable discussions on the challenges posed on Hydro-Power-Generation by requirements of the EU-Water Framework Directive and Nature Protection. It may also involve the discussion of "follow ups" with the possible perspective to launch in future joint EU-promoted trans-boundary projects, be it within the LIFE-Programme, be it within the upcoming European Territorial Cooperation Programme, the former INTERREG-Programme.

To send out an adequate signal we have prepared a Declaration which was already signed today noon during a Press Conference by the representative of Italy and the representatives of the four riparian States responsible for cooperation in the framework of the Danube Protection Convention. Obviously it would have been desirable to involve you all with this document in advance of this signing procedure. This seemed virtually not feasible. However, during the development of the Declaration a constant examination procedure took place via the focal points of all 5 riparian states and a large number of you have had the possibility to comment on it. So we do hope that the content of this Declaration will find also the consensus of all of us, the main point to discuss at the end of the Symposium being the possible follow up to this Symposium.

You may ask why the Head of Delegations of the Riparian States to the International Commission for the Protection of the Danube River have signed this declaration. To answer this question I like to refer to Mr. Phil WELLER, follow speaker of our Symposium and ES of the Secretariat of the ICPDR. I may only say that the Head of Delegations concerned promise to act as ambassadors and supporters for matters that concern the River in our focus.

Dear Colleagues,

Let me at the end mention the well known fact that CRO is an accession candidate and that all other riparian states are Member States to the European Union. Therefore much of what we do in our administrations nowadays is widely determined by decisions taken inside the European Union and by its executive organ, the European Commission. So I am particularly pleased to welcome a high ranked representative of the European Commission, Mr. Philip OWEN, Head of the LIFE-Unit in Brussels, which handles the financing tool for the Environment, the LIFE-Programme, to be used by all interested Member- and Accession Candidate States for co-financing LIFE-Projects till a share of 50 to 75 %. We want to express our hope that the support of our River-projects by LIFE will continue in future.

Finally I wish us for our Symposium the best possible success!

European sustainable river basin management and LIFE+

Philip Owen
European Commission,
Head of LIFE Unit

Set background for discussions on river basin management in general and the Drava river in particular. Also offer you may support for your Memorandum of Understanding

In a Eurobarometer survey for the European Commission 96% of Europeans said that protecting the environment was important for them. Europeans are most likely to be concerned about climate change (57%) and water (42%) and air (40%) pollution. In Slovenia 61% of respondents were concerned about water pollution.

Over the last 20 years – according to the European Environment Agency – there have been significant advances in the treatment of sewage and industrial waste leading to improved water quality. But challenges remain.

There are two main factors which risk nitrate levels and physical interventions including river regulation.

One of the main elements of the Water Framework Directive is the establishment of a system for integrated river basin management. The LIFE+ Regulation explicitly identifies contributing to enhanced water quality by developing cost-effective measures to achieve good ecological status in view of developing the first river basin management plans, required by the Water Framework Directive, by 2009.

To date via the LIFE programme 150 river related projects have been financed.

- Finland – a project relating to water management on the scale of the river basin.
- Spain – the involvement of the whole community; the promotion of political and technical structures and the development of systems to improve the natural environment helped the region meet the requirements of the WFD.
- The Danube has attracted several projects. Two Austrian projects concerning firstly the restoration and management of the Danube's alluvial floodplain and secondly the restoration of river
- In the UK a project looked at 7 rivers and conservation objectives were planned and developed for each species and habitat type.
- The Drau projects:
 - The 1999 project aimed at river bed widening, natural river bank management, linking up river branches and reactivating water meadows
 - The 2006 project builds on the earlier successes. The new project looks at innovative management solutions:
 - Reducing impacts from swell
 - Increasing bed load material

LIFE+ funds nature conservation and environmental technology projects. Best practice or pilot projects for nature conservation.

As regards LIFE+ environmental policy and governance projects must be innovative or pilot project

LIFE+ funding is normally provided at a 50% intervention rate and 15% of the budget is aimed at transnational projects. The programme is open to public and private sectors as well as not for profit. There is an annual call for proposals – the next closes on 21 November 2008 and workshops are being held in Slovenia on 26 September and Hungary and Austria on 1 October.



ABSTRACTS

Dr. Gerhard Sigmund
Austrian Ministry of Environment,
Division Nature Conservation

Global View on Sustainable River Basin Management and Biodiversity Conservation International and Regional Conventions as a legal Background for Drava River Basin Cooperation



Conventions are multilateral treaties, adopted by international bodies, e.g. the United Nations, the European Council, or others. They have to be ratified in the signatory states before they enter into force and become legally binding.

When we consider future strategies for the Drava River Basin Management we should regard earlier commitments deriving from existing conventions. Possibly most relevant are the following:

Global / regional Water-relevant Conventions and Strategies:

- Convention on Biodiversity CBD (Rio 1992)
- Convention on Wetlands (Ramsar, 1971)
- Danube River Protection Convention (Sofia 1994)
- UNECE Water Convention (Helsinki 1992)
- Bern Convention 1979 (European Wildlife and Habitats)

The **Ramsar Convention** from the year 1971, the „Convention on Wetlands“, is an important convention for river basin management. Contracting Parties shall consult with each other especially in the case of a wetland extending over the territories of more than one Contracting Party or where a water system is shared by Contracting Parties.

Wetlands such as stable or running waters, peatlands, marshes, etc. have fundamental ecological functions as regulators of water regimes and as habitats supporting characteristic flora and fauna. Article 4 states that each Contracting Party shall promote the conservation of wetlands and waterfowl and provide adequately for their wardening. The heart of the Ramsar Convention is the „Wise Use“ Principle : Wise Use is understood as „Sustainable Use“ and means „sustainable utilization of wetland resources in such a way as to benefit the human community while maintaining their potential to meet the needs and aspirations of future generations“. The Ramsar Convention provides a large amount of guidance for the wise use of wetlands, all to be found under www.ramsar.org.

The **Berne Convention** from the European Council, the „Convention on the Conservation of European Wildlife and Natural Habitats“ goes back to the year 1979, the year of the EU Bird's Directive. Its aims are similar to EU „Habitats Directive“ and EU „Birds Directive“ (= Natura 2000). Contracting Parties shall ensure the conservation of habitats of wild flora and fauna species, especially those in Appendices I and II and the conservation of endangered natural habitats. The Berne Convention is the basis for „Important Bird Areas“ (IBA) which have become „SPAs“ Special Protected Areas in EC member states and „Emerald Sites“ as part of the „Emerald Network“ of the European Council in Non-EC-member states. Planning and development policies of the signatory states shall have regard to the conservation requirements of the protected areas. The convention text and additional information can be found under <http://www.unep.ch/regionalseas/legal/bern.htm>

The **Convention on Biodiversity („CBD“)** was signed at the World Conference on sustainable development in Rio de Janeiro, Brazil, in 1992. Its main objectives are the conservation of biological diversity and the sustainable use of its components, the fair and equitable sharing of the benefits arising from ecosystems and resources for the benefit of present and future generations. In April 2002 it was decided to significantly reduce biodiversity loss by 2010 at the global, regional and national level as a contribution to poverty alleviation and to the benefit of all life on Earth. Also the „Biological diversity of inland water ecosystems“ has become more and more important in CBD since 2004, reflected in a work programme on inland waters. The year 2006 brought a new Programme for Protected Areas (PoWPA). It was stated that conservation and sustainable use of biological diversity will strengthen friendly relations among States and contribute to peace for humankind. All relevant informations about biodiversity and the CBD can be found under <http://www.cbd.int/>

The year 1992 brought not only the CBD but also the UNECE Helsinki **“Water Convention on Transboundary Watercourses and Lakes”**. Contracting parties shall ensure that transboundary waters are used with the aim of ecologically sound and rational water management, conservation of water resources and environmental protection; the restoration of ecosystems, the development of harmonized policies, programmes and strategies covering the relevant catchment areas, and the protection of the environment of transboundary waters or the environment influenced by such waters. The UNECE „Helsinki Convention“ has served as a framework convention for some regional conventions such as the „Danube River Protection Convention“. You will find more under <http://www.unece.org/env/water/>

The „**Danube River Protection Convention**“ **DRPC** was signed in Sofia in 1994 after only two years of preparation. Its objectives and principles for cooperation determine that the CPs shall cooperate...on fundamental water management issues and take all appropriate, legal and administrative measures to improve the current environmental and water quality conditions in the Danube and its tributaries. The Parties ensure the sustainable use of water resource as well as the conservation and restauration of ecosystems and to cover also other requirements occurring e.g. public health. The international Secretariate of DRPC is located in Vienna and the Conference of the Parties is the International Commission for the Protection of the Danube River ICPDR. See also the journal „Danube Watch“ and the homepage under www.icpdr.org

ABSTRACTS

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From vision to action: towards the designation of the Transboundary Biosphere Reserve 'Danube-Drava-Mura'.

Introduction

Within fragmented geo-political scenarios, the possibility of framing a landscape 'puzzle' in a coherent mosaic is proving to be of essential importance. The concept of Biosphere Reserve (BR), as developed within the intergovernmental programme 'Man and Biosphere Programme (MaB)' hosted by the United Nations Educational, Scientific and Culture Organisation (UNESCO), represents a unique international designation, that can simultaneously foster biodiversity preservation and local development, by promoting innovative territorial management practices.

The MaB Programme: brief overview

Launched in 1971 as an intergovernmental programme, the MaB original idea dates back to 1968, when UNESCO set an international conference in order to stimulate a larger scientific cooperation, in close cooperation with FAO and IUCN: the „Intergovernmental Conference of Experts on the Scientific Basis for the Rational Use and Conservation of the Resources of the Biosphere“, later on shortened into „the Biosphere Conference“. Initially, the concept of Biosphere Reserves (BRs) appeared in 1971 when the idea for a World Network of Biosphere Reserves combining conservation and research was formalized.

BRs are defined as „areas of terrestrial and coastal ecosystems or a combination thereof, which are internationally recognized within the framework of UNESCO's MaB Programme“. The Statutory Framework (SF) of the World Network of BRs serves as a not-legally-binding instrument for the proper establishment and implementation of these territories. The SF was designed in order to enhance the effectiveness of individual BRs and strengthen cooperation, understanding and communication at the regional and international level. The original aim of the BRs network was the one to establish a network of terrestrial and coastal areas, representing the main planetary ecosystems. Within these areas, genetic resources aimed to be protected and research on ecosystems, monitoring and capacity building expected to be located, as a constituency part of the Programme's activities. The conservation objective is thereby supported by research, monitoring and training activities.

In 1995, in order to identify the specific role of BRs in developing a new vision of the relationship between conservation and development, the Seville Strategy was adopted by the Intergovernmental Coordinating Committee (ICC) as tool for the World Network of Biosphere Reserves' implementation. Finally, each BR remains under the sovereign jurisdiction of the State/s where it is located.

The Network is sub-structured in regional and/or thematic networks such as the AfriMAB, ArabMAB, CYTED, EABRN, EuroMAB, IberoMAB, PacMAB, REDBIOs, SeaBRnet and SACAM, being supported by the UNESCO Regional and Cluster Offices.¹

The Transboundary Biosphere Reserve 'Danube-Drava-Mura': the main steps

The proposal of a Transboundary Biosphere Reserve (TBR) 'Danube-Drava-Mura' (DDM) resulted out of a long consultation process, which included the initial support of Croatia, Hungary and Slovenia respective Ministries of Environment, as well as the contribution of more than 40 experts from various countries. In fact, the idea of fostering the transboundary cooperation dates back already to 1993, when the vision of protecting the entire Danube-Drava-Mura river system was foreseen by the authorities of Austria, Slovenia, and Hungary, as well as few international NGOs.

The sparking project (1997-1999), was financed through the PIN Matra Fund/Programme International Nature Management, by the Dutch Ministry of Agriculture, Nature Management and Fisheries and the Dutch Ministry of Foreign Affairs; one of the outputs was the TBR scenario.

The idea has gained UNESCO's support since 1997, while highlighting that one joint transboundary initiative would be rather welcome. The WWF publication on „Saving the picture of a beauty – The Danube-Drava-Mura river corridor“ has become one of the most visible and effective information tools in disseminating the DDM-TBR idea.

Within the EU approximation process, the focus on the Drava-Mura has been 'channeled' into the European ecological network framework (Natura 2000), as an effort towards a better compliance with the Habitats and Birds Directives.

Additionally, the intergovernmental process activated by Bulgaria, Romania, Moldova and Ukraine towards a „Lower Danube Green Corridor“ and the declaration of the „Head of States Summit and Sustainable Development in the Carpathians and Danube Region“ (2001), boosted the overall process; in fact, Hungary, Croatia and Serbia moved forward in the joint protection of the 'Danube-triangle' and Croatia created a Regional Park across five different counties.

In October 2005 - during the EuroMaB meeting held in Austria - an informal meeting on the advancement of the proposed TBR was held, attended by WWF, the Austrian MAB Committee and UNESCO representatives. UNESCO-BRESCE (formerly ROSTE), while fostering the joint nomination as the most effective way ahead – stressed the need for the proposal to have the necessary political



¹ For further details, please consult the official MaB web page: www.unesco.org/mab

support from all the governments concerned; additionally, it proposed to facilitate the initial steps towards the configuration of the most appropriate joint transboundary mechanisms to be launched by various countries.

In November 2005, a meeting between the Croatian Ministry of Culture, WWF and Green Action was held in Zagreb; the main outcome of which was the re-emphasizing of the willingness to establish a Regional Park along the Drava and Mura rivers which would proceed with the official designation, under „preliminary protection“, according to the law. Followed by a preliminary protection of three years, from 2006 on, the borders were to be defined by the Institute for Nature Conservation. After this approval, the Minister would foresee the establishment of the Regional Park in 2007, and, ultimately, of the BR in 2008. During the same session, WWF/Green Action presented the TBR proposal, as prepared in 1999 and informed about the expressed support to the nomination by the Hungarian and Serbian Ministries of Environment.

In January 2006, UNESCO-BRESCE expressed to the Croatia's Ministry of Culture its willingness to effectively support the initiative of establishing a TBR and to platform the intergovernmental process with the neighboring countries (Austria, Hungary, Serbia and Slovenia).

WWF raised attention towards the water dimension and recalled that the Drava-Mura is an international sub-basin under the EU Water Framework Directive. During the meeting, it was suggested that Hungary and Croatia should declare first the TBR and extend it to the neighboring countries within the basin. The justification held for this purpose was based on the Bilateral Agreement on cooperation on environment and nature protection between the two countries (signed on 26/01/06). Sustainable tourism was regarded as one of development activities-functions to be kept within the Drava region.

During the last EuroMaB (Antalya, Turkey, November 2007), the representatives of the Institute for Nature Conservation of Serbia and the IUCN-Programme Office for SEE held a presentation on the „Gornje Podunavlje Special Nature Reserve“ with a tentative map of the TBR scenario. A discussion with the MaB stakeholders of the five countries concerned followed during the same meeting.

On January 2008, Serbia took over the Presidency of the International Commission for the Protection of the Danube River (ICPDR) for the full year. Within this context, a particular interest was expressed in assuring information availability and access on the current status of the Danube; this is expected to ensure public support in form of more national funds spending on wastewater systems and treatment plans. During the 3rd World Congress of Biosphere Reserves held in Madrid, Spain in February 2008, a poster was presented by the Croatian representative on „Proposed Biosphere Reserve Mura-Drava-Danube (Croatia) – Activities for protection of the ecosystems along rivers Drava and Mura on the national level and as a UNESCO Biosphere Reserve“. Ultimately, a specific operative meeting will be organised by UNESCO-BRESCE with the representatives of the five countries to define a road map toward the preparation of a joint designation dossier.

ABSTRACTS

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Danube River Basin – a source for transboundary cooperation

The Results and Potentials for Transboundary Water Management Cooperation



The Danube River Basin is a basin composed of nineteen countries, fourteen of which share major parts of their territories in the basin. Over 81 million people - with different languages, cultures and histories – inhabit the world's most international river basin and share the benefits and problems of the Danube, the second largest river in Europe.

Despite the complex political situation in the Danube River Basin the countries of the region are cooperating together in managing this diverse and important river. Cooperation began in the mid 1980s but was intensified and strengthened since the political changes at the beginning of the 90s. The cooperation was formalized in 1994 when the Danube River Protection Convention was signed.

The Convention entered into force in 1998 and is a legal framework for cooperation for the protection of water and ecological resources and their sustainable use in the Danube River Basin.

The Danube River Protection Convention has multiple objectives. These are:

- Sustainable and equitable water management
- Conservation, improvement and rationale use of surface waters and ground waters
- Control discharges of water waters including nutrients and hazardous substances from point and non-point emissions
- Control floods and ice hazards
- Control hazards originating from accidents, and
- Reduce pollution loads of the Black Sea from sources in the Danube catchment area.

The International Commission for the Protection of the Danube River is the institution responsible for ensuring that the countries uphold their commitments under the convention.

The ICPDR is in the first instance a forum under which the countries work together on issues of water management. The issues of water quality and control of floods have been central to the work of the Commission since its founding.

Of great importance is that all the countries with territories over 2,000 km² are contracting parties to the Convention and are actively participating in the work of the Commission. The contracting parties include Austria, Bosnia-Herzegovina, Bulgaria, Croatia, the Czech Republic, the European Union, Germany, Hungary, Moldova, Montenegro, Romania, Serbia, Slovakia, Slovenia, and Ukraine. There are five countries which are located in the Danube basin but have territory less than 2,000 km². These are: Albania, Italy, Macedonia, Poland and Switzerland.

It is clear, however, that governments alone cannot effectively manage the waters of the Danube river Basin and that decisions and actions of business, local governments and individuals influence the situation in the region. The ICPDR has been very successful in ensuring that international organizations, scientific researchers, business associations, water resources users and environmental NGOs are actively involved in the work of the Commission.

The ICPDR set up a Secretariat based in Vienna, which coordinates the work of the representatives in the countries and the work of the Expert Groups in particular. These include work groups on Monitoring and Assessment, Pressures and Measures, Flood Protection and River Basin Management. In addition significant work has been done in recent years on public awareness raising through the Public Participation expert group. Coordinated efforts to produce GIS related information are being undertaken by the Information and GIS expert sub group.

Above all the ICPDR is a platform for cooperation and coordination among Danube countries using the resources of the countries and involving other partners. This mechanism has been especially important for monitoring the water quality, for tracking the pressures on the river system and for creating a mechanism for developing joint responses to problems.

In the Danube we have developed a Transnational Monitoring Network that involves monitoring stations from each of the Danube countries. The data from these monitoring stations are collected and provide a complete overview of the water quality situation in the Danube. The ICPDR also maintains an inventory of pollution sources into the Danube and the location of facilities where pollution reduction is needed.

With the adoption of the EU Water Framework Directive the ICPDR has been nominated as the platform to develop the Danube River Basin Management Plan. The national governments are the competent authorities that must report directly to the EU, but the ICPDR serves as the forum under which an international river basin plan is prepared. This role is especially important in providing coordination of actions, information exchange, development of joint strategies and the harmonization of methods and mechanisms of analysis.

In December 2004 the ICPDR convened a meeting of Danube River Basin Ministers to adopt the first stage report prepared under the EU Water Framework Directive. The report provides a synthesis of information from the countries on situation of water resources in the region. The cooperative efforts of the countries to put the



report together were very constructive and even non EU countries such as Serbia and Moldova attempted to provide information in a comparable manner.

The Danube Basin Analysis report (2004) provides the foundation for the development of a Danube River Basin Programme of Measures. It identifies where and in which sectors action has to be taken in order to achieve good ecological status of water by the year 2015.

More recent efforts have focused on the development of a River Basin Management Plan. A strategic paper, a road map and a work plan have been developed as well as issue papers on key issues such as organic pollution, nutrient and hazardous pollution, hydromorphological alterations. And we are engaging in stakeholder consultation processes, particularly with those stakeholder groups who need to undertake actions in support of reaching the good status. The consultation will include opportunities to submit comments on the River Basin Management Plan as well as a basin-wide stakeholder forum, which will be held in June 2009.

ICPDR will continue its efforts to ensure that understanding and dialogue on a basin wide level is achieved and will offer support for regional initiatives like the Sava and the Tisza, and strengthen and promote cooperation with country initiatives like the Drava River Basin.

International cooperation is envisaged with other river basins (like the Mississippi, the Mekong and the Orange River Basins) in order to share experiences and to achieve technical exchange and collaborative actions on specific water issues.

Since the signing of the Danube River Protection Convention the ICPDR has evolved into an effective and flexible organization that has been able to be an appropriate forum for addressing water conflicts. The EU Water Framework Directive has provided a further basis for organizing our actions in addressing conflicts.

The cooperation in the Danube river region provides a positive example of how countries can cooperate together and work together with other key stakeholders in improving the water quality and ecosystem conditions.

ABSTRACTS

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„The source of the vision“ – The Drava River in South Tyrol



Characterization of the Drava River catchment within the Autonomous Province of Bolzano/Bozen – a synopsis

The Drava River catchment is located in the far eastern part of South Tyrol and its area is about 165 km², including the proper catchment of the Drava River with approximately 1/3 of the total area and the catchment of the Sextner torrent, which opens to the Drava River in Innichen, with 2/3 of the total area. The lowest elevation point lies 1.113 meters above sea level (Border to „Osttirol“ close to Winnebach), the highest elevation measures 3.157 meters above sea level (Dreischusterspitze in the „Sextner“ Dolomite Alps). From a geologic perspective the small catchment is extremely multifaceted when considering on the one hand tectonic discontinuity lines and on the other hand the sedimentary rock formations of the Dolomites, that contribute to the beauty of the landscape, surely one of the most marvellous of our Province. A unquestionable hotspot is the world famous mountain range of the Sextner Dolomites with the „Dreizinnen“, which magnetizes tourists, not only because of the presence of first class skiing areas but also for gentle tourism with a broad range of support infrastructure. Within the regions we have 3 skiing areas, Winterport infrastructures (also cross-country skiing) and a summer toboggan run. The Drava River catchment is composed of the municipalities of Innichen, Sexten and a small part of the municipality of Toblach where the Drava has its source in the „Toblacher Feld“. The municipality of Innichen comprises the main village of Innichen and the localities of Vierschach, Winnebach and Innichberg, which were autonomous municipalities until 1929. Innichen has approx. 3150 inhabitants, 83% of them are German speaking, 16% Italians and 1% Ladins. From an economic point of view the region is supported by several pillars: tourism, small trade, commerce and trading, public services and agriculture. The municipality of Innichen counts ca. 400.000 accommodations per year, half of it in summertime prevalently Italian guests. Within the region there are real magnets for tourists like the bicycle route Toblach- Sillian and the carnic altitude way. Trading nearby the route and the connections to the North-Italian regions allow lot of things. The region offers cultural highlights too. The cathedral of Innichen, the Robert Stolz museum in Sexten, the accessible front lines of the First World War is only a few examples. The region within the Drava River catchment is frontier land. During the First World War the front line between Austria and Italy proceeded through this region, which was hotly fought over. Until the recent past the bottom of the Drava valley was of military domain evidenced by the still existing military fortifications and infrastructures and the fact that the Drava River was until 1999 under the jurisdiction of the state. The economic boundary conditions have a strong influence on the Drava River and its tributaries. This is reflected by a high concentration of settlements, residential areas, infrastructures, the international road and the railway. The water resource is intensely utilized by a hydropower electric utility and also as high quality drinking water (several mineral water sources). The above listed circumstances together with the rapid changes occurred along the watercourse during the last 100 years and the high natural hazard potential straightforwardly result into interwoven management tasks. The competent authorities dispose of relative good information sources, ranging from land use data to hazard event documentation, gathered by survey and monitoring concerning the condition of the watercourses.

Duties, competences and responsibilities

South Tyrol is an Autonomous Province within the Italian State. This autonomy is internationally safeguarded. As a consequence of this Autonomy South Tyrol has widespread and embracing duties as well as responsibilities in River related topics and issues. The Province South Tyrol enacts laws which are implemented taking into consideration European and National laws. Typical fields of competences are: Administration and regulation of the watercourses; water protection, water resources utilization up to a limit of...., nature and wildlife protection, land use planning; agriculture, forestry, civil protection etc. While the largest part of South Tyrol falls within the Etsch River catchment, which is a national scale catchment and is administrated by a proper national catchment authority, the Drava River within the borders of South Tyrol has a regional character and according to Italian law it is managed by the Province with a proper planning unit. Up to now we have not setup a proper administration authority, because we administrate the Drava in full analogy with the other regional catchments.

With the coming into effect of the implementing regulation 463/99 within the Etsch River catchment, South Tyrol assumed the role of supervising authority of the Etsch catchment. This means, that the implementation of the nowadays valid national and international regulations falls within the competence spectrum of the Province. Planning and administration of the catchments is definitely the duty of the Autonomous Province of Bolzano. Widening up the analysis on an international level today an international coordination of the planning measures within the Drava River catchment does not exist. In Italy the question of authority is unclear and the international coordination is not regulated so more questions than answers arise, e.g.: At which level the harmonization should take place? Where are the technical limits? Where are the limits of purpose and meaningfulness? Is a higher level administration authority necessary or is coordination at the level of planning the better way?

The instrument of the water resources utilization plan

The water utilization plan of the Autonomous Province of Bolzano, as regional planning tool, is valid for the whole Province comprising all hydrological catchments and rules coherently with the European and National dispositions (e.g. water framework directive, decree 463/99) the watercourse management defining principles, which the Province has to comply with.

In the legal sense the water utilization plan has to be harmonized with the catchment plan of the Etsch River, in order to assure a coordinated management of the qualitative and quantitative protection of water resources and against hydrological hazards.

The water utilization plan of the Autonomous Province of Bolzano is redacted by the Province itself and is approved by the concerned municipalities and interest groups, which can rise objections and make proposals. The plan is subjected to an Environmental Impact Assessment Procedure and to a technical revision through representatives of the Autonomous Province of Trento, the Region Veneto and the secretary general of the catchment authority of the Etsch River. Once the revision is concluded the plan is approved together with the results of the technical evaluation and the expertises of the regional and provincial institutions of the equal right's committee in the truest sense of the art.9 of the D.P.R. Nr. 381 – 1974 and becomes legally binding as constitutional law.

The water utilization plan is subdivided into two parts.

The first part describes the general backgrounds and the actual situation and is further subdivided into the following sections:

Physical, geomorphic and climatic properties of the Province and their impact on the different characteristics of the water course types in South Tyrol. Assessment of the watercourses present within the Province liked with the corresponding characteristics. In appendix 1 you find an overview of the contents of the water utilization plan. The implementation of the water utilization plan is carried out by the different departments of the Province with their own competences and with the municipalities. An authority directly in charge of implementing the water utilization plan does not exist. Each department works within its own competence space.

Perspectives on international cooperation: the challenge of Drava River management

With the setup of the „functional centre“ the premises for the development of a warning system harmonized with the bordering countries are given. Unfortunately the possible pre-warning lags are short; this implies that the warning system has to rely prevailingly on meteorological forecasts. A hydraulic model exists for the Etsch River, but not for the Drava River. It would be appropriate to deliver data for a complete model. The delivery of data could be managed through the „functional centre“.

From the obligation to carry out hazard zone maps and the subsequent civil protection planning all hydro-geologic hazard and risk zones will be known as well as the flood zones. While the possibility of a creation in the source area of the Drava River has to be further investigated the creation of protection zones will be possible in the short term only along the tributaries of the Drava River. Ecological redesign measures are pursuit along the whole regulated tracts, while in the intensely urbanized areas the available options are limited. The reestablishment of the water flow continuum is a decisive either for the flood protection or fort he water utilization.

The utilization of the Drava River as a recovery area is an interesting and fascinating task. The willingness of the bordering municipalities is very high. The bicycle route Toblach – Sillian is an important path-breaking infrastructure

The further development of the international cooperation is an important political premise for the all embracing Drava River plan.

River management is the only form which leads to cooperation and participation. Multiple approaches are possible. In the framework of a River space forum the participation of all actors is guaranteed, if there is the willingness. For larger areas this system didn't function.

Concerning flood prevention a possible implementation of the EU – directives in the international flood protection, we are ready to meet some requisites. Within less then 3 years, when complete hazard zoning maps will be available for the catchments, this obligation should be complied with.

Event documentation has been carried out completely since 10 years in our province. A historical database, which is further developed and expanded, exists with approx. 2000 entries. ED30, IFFI, avalanche surveys, the harmonization of the databases is possible and necessary. A unique and standardized database is actually not available. The decision has been taken to manage separately the databases but nevertheless to publish and deliver conjointly the requested data. The publication of the results is necessary. How does the information reach the stakeholders?

South Tyrol has decided to carry out hazard mapping following the Swiss example on a municipality basis taking into consideration all natural hazards. The hydrologic risk plan of the Province is the aggregation of all plans. For the Drava River catchment actually we have a relevant part of the knowledge required in order to meet the demands of international rules and to make a status quo assessment, to push forward the production of hazard zoning maps and to redact a master management plan.

The catchment of the Drava River is suitable as a planning unit according to the River management plan. This means that within the framework of a pluri-annual management plan and based on detailed surveys, a desirable future state for the Drava can be defined. Descending from this defined future state interdisciplinary master plans can be worked out that could be valid over a long period of time. In the framework of these master plans the concerned actors develop working schedules and programs. Information and participation takes place within the framework of these master plans. Only with this planning level all actors can be brought around the table. An essential part of the plan is the River basin forum where the plans are approved.

ABSTRACTS

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Is the Drava River basin management well on the way?

Overview



Within the territory of Austria river Drava flows through the federal states of Tyrol and Carinthia. It covers a distance of 260 km with a mean gradient of 3‰ in the upstream and 1‰ in the downstream reach. The Austrian Drava basin has an area of 9420 km² and is divided in three sections concerning water management issues. The section in East Tyrol until Lienz is characterised by a large bed gradient and four hydro power stations. From Lienz to downstream of Spittal/Drau in Carinthia, on a reach with a length of 70 km, the longest uninterrupted section of river Drava in Austria can be found. Starting with the hydro power station near the village of Paternion until the Austrian/Slovenian border at Lavamünd river Drava is hydroelectrically occupied by a chain of ten hydro power stations.

The mean discharge at the uninterrupted reach in Carinthia is about 74 m³/s and at the Slovenian border it is about 290 m³/s. The discharge of a one in a hundred years event is about 1050 m³/s in the Upper Drava valley and goes up to 2600 m³/s downstream at Lavamünd.

Along the uninterrupted section in Carinthia the river reach and the area close to the river – mainly rare grey alder woods – with a total area of 1000 ha were dedicated as a Natura 2000 protection area.

Main problems and challenges in integrated river basin management

The Upper Drava section from Lienz to Spittal/Drau was systematically structured since 1882. After disastrous floods in 1965 and 1966 Upper Drava was regulated on a length of 70 km. To maintain the flood protection for the city of Villach, this river section was only regulated for mean flow conditions to reduce the amount of water which reaches Villach. Due to this reason the Upper Drava valley today is still characterised by extensive retention areas, while the lower Drava valley is strongly characterised by hydro electrical utilisation.

Due to the regulating measures following the floods in the 1960ies, which largely straightened Upper Drava, massive bed degradation could be observed in recent years. These bed degradations negatively affect the flood management and the river ecology and the diversity of habitats as well. While on the one hand bank protection measures, which are necessary to protect adjacent settlements, are affected in their stability, on the other hand retention areas are cutted-off from the main stream because of bed degradation. Hence the flood wave could be accelerated. Within the past 70 years the maximum degradation was 1,5 m and could have increased to 2 m if no countermeasures were taken. Furthermore today there are settlements which are still not protected from floods and will have to be defended by local protection structures in the next few years.

Beyond, the bed degradation increases the loss of habitats and thus of endangered species because of a lacking connection of semi-aquatic habitats to the river. Additionally the intensive utilisations of the stream surroundings (agriculture, forestry, tourism) lead to a substantial loss of habitats of Upper Drava.

Because of the monotonous river regulation and the therewith linked reduced river dynamic it came to a reduction of river related habitats in recent years. It lead to a dramatic reduction of the pilot fish species of Upper Drava, the greyling, just as of a typical inhabitant in the past, hucho hucho.

Furthermore, hydrological stress, which affects the ecological situation, arises downstream the village of Sachsenburg because of the intensive hydropower utilization. This is mainly due to hydro peaking and discontinuations of the river system by large river power stations.

Analysis in the course of the implementation of the WFD have shown that in the whole Drava basin about 70% of water bodies are in danger not to reach the environmental goal.

Examples of sustainable activities and measures in river basin management

The situation described in the beginning forced the Carinthian water management authority already in the early 1990ies to think about counter strategies. In the frame of a stream care plan in the year 1991 a catalogue of measures to reduce the bed degradation was elaborated. This catalogue was partially implemented within in the two LIFE projects ("Interconnection of Riparian Forests at Upper Drava", 1999-2003 and "Lifeline Upper Drava", 2006-2011). Basically counter measures consist of river widening, which is on the one hand able to reduce the bed degradation and on the other hand able to improve the ecological habitat inventory by initiating river morphologic processes.

But not only along the uninterrupted reach measures have been realised. Just as well along the hydro power influenced reach fish ladders were built. As a result of a monitoring program measures against bed degradation as well as measures for the improvement of the continuity have shown the ability to reach advancement in the purpose of the realisation of the WFD as well as of the FFH-Directive.

Sustainable activities and measures in river basin management planned for the future

For the future development in the catchment the implementation of the three relevant directives of the European Union, the WFD, the Flood Directive and the FFH-Directive are crucial. The results of past LIFE projects and national investigations have shown that the chosen way is able to achieve the target of the directives. Hence it is foreseen to implement further river widening at river Drava in the frame of the national stream management plan, and to implement the installation of several fish ladders.

Conclusions and Outlook

The measures at Upper Drava, which have been implemented within LIFE projects in recent years demonstrated that it is possible to combine the goals of flood protection, nature protection an river ecology in accordance with a sustainable hydro power utilisation. Conducted measures have shown an improvement of flood protection, an improvement of the utilisation of retention areas, an increase of morphologic processes, an increase of aquatic habitats and habitats in riparian forests and collateral river structures.

Additionally it is possible to enhance the recreational use and the touristic activities in this region.

Are the state and the trends on the Drava river basin promising, are the challenges and opportunities for sustainable development manageable, are we prepared to cooperate in the frame of the entire Drava river basin?

The Drava River is the most important river based on the discharges leaving Slovenia. To those discharges attached aquatic and riparian biotope, energy potential and available discharges, as well as the associated hazards and risks have marked all human activities on and around the Drava River. The use and exploitation water potentials have caused that the Drava River is a strongly changed watercourse today, while its aquatic and riparian zones are stressed by numerous contradictions between natural conditions, people's needs and development challenges.

The state and trend review on the Drava river basin has to be performed first of all for closed subsystems and afterwards for the whole river basin. In Slovenia it is necessary to analyse the current state and the trends separately for the river sections of the hydropower plants with its surrounding floodplains, afterwards the dependencies between the deviation and the natural channel of the Drava River, as well as the Ptuj and Ormož lakes, the Drava tributaries and its groundwater. The features of the described sections, the anthropogenic interventions to them and the pursued objectives are bringing up a lot of new challenges (problems?) and also opportunities – opportunities for harmonious, sustainable development.

Several processes are characteristic for the river basin, which require continuous analysis along the Drava River. All the processes are important and many of them are already supported by EU Directives. The management framework is given by the Water Framework Directive, which is constantly upgraded with new regulations. Continuous management of water quantities along the whole river is supported by the Flood Directive, while the management of key infrastructure for human survival is governed by the Critical Infrastructure Directive (e.g. water supply system). The good status of aquatic and riparian environment and continued movement of live organisms is regulated by the Habitats Directive, etc. The common message is that human desire: sustainable development should enable people to live in the very best environment, with manageable risks of natural disasters.

The presented objectives are so diverse, that in the past individual objectives were dealt with in favour to the common objectives. Later on multipurpose projects appeared which were combining several of the mentioned objectives, but with different weights. The initiative to prepare a integrated image of the Drava river basin has to be understood in the sense to cover all integration processes of humans within the Drava water potentials, and joining the diverse objectives and requirements of states on and along the river basin, throughout the national boundaries.

The bases are good – for several decades a good bilateral cooperation exists across national boundaries, and Maribor hosted some conferences on the Drava River. The common European area that will be soon widened by Croatia opens new opportunities. It is possible to upgrade the freedom of movement of people, goods and services with a common view on the status objective of the Drava river basin, for achieving agreement with regard to different objectives, thus differentiated like accordant. If we achieve free movement of good ideas, best practice and an orientation towards cooperation such a vision will originate.

A short overview of the past tells us that on the Drava river basin several of the mentioned objectives have been already followed. Flood protection planning, improving agricultural production, energy supply etc. had significant changed the Drava river and its river basin. The consequences of the changed runoff regimes are observable on the morphology of the Drava river bed, where we face an intensified overgrowing of bars, increased vegetation is reflecting in decrease of stream cross-sections in time of floods and an increasing side and depth erosion, increasing threat for local land use increases human exposure to their property, fauna and flora. A simplified representation of the cause and effect cycle shows that the highest hazards for water and water environments is appearing at times, when there is no appropriate, technical supported answer available for the request of using water potentials or for protection calls to control water hazard.

To elaborate the „Drava Image“ or appropriate management of its river basin, numerous challenges are waiting – therefore challenges, because problem solving for most of the people is a challenge, either professional or personal.

And challenges are unavoidable in determining the „Drava image“. In the beginning of this paper we stated that Drava is a very important river for Slovenia, because of its natural conditions. Its water quantities, cooling and transporting possibilities, biological variety of aquatic and riparian environments are seen by many stakeholders as an opportunity and challenge for their activities. While assuring the public interest a business initiative is welcome, because it adds positive initiatives to a good economic environment and also to other segments, as well as contrariwise, in periods of water deficit it also affects the environment.

Besides objectives to protect the aquatic and riparian environment as well as objectives to reduce water risks (drought, floods, erosion etc.), it will be necessary to monitor also objectives of other branches, land users and human settlement. It will be necessary to estimate the state of threats for today, and likewise for most probable scenarios of climate change. It will be necessary to estimate the extent of acceptable developments in the field of renewable energy sources, how much water could be assigned for food, for preservation of habitats in protected areas, for ecological diversity and other activities.

The Drava River is not only its riverbed and riparian zone – Drava river basin is a lot more. The proposal for preparing the „Drava Image“ is a comprehensive approach of harmonizing objectives from different fields, which are interrelated by the waters of Drava, its tributaries and groundwater.

Human activities as well as dealing with water, wastes, fauna and flora are reflected in our river. Waters of the Drava river basin tell us a lot about the inhabitants on the river basin – Drava is our mirror.

The elaboration of the „Drava Image“, achieving milestones and continuous monitoring of its state, i.e. how far are we form the final „Image“, is a long-term process. It is not about reaching a goal; it is about the way to reach it. On this way we need all strength: everybody, who cares about the Drava river basin, material resources, as well as the understanding of the „Image“ and the support to reach it, e.g. from the inhabitants of the river basin as well as the broader social environment.

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Dr. Mitja Bricelj

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Importance of sustainable river basin management in transboundary context

For more information and further presentations see: www.life.drau.at

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Approach to the management of Drava river flood plain between 0+176 river kilometer for the sustainable flood defence and wetland restoration



Historical overview of the development of Drava flood plain

The analysis included geomorphological changes of Drava river bed and flood plain, overview of old maps and longitudinal profiles, existing conditions of the flood plain and expected changes of the flood plain according to the future plans for building two hydroelectric power plants on this river stretch.

Main findings of the analysis are morphological changes of observed river section without anthropogenic influence till the end of 18th century, length of the most downstream river branch was reduced by almost 100 kilometers during 19th century with regulations works, Drava river also on this stretch was most regulated river in Europe in the past – navigable up to Mura's river mouth and intensive regulation works, excavation of gravel and sand from river bed and building of dykes during 20th century.

Results of the analysis – significant changes of the flood plain were observed: 259 km of dykes was build (mostly prevention from flooding 100 years return period) - reduction of flood plain for 47480 acres (before the dyke construction flooded area was 69400 acres– mainly forest and arable land) and between the river bed and dykes today still remain 17230 acres of flood plain which is covered by forest with 63 % – cause: reduction of areas with water bodies and grasslands).

Analysis of possible measures for efficient flood protection

Taking into account results of previous analysis in the next step of study the transportation capability of extreme flood waves is investigated and efficiency of existing flood protection system. For that purpose the preliminary modeling of observed river stretch is carried out applying HEC RAS model for stationary flow state – calculation of water levels for discharges with different return periods of occurrence. Results by model calibration and verification such as flood plains have much larger coefficient of roughness than expected, causing the reduction of transport capacity of the river in case of occurrence of extreme flood waves and most threatened river section from the aspect of flooding is section downstream of Belisce up to the city of Osijek (52-24 rkm) where existing dykes (constructed for 100 years flood) potentially can not prevent from flood with occurrence of 25 years return period.

Conclusions are increased risk from flooding on the most downstream stretch of the river (reduced possibility for the mitigation of flood waves in upstream and middle part of Drava river – constructed dams, loss of previous floodplains – existing dykes; present state of flood plain on the observed section of the Drava river), proposed measures: enforcement of existing dykes, increase of grassland areas downstream of 77 river kilometre, eventually opening of new retention areas along the river stretch – expensive solutions) and all measures could be applied until the construction of two dams - multipurpose hydro system on observed river stretch (according to State space plan 31+200 and 74+000 rkm VHS Osijek, 85+200 and 159+000 VHS D. Miholjac) as a final prevention from flooding.

Restoration of wetlands in Drava flood plains

The analysis includes overview of existing and “lost” water bodies, identification of possible wetlands for restoration in order to establish “new” valuable wet habitats, proposal of measures and activities for the restoration of sites with high ecological potential in the river bed, in existing and former flood plain and measures and activities for the protection and improvement of overall ecological status of Drava flood plain after the construction of two planned dams on analysed stretch of Drava river.

Abundance of wet habitats in different levels of succession with significant biodiversity despite antropogenic influence during the last 200 years – can be explained by presence of dynamic processes which secure the sustainability of ecological river ecosystem (picture commentary).

Results of the analysis are present overall state of the flood plain besides negative influence on the flood wave transportation capability is also not acceptable from the bio-ecological aspects – replacement of wet habitats by forested areas, in the most of existing wetlands hypertrophic conditions are observed because of large primary organic production – raising of bottom of water bodies and priorities for restoration of valuable wet habitats are chosen according to their bio-ecological characteristics in order to preserve existing biodiversity on analysed river reach.

Proposed measures in the Drava river bed are restoration of 8 old river branches by removal or lowering artificial barriers between old and active river bed – entrance of fresh water in order to prevent further forestation and protection of high river banks.

Proposed measures in the existing flood plain are restoration of 9 old river branches by fresh water intake together with controlled removal of high water vegetation and restoration of 7 swamps also by fresh water intake together with controlled removal of high water vegetation. Proposed measures in the former flood plain are water intake on 4 locations for the wetland restoration and restoration of forest on 9 locations and reestablishment of grassland on 3 locations.

Conclusions

The results of preliminary analysis show that present state of Drava flood plain reduce transport capability for extreme flood waves and emphasise need for restoration of wetlands along the most downstream part of the Drava river (further development of the model for unstationary flow state). The analysis of existing bio-ecological values of the Drava river and its flood plain shown that this river stretch belongs to the most preserved river ecosystem in Europe thanks to good water management practice and the presence of dynamic processes such as sediment transport and deposition, erosion of river banks, meandering and periodically flooding of inundation. Proposed measures and activities for restoration of wet habitats will lead to the further protection and improvement of biodiversity. Concerning future plans for multipurpose use of this Drava river stretch, the sustainability principle should be applied in order to preserve and improve existing natural values of the area.

Conventions are multilateral treaties, adopted by international bodies, e.g. the United Nations, the European Restoration of Szaporca Oxbow System

András Tálos

South-Transdanubian Environment Protection and Water Management Directorate Pécs - Hungary

The Hungarian South-Transdanubian Environment Protection and Water Management Directorate's (www.ddkovizig.hu) management area has its range of Drava and Danube rivers and the southern shore of Lake Balaton. The Directorate is located in the City of Pécs. The management area (10.000 km²) has two whole counties: Somogy County and Baranya County and three sub region in Tolna County. The Directorate profiles are: river basin management and monitoring, floodplain management, maintaining rivers, lakes, and dikes, flood protection, implementation of the Water Framework Directive (WFD), hydrological monitoring, regional charges with public water utilities and waste water, ship navigation assignment and so on.

An enormous number of oxbow lakes can be found alongside Drava River of the Hungarian side. Due to lack of water replenishment the sedimentation has far-gone in these oxbow lakes mostly all of them have silted up and are therefore are non-utilizable. More than 20 oxbow lakes can be found in the region in most of them are situated in the management area of the Directorate and the Duna-Drava National Park and some are in the Natura 2000 Network.

All of the oxbows along the Drava should be investigated for utilization since the degradation and the sedimentation has become significant. However, the Directorate would like to focus on only one oxbow system. Because of its facilities a complex development and near-natural utilize of it can be achieved. An INTERREG project under evaluation would be implemented on this particular section of Drava River: at the confluence of Fekete-víz River and the Drava. This oxbow lake is called the Szaporca Oxbow System and contains four oxbow lakes. Moreover, through the quality and capacity increased water source a near-natural land management could be realized.

The Szaporca Oxbow System is a Ramsar area as well. The Oxbow System has its connection to the main river bad through a small sluice only during high water levels. However, due to the river bed deepening and changing in water flow high water levels are infrequent. This is why this oxbow has silted up, too. The valuable habitat for fish and migratory birds has become degraded. The open water surface has become smaller and smaller during the past few decades. The water replenishment of this oxbow system can be solved through the Fekete-víz River and through the Drava River as well. The water replenishment can be arranged by gravity through the Fekete-víz River, where no pump station is needed. The implementation of developments (building small canals, some dikes and a small dam) can contribute to the near-natural land use and the flood-protection of the area and can be a quality water source of other activities (e.g. eco-tourism, recreation, and fishing) or functions (e.g. agricultural functions). Because of these features the results of the project will be sustainable. This area used to have a lot more wetland. All the oxbows, small rivers and wetlands have degraded during the last 150 years. The implementation of this project would ameliorate the bad status of the area and could be a good example for best practice of utilization silted up oxbows.

In Hungary, we can find the least developed regions along the River Drava but these regions are in possession of inestimable natural values, such as oxbow lakes. When we survey oxbow lakes to be utilized and the ways of utilization, we can reveal and develop methods to use these natural valuable natural sites. Any development would play an important role in the life of the neighbouring settlements. The restoration of oxbow system would affect positively several aspect of life: natural conservation, biodiversity, natural values, flood-protection, economy, eco-tourism, labour market, and population-retain accomplishment of the area and so on.

The target area is one of the least developed regions in Hungary – with a score of hamlets alongside the Drava River. The causes of lack of development are mainly due to labour market conditions, social, economic and other problems. In general, the household incomes are very low, and the labour pool consists of semi-qualified individuals or there is structural unemployment – causing general hardship. However, nature holds a vast source of opportunities. There are pastures, meadows, forests and wetlands in great abundance. The presence of oxbow lakes adds to the distinctiveness of the area and it proves the former significance of water bodies.

Nature is mostly intact due to the low level of industrialization. Eco-tourism (cycling, hiking, fishing, and recreation) is expected to play an important role in the development of these small settlements along the Drava River. A range of restored and hence utilized oxbows would help increase tourism that could also contribute to the improvement of the quality of life in this less developed region. Dispersing of near-natural agricultural production is another important aspect, as it would help people of the region to make a living. It could be ensured that all the developments are in line with the needs of the natural environment. When this project is implemented, it would support citizens living in this undeveloped area. The target groups are those who are involved or concerned with the restoration of the oxbow lakes (such as consultants, local government, municipalities, civil community, tourists and so on). In addition, we could account for the citizens who would use the services that would appear as having been prompted by the restoration of the oxbow lake. Therefore, we may account for citizens of the villages along the River Drava as indirect beneficiaries of the interventions. Yet, inhabitants of the region may be regarded as beneficiaries since as well, since the population-retain accomplishment of the area may increase by the restoration of oxbows.

he target area has many ecological values: first of all the oxbow lakes themselves, resident and migratory birds. However the biodiversity of flora and fauna is needed to be cultivated. The development of Szaporca Oxbow System (canals, dikes, dam) could assist to the better and more safety flood-protection along the Drava River beyond the quality water source supported near-nature land use.

The restoration of oxbow lake could mean a heavy blandishment for the Hungarian side of Drava River because of the abovementioned integral envisaged developments.



ABSTRACTS

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Status and future perspectives of the Drava River Basin



The upper and lower parts of the Drava and Mura Rivers are to a large extent still free-flowing. The middle parts are impounded due to a chain of about 50 hydropower dams. EU environmental legislation - in particular the Water Framework Directive and the Habitats and Birds Directives - provides a common basis for the five Drava basin countries Austria, Croatia, Hungary, Italy and Slovenia for the protection and ecological management of the rivers.

The management of the free-flowing stretches is challenging both nature conservation and water management, and their management is a benchmark for the effective implementation of EU environmental legislation in the region.

However, to date the management of the free-flowing stretches and riverine areas differs from country to country. Though most of the ecological valuable stretches are part (A, H, SI) or are planned to be part (HR) of the Natura 2000 network, the current management of the rivers is quite contradictory: Whereas river restoration projects have been implemented along the upper and middle stretches (A, SI), ongoing river regulation activities and hydropower dams (new embankments, sediment extraction, hydro-peaking) are considerably impacting the lower stretches (HR, H).

Upper and middle stretches (A, SI):

River restoration - Benefits for nature conservation and water management

Today, problems in river ecosystems for both nature conservation and water management have basically the same origin: a high degree of engineering of the natural water courses of the rivers. The enormous decline of freshwater biodiversity has challenged nature conservationists. At the same time the deterioration of natural flood retention capacity, the river bed deepening and the fall of groundwater tables has caused a paradigm shift in the Water Management Authorities. For the sake of both, conservation of valuable habitats, species and sustainable water management, numerous projects were or are already implemented on several rivers in Europe. Good examples with the aim of restoring the natural river dynamic processes can be found on the rivers Drava and Mura in Austria and Slovenia. Further examples encompass the rivers Lech, Danube and Pielach in Austria or the Loire-Allier river system in France.

River restoration in the Drava River Basin

To date six large river restoration projects have been implemented in the Drava River Basin. They have been mainly aimed at restoring the river dynamics by widening the river bed and reconnecting the former side-arm systems. Benefits encompass stopping of river bed deepening, improving natural flood protection and maintaining and restoring characteristic habitats and species populations. Around 20 Million Euros have been allocated in total including EU funds for work related to river restoration. Two projects have been funded under Interreg IIa and IIa (border Mura between Austria and Slovenia), the others under LIFE Nature (upper Mura and Drava I + II in Austria, inner Mura in Slovenia).

Examples of ongoing river restoration in the Drava River Basin:

- LIFE Project „Upper Drava I“ Austria (1999 – 2003): www.wasser.ktn.gv.at/life_drau/drau.html
- LIFE Project „Upper Drava II“ Austria (2006 – 2010): www.life-drau.at
- LIFE Project „Upper Mura“ Austria (2003 – 2007): www.murerleben.at
- LIFE Project „Inner Mura“ Slovenia (2006 – 2011): www.biomura.si/ang/projekt.aspx

Lower stretches (H, HR):

Spanning Austria, Croatia, Hungary, Serbia and Slovenia, the lower courses of the Drava and Mura Rivers are among Europe's most ecologically important riverine areas.

Once „protected“ under the „Iron Curtain“ during the Cold War, this trans-boundary river system (including related sections of the Danube River) now forms a 700 km long „green belt“ connecting more than 400,000 ha of highly valuable natural and cultural landscapes.

The area is a hot spot of natural habitats that are rare in Europe such as large floodplain forests, river islands, gravel banks and oxbows. It is home to the highest density of White-tailed Eagles in the Danube River Basin and hosts endangered species such as Little Tern, Otter and Sturgeons. Moreover, the river ecosystem is the major source for good water quality, for natural flood protection and fisheries as well as an important area for recreation.

Over 40 protected areas along the rivers underline their ecological values. Most recently Croatia has declared about 145,000 ha of the Danube, Drava and Mura area as a future Regional Park.

However, the riverine landscape has seen many changes and human impacts. Channelling of the natural river courses, extraction of gravel and sand from the riverbed and hydropower dams are having a major impact on its ecological integrity, biodiversity values and natural resources.

In order to better preserve the trans-boundary ecosystem over the long term, innovative conservation and management efforts are needed.

The protection of the area as a Trans-Boundary UNESCO Biosphere Reserve „Danube-Drava-Mura“ (TBR „DDM“) is one of Europe's most ambitious and exciting nature conservation projects, covering an overall area



**Drava-Mura confluence
between Croatia and Hungary:**
A European natural treasure
(Dubravko Lesar)

of more than 400,000 ha and spanning current and future EU members. The plan for a TBR is already highly developed in Croatia and Hungary.

Once established it will be Europe's largest single river protected area, providing a strong framework for protection and ecological management of the area's unique natural values and forming a catalyst for sustainable development in the region.

The central management goal of a TBR should be to halt any further degradation of the riverine landscape and to begin the improvement of the natural river dynamics. This should be achieved through implementing a trans-boundary „River Restoration Programme“ (RRP) for the Lower Drava and Mura.

Passive management measures are proposed which will prevent further damage to the river landscape. Important steps in achieving this include to ban further river regulation and sediment extraction activities as well as to prevent further impacts from hydropower dams.

Active restoration measures should include the removal of river training structures in order to promote the self-restoration processes of the rivers.

River restoration and ecological river management have the benefit of promoting and improving:

- habitats and species populations
- flood protection
- groundwater conditions
- drinking water
- water quality
- fish populations
- sustainable forestry
- eco-tourism and recreation.

River restoration and ecological river management also are essential steps necessary for achieving compliance with the requirements of the EU Water Framework Directive, Flood Directive and Habitats and Birds Directives.

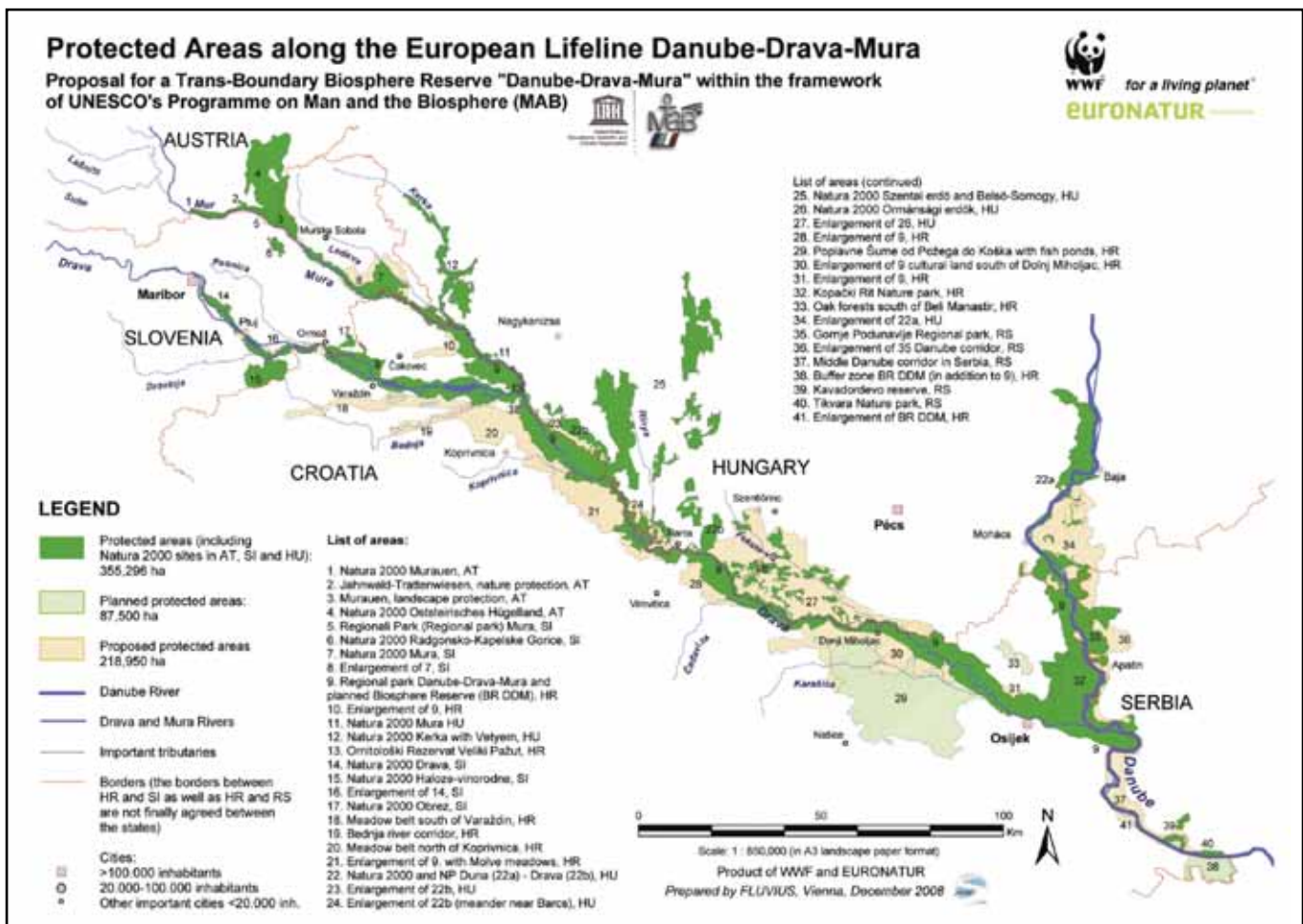


New Drava Vision Brochure:

„Lifeline Drava-Mura 2009 - 2020.
A Plan for Conserving and Restoring the
Drava and Mura Rivers for Nature and
People“, Vienna 2008.

Download under:
www.sterna-albifrons.net

Proposed Trans-Boundary UNESCO Biosphere Reserve „Danube-Drava- Mura“ (WWF/EuroNatur)



ABSTRACTS

Dr. Reinhold Turk

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Natura 2000 obligations and their implementation in the Drava River Basin, including a European overview



In order to preserve the biodiversity within the range of the EU, two nature conservation directives need to be implemented by the member states, the „Birds Directive“ (79/409/EEC) and the Habitats Directive (92/43/EEC).

EU-Member states are obliged to designate sites under the NATURA 2000 network as stipulated in the Habitats Directive. These sites are called NATURA 2000 sites or Special Areas of Conservation (SAC). They consist of Sites of Community Interest proposed under the Habitats Directive and of Special Protection Areas (SPA) designated under the Birds Directive. They are home to significant occurrences of habitats and species listed in Annexes I and II of the Habitats Directive and Annex I of the Birds Directive.

Once the sites are part of the NATURA 2000 network, member states have to put measures into place in order to maintain and restore the favourable conservation status of the sites and, where necessary, with the help of management plans.

Rivers, streams and associated wetlands are central to a significant number of NATURA 2000 sites, as a large number of listed habitats and species depend on these particular ecosystems.

In Styria, out of 41 NATURA 2000 sites, 17 feature rivers or streams, 6 of which lie within the Drava River catchment area.

This presentation focuses on the general obligations EU member states face when implementing NATURA 2000. Two Styrian sites within the Drava River catchment area are chosen to highlight examples of management activities in these sites as well as the difficulties encountered during the establishment of such a site.

In one site, the upper reaches of the River Mura, a number of significant river restoration activities, such as the removal of artificial bank fortifications and the recreation of smaller river branches, were carried out with the help of a LIFE III – Project. Furthermore management plans for the remnants of riverine forest, amphibians and fishes were developed. One very significant action was the building of a migration aid for the Danube Salmon to bypass a hydro-electric power station in the town of Murau.

By showing the example of the NATURA 2000 site „Steirische Grenzmur mit Gamlitzbach und Gnasbach“ the slow and at times very sensitive process of site designation and delimitation is demonstrated, highlighting the necessity of co-operation between administration and stakeholders. This site lies directly on the Austrian border with Slovenia, with the middle of the River Mura forming the actual national border.

An INTERREG IIIa – Project made it possible to finance massive river restoration works at various locations along the whole stretch of the site. Furthermore, existing, but no longer functioning backwaters have been restored and new habitats for amphibians and fishes created. Another product of the INTERREG IIIa Project is an integrated Management Plan for the entire site, taking into consideration the needs of land owners and other stakeholders, with particular focus on land management, ground water management, flood water management spatial development and tourism.



Dr. Gordana Beltram,

Ministry of Environment and
Spatial Planning, Slovenia,
chairwoman of session 1 on day 2

Finally, a look at future activities points at the necessity for ongoing implementation of the management plan and the need for co-operation between the countries and regions sharing the Drava River Basin.

Management of Drava River in the Frame of Natura 2000

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Director, Institute of the Republic of Slovenia
for Nature Conservation

Simona Kaligarič

Institute of the Republic of Slovenia for
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Slovenia adopted three European directives into Slovenian legislation:

- Birds Directive (Council Directive 79/409/EC of 2 April 1979 on the conservation of the wild birds)
- Habitats Directive (Council Directive 92/43/EEC of 21 May 1992 on the conservation of natural habitats and of wild fauna and flora)
- Water framework directive (Directive 2000/60/EC of the European Parliament and of the Council of 23 October 2000 establishing a framework for Community action in the field of water policy)

They bring stronger national nature protection legislation due to new "EU" demands, designation of Species and habitats of Community importance and designation of SPAs and pSCIs. Additionally assessment of all plans and projects that could have significant effect on site's conservation objectives needs to be done.

According to Article 6 of Habitat directive Member States shall establish the appropriate management plans specifically designed for the sites or integrated into other development plans.

This is also appointed in Article 33 of Nature conservation act (ZON – Zakon o ohranjanju narave).

Institute of the Republic of Slovenia for Nature Conservation carried out LIFE project "*Natura 2000 in Slovenia – management models and information system*". Project activities were opportunity for solving problems between different sectors (nature conservation, forestry, water management, agriculture). Workshops were organized for management plans preparation and were proved useful. Response from participant was very positive.

Workshops in this project were also part of the background for preparation of *Natura 2000 site management program*.

The operational program designates protection objectives and measures at Natura sites, as well as the competent sectors and responsible implementers of these protection measures. A further goal in this respect is to enable horizontal links with strategic plans and development programs.

Institute of the Republic of Slovenia for Nature Conservation on the principle of participation with experts from other sectors prepare Nature Conservation guidelines. On the basis of these guidelines sectors prepare Sectoral management plans (e.g. River basin management plans).

Natura 2000 area Drava is an example of complex area, where different management sectors are taking an active role. The conservational value is a consequence of traditional agricultural land-use, riparian forests and different water habitats, are present on the area.

In the frame of PHARE project »Sustainable management of the Drava river area«, completed in 2006, a model of cooperation between different management sectors, essential for nature conservation, was proposed. In the extensive project lead by Maribor Development Agency, 23 partners were involved. Special aim was to achieve to preserve favourable condition of the Natura area through appropriate sector plans, especially spatial planning, agriculture programs and forest management plans. Spatial data, including the hydrology and hydro morphology base were obtained; they enable precise definition of proper measures for reaching the conservational targets within the Natura 2000 area. A draft management plan was prepared as a result of reconciliation between different involved sectors



ABSTRACTS

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National ecological network and Natura 2000 in Croatia along rivers Mura and Drava



Introduction

Rivers Mura and Drava are extremely important for conservation of biodiversity in Croatia and on the European level. These water courses together with surrounding wetland areas are among the best preserved in Central Europe while River Danube at its confluence with Drava delimits flood area of Kopački rit which is also a RAMSAR site.

Still active hydro morphologic processes such as meandering, flooding and creation and destruction of banks are the key for the rich biodiversity on these rivers. For this reason modern approach in river management should not aim to stabilise the river flow but permit its free lateral movement in the inundation area while in the same time ensuring through appropriate sets of measures and planning adequate protection from harmful effects of water and safety of human lives, settlements and property.

Sediment extraction is also one of the threats to biodiversity of this rivers which is already deprived of sediments due to the upstream dams, especially since such activities directly affect important habitats like gravel bars.

Biodiversity

Threatened habitats such as alluvial forests, wet grasslands, gravel and sand bars, islands, steep banks, oxbow lakes, stagnant backwater, abandoned riverbeds and meanderings are still present on these rivers and their flood plains. The wider area along the rivers makes a mixture of 77 habitat types, 35 of them being rare and endangered and protected under the Croatian Nature Protection Act.

This is also distribution area of threatened and protected bird species such as Pygmy Cormorant (*Phalacrocorax pygmaeus*), Willow Warbler (*Phylloscopus trochilus*), White-tailed Eagle (*Haliaeetus albicilla*), Little Tern (*Sterna albifrons*), Common Tern (*Sterna hirundo*) Common Sandpiper (*Actitis hypoleucos*), Little Ringed Plover (*Charadrius dubius*), Black-winged Stilt (*Himantopus himantopus*), Bittern (*Botaurus stellaris*), Purple Heron (*Ardea purpurea*), Great White Egret (*Egretta alba*), Black Stork (*Ciconia nigra*), Great Cormorant (*Phalacrocorax carbo*), White Stork (*Ciconia ciconia*) and other. Gravel banks of Mura and Drava are especially important for nesting of remaining populations of Small Tern and Little Ringed Plover. Steep river banks are nesting place of tens of thousands of Sand Martins (*Riparia riparia*).

In the rivers Drava and Mura 65 fish species and five endemics of Danube catchment area have been found: Huchen (*Hucho hucho*), Danubian Roach (*Rutilus pigus*), Balon's Ruffe (*Gymnocephalus baloni*), Schraetzer (*Gymnocephalus schraetzer*) and Streber (*Zingel streber*). 19 of them are in the Red Book of Freshwater Fish of Croatia like: Ziege (*Pelecus cultratus*), Asp (*Aspius aspius*), Weather Loach (*Misgurnus fossilis*) and European Mudminnow (*Umbra krameri*).

Among the amphibians, 2 regional amphibian endemics should be emphasised – the Danube Crested Newt (*Triturus cristatus/ dobrogicus*) and the Pannonian Moor Frog (*Rana arvalis wolterstorfi*). Potentially threatened species of wetland and water habitats such as the European Pond Terrapin (*Emys orbicularis*), the Fire – bellied Toad (*Bombina bombina*) and Tree Frog (*Hyla arborea*) are also present.

The area is important as a favorable habitat for dragonflies (Odonata). Only in the area of the upper flow of river Drava qualitative content of fauna makes 60% of the total number of dragonfly species recorded in Croatia.

Among wetland plants that are threatened or rare on the European level following are particularly important: Siberian Iris (*Iris sibirica*), Arrowhead (*Sagittaria sagittifolia*), Water Soldier (*Stratiotes aloides*), Flowering Rush (*Butomus umbellatus*), Water-Meal (*Wolffia arrhiza*), Water Chestnut (*Trapa natans*) and others. Critically endangered species in Croatia that grows on river bars is False Tamarisk (*Myricaria germanica*).

National Ecological Network

Ecological Network of the Republic of Croatia was designated by the Decree of Croatian government in the year 2007. It is regulated by the Croatian Nature Protection Act of 2005 and implements majority of provisions of the EU birds and habitat directives in the Croatian legislation. Decree on the national ecological network was followed by the Rule Book on the Nature impact assessment which introduced the procedure of appropriate assessment in accordance with Article 6 (3,4) for the National Ecological Network sites

Activities to create national ecological network in Croatia started in the year 2000 and they were supported by national funding and strong contribution of European funds. The activities started with PEEN and Emerald projects. Project CRO-NEN (2003-2005) funded by EU LIFE program is in this context the landmark since its result was the first draft of the National Ecological Network (NEN). From the year 2005 to 2006 a revision of NEN on the basis of new collected data was performed. Emerald II project created a database of potential Natura2000 sites. A PHARE project „Implementation of Natura 2000“ in Croatia started in 2008. In this project the Croatian Natura 2000 expert proposal is going to be finalised through expert work and extensive consultation process which will include all stakeholders.

The National Ecological Network (NEN) is comprised of areas important for conservation and/or establishment of favorable status of wild taxa and habitat types threatened on national or international level. It is comprised of internationally important ornithological sites and sites important for other wild taxa and habitats. The taxa include internationally threatened taxa and habitat types listed on Annexes of BD and HD as well as nationally threatened taxa and habitat types listed on Croatian Red List or in the Ordinance on habitat types. NEN also

includes speleological objects (including marine caves). All NEN sites have defined conservation objectives and protection guidelines. NEN sites of international importance are potential Natura 2000 sites.

Flow of Drava in Croatia, is completely contained by the 4 large internationally important ornithological sites of the national ecological network. (Drava Accumulations, Upper flow of Drava, Middle flow of Drava, Area along the Danube and Lower Flow of Drava) Complete flows of the rivers Mura and Drava are within the important sites for wild taxa and habitat types of National Ecological Network and the total of more than 50 NEN sites of various sizes are on these rivers or in their vicinity.

Conclusion

Besides National ecological network rivers Mura and Drava are under the preventive protection in Croatia as a regional park and the area has also been proposed for protection as a UNESCO Biosphere Reserve. The human impacts present a significant threat to preservation of their biodiversity and cooperation between sectors especially water management and nature protection is essential for the bright future of this beautiful rivers and its nature.

Implementation of WFD and sustainable electricity production - tasks, challenges and experiences in Drava River Basin

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General

VERBUND Austrian Hydro Power (AHP) is Austria's largest producer of electrical energy. Actually AHP operates 90 hydro power plants with an 6023 MW installed capacity and 22.774 GWh/a annual average generation (equal to 40% of Austria's electricity consumption).

In the Austrian part of Drava river basin, AHP operates a system of storage power plants in the alpine areas and a cascade of 10 run off river plants on river Drava itself. Development of the power stations starts during world war II and was finished in year 1988.

Actual challenges for hydro power

Since 1990 the general framework for hydro power has changed significantly. On the one hand in the field of energy policy especially the liberalization of Energy Markets and the discussion regarding climate change (Kyoto protocol). An additional problem is the increasing dependency on energy sources from outside Europe. There the use of renewable power becomes an more and more important task.

On the other hand, environmental targets become more and more important, stated in the Water Framework Directive (WFD), FFH Directive or Bird Directive (NATURA 2000). Especially the implementation of the WFD leads to new challenges for hydro power. There are three fields of potential conflict:

- river continuum, lateral and transversal
 - Investment Costs for fish passes and ecological structures
- Ecological Flow
 - Reduction of generation (Assumption for Austria app. 2 - 7 %)
- Hydro Peaking
 - Impacts on energy and grid management

Actual measures of AHP

Regarding the implementation of WFD, AHP actually carry out following measures in Drava river basin:

- Studies: the actual example is a study regarding Basin Management for the reservoirs on river Drava containing a status quo analysis, identification of problems and proposal for general mitigation measures (download of study see: www.verbund.at)
- Pilot projects like fish passes at Villach HPP or Spielfeld HPP
- For new investment projects in power infrastructure the main focus is actually on upgrading and optimization of existing facilities (e.g. PSP Reisseck II). For implementation of WFD from AHP's viewpoint development of balanced management plans with adequate integration of sustainable production of hydro power are essential.



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ABSTRACTS

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Masterplan for Hydropower in Austria



Hydropower is the most important renewable energy source for Austria. At present there are about 2.300 hydropower plants producing about 38 TWh per year. Additionally there are about 2.000 micro hydropowerplants exclusively serving private supply.

Due to various developments in the past years (liberalisation of the energy market, Kyoto protocol, renewables directive etc.), on the one hand there is an increasing pressure to extend electricity generation by hydropower. The government of Austria convened on aiming to increase electricity generation by hydropower by 7 TWh till 2020 in order to contribute to the targets set for renewable energy (Austria has to increase the share of renewables from 23% up to 34% in 2020 as proposed by the EC).

Because of the already existing intensive use of hydropower the ecological situation of Austrian rivers is already very seriously impacted as it was proved in the Impact and Pressure Analysis 2004/2007 performed in line with the provisions of article 5 of the EU water Framework Directive: Rivers are highly fragmented. More than 80% of the hydro power plants have no fish pass, the older ones not even providing an ecological minimum flow. A total length of more than 1.000 km (3,5% of entire river net) is impounded, totally changing the character of a free flowing river. 800 km are impacted by severe water level fluctuations due to hydroppeaking (that is 2,6% of the entire river net).

So on the other hand, restoration measures (fish passes, improving river morphology, restoration of ecological minimum flow,...) have to be put in place to achieve the objectives of the EU Water Framework Directive (good ecological status/ good ecological potential). It is not yet clear, to which extent the further development of hydropower production is in accordance with the objectives and requirements of the EU WFD.

The EC is aware of these partly contradictory directives and recommends pre-planning mechanisms, in which regions and municipalities allocate suitable and „no-go“ areas for the development of hydropower. First attempts for such planning instruments have already been developed by several federal countries of Austria (i.e. Lower Austria, Tyrol, Upper Austria and Styria). These federal tools partly have different focal points (nature conservation, water management, ...), legislative frames and results (maps or evaluation schemes).

So at present efforts are undertaken to develop basic information and criteria towards a national masterplan for hydropower. Ideally such a masterplan should be based on an independent evaluation of the technical resp. economical feasibility of the hydropower potential on the one hand and an assessment of the ecological sensitivity of the river stretches on the other hand. After superimposing these evaluations, a balance sheet resp. map with various combinations of economical feasibility and ecological sensitivity is obtained as a base for decisions on the future development of Austrian rivers.

As a first step on this way a set of criteria for the ecological assesment is developed on behalf of the Federal Ministry of Agriculture, Forestry, Environment and Water Management (whereas economical evaluations lie in the field of responsibility of the Ministry of Economics).

These criteria have to fulfill several requirements:

- to be in accordance with the ecological specifications of the WFD resp. Austrian Water Act
- to be harmonised with Austrias federal countries, thus gaining a national applicability
- no restrictions due to river size or type of power plant
- 3-stepped assessment, where the worst single criterion is decisive

The highest stage of ecological sensitivity is not to be misunderstood as

- a no-go-area
- an anticipation of the application of Art, 4 (7) WFD (or § 104a WRG),

Such a set of criteria has already been developed in cooperation with the ecological experts of the federal countries. These criteria can be grouped into

- „Invaluable“ attributes: Ecomorphological quality, supraregional sensitivity / rareness of river types, sensitivity depending on river size (special protection of small brooks), faunistic/floristic „specialties“ (e.g. freshwater pearl mussel), fish migration (special protection of estuaries)
- Pre-impacted sites: Impoundments, preservation of free-flowing river stretches, existing hydropower usage (water abstraction, hydroppeaking), water quality, thermal impact
- National/Federal interests of nature conservation (not included are regional aspects of nature conservation, as these lie in the responsibility of the various federal countries): International protection areas, i.e. National Parks, UNESCO Biosphere reserve, water-specific Natura2000 areas, RAMSAR
- Hydropower type: different impacts of storage or run-of-river power plants etc.; different efficiency (where smaller hydropower plants show a clear tendency for using up longer river stretches per units of electricity production)
- „Other criteria“: Reference/monitoring sites, „sponsored“ river stretches (e.g. LIFE-Projects or nature-orientated flood protection sites, where public funds are spent to improve the ecological status)

So the basis is laid for the development of a masterplan, which really would deserve its name. To reach this goal, a wider acceptance of these criteria has to be gained and the above-mentioned further steps – development of criteria and assessment from the economical point of view – still would have to be carried out.



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New possibilities for exploitation of hydro energy on the Drava River

For more information and further presentations see: www.life.drau.at

Sustainable planning of the multipurpose hydropower schemes

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Multipurpose hydropower schemes are natural and man-made systems that combine functions of water utilization, water protection and protection against water impact.

Planning multipurpose hydropower schemes includes:

- determining optimum degree of water resources management development in a region, including concept of water resources utilization, resolving conflict of interest of different stakeholders, creating alternative concepts, and selection of an optimum alternative which includes phased project construction,
- determining optimum capacities and sizes of the scheme elements,
- determining optimum scheme management, including long-term operational strategy and short-term operational management.

The multipurpose schemes function is a complex one, since they serve different users. They affect development and state of the environment, as well as the socio-economic relations, which has to be taken into account in evaluation of such schemes. Complex functions consequently result in opposing interests, thus the scheme optimization shall not be optimal for all stakeholders regarding either the scheme concept or its management. The optimization aims at reducing the contradictions to minimum, pursuant to the evaluation criteria.

Depending on how comprehensive the problem understanding is, how the objectives are set up, and what criteria are used, possible concepts and solutions are offered and their potential success elaborated. Selected technical concepts will not render solutions to the problem unless the actual problem has been pinpointed. Thus, the first three phases in the planning process are particularly important since they create a background for successful problem resolution. Comprehensive understanding of the problem results in full and comprehensive land use development planning within this type of projects.

Among the above general planning phases, the third phase is dedicated to determination of objectives, setting up of criteria and restrictions. This phase, combined with the previous two phases, is vital for success of concept implementation. In this phase, all the objectives are determined, and those future objectives that are still not clear envisaged. Knowledge needed for understanding of the problem ultimately affects involvement of larger multi-disciplinary teams and team members collaboration.

Selection of optimum solution is always related to a criterion used for selection of an optimum solution. Restrictions include all the conditions and requirements the system needs to meet in any phase. Generally, the restrictions are intended to narrow down the number of available solutions from which an optimum solution is selected.

Alternative concepts meeting the requirements need to be selected and detailed on the basis of set up objectives, conditions and restrictions. Any alternative concept needs to be determined:

- related costs
- value gained by concept implementation.

The costs include:

- the scheme construction and potential decommissioning costs after the lifetime of the scheme,
- operating and maintenance costs during the entire scheme lifetime, including the costs of the environmental monitoring, charges, and implementation of protection and remediation measures,
- external costs caused by the scheme construction and operation, which are non-measurable costs of the project impact on the community, environment and nature.

Thus, the setup objective is used to detail the scheme values. The scheme values could be either use values or non-use values. The use values are values which directly create benefits or prevent damage or which indirectly cause creation of benefits or create conditions in which benefits can be created. The use values are further divided into direct values, indirect values and possible values. Non-use value is the value of sheer existence and possibility of use of an entity, i.e. value of cultural and natural heritage.

Selection of a method to be used for quantification of the objective realization progress depends on an objective, namely on an activity pursued to achieve the considered objective. The method needs to be selected for evaluation of individual values. Methods used are divided into three groups:

- market approach method
- substitute market method
- market simulation method.

Alternatives are compared on the basis of social justification analysis of all set up alternatives. Here, the cost-benefit analysis is used for comparison of the project implementation costs and new values gained by its implementation. The basic indicator of social justification is net present value during the project lifetime. An alternative is justified when its total net value is positive, namely if the willingness to pay for (or to accept) the project is higher than the total final cost or rather than the total lost benefit. In addition to the net present value, indicators of social cost-efficiency include cost and benefit ratio and economic of return rates.

Multipurpose hydropower schemes are conceived and intended to resolve water-related demands and issues arising from the land use. In order to resolve these problems and meet the demands, activities are undertaken that ultimately affect the space and change it in order to meet those requirements and demands. Since any activity ultimately affects the space, water resources management within such schemes involves development plans for the region and should contribute to its future development. Namely, water resources management should be considered within a context of overall and comprehensive land use development approach.



Possible multipurpose hydropower scheme planning phases are:

- 1 Problem pinpointing
- 2 Available knowledge
- 3 Problem elaboration
- 4 State determination
- 5 State analysis
- 6 Preparing alternatives and optimisation
- 7 Concept development
- 8 Concept implementation
- 9 Problem resolving technique improvement

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Flood hazard, flood damage potential and residual risk on the Drava River Basin



Water is an essential condition for living and at the same time a source of different hazards. The human behavior and its adjustment to the natural processes have to be analyzed in the light of hazard assessment, their exposure and vulnerability, as well as the possibility of managing undertaken and residual risks.

Flood hazard is the common term for a set of threatening adverse or undesirable consequences of processes, which are related with discharges that exceeded the bankfull discharge of the water course and are spreading in the near-water environment. Since floods arise from a variety of causes, we will limit the discussion only to direct flooding from water courses. In those instances it is necessary to concurrently consider travel time of floods, erosion and sedimentation processes, debris transport and its effect on the water course conveyance, particularly at hydraulic structures on the water course, as well as pollution arising from floods, damaged engineering structures or other sources. In general flood hazard can be determined quite good, because the evaluated natural processes are known and there exists a good network of measurement stations. Furthermore there exists different methodologies, which are derive from different sources (for instance silence witnesses of floods) and which indirect determine the hazard level and the dimension, the primary and secondary hazard sources, as well as the main loads and initiated processes. The main approaches of flood protection were based on determining the event probability and the level of protection was chosen upon the chosen probability of occurrence. Therefore the individual types of human settlements, activities etc. had the same level of flood protection. Determination of the level, source, intensity and the occurrence probability of flood hazards demands reliable data, good evaluation methodologies and rational interpretation of processed results. However also at long-standing sets of discharge data, there is still an uncertainty in determining the level of protection, because of non-homogeneity or insufficiency of the aggregated data documentation. For example the natural cyclicalities of precipitation events have effects on the probability calculations of flood events, as well as the changed land use in a short time-frame, if it is sealing surface or accelerating the runoff (for example: highway construction demands asphaltting surfaces, which amount together one thousandth of the Slovenian territory). The river Drava, which to a large extent is already used for energy production, has a strongly modified runoff regime, which in turn modifies the water status and aquatic environment, both conditioned by the runoff conditions. Besides the natural dynamics of water, sediment and debris transport there are also important effects of operating individual hydropower plants, as well as the whole chain. Executing the basic principal of water storage at every step, requires the Drava vision to consider, how and where the Drava water could be stored at the river basin – for multifunctional use, recharging water biotopes, flood protection.

Men required water; therefore human settlements were built in their neighborhood, sometimes even to close. As a consequence he exposed himself, his property and his activities to flood hazards. In less developed nations also the flood damages were smaller, while in more connected social activities the damages were higher, because besides the direct damages also indirect damages have occurred (e.g. failure of industrial supply chains because of interrupted traffic connections). Because of those reasons the selection of the flood protection level is based upon the damage potential. This is determined for individual areas, which are affected by floods, as the expected flood damage at certain probabilities of flood events. To determine the expected damage, it is necessary to analyze the vulnerability of structures, the activities and the space at the flood prone areas. The difficulty in this approach is that in the same areas and at the same flood event it is not necessary that the damage for two types of structures will be the same. The mechanism of damage occurrence is dependent upon information at which water level and where water intrudes into the building, what type of building is flooded (water resistant building), what is the primary use or activity in the building, in a word, how flood damages raise based on the water level. Only the determination of the flood damage curve provides the determination of the damage potential.

In circumstances when it is necessary to analyze the economic effect of flood protection investments the cost-benefit method assesses the investment volume against the prevented flood damage, taken into account as the gained benefit. Therefore it is necessary to first evaluate the current damage potential (i.e. without interventions) and afterwards the reduction of the damage potential for the individual interventions. Because those calculations are applied in different countries, it would be good to compare this methodologies on the whole river basin of river Drava, which would enable to compare the cross-border influences of flood protection measures, a suchlike approach would help to compare the effect of retention measures in individual countries. The vision of the river Drava is unambiguously have to answer also the question, where and how to retain the men-made flood discharges or how to deliver retention areas as a response to climate change.

When man is confronted with hazard, he also evaluates risk – a part of this risk can be undertaken by protection equipment, protection measures and frequently by influencing the source of hazard. All anthropogenic measures have a limited reach; therefore the undertaken risk is always smaller than the whole risk. The difference, i.e. the residual risk, has a certain probability of occurrence; therefore it is not always necessary that it materializes itself. But whenever they materialize the expected consequences occurred. Organized societies usually determine the degree of allowed risks, i.e. the risk, which is still acceptable and in public interest – such as the construction order, which imposes the safety factors for construction. On cross-border water courses individual countries can have different degrees of undertaken risks, e.g. for safety freeboard of bridges above the design discharge.

The river Drava was, because of its importance, already regulated to a high degree of flood protection, so that the hydrologic, hydraulic as well as morphologic aspects were taken into account, which in turn influence the biosphere. However the development brings changes to numerous processes – on one hand the damage

potential rises, on the other hand extremes rises, i.e. the span between the base flow and flood discharges, because of the importance of renewable energy sources as well as the operation of the structures on the Drava. The Flood Directive brings opportunities to reevaluate the current concepts, their advantages, disadvantages, risks and available opportunities. In the vision of regulating the Drava river basin it is therefore necessary to present also the damage potential, the undertaken risk and inform about the excessive level of residual risk. This way it will be possible to inform all stakeholders with the current situation and the trends, while the discussion about the undertaken and residual risks should answer the question: Are we to courageous, when we are exposing ourselves to the forces of water?

Sustainable Flood Protection on the Drau River in Carinthia

In 2002 and 2005 heavy floods affected many regions of Austria, with severe consequences for people, settlements and industrial areas. At the Drau river the last severe floods occurred 1965/66 with recurrence intervals of more than 100 years. This presentation discusses essential parts of a sustainable flood protection on the Drau River in Carinthia/Austria.

Preservation and restoration of river floodplains for reducing floodrisk, Floodplain evaluation matrix FEM+

The main objectives of this part of the presentation is to identify and evaluate the hydromorphological contribution of still existing significant water retention in floodplain systems at the Upper Drau river. The interdisciplinary outcome of this part of the presentation is the Floodplain Evaluation Matrix FEM / FEM+, integrating technical, ecological and sociological aspects, developed in the Eranet CRUE project Pro_Floodplain (Habersack et al., 2008, www.pro-floodplain.eu).

Morphodynamics and river restoration as part of sustainable flood protection

At the Drau River problems with flood protection, river bed degradation (Habersack and Nachtnebel, 1998), and ecology have been appraised through an interdisciplinary project. Among the considered alternatives, those reducing transport capacity or shear stresses by widening the river channel have yielded positive results. Further measures of interest are those that increase bedload input either from tributaries or through side (lateral) erosion. Restoration measures (mainly river-bed widenings) have been realised during and after the project "stream care scheme Upper Drau" since 1991 and especially since 2001 within the EU LIFE project "Restoration of the wetland and riparian area at the Upper Drau River, 1999–2003" (currently about 10 of ca. 70km are restored); the latter has now been extended in a Life II project for another 3 years. At Kleblach/Lind a side channel was initiated along the left bank of the Drau River. In this project, river-bed width was doubled in the lower and upper part of the section (Habersack et al., 2003). The main goals were to: (i) stabilise the river bed by increasing the bed width, (ii) initiate natural morphological developments, (iii) initiate improved habitats for plants and animals, and (iv) improve flood protection. The monitoring of the restored river section shows that different aims can be reached concurrently: flood protection, riverbed stabilisation, along with valuable new habitats for endangered animals and plants (Formann et al., in press). As important boundary condition for successful restoration gravel mining in rivers is now generally forbidden in Austrian rivers.

Sediment transport as boundary condition

Bedload transport is a fundamental factor in determining the morphologic development of alluvial river reaches (also river bed widening) and thus affects flood risk propagation. Fluvial problems associated with sediment transport are related to a lack or surplus of bedload and/or to negative influences produced by anthropogenic interference with natural processes (Habersack et al., 2008). Integrated automatic bedload monitoring stations (geophones, traps, basket samplers, tracers) are installed at the Isel River and Upper Drau River and at the Drau River at Dellach in Carinthia, Austria. The technology is presented in the talk.

Conclusion

- Integrated floodrisk management covers total Drau river basin (see also WFD, FLOODS Directive)
- Sustainable flood protection on the Drau River is based on river basin management:
 - Floodplain management (preservation and restoration of floodplains) – non structural measures
 - Flood protection (ring dams, object protection...) - structural measures
 - River flow management (surge effects, residual flows...)
 - Morphodynamics and sediment management (river restoration, sediment input, transfer...)
- Scientific results:
 - Floodplain evaluation matrix FEM+
 - Self forming river restoration, monitoring and modelling
 - Automatic, integrated bedload and suspended sediment transport monitoring

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ABSTRACTS

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Flood protection experiences on the Drava River Basin in Croatia



The presentation consists of main characteristics of the Drava river basin in Croatia, historical overview of floods and description of flood protection system. Historical overview of flooding gives the deep insight of catastrophic episodes in 1926, 1965 and 1972.

Based on the analysis, it is concluded that construction of flood protection facilities gave a positive result. Evidence is that in the last 35 years, floods of larger scale were not recorded on the river basin despite the occurrence of less extreme flood waves (backwater effects of Danube River). As a result of intensive flood protection works nowadays we have totally 522 km of dykes (340 km along the Drava river), which protect around 145,000 hectares of urban, forestry and agricultural areas (approximately 16% of Drava and Danube river basin area) mostly with protection from flood of 100 years return period of occurrence.

Thanks to existing functioning flood protection system and thanks to timely taken flood protection measures, as well as professional approach in spirit of a hundred years old tradition in water management on this area, the situation as in 2006 on upstream part of Danube water basin was prevented.

In the future, we can expect reaching and exceeding the historical maximum water levels on Drava and Danube rivers. Therefore, further improvement of the flood protection system should be made.

In addition, it is necessary to finish remote flood alert system and further develop hydraulic and hydrological mathematical models for flood forecasting, as well as rising of public awareness about flood hazard since flooding is a natural phenomenon that can not be completely prevented.

KEYWORDS: historical water levels, flood, flood protection, dykes

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Environmental effects of industrial dredging on alluvial riverbeds



Regular bed-load measurements on the Hungarian reach were started at Barcs and at Drávaszabolcs in 1969, however, the data collection has been discontinued in 1983. This interruption was all the more unfortunate, because in 1982 and 1989 two run-of-river hydropower plants have been constructed on the Croatian reach of River Drava, upstream of the section dealt with in this presentation. Besides, in 1982, both countries started regular dredging activities in various parts of the river with the purpose of improving the conditions for navigation and/or obtaining construction material.

In 1998, the measurements have been resumed and two new measuring cross-sections were selected and established at Botovo/Ortilos (227.2 rkm) and at Novo Virje/Bélavár (198.4 rkm) supplementing the stations Barcs (152.7 rkm) and Donji Miholjac/Drávaszabolcs (77.7 rkm) (Figure 2). The length of the recently investigated reach of Drava River extends from Botovo to Drávaszabolcs (about 150 km).

The local District Environmental and Water Authority (Pécs) systematically sampled the bed material within the study reach of R. Drava between 1998 and 2000. The samples were taken at every river km section in 5 points. Figure 3, shows the distribution of the cross-sectional average grain-sizes along the river. The striking difference of the gravel-bed and sand-bed reaches upstream and downstream of Barcs is clearly visible. Along the Botovo-Barcs reach, several mm changes in grain-sizes can be seen. The reason of it might be the dredging activity, however, the planform of R. Drava reveals that the finer grains are more characteristic to the fords and the coarser ones to the pools of curvatures of the river channel.

The influence of the flow regime on the armouring process, often characterizing the surface layer of gravel beds, is demonstrated by change of average grain sizes along the cross-sections Botovo and Bélavár. Figure 4 shows that at mean flow (467 m³/s) a fully developed armouring could occur on the right- and the left-hand side of the section, where the grain sizes are high. Figure 5 demonstrates that at Bélavár the partial bed-load movement became effective along the entire cross-section at higher flows (983 m³/s) only, when the erosion-protective armour layer had broken up.

Graphical correlations between water and bed-load discharges (bed-load rating curves) could be established for the sediment measuring stations (Figs. 6, 7, 8, 9). Using the multi-annual time series of daily mean flow discharges and the bed-load rating curves, the annual bed-load transport values were calculated for each station. The results are shown in Table 1 (Fig. 10). Depending on the flow regime within the 1986-2003 period, the total mass of bed-load transport varied between 10 000-186 000 t/year at Botovo, 3 000-66 000 t/year at Bélavár, 8 000-130 000 t/year at Barcs and 27 000-320 000 t/year at Drávaszabolcs. Along the reach between Botovo and Barcs the dynamic bed-load supply depends heavily on the flow regime, the effects

of the Croatian hydropower plants and on the volume of annual dredging from the river channel. Here the supply shows a decreasing tendency with the increasing distance from Botovo. The supply increases from Barcs to Drávaszabolcs, mainly due to the erosion of soft banks here. Disregarding the unknown and probably not significant amount of gravel bed-load entering the R. Dráva from R. Mura, the gravel supply for the section Botovo-Barcs is not renewable, because the Croatian river barrages hamper the bed-load supply to arrive here. The annual dredged bed material masses are given in Table 2 (Figure 11), subdivided according to the two riparian countries and to the sand and gravel material. It can be seen that in the period 1986-2003 Hungary and Croatia together excavated 6 899 000 t bed material, 5 550 000 t of which was gravel. The former figure equals 328 000 t/yr, the latter 265 000 t/yr in the average, while the average annual bed-load transport varies from 37 000 t (Bélavár) to 78 000 t (Barcs). These data demonstrate that the bed-load transport balance is negative, i.e. R. Dráva can not supplement the material dredged from the river channel. Regarding that the annual mean and minimum flow discharges in the 1970-2000 period at station Barcs are almost unchanged. It means that if the annual minimum and mean water levels have a decreasing tendency, the only reason for it can be the degradation of bed level.

Figures see presentation at
www.life-drau.at

The trends of annual low-, mean and high flow gauge heights are to be seen in Figs. 12, 13, and 14 for three stations. It can be seen that all the three trends of characteristic water levels definitely decrease due to the lowering of riverbed. The drop of mean flow levels is 1.20 m at Ortilos (near Botovo) and at Barcs 1.60 m during 43 years. These data correspond to 0.028 and 0.037 m/yr respectively. The drop of low flow levels calculated in a similar way is 0.039 m/yr at Ortilos and 0.046 m/yr at Barcs. At station Drávaszabolcs the rate of decrease is less, probably due to the backwater effect from River Danube and to the moderate intensity of dredging: 0.024 m/yr and 0.030 m/yr.

The results of these estimations can also be checked by the evaluation of shifting processes of flow discharge rating curves (Figs. 15, 16, 17, 18). The upward shift means aggradation and the downward shift degradation of riverbeds. For example, the shift of rating curves at Barcs (Fig. 17) indicates between 1972 and 1982 a deepening of about 0.04 m/yr. From that time till 2000 the annual rate of degradation was 0.03 m/yr in the 400 m³/s discharge range and 0.02 m/s in the 1000 m³/s range. This means 0.8-1.0 m bed level drop within the investigated 30 years interval.

At Drávaszabolcs higher rates of bed degradation (0.05-0.08 m/yr) have occurred from 1971 till 1979 (Fig. 18), maybe due to the narrowing of the river channel by a series of spur dikes. This has accelerated the deepening process, which later gradually decreased to 0.015-0.02 m/yr.

Conclusions

The degradation of the river channel in River Dráva has been started several centuries ago and its annual rate is changing according to the intensity of human interventions. This gradual deepening of the riverbed not only directly influences the life conditions of the fluvial flora and fauna but decreases the frequency of floodplain inundations and decreases the ground water level in the riparian regions.

The gravel and sand dredging operations carried out in various sections of the river by Croatia and Hungary since 1986 have accelerated the degradation process. The presented study, finished in 2003 succeeded to estimate the annual rate of this process by different methods and to separate the effects of the human interventions from the natural erosion processes. The environmental consequences make it necessary to decrease the dredging activities to a reasonable level in order to let this precious environment with various water habitats to recover and survive. The volumes of gravel annually dredged from the bed channel show a sign of decreasing tendency in the recent years, especially in Croatia. The first positive results can be observed as a slight rise of annual mean and minimum gauge heights between 2003 and 2007. However, further reducing of excavated volumes is needed in order to show a definite and remarkable rise of these gauge heights and to make the slope of the long-term regression lines seemingly milder.

ABSTRACTS

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River regulation of Dráva - Mura Rivers' mouth

Abstract

The Drava-Mura Rivers' mouth changes its place every year. The rivers build but erode at the same time both in the riverbed and in the riverbank. This process has made a rather serious situation. If the confluence of these two rivers able to lead the discharge without any trouble or do the Hungarian and Croatian experts have to do something to avoid the damages? The question is known and we are working on the answer.

Introduction

30 – 40 years ago the Drava – Mura Rivers' mouth was 900 m above towards to the Mura river than today. This situation can be seen in the 1972's Drava Hydrographical Atlas. This section is signed by a table '0' from the past along the Mura River on its left bank which point shows us the original place of the mouth. Year by year the impact of the erosion, which is 8-10 meters/year on the river bank (see picture 1.), – in this region causes the migration of the Drava River. There are two enormous bends at the Drava river right one and a left one. In case of upper one the Drava almost reaches the Mura River. The two rivers are only 50 meters away from each other. Moreover this distant reduces year by year and within a few years – by our calculation not more then 5 – the new-old mouth will from naturally during high water levels.

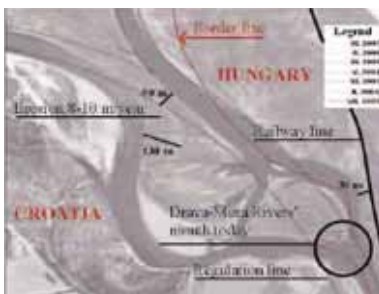
The problems are the followings: how can we carry away the discharge of both rivers in one river bed without major damages? And how can we defend the near railway line nearby (only 30 meters far) what runs between Barcs and Nagykanizsa, moreover what will happen with the flood-prevention dike near by the Croatian town Legrad if the Drava and Mura will change its confluence?

The goals of the project

To solve the above mentioned problems is not easy. Moreover in this region the Drava and Mura Rivers flow though two countries Hungary and Croatia. These two countries together must handle the situation. Water-building engineers worked out the first solution plan 12 years ago. After modelling of two planned solutions the results confirmed that to restore the original or nearly original situations by building a suitable new river bed throughout full at the gate of mouth and it's helping auxiliary objects would help the situation. Both countries' water experts agreed on it.

Time passed and because of the erosion impact – as we can see in the picture 1. above – and by the agreement of the Hungarian and Croatian Water Management Committee (HCWMC), Hungary has to plan and build the necessary water regulation objects to help flowing discharge in any water level situation. Moreover Croatia has to plan and build the new planned main river bed across the full between Drava and Mura Rivers. The planned regulation objects are shown in the picture 3. below.

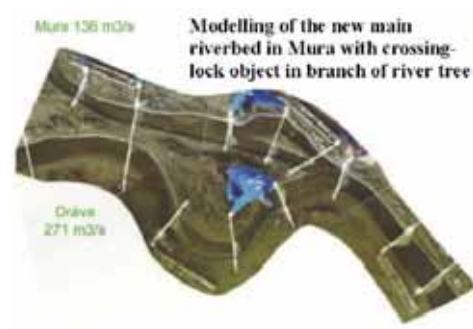
How can Hungary finance the program? The end of last year there appears an appropriate project opportunity by the Regional Operative Program in Hungary. Hungary within this program handed a project in March this year to implement the Drava-Mura mount's regulation. By the program Hungary must examine and plan not only the regulation object but also all of the impacts on nature. As it was mentioned Croatia is a partner to implement this common problem by finance and built own work such as to plan and to built a new main river bed across the full. By the time of the symposium we do not know the result of our project but we have started the common work by the planning the nature impacts.



Picture 1. The Drava-Mura River's mouth today with the erosion



Picture 3. The main planned regulation objects – through cut with the crossing regulation object



Pictures 2. Modelling of the regulation in a real situation by a new main river bed across the full



Cooperation on Nature Conservation between Croatia and Hungary Along Drava River

This work presents an overview of activities and experience on nature conservation along Drava River between Croatia and Hungary, that altogether lead to the Transboundary Biosphere Reserve Mura-Drava-Danube, as the best promising model for the conservation of Drava River ecosystem .

First concrete cooperation in the 90' started in 1999 between two parks in the region, these are Kopački rit Nature park and Duna – Dráva National park with signing of the Memorandum of Cooperation. Further on, non-governmental organizations (IUCN, Euronatur, WWF, WWF Hungary, Dravska liga, Prirodoslovno društvo Drava, Zeleni Osijek, Bird Life) were very supportive by initiating and supporting activities that led to the protection of the Drava River.

Starting with bilateral cooperation between Croatian Government and Hungarian Government, initiative for the protection of Drava River get the high-level political support. In response to popular demand for the protection and maintenance of the area Governments decided to nominate new Transboundary Biosphere Reserve Mura-Drava-Danube. This proceeded with the appointment of coordinators Mirna Bojic (HR) and Szabolcs Zavoczky (HU) in April 2008 for specific task – preparation of nomination for Transboundary Biosphere Reserve Mura-Drava-Danube. Preparation was supported by Croatian State Institute for Nature Conservation, Duna-Drava National park Directorate, representatives of the Ministries, national MaB committee representatives and experts for the area. After three months of intensive work a joint nomination for biosphere reserve was prepared, as well as joint map of the total area.

On the occasion of the third joint meeting of Croatian and Hungarian governments in October 2008 it is planed to sign the Joint Declaration on nomination of TBR Mura-Drava-Danube. We found that this biosphere reserve would play extremely important role in promoting the development of eco-tourism, awareness raising and environmental education in the concerned regions. It is expected that life of 300 000 people will be positively affected directly and indirectly by the creation of this reserve.

This is also an invitation for other countries along Drava River to join us on *developing Drava River as an 'ecological backbone'*.

Mirna Bojic

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DECLARATION

international symposium
23-25 September 2008
Maribor, Slovenia

DRAVA
RIVER
VISION

DECLARATION

concerning common approaches to water management, flood protection, hydropower utilization and nature and biodiversity conservation in the Drava River basin

Based on the holding, from 23 to 25 September 2008 in Maribor, Slovenia, of the international Symposium "Drava River Vision", in which representatives from water management and nature conservation bodies, education institutions and non-government organizations (NGOs) from the Drava River riparian states Italy, Austria, Slovenia, Croatia and Hungary participated, in response to popular demand for the protection and maintenance of the riverine landscape of the Drava River across the different national borders concerned, and in order to strive for a good status of the river, aspiring to support and strengthen existing strong common approaches to water management, flood protection, hydropower utilization and biodiversity conservation in the river basin, affirming our intention to cooperate in the conservation, administration and further appropriate development of the Drava River and its associated topographical, hydrological and ecological systems,

PRESENT SITUATION:

The Drava River (Italian: Drau, German: Drau, Slovenian: Drava, Croatian: Drava, Hungarian: Dráva) is a tributary of the Danube, and has its source at Toblach (Italy), approximately 1,450 m above sea level. It flows through Italy, Austria, Slovenia, Croatia and Hungary, and discharges into the Danube at Osijek (Croatia) at approximately 90 m above sea level. With a length of 749 km and a median flow of 560 m³/s, the Drava River is the fourth largest tributary of the Danube.

The Drava River basin is rich in natural resources of water and raw materials, and offers huge potential for sustainable development.

During past centuries, large sections of the Drava River were regulated, successfully reducing natural hazards. Fish migration however has been prevented by the many structures that have been introduced. From Paternion (Carinthia, Austria) downstream, the Drava River is heavily utilized for hydropower. On the Austrian side of the river there are eleven hydropower stations, with a further eight on the Slovenian side and three on the Croatian side. Additional proposed stations are under discussion in Slovenia and Croatia.

Along the Drava River there are important and well preserved ecological core zones, with a huge diversity of animal and plant species. Many of these areas have been placed under protection by the governments concerned, through protection regimes such as National Parks and Nature Parks, and they form part of the "Natura 2000" European protected areas network. In the EU-candidate country Croatia, the nomination of suitable Natura 2000 areas is in preparation, alongside other national protected area designations. The EU has supported many river restoration and rehabilitation projects in recent years, which have served flood protection objectives as well as the conservation of wild fauna, flora and habitats. Increasing areas of natural inundation has been a benefit not only for rare and endangered wildlife but also for the status of the waters.

Overall there has been an obvious improvement in the water quality of the Drava River in recent decades. This has been achieved by the connection of numerous settlements and industrial plants to sewage systems and waste-water treatment plants, which generally operate at high efficiency. There is, nonetheless, still a need for action in several areas.

The International Symposium Drava River Vision is a part of the LIFE Project »Life Vein Upper Drau Rivers«.

DRAVA RIVER VISION

DECLARATION

To secure the values and ecological functions of the Drava River basin for generations to come, we agree the following ten objectives as priorities for the future:

1. To promote the Drava River as a model for integrated implementation of EU policies on water and nature protection

The EU Directives on water management (Water Framework Directive), flood protection (Flood Directive), and biodiversity conservation (Flora-Fauna-Habitat Directive and Birds Directive) constitute a fundamental basis for river basin management in the Drava River catchment. Intergovernmental coordination and exchange of information can positively reinforce the implementation of relevant policies.

2. To enhance flood protection through the improvement of flood warning systems and through increased information exchange

Flood protection in the Drava River basin is a shared responsibility of all riparian countries. To give warnings in flood-prone areas at an early stage, flood risk must be detected sufficiently early to provide time for people to react. In a context of cross-border coordination and climate change along the Drava River, emphasis should be given in future to the improvement and adjustment of flood forecast models and flood warning systems.

3. To enhance flood protection through protection and restoration of water retention areas along the Drava River

Recent insights – particularly based on flooding disasters – indicate that linear security measures for protection from floods alone may not provide the most effective solutions. In the face of climate change and an expected increase in extreme flood events, we aspire to an improvement in the flood situation and raising the level of system security along the Drava River – this means in the first instance preservation, and then, where necessary and feasible, creation or restoration of suitable water retention areas.

4. To continue and further develop restoration of the Drava River and its floodplains

In recent years many river restoration and rehabilitation projects have shown that flood protection and nature conservation need no longer conflict with each other. River restoration often leads to an enhancement of ecological diversity. Water retention areas associated with the river can prevent uncontrolled outflow of water, thus improving flood protection. Further river restoration and rehabilitation projects with these multiple benefits will be encouraged, both on national level and in a transboundary context, taking into account the economic capacities of particular states.

5. To maintain and further develop the Drava River as an "ecological backbone"

Ecological core zones along the Drava River such as Natura 2000 areas, nature conservation areas, landscape conservation areas or free flowing river sections form an "ecological backbone" of the river basin. This transnational biotope network has to be safeguarded through active transboundary cooperation. The establishment of transboundary protected area systems such as the proposed UNESCO Biosphere Reserve "Danube-Drava-Mura" across five riparian countries forms a key part of this, and will be supported.

6. To re-establish the ecological connectivity of the Drava River for migratory fish

As a result of numerous barriers, the Drava River is no longer passable for fish migrating over long distances. In the future we aim to cooperate in establishing appropriate measures, including fish passes and fish by-passes, to support fish migration in the Drava River and its tributaries, in accordance with the objectives of the Water Framework Directive and the Habitats Directive.

DECLARATION

International symposium
23-25 September 2008
Maribor, Slovenia

DRAVA RIVER VISION

7. To establish the Drava River as a cross-border recreation area

The Drava River provides an attractive location for holiday-makers. A 366 km Drava River cycle path leads from the river's source to Maribor in Slovenia. Opportunities for sustainable regional recreation developments of this kind, based on the Drava River's intrinsic values, should be further explored. We aim to enhance the quality of the Drava River's environment for those who seek recreation and relaxation in an attractive landscape setting.

8. To use opportunities for the Drava River to be a connecting lifeline for different nations

After many years of fragmented approaches, today's more unified Europe offers new opportunities to bring together the people of many different origins who live in the Drava River basin. Those responsible for water management and nature conservation in each country will initiate new dialogues with their counterparts in the other riparian countries, in coordinated efforts towards the shared aim of a high quality of life for the people in this region.

9. To undertake integrated river basin management rather than fragmented sectoral measures

International agreements concluded in recent years such as "Agenda 21", and EU Directives such as those on Water, Floods, Flora, Fauna and Habitats, Wild Birds and Sustainable Energy Sources, together with the shift in social perceptions which these texts represent, strengthen the ongoing development of more sustainable approaches in the field of flood protection and hydropower. Modern approaches to activities such as these, therefore, in a context of integrated river basin management, seek to integrate economic, ecological and social aspects. Harmonised planning of water management, flood protection, hydropower use, recreation and biodiversity conservation can lead to sustainable solutions that also have higher public acceptance.

10. To undertake further development of the Drava River area in partnership with its resident human populations

Those engaged in agriculture, forestry, tourism, energy production and economic development, as well as residents in local communities, are all important partners in achieving the objectives of sustainable development of the Drava River. Adequate cooperation among all these groups can help to minimize any conflict between ecosystem values and economic development.

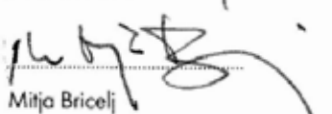
Signed as a signal for full support at the Drava River Vision Symposium, Maribor, 24 September 2008

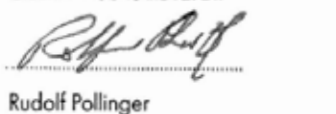
by the Heads of Delegation of the International Commission for the Protection of the Danube River from the Danubian States Austria, Croatia, Hungary and Slovenia and by the Director of the Department for Hydraulic Engineering of Bolzano, South-Tyrol in Italy,


Richard Stadler
Austrian HOD to the ICPDR


Željko Ostojić
Croatian HOD to the ICPDR


Gyula Holló
Hungarian HOD to the ICPDR


Mitja Bricelj
Slovenian HOD to the ICPDR


Rudolf Pollinger
Italian Representative Hydraulic Engineering

and adopted by the Participants at the Drava River Vision Symposium.

Let us join forces in the conservation and sustainable development of the Drava River - an aquatic ecosystem functioning as a corridor of recovery in the heart of Europe!

**Signing ceremony
Maribor, 24. September 2008**



Signing the DRAVA DECLARATION:

from left to right:

Richard Stadler
Austrian HOD to the ICPDR

Zelko Ostojic
Croatian HOD

Gyula Holló
Hungarian HOD

Mitja Bricelj
Slovenian HOD

Rudolf Pollinger
Italian Representative Hydraulic
Engineering

Note:
HOD = Head of Delegation
ICPDR = International Commission for the
Protection of the Danube River



Closing act: from left to right:

Norbert Sereinig
Regional government of Carinthia,
Dep. 18 Water Management
Project Manager LIFE Drau Project

Ales Bizjak
Institute for Water of the Republic of
Slovenia; Organizer of the Symposium

Zelko Ostojic
Croatian HOD

Gyula Holló
Hungarian HOD

Richard Stadler
Austrian HOD to the ICPDR

Mitja Bricelj
Slovenian HOD

Rudolf Pollinger
Italian Representative Hydraulic
Engineering

über gemeinsame Ansätze zu Wasserwirtschaft, Hochwasserschutz, Wasserkraftnutzung sowie Naturschutz und Schutz der biologischen Vielfalt im Einzugsgebiet der Drau

Auf der Grundlage des von 23. bis 25. September 2008 in Marburg, Slowenien, abgehaltenen internationalen Symposiums „Drava River Vision“, an dem Vertreter von Wasserwirtschafts- und Naturschutzeinrichtungen, Bildungsinstitutionen und Nichtregierungsorganisationen (NGOs) aus den Drauanrainerstaaten Italien, Österreich, Slowenien, Kroatien und Ungarn teilgenommen haben,

als Antwort auf die vielfache Forderung nach Schutz und Erhaltung der Flusslandschaft der Drau über die verschiedenen betroffenen Staatsgrenzen hinweg sowie in dem Bestreben, sich für einen guten Zustand des Flusses einzusetzen,

in dem Wunsch, bestehende vielversprechende gemeinsame Ansätze in den Bereichen Wasserwirtschaft, Hochwasserschutz, Wasserkraftnutzung und Schutz der biologischen Vielfalt im Einzugsgebiet des Flusses zu fördern und zu stärken,

in Bekräftigung unserer Absicht, in den Bereichen Schutz und Verwaltung sowie bei weiteren diesbezüglich geeigneten Entwicklungen der Drau und der mit ihr verbundenen topographischen, hydrologischen und ökologischen Systeme zusammenzuarbeiten.

AKTUELLE SITUATION

Die Drau (italienisch: Drau, deutsch: Drau, slowenisch: Drava, kroatisch: Drava, ungarisch: Dráva) ist ein Nebenfluss der Donau und entspringt bei Toblach (Italien), etwa 1450 m über dem Meeresspiegel. Sie fließt durch Italien, Österreich, Slowenien, Kroatien und Ungarn und mündet bei Osijek (Kroatien) auf einer Höhe von ca. 90 m über dem Meeresspiegel in die Donau. Mit einer Länge von 749 km und einem Medianabfluss von 560 m³/s ist die Drau der viertgrößte Nebenfluss der Donau.

Das Einzugsgebiet der Drau ist reich an natürlichen Wasser- und Rohstoffressourcen und bietet enormes Potential für nachhaltige Entwicklung.

Weite Abschnitte der Drau wurden während der letzten Jahrhunderte reguliert, womit es auch gelang, Naturgefahren einzudämmen. Allerdings verhindern die zahlreichen eingebauten Strukturen die Fischwanderung. Von Paternion (Kärnten, Österreich) flussabwärts wird die Drau intensiv für die Wasserkraft genützt. Auf der österreichischen Seite des Flusses befinden sich elf Wasserkraftwerke, weitere acht finden sich auf der slowenischen und drei auf der kroatischen Seite. Zusätzliche geplante Kraftwerke stehen in Slowenien und Kroatien in Diskussion.

Entlang der Drau befinden sich bedeutende und gut geschützte ökologische Kernzonen, die sich durch enorme Artenvielfalt bei Tieren und Pflanzen auszeichnen. Viele dieser Gebiete wurden von der betreffenden Regierung durch Schutzsysteme wie Nationalparks und Naturparks unter Schutz gestellt und sind Teil des europäischen Schutzgebietsnetzwerks „Natura 2000“. Im EU-Beitrittsland Kroatien ist die Nominierung geeigneter Natura 2000-Gebiete zusammen mit anderen nationalen Schutzgebietsbezeichnungen in Vorbereitung. Die EU hat in den letzten Jahren zahlreiche Flussrenaturierungs- und -sanierungsmaßnahmen gefördert, die dem Hochwasserschutz sowie dem Schutz wildlebender Tiere und Pflanzen und der Lebensräume gedient haben. Die Zunahme der natürlichen Überflutungsflächen stellt nicht nur für seltene und gefährdete wildlebende Tiere, sondern auch für den Gewässerzustand einen Vorteil dar.

Die Wasserqualität der Drau hat sich insgesamt in den letzten Jahrzehnten spürbar verbessert. Erreicht wurde dies durch die Anbindung zahlreicher Siedlungen und Industrieanlagen an Abflusssysteme und Abwasseraufbereitungsanlagen, die im Allgemeinen hocheffizient arbeiten. Dennoch besteht in manchen Bereichen weiterhin Handlungsbedarf.

DEKLARATION

VEREINBAREN WIR, um die Werte und ökologischen Funktionen des Einzugsgebiets der Drau für zukünftige Generationen zu sichern, schwerpunktmäßig folgende zehn Ziele für die Zukunft:

1. Förderung der Drau als ein Modell für die integrierte Umsetzung der EU-Wasser- und Naturschutzpolitiken

Die EU-Richtlinien betreffend Wasserwirtschaft (Wasserrahmenrichtlinie), Hochwasserschutz (Hochwasserrichtlinie) und Schutz der biologischen Vielfalt (Flora-Fauna-Habitat-Richtlinie und Vogelschutzrichtlinie) bilden eine wesentliche Grundlage für die Flussgebietsbewirtschaftung im Einzugsgebiet der Drau. Zwischenstaatliche Koordination und Informationsaustausch können die Umsetzung der jeweiligen Maßnahmen positiv verstärken.

2. Intensivierung des Hochwasserschutzes durch die Verbesserung von Hochwasserwarnsystemen und verstärkten Informationsaustausch

Der Hochwasserschutz im Einzugsgebiet der Drau obliegt der gemeinsamen Verantwortung sämtlicher Anrainerstaaten. Um in hochwassergefährdeten Gebieten frühzeitig warnen zu können, ist es nötig, das Hochwasserrisiko zu einem Zeitpunkt zu erkennen, der den Menschen noch ausreichend Zeit gibt, darauf zu reagieren. Im Rahmen der grenzüberschreitenden Koordination und des Klimawandels an der Drau sollte künftig der Schwerpunkt auf die Verbesserung und Anpassung von Hochwasserprognosemodellen und Hochwasserwarnsystemen gelegt werden.

3. Verstärkung des Hochwasserschutzes durch den Schutz und die Wiederherstellung von Wasserrückhalteräumen an der Drau

Speziell auf Überschwemmungen beruhende Erfahrungen der letzten Zeit deuten darauf hin, dass lineare Sicherheitsmaßnahmen allein möglicherweise nicht die wirksamsten Lösungen für den Schutz gegen Hochwasser bieten. Angesichts des Klimawandels und der erwarteten Zunahme extremer Hochwasserereignisse streben wir eine Verbesserung der Hochwassersituation sowie eine Erhöhung der Systemsicherheit entlang der Drau an - dies bedeutet in erster Instanz die Erhaltung und danach, wo dies nötig und machbar ist, die Schaffung oder Wiederherstellung geeigneter Wasserrückhalteräume.

4. Fortsetzung und Weiterentwicklung der Renaturierung der Drau und ihrer Auen

Zahlreiche Flussrenaturierungs- und -sanierungsprojekte haben in den letzten Jahren deutlich gemacht, dass Hochwasserschutz und Naturschutz keine Gegensätze mehr sein müssen. Die Flussrenaturierung führt oftmals zu erhöhter ökologischer Vielfalt. Mit dem Fluss verbundene Wasserrückhalteräume können das unkontrollierte Ausfließen von Wasser verhindern und somit den Hochwasserschutz verbessern. Weitere Flussrenaturierungs- und

-sanierungsprojekte mit diesen zahlreichen Vorteilen werden unter Berücksichtigung der wirtschaftlichen Möglichkeiten der jeweiligen Staaten sowohl auf nationaler Ebene als auch im grenzüberschreitenden Kontext angeregt.

5. Erhaltung und Weiterentwicklung der Drau als „ökologisches Rückgrat“

Ökologische Kernzonen entlang der Drau wie Natura 2000-Gebiete, Naturschutzgebiete, Landschaftsschutzgebiete oder freie Fließstrecken sind das „ökologische Rückgrat“ des Flusseinzugsgebiets. Dieses länderübergreifende Biotopnetzwerk ist durch aktive, grenzüberschreitende Zusammenarbeit zu gewährleisten. Die Errichtung länderübergreifender Schutzgebietssysteme wie das geplante, über fünf Anrainerstaaten reichende UNESCO Biosphärenreservat „Donau-Drau-Mur“ bildet einen wesentlichen Teil davon und wird unterstützt.

6. Wiederherstellung der ökologischen Durchgängigkeit der Drau für Wanderfische

Infolge zahlreicher Barrieren ist die Drau über weite Strecken für Wanderfische nicht mehr durchgängig. Wir sind bestrebt, künftig gemäß den Zielen der Wasserrahmenrichtlinie und der Habitat-Richtlinie bei der Erstellung geeigneter Maßnahmen, einschließlich Fischpasse und Fischwanderhilfen, zusammenzuarbeiten, um die Fischwanderung in der Drau und ihren Nebenflüssen zu fördern.

7. Schaffung eines grenzüberschreitenden Erholungsgebiets an der Drau

Die Drau stellt eine attraktive Umgebung für Urlauber dar. Ein 366 km langer Drau-Fahrradweg führt vom Ursprung des Flusses nach Marburg in Slowenien. Solche Möglichkeiten der nachhaltigen Entwicklung im regionalen Erholungsbereich, die auf dem „Eigenwert“ der Drau beruhen, sollten weiter untersucht werden. Wir streben nach einer qualitativen Verbesserung der Umgebung der Drau für Menschen, die in einem attraktiven landschaftlichen Umfeld Erholung und Entspannung suchen.

8. Nutzung der Drau als länderverbindende Lebensader

Nach jahrelangen fragmentarischen Ansätzen bietet das nunmehr stärker geeinte Europa der heutigen Zeit neue Möglichkeiten, die Menschen so unterschiedlicher Herkunft, die im Einzugsgebiet der Drau leben, zusammenzuführen. In koordinierten Bemühungen um das geteilte Ziel einer hohen Lebensqualität für die Menschen dieser Region werden die Verantwortlichen aller Länder in den Bereichen Wasserwirtschaft und Naturschutz neue Dialoge mit ihren Amtskollegen in den anderen Anrainerstaaten initiieren.

9. Integrierte Bewirtschaftung des Flusseinzugsgebiets statt fragmentarischer abschnittsweiser Maßnahmen

In den letzten Jahren abgeschlossene internationale Verträge wie „Agenda 21“ und EU-Richtlinien wie jene zu den Bereichen Wasser, Hochwasser, Flora, Fauna und Habitate, wildlebende Vogelarten und nachhaltige Energiequellen stärken gemeinsam mit der Verschiebung im gesellschaftlichen Verständnis, das diese Dokumente darstellen, die laufende Entwicklung nachhaltigerer Ansätze im Bereich Hochwasserschutz und Wasserkraft. Moderne Ansätze zu solchen Aktivitäten versuchen deshalb, im Rahmen eines integrierten Flusseinzugsgebiets-Management wirtschaftliche, ökologische und soziale Aspekte einzubinden. Eine harmonisierte Planung von Wasserwirtschaft, Hochwasserschutz, Wasserkraftnutzung, Erholung und biologischer Vielfalt kann zu nachhaltigen Lösungen führen, die auch seitens der Öffentlichkeit höhere Akzeptanz genießen.

10. Weitere Entwicklung des Flussgebiets der Drau in Partnerschaft mit der ansässigen Bevölkerung

Sämtliche in der Land- und Forstwirtschaft, in den Bereichen Tourismus, Energieproduktion und wirtschaftliche Entwicklung Tätigen sowie Einwohner lokaler Gemeinden sind wichtige Partner für die Erreichung der Ziele der nachhaltigen Entwicklung der Drau. Eine entsprechende Zusammenarbeit zwischen all diesen Gruppen kann dazu beitragen, allfällige Konflikte zwischen dem Reichtum des Ökosystems und der wirtschaftlichen Entwicklung zu minimieren.

Unterfertigt als Zeichen der vorbehaltlosen Unterstützung des Symposiums „Drava River Vision“

von den Delegationsleitern der Internationalen Kommission zum Schutz der Donau aus den Donaustaaten Österreich, Kroatien, Ungarn und Slowenien sowie vom Leiter der Abteilung Wasserschutzbauten der Autonomen Provinz Bozen-Südtirol in Italien,

.....
Richard Stadler
Österreichischer DL
zur IKSD

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Zelko Ostojic
Kroatischer DL
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Gyula Holló
Ungarischer DL
zur IKSD

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Mitja Bricelj
Slowenischer DL
zur IKSD

.....
Rudolf Pollinger
Italienischer Vertreter
Wasserschutzbauten

und verabschiedet von den Teilnehmern des Drava River Vision Symposiums, 23. – 25. September 2008 in Marburg.

Vereinigen wir unsere Kräfte für den Schutz und die nachhaltige Entwicklung der Drau – ein aquatisches Ökosystem, das im Herzen Europas als Korridor der Revitalisierung wirkt!

o skupnem pristopu na področju upravljanja voda, zagotavljanja poplavne varnosti, izkoriščanja hidroenergetskega potenciala, ohranjanja narave in biotske raznovrstnosti na porečju reke Drave

osnovana v okviru mednarodnega simpozija Drava River Vision, ki je potekal od 23. do 25. septembra 2008 v Mariboru, Slovenija, na katerem so sodelovali strokovnjaki s področij upravljanja voda in ohranjanja narave, izobraževalnih ustanov in nevladnih organizacij iz obrežnih držav reke Drave – Italije, Avstrije, Slovenije, Hrvaške in Madžarske, kot odgovor potrebam po zagotavljanju zaščite in ohranjanja rečne krajine reke Drave preko državnih meja, prizadevanju za doseganje dobrega stanja reke, krepitevi skupnih pristopov na področjih upravljanja voda, zagotavljanja poplavne varnosti, hidroenergetske rabe in ohranjanja biotske raznovrstnosti v porečju, izražamo namero o sodelovanju na področju ohranjanja, upravljanja in nadaljnjega razvoja reke Drave ter njenih pripadajočih topografskih, hidroloških in ekoloških sistemov.

STANJE:

Reka Drava (v italijanščini Drau, nemščini Drauf, slovenščini Drava, hrvaščini Drava, madžarščini Dráva) je pritok Donave in izvira v Toblachu (Italija), približno 1450 m nad morjem. Teče skozi Italijo, Avstrijo, Slovenijo, Hrvaško in Madžarsko. Pri Osijeku (Hrvaška), približno 90 m nad morjem, se izlije v Donavo. Z dolžino 749 km in srednjim pretokom 560 m³/s je četrti največji pritok Donave.

Porečje reke Drave je bogato z raznovrstnimi naravnimi viri in ima velik potencial za trajnostni razvoj.

V zadnjih stoletjih so bili obsežni deli reke Drave regulirani, kar je prispevalo k zmanjševanju posledic naravnih nesreč. Toda zaradi številnih prečnih objektov v reki Dravi je onemogočena migracija rib. Dolvodno od Paterniona (Koroška, Avstrija) je reka Drava hidromorfološko zelo prilagojena hidroenergetski rabi. Na avstrijski strani je 11 hidroelektrarn, na slovenski 8 ter na hrvaški 3. Na slovenski in hrvaški strani so načrti za izgradnjo novih hidroelektrarn.

Vzdolž reke Drave se nahajajo pomembna in dobro ohranjena ekološka območja, za katera je značilna visoka raznovrstnost živalskih in rastlinskih vrst. Številna so zavarovana z varstvenimi režimi, na primer kot narodni parki ali naravni rezervati, mnogokrat pa so tudi del evropskih zavarovanih območij Natura 2000. Hrvaška, država kandidatka za vstop v EU, pripravlja predlog območij, ki bodo postala del mreže Natura 2000, vključujoč tudi ostala zavarovana območja.

EU je v preteklih letih podprla številne projekte za obnovo rečnih koridorjev, ki so združevali reševanje poplavne problematike in ohranjanje prvobitne favne, flore in habitatov. Povečevanje območij naravnih poplav ni pomembno le zaradi ohranjanja redkih in ogroženih vrst, temveč tudi zaradi splošnih koristnih vplivov na stanje voda.

V zadnjih desetletjih je zaznati vidno izboljšanje kakovosti vode reke Drave. To je bilo doseženo z ureditvijo ustreznega odvajanja in čiščenja komunalnih in industrijskih odpadnih voda na čistilnih napravah, ki so v splošnem visoko učinkovite. Kljub temu še vedno ostajajo območja, na katerih so potrebni ukrepi.

DEKLARACIJA

Z namenom varovanja vrednot in ekoloških funkcij porečja reke Drave za prihodnje generacije soglašamo z desetimi cilji kot prioriteta:

1-Promoviranje reke Drave kot modela za celostno izvajanje politik Evropske unije na področjih upravljanja voda in ohranjanja narave

Direktive EU s področja upravljanja voda (vodna direktiva), zagotavljanja poplavne varnosti (poplavna direktiva) in področja ohranjanja biotske raznovrstnosti (habitatska in ptičja direktiva) tvorijo skupno osnovo za upravljanje porečja reke Drave. Medsektorsko sodelovanje in izmenjava informacij lahko prispevata k učinkovitejšemu uresničevanju ustrezne zakonodaje.

2-Povečanje poplavne varnosti z izboljšanjem opozorilnega sistema in večjo izmenjavo informacij

Zagotavljanje poplavne varnosti na porečju reke Drave je deljena odgovornost vseh obrežnih držav. Dovolj zgodnje zaznavanje nevarnosti poplav in opozorilni sistemi na poplavnih območjih omogočajo pravočasno ukrepanje. Glede na čezmejno koordinacijo obrežnih držav in glede na podnebne spremembe je treba v prihodnje večji poudarek dati izboljšanju in prilagoditvi modelov za napovedovanje poplav in sistemov zgodnjega opozarjanja.

3-Povečanje poplavne varnosti z ohranjanjem in obnovo vodozadrževalnih površin na porečju reke Drave

Izkušnje ob naravnih poplavnih nesrečah kažejo, da dosednji enovrstni varnostni ukrepi za zagotavljanje poplavne varnosti niso dovolj učinkoviti. Podnebne spremembe in pričakovano posledično povečanje števila ekstremnih poplavnih dogodkov zahtevajo izboljšanje trenutnega stanja poplavne varnosti in dvig ravni varnostnih sistemov vzdolž reke Drave. To v prvi vrsti pomeni ohranjanje obstoječih vodozadrževalnih površin in ustvarjanje ali obnavljanje vodozadrževalnih površin, kjer je to potrebno in hkrati izvedljivo.

4-Nadaljevanje in razvoj obnove reke Drave in njenih poplavnih ravníc

Rezultati številnih projektov za obnovo rečnih koridorjev zadnjih let kažejo, da zagotavljanje poplavne varnosti in ohranjanje narave nista nujno nasprotujoči vrednoti. Obnova rečnih koridorjev običajno privede do izboljšanja ekološke raznovrstnosti. Vodozadrževalne površine preprečujejo nekontroliran odtok vode ter tako prispevajo k večji poplavni varnosti. Spodbujati je treba nadaljnje projekte obnove rečnih koridorjev, ki ob upoštevanju ekonomske zmogljivosti posamezne države prinašajo našteté mnogovrstne koristi na državni in čezmejni ravni.

5-Ohranjanje in nadaljnji razvoj reke Drave kot ekološke osi

Ekološko pomembna območja, kot so območja Natura 2000, območja ohranjanja narave, območja ohranjanja krajine in naravno ohranjeni odseki reke Drave, tvorijo ekološko os porečja. Nadnacionalni biotop vzdolž reke Drave je treba varovati z vzpostavitvijo aktivnega čezmejnega sodelovanja. Ustanovitev čezmejnih sistemov zaščitenih območij, kot je predlog UNESCO za ustanovitev Biosfernega rezervata Donava-Drava-Mura vzdolž petih obrežnih držav, je treba podpreti, saj predstavlja ključni korak k ohranjanju ekološke osi.

6-Vnovična vzpostavitev ekološke kontinuitete reke Drave za selitvene ribje vrste

Zaradi številnih neprehodnih prečnih objektov je na reki Dravi onemogočena migracija rib z dolgimi selitvenimi potmi. V prihodnje si je treba prizadevati za izvajanje ukrepov, med njimi za izgradnjo ribjih stez in obtokov, s katerimi bo omogočena migracija rib v reki Dravi in njenih pritokih, kar je v skladu s cilji vodne in habitatne direktive.

7-Vzpostavitev čezmejnega rekreacijskega območja vzdolž reke Drave

Reka Drava je privlačna tudi za počitnikovanje. Ponuja 366 km kolesarskih poti, od izvira do Maribora v Sloveniji. V prihodnje je treba dodatno preučiti možnosti za nadaljnji trajnostni regionalni razvoj tovrstnih rekreacijskih območij, ki temeljijo na izvorni vrednosti reke Drave. Stanje obvodnega okolja je treba izboljšati ter s tem ponuditi možnost vsem, ki si želijo rekreacije in sprostitve.

8-Izkoristiti priložnosti reke Drave kot povezovalne življenjske osi narodov

Po mnogih letih nepovezanih pristopov danes združena Evropa ponuja številne priložnosti za povezovanje prebivalcev različnih narodnosti porečja reke Drave. Odgovorni za področja upravljanja voda in ohranjanja narave bodo vzpostavili nove dialoge s sovrstniki v sosednjih obrežnih državah in s tem delovali v smeri izboljšanja kakovosti bivalnega okolja ljudi v regiji.

9-Izvajanje celostnega upravljanja porečja namesto izvajanja sektorskih ukrepov

Mednarodni sporazumi zadnjega obdobja, kot so Agenda 21 in direktive EU – vodna, poplavna, habitatna, ptičja direktiva in direktiva o obnovljivih virih energije, skupaj s spremenjeno družbeno percepcijo, ki jo povzemajo ti dokumenti, krepijo razvoj trajnostnih izhodišč na področju poplavne problematike in hidroenergetske rabe. Sodobno celostno upravljanje voda vključuje ekonomski, ekološki in družbeni vidik upravljanja voda. Usklajeno načrtovanje upravljanja voda, zagotavljanja poplavne varnosti, hidroenergetske rabe, rekreacijskih aktivnosti in ohranjanja biotske raznovrstnosti vodi v trajnostne rešitve z višjo stopnjo družbene sprejemljivosti.

10-Nadaljnji razvoj reke Drave v sodelovanju z lokalnim prebivalstvom

Zaposleni v kmetijstvu, gozdarstvu, turizmu, energetiki in ekonomskem razvoju kot tudi prebivalstvo lokalnih skupnosti so pomembni partnerji trajnostnega razvoja reke Drave. S primernim sodelovanjem naštetih skupin se zmanjšajo morebitni konflikti ekosistemskih vrednot in ekonomskega razvoja.

Podpisano kot znak polne podpore s strani predstavnikov vodij delegacij pri Mednarodni komisiji za zaščito reke Donave iz donavskih držav Avstrije, Hrvaške, Madžarske in Slovenije in s strani direktorja Oddelka za hidravlični inženiring Bolzano, Južna Tirolska, Italija, na simpoziju Drava River Vision v Mariboru, 24. septembra 2008,

.....
Richard Stadler
vodja delegacije
Republike Avstrije
pri ICPDR

.....
Željko Ostojić
vodja delegacije
Republike Hrvaške
pri ICPDR

.....
Gyula Holló
vodja delegacije
Madžarske
pri ICPDR

.....
Mitja Bricelj
vodja delegacije
Republike Slovenije
pri ICPDR

.....
Rudolf Pollinger
predstavnik
Republike Italije

in sprejeto s strani udeležencev simpozija Drava River Vision.

Združimo moči pri ohranjanju in trajnostnem razvoju reke Drave – vodnem ekosistemu kot koridorju okrevanja v osrčju Evrope!

o zajedničkim pristupima upravljanju vodama, zaštiti od poplava, korištenju hidroenergije i očuvanju biološke raznolikosti u slivu rijeke Drave

Temeljem održavanja međunarodnog simpozija „Vizija rijeke Drave“ od 23. do 25. rujna 2008. u Mariboru u Sloveniji na kojemu su sudjelovali predstavnici tijela vodnog gospodarstva i očuvanja prirode, obrazovnih institucija i nevladinih organizacija iz država u slivu rijeke Drave, Italije, Austrije, Slovenije, Hrvatske i Mađarske, kao odgovor na opći zahtjev za zaštitom i održanjem riječnog krajolika rijeke Drave preko nacionalnih granica, u nastojanju da postignemo dobro stanje rijeke, u težnji da podržimo i ojačamo postojeće snažne zajedničke pristupe upravljanju vodama, zaštiti od poplava, korištenju hidroenergije i očuvanju biološke raznolikosti u slivu rijeke, potvrđujući svoju namjeru da surađujemo na očuvanju, upravljanju i daljnjem odgovarajućem razvoju rijeke Drave i s njom povezanih topografskih, hidroloških i ekoloških sustava,

SADAŠNJE STANJE:

Rijeka Drava (na talijanskom jeziku Drau, na njemačkom Drau, na slovenskom Drava, na hrvatskom Drava, na mađarskom Dráva) je pritok Dunava, s izvorom kod Toblach u Italiji, na otprilike 1450 m nadmorske visine. Teče kroz Italiju, Austriju, Sloveniju, Hrvatsku i Mađarsku i ulijeva se u Dunav kod Osijeka u Hrvatskoj, na oko 90 m nadmorske visine. S duljinom od 749 km i srednjim protokom od 560 m³/s, rijeka Drava je po veličini četvrti pritok Dunava.

Sliv rijeke Drave bogat je prirodnim resursima, vodom i sirovinama, i predstavlja ogroman potencijal za održivi razvoj.

Tijekom proteklih stoljeća, veliki su dijelovi rijeke Drave bili regulirani, čime su se uspješno smanjile prirodne opasnosti. No mnogobrojne stvorene građevine spriječile su migraciju riba. Nizvodno od Paterniona u austrijskoj Cariniji, rijeka Drava se intenzivno koristi za hidroenergiju. Na austrijskoj strani rijeke nalazi se jedanaest hidroelektrana, uz dodatnih osam na slovenskoj strani i tri na hrvatskoj strani. O novim prijedlozima hidroelektrana raspravlja se u Sloveniji i Hrvatskoj.

Uz rijeku Dravu se nalaze važne, dobro očuvane ekološke zone od vitalne važnosti, s ogromnom raznolikošću životinjskih i biljnih vrsta. Mnoga od ovih područja stavile su pod zaštitu vlade, putem zaštitnih režima kao što su nacionalni parkovi i parkovi prirode, koji čine dio europske mreže zaštićenih područja „Natura 2000“. U Hrvatskoj, zemlji kandidatu za EU, u pripremi je imenovanje odgovarajućih područja Natura 2000, uz ostale vrste zaštićenih nacionalnih područja. EU je u proteklom godinama podržala brojne projekte obnove i sanacije rijeka, koji služe i ciljevima zaštite od poplava i očuvanju divlje faune, flore i staništa. Sve veća prirodno plavljena područja korisna su ne samo za rijetke i ugrožene biljne i životinjske vrste, nego i za stanje voda.

U proteklom desetljećima kakvoća vode u rijeci Dravi očigledno se poboljšala. Ovo je postignuto spajanjem brojnih naselja i industrijskih postrojenja na sustave odvodnje i uređaje za pročišćavanje otpadnih voda, koji uglavnom rade veoma učinkovito. No unatoč tome, na nekim područjima još je uvijek prisutna potreba za djelovanjem.

DEKLARACIJA

Kako bismo osigurali vrijednosti i ekološke funkcije sliva rijeke Drave za naredne generacije, suglasni smo sa sljedećih deset ciljeva kao prioriteta za budućnost:

1. Promovirati rijeku Dravu kao model međunarodno integrirane provedbe politika EU o vodama i zaštiti prirode

Direktive EU o upravljanju vodama (Okvirna direktiva o vodama), zaštiti od poplava (Direktiva o zaštiti od poplava), i očuvanju biološke raznolikosti (Direktive o staništima i Direktiva o pticama) tvore temelj upravljanja riječnim slivom Drave. Međuvladina koordinacija i razmjena informacija mogu pozitivno djelovati na provedbu relevantnih politika.

2. Unaprijediti zaštitu od poplava poboljšanjem sustava uzbunjivanja u slučaju poplava i povećanom razmjenom informacija

Zaštita od poplava u slivu rijeke Drave je zajednička odgovornost svih zemalja u slivu. Kako bi se provelo rano uzbunjivanje u područjima sklonim poplavama, rizik od poplava mora biti otkriven dovoljno rano da bi se ljudima osiguralo vrijeme za reakciju. U kontekstu prekogranične koordinacije i klimatskih promjena uz rijeku Dravu, u budućnosti se naglasak mora staviti na poboljšanje i prilagodbu modela za prognoziiranje poplava i sustava uzbunjivanja u slučaju poplava.

3. Poboljšati zaštitu od poplava očuvanjem i obnovom retencijskih područja uz rijeku Dravu

Najnovije spoznaje, naročito one iz katastrofalnih poplava, ukazuju na činjenicu da linearne sigurnosne mjere zaštite od poplava možda same ne mogu pružiti najučinkovitija rješenja. Suočeni s klimatskim promjenama i očekivanim porastom slučajeva ekstremnih poplava, težimo ka poboljšanju stanja u pogledu poplava i podizanja razine sigurnosti sustava uz rijeku Dravu, što prvenstveno znači očuvanje, a potom, ako je potrebno i izvedivo, stvaranje ili obnavljanje odgovarajućih retencijskih područja.

4. Nastaviti s daljnjom obnovom rijeke Drave

Posljednjih su godina brojni projekti obnove i sanacije rijeka pokazali da zaštita od poplava i očuvanje prirode više ne moraju biti suprotstavljene. Obnova rijeka često vodi ka poboljšanju ekološke raznolikosti. Retencijska područja vezana uz rijeku mogu spriječiti nekontrolirano izlivanje vode, te tako poboljšati zaštitu od poplava. Novi projekti obnove i sanacije rijeka, uz ove mnogostruke koristi, biti će poticani, i na nacionalnoj razini i u prekograničnom kontekstu, uz uvažavanje gospodarskih mogućnosti konkretnih država.

5. Održati i dalje razviti rijeku Dravu kao „ekološku kralježnicu“

Ekološke zone od vitalnog značaja uz rijeku Dravu, poput područja Natura 2000, područja očuvanja prirode, područja očuvanja krajolika i područja slobodnog riječnog tijeka čine „ekološku kralježnicu“ riječnog sliva. Ovu transnacionalnu mrežu staništa potrebno je zaštititi aktivnom prekograničnom suradnjom. Uspostava prekograničnog sustava zaštićenih područja poput predloženog UNESCO-vog Rezervata biosfere „Dunav-Drava-Mura“ na području pet riječnih država predstavlja njegov ključni ovoga, i biti će podržan.

6. Ponovno uspostaviti ekološku povezanost u rijeci Dravi za potrebe migracije riba

Kao posljedica mnogih prepreka, rijeka Drava više nije prolazna za ribe koje migriraju velikim udaljenostima. U budućnosti namjeravamo surađivati na uspostavi odgovarajućih mjera, uključujući riblje staze, kako bismo podržali migraciju riba u rijeci Dravi i njenim pritocima, u skladu s ciljevima Okvirne direktive o vodama i Direktive o staništima.

7. Uspostaviti rijeku Dravu kao prekogranično rekreacijsko područje

Rijeka Drava predstavlja privlačnu lokaciju za turiste. Biciklistička staza uz rijeku Dravu duga 366 km vodi od izvora rijeke do Maribora u Sloveniji. Mogućnosti za održiv razvoj regionalne rekreacije ove vrste, zasnovane na suštinskim vrijednostima rijeke Drave, trebalo bi nastaviti istraživati. Namjeravamo poboljšati kakvoću okoliša rijeke Drave za one koji žele rekreaciju i opuštanje u privlačnom krajoliku.

8. Iskoristiti mogućnost rijeke Drave kao poveznice raznih naroda

Nakon godina fragmentiranih pristupa, današnja ujedinjenja Europa nudi nove mogućnosti za zbližavanje naroda najrazličitijeg porijekla koji žive u slivu rijeke Drave. Odgovorni za upravljanje vodama i očuvanje prirode u pojedinim zemljama potaknut će dijaloge sa svojim kolegama u drugim zemljama u slivu, u koordiniranom naporu na ostvarenju zajedničkog cilja - visoke kakvoće života ljudi u regiji.

9. Provoditi integralno upravljanje riječnim slivom, a ne fragmentalne sektorske mjere

Međunarodni sporazumi sklopljeni posljednjih godina, poput „Agende 21“ i direktiva EU poput direktiva o vodama, poplavama, flori, fauni i staništima, divljim pticama i održivim izvorima energije, uz pomak u socijalnim percepcijama koji predstavljaju, jačaju i stalni razvoj održivijih pristupa na području zaštite od poplava i hidroenergije. Modernim pristupima ovim djelatnostima, u kontekstu integralnog upravljanja riječnim slivom, pokušavaju se integrirati gospodarski, ekološki i društveni aspekti. Usklađeno planiranje upravljanja vodama, zaštite od poplava, korištenja hidroenergije, rekreacije i očuvanja biološke raznolikosti može voditi ka održivim rješenjima s većom društvenom prihvatljivošću.

10. Provoditi daljnji razvoj područja uz rijeku Drave u partnerstvu s lokalnim stanovništvom

Oni koji se bave poljoprivredom, šumarstvom, turizmom, proizvodnjom energije i gospodarskim razvojem, jednako kao i stanovnici lokalnih zajednica, važni su partneri u postizanju ciljeva održivog razvoja rijeke Drave. Odgovarajuća suradnja među svim ovim grupama može pomoći u smanjenju konflikata između vrijednosti ekosustava i gospodarskog razvoja.

Potpisali u znak pune podrške Simpoziju o viziji rijeke Drave u Mariboru 24. rujna 2008. godine

Voditelji delegacija pri Međunarodnoj komisiji za zaštitu rijeke Dunav iz podunavskih država Austrije, Hrvatske i Slovenije, te direktor Odjela za hidraulički inženjering iz Bolzana u Južnom Tirolu u Italiji,

.....
Richard Stadler
Voditelj delegacije
Austrije pri ICPDR-u

.....
Željko Ostojić
Voditelj delegacije
Hrvatske pri ICPDR-u

.....
Gyula Holló
Voditelj delegacije
Mađarske pri ICPDR-u

.....
Mitja Bricelj
Voditelj delegacije
Slovenije pri ICPDR-u

.....
Rudolf Pollinger
Talijanski predstavnik
Hidraulički inženjering

i usvojili Sudionici Simpozija o viziji rijeke Drave.

Udružimo snage na očuvanju i održivom razvoju rijeke Drave – vodnog ekosustava koji funkcionira kao koridor otkrića u srcu Europe!

a vízgazdálkodás, az árvízvédelem, a vízenergia hasznosítás, valamint a természet és a biológiai sokféleség megőrzése közös szemléletéről a Dráva vízgyűjtőjén

„A Dráva-folyó jövője” nemzetközi szimpózium alapján, amelyet 2008. szeptember 23-25. között tartottak Mariborban, Szlovéniában, melyen a Dráva folyó part menti országai, Olaszország, Ausztria, Szlovénia, Horvátország és Magyarország vízgazdálkodási és természetvédelmi testületeinek, oktatási intézményeinek és civil szervezeteinek képviselői vettek részt, válaszul a Dráva-folyó part menti tájképének védelmére és fenntartására irányuló közkeletű igényre az érintett különböző országhatárokon át, a folyó jó állapotának elérése érdekében, törekedvén a vízgazdálkodás, az árvízvédelem, a vízenergia hasznosítás és a biológiai sokféleség megőrzése jelenleg meglévő, hatékony, közös módszereinek támogatására és fejlesztésére, megerősítvén együttműködési szándékunkat a Dráva-folyó és annak topográfiai, hidrológiai és ökológiai rendszerei megőrzésében, fenntartásában és megfelelő továbbfejlesztésében, az alábbi nyilatkozatot tesszük.

JELENLEGI HELYZET

A Dráva-folyó (olaszul: Drau, németül: Drau, szlovénül Drava, horvátul: Drava, magyarul: Dráva) a Duna egyik mellékfolyója, amely Toblach-nál (Olaszország) ered, mintegy 1450 m-rel a tengerszint felett. Útja Olaszországon, Ausztrián, Szlovénián, Horvátországon és Magyarországon keresztül vezet, míg végül Osijeknél (Eszék, Horvátország) ömlik a Dunába mintegy 90 méterrel a tengerszint felett. 749 km-es folyóhosszával és 560 m³/s közepes vízhozamával a Dráva a Duna negyedik legnagyobb mellékfolyója.

A Dráva-folyó természetes vízi erőforrásokban és nyersanyagban gazdag, és óriási lehetőséget kínál a fenntartható fejlődésre.

Az elmúlt századok során a Dráva-folyó jelentős szakaszait szabályozták, amivel sikeresen csökkentették az árvizekhez kapcsolódó kockázatokat. A folyón épült számos műtárggyal azonban meggátolták a halak vándorlását. Paterniontól (Karinthia, Ausztria) kezdődően a folyó alsó szakaszán jelentős a vízenergia hasznosítás. A folyó osztrák szakaszán tizenegy vízerőmű létesült, majd további nyolc a szlovén oldalon és három a horvát oldalon. További erőművek létesítéséről tárgyalnak Szlovéniában és Horvátországban.

A Dráva-folyó mentén jelentős és jól megőrzött, rendkívül gazdag flórával és faunával rendelkező ökológiai magterületek találhatók. E területek többségét az érintett kormányok valamilyen védelmi rendszerben, például nemzeti parkok vagy természetvédelmi parkok formájában védelem alá helyezték, és ezek egyben a „Natura 2000” európai természetvédelmi hálózat részét képezik. Horvátországban, amely EU tagjelölt ország, előkészületben van a megfelelő Natura 2000 területek kijelölése, más, országos védelem alá kerülő területek kijelölésével párhuzamosan. Az EU az elmúlt években számos folyami helyreállítási és rehabilitációs projektet támogatott, melyek árvízvédelmi célokat, illetve a vadon élő állat- és növényvilág, valamint élőhelyeik megőrzését célozta. A természetes, elöntött területek növekvő mérete nemcsak a ritka és veszélyeztetett vadon élő állatok számára volt hasznos, hanem a vizek állapotát is javította.

Összességében elmondható, hogy a Dráva folyó vízminősége az elmúlt évtizedek során nyilvánvalóan javult. Ez annak köszönhető, hogy számos települést és ipari létesítményt szennyvízgyűjtőrendszerre és szennyvíztisztító üzemre kapcsoltak rá, amelyek általában nagy hatékonysággal üzemelnek. Azonban számos területen továbbra is szükség van cselekvésre.

DEKLARÁCIÓ

A jövő nemzedékek számára a Dráva vízgyűjtő értékeinek és ökológiai funkcióinak biztosítása érdekében az alábbi tíz, prioritásként kezelendő célkitűzésben állapodunk meg:

1. Elő kell segíteni az EU vízügyi és természetvédelmi szakpolitikáinak mintaként történő integrált megvalósítását a Dráva-folyón

Az EU vízgazdálkodási irányelve (Víz Keretirányelv), árvízvédelmi irányelve, valamint a növények és állatok élőhelye és a madarak védelméről szóló irányelvei alapozzák meg a vízgyűjtő-gazdálkodást a Dráva folyó vízgyűjtő területén. A kormányközi egyeztetés és információcsere pozitívan erősítheti a vonatkozó szakpolitikák végrehajtását.

2. Elő kell mozdítani az árvízvédelmet jobb árvízriasztási rendszerek alkalmazásával és fokozottabb információcserével

Az árvízvédelem a Dráva vízgyűjtőjén valamennyi Dráva menti ország közös felelőssége. Ahhoz, hogy elég korán küldhessenek figyelmeztetést az árvízveszélyes területeken, az árvízveszélyt elég korán kell megállapítani, hogy a lakosság reagálni tudjon. A határon átnyúló egyeztetéssel összefüggésben és tekintettel az éghajlatváltozásra, a Dráva folyó mentén a jövőben hangsúlyt kell kapnia az árvíz-előrejelző modellek és az árvíz-riasztási rendszerek fejlesztésének és módosításának.

3. Erősíteni kell az árvízvédelmet a vízviasszatartó területek védelmével és helyreállításával a Dráva-folyó mentén

Legfrissebb ismereteink – különösen az árvízi katasztrófákról szóló ismeretek – azt jelzik, hogy az árvízvédelmet szolgáló biztonsági intézkedések nem a leghatékonyabb megoldások. A szélsőséges árvízi események éghajlatváltozás révén várható növekedése miatt arra törekszünk, hogy javítsuk az árvízvédelmi helyzetet és növeljük a Dráva-folyó mentén a rendszer biztonsági szintjét – ez első helyen a megőrzést jelenti, illetve a továbbiakban megfelelő vízviasszatartó területek létrehozását vagy helyreállítását, ahol ez szükséges és megvalósítható.

4. Folytatni kell, és tovább kell fejleszteni a Dráva és árterei helyreállítását

Az elmúlt évek során számos folyami helyreállítási és rehabilitációs projekt igazolta azt, hogy az árvízvédelemnek és a természetmegőrzésnek nem kell többé ellentmondásban lennie egymással. A folyami helyreállítás eredményeként gyakran növekszik a biológiai sokféleség. A folyóhoz kapcsolódó vízviszatarító területek megakadályozhatják az ellenőrizetlen víziáramlást, javítva ezáltal az árvízvédelmet. Fel kell karolni ezeket a sokféle előnnyel rendelkező, országos szintű vagy határon átnyúló, további folyami helyreállítási és rehabilitációs projekteket, figyelembe véve az egyes államok gazdasági lehetőségeit.

5. A Dráva-folyót, mint „ökológiai folyosót” fenn kell tartani, és tovább kell fejleszteni

A Dráva-folyó mentén található ökológiai magterületek, így például a Natura 2000 területek, nemzeti parkhoz tartozó területek, tájvédelmi területek vagy szabályozatlan folyószakaszok a vízgyűjtő „ökológiai folyosóját” alkotják. Ezt a nemzetközi élőhely-hálózatot aktív, határon átnyúló együttműködéssel kell védeni. E tevékenység kulcsfontosságú része a határon átnyúló védett területek rendszere, például az öt folyami országot összefogó, UNESCO felé javasolt „Duna–Dráva–Mura” bioszféra rezervátum létrehozása, amit támogatni kell.

6. Helyre kell állítani a Dráva folyó ökológiai kapcsolatrendszerét a vándorló halfajok számára

A számos gátnak/akadálnak köszönhetően a Dráva folyó nem átjárható a nagy távolságra vándorló halfajok számára. A jövőben szándékunkban áll együttműködni megfelelő intézkedések, köztük hallépcsők és vízlépcsőket elkerülő halútvonalak létrehozásában, hogy elősegítsük a halvándorlást a Dráva-folyón és mellékfolyóin, összhangban a Víz Keretirányelv és az élőhelyvédelmi irányelv célkitűzéseivel.

7. Létre kell hozni a Dráva folyó országhatárokon átnyúló rekreációs területét

A Dráva-folyó vonzó helyszín a pihenni vágyók számára. A 366 km hosszú Dráva kerékpárút a folyó forrásától Mariborig tart Szlovéniában. Fokozottabban fel kell tární az ilyen jellegű, a Dráva-folyó belső értékeire épülő, fenntartható, regionális rekreációs fejlesztési lehetőségeket. Célunk az, hogy javítsuk a Dráva-folyó környezetének minőségét azok számára, akik e vonzó tájképi környezetben kikapcsolódást és pihenést keresnek.

8. Ki kell használni azokat a lehetőségeket, amelyek a Dráva-folyót különböző nemzeteket összekapcsoló „életvonallá” teszik

Sokéves széttagoltság után, napjaink egységesebb Európája új lehetőségeket kínál a Dráva-folyó vízgyűjtőjén élő, sokféle eredetű népek összehozására. Az egyes országok vízgazdálkodási és természetvédelmi felelősei új párbeszédet kezdeményeznek más folyók menti országokban dolgozó kollégáikkal, összehangolva erőfeszítéseiket a közös cél, a régió népei magas életminőségének megvalósítására.

9. Széttagolt ágazati intézkedések helyett integrált vízgyűjtő-gazdálkodást kell megvalósítani

Az elmúlt években létrejött nemzetközi megállapodások, így az „Agenda 21”, továbbá a vízről, árvízvédelemről, a növények és állatok élőhelyeinek védelméről, vadon élő madarakról és a fenntartható energiaforrásokról szóló EU irányelvek, együtt az e szövegekben is tükröződő, társadalmi felfogásban bekövetkezett elmozdulással, a fenntartható megközelítések folyamatos fejlesztését erősítik az árvízvédelem és vízenergia-hasznosítás területén. Ezért az integrált vízgyűjtő-gazdálkodás kontextusában, például e tevékenységekre alkalmazott modern megközelítések a gazdasági, ökológiai és társadalmi aspektusok integrálására törekednek. A vízgazdálkodás, az árvízvédelem, a vízenergia-felhasználás, a rekreáció és a biológiai sokféleség megőrzésének összehangolt tervezése olyan fenntartható megoldásokat eredményezhet, amelyeknek magasabb az elfogadottsága a nyilvánosság körében.

10. A Dráva-folyó területének továbbfejlesztését az ott élő lakossággal partnerségben kell megvalósítani

A mezőgazdaságban, erdészetben, turizmusban, energiatermelésben és gazdaságfejlesztésben dolgozók, illetve a helyi települések lakosai mind fontos partnerek a Dráva-folyó fenntartható fejlesztésével összefüggő célok megvalósításában. E csoportok közti megfelelő együttműködéssel minimálisra lehet csökkenteni az ökológiai értékek és a gazdasági fejlődés közti bármilyen ellentétet.

Aláírták, teljes körű támogatásuk jeleként, 2008. szeptember 24-én, Mariborban, a Dráva-folyó jövője szimpóziumon

a Nemzetközi Duna-védelmi Bizottságban (ICPDR) Ausztria, Horvátország, Magyarország és Szlovénia, mint Duna menti államok delegációvezetői, valamint a Bolzano-i hidraulikus gépészeti főosztály igazgatója (Dél-Tirol, Olaszország)

.....
Richard Stadler
ICPDR osztrák
delegáció vezető

.....
Zeljko Ostojic
ICPDR horvát
delegáció vezető

.....
Holló Gyula
ICPDR magyar
delegáció vezető

.....
Mitja Bricelj
ICPDR szlovén
delegáció vezető

.....
Rudolf Pollinger
Hidraulikus gépészeti főosztály
olasz képviselője

és elfogadták a Dráva-folyó jövője szimpózium résztvevői.













Egyesítsük erőinket a Dráva-folyó megőrzése és fenntartható fejlődése érdekében, amely vízi ökoszisztémaként a gyógyulás folyosójaként működik Európa szívében!

DRAVA RIVER MAP

Nature protection areas, hydropower plants and floodplain



LEGEND

-  Drava River Basin
-  Drava and Mura rivers
-  Major tributaries
-  Active floodplain* (between flood protection dykes: 880 km²)
-  Potential floodplain* (between lower terraces: 2,450 km²) (*including all waters)
-  Protected areas (Natura 2000 for AT, SI, HU; for HR other river relevant protected areas)
-  Ramsar sites
-  Hydropower plants (dams, weirs)
-  Borders
-  Cities: >100,000 inhabitants
-  20,000-100,000 inhabitants
-  Other important cities <20,000 inh.

Data was provided by: Amt der Kärntner Landesregierung (Natura 2000 Kärnten), Amt der Steirischen Landesregierung (Natura 2000 Steiermark), WWF Austria: Protected areas for SI, HU, HR, RS, FLUVIUS: Catchment, Hydropower plants and floodplain, RAMSAR: Ramsar sites



Scale: 1 : 1,350,000
(in A3 landscape paper format)

Prepared by FLUVIUS, Vienna, September 2008



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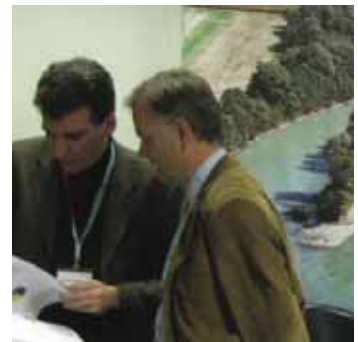
PHOTO IMPRESSIONS

Press Conference,
23. September 2008
Maribor, Slovenia;

from left:
N.N., Dr. Mitja Bricelj (State Secretary,
Slo), Dr. Aleks Bizjak (Institut for water, Slo),
Philip Owen (EU LIFE Unit), Translator,
Arno Mohl (WWF Austria), Translator,
Philip Weller (ICPDR)



„Breaking news“



Full auditorium
Day 1 , 23.9.2008





Coffee break



Thomas Mikloutsch, New World Spirit film creation, Carinthia, giving an introducing statement to his new film „Rittlingers Dream“.

The film is a philosophical and scientific snapshot about the revitalization of the Upper Drava.
At the Symposium on 24. September 2008 it had it's world projection premiere.



Discussions getting off the ground
Day 1, 23.9.2008

PHOTO IMPRESSIONS

Signing ceremony
Day 2, 24.09.2008



A final photo,
Day 2, 24.9.2008



After work party.
Sunset raft on Drava river,
End of Day 2, 24.9.2008



Field trip on Day 3
25. September 2008



FOLLOW UP ACTIONS

international symposium
23-25 September 2008
Maribor, Slovenia

DRAVA
RIVER
VISION

1. Solutions for enhanced flood protection, low water and drought management with non structural adaptation measures for the international DRB (DRV Declaration: points 2, 3, 4)

- nomination of a core group of members from 5 riparian states
- cooperation with the expert groups of the ICPDR and the ISRBC
- workshop in spring 2009 on the strategy for the EU funds project proposal (INTERREG)

2. Development of criteria for sustainable use of renewable resources utilisation in the international DRB (DRV Declaration: points 6, 9)

- nomination of a core group of members from 5 riparian states
- expert meeting for the development of the strategy

3. Communication strategy for the international DRB (DRV Declaration: points 1, 10)

- nomination of a core group
- authorities, educational institutions, business sector
- cooperation with the expert groups of the ICPDR and the ISRBC
- workshop in spring 2009 on the strategy for the EU funds project proposal (LIFE+)

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