European Centre for River Restoration
Secretariat:
Italian Centre for River Restoration
Viale Garibaldi 44/A
30173 Mestre – Venice, ITALY

# European Centre for River Restoration

# NEWSLETTER – November 2007

*Special issue on the ECRR seminar "River restoration practices in the Danube Basin"*

Editor: Francesco Pra Levis

**CONTENTS:**



***The ECRR wishes to thank all the invited speakers of the seminar for their cooperation to the report published in this ECRR newsletter.***

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# 1. REPORT ON THE ECRR SEMINAR

## "PRACTICES OF RIVER RESTORATION IN THE DANUBE BASIN"
## BUDAPEST, 28-29 September 2007

**In collaboration with**

**Centro Italiano per la Riqualificazione Fluviale (CIRF)**

**National Centre for Water Management, The Netherlands**

**Water Resources Research Centre (VITUKI)**

On the days 28-29 September 2007, the European Centre for River Restoration organized the seminar "Practices of river restoration in the Danube Basin", held in Budapest, Hungary.
The event focused on river basin management and river restoration experiences carried out in the Danube Basin, with the aim of sharing knowledge, concepts, approaches, methods and strategies on river restoration and fostering networking associating subjects working in river restoration within the frame of ECRR.

VENUE

VITUKI - Hungarian Water Research Center
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Budapest
H-1095
Web: **www.vituki.hu**
E-mail: **vituki@vituki.hu**

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# PROGRAMME OF THE SEMINAR

| ***Day 1 – Friday 28 September 2007: Seminar*** | |
|---|---|
| 9.00 | Opening and overview of ECRR, Bart Fokkens, National Centre for Water Management, The Netherlands |
| 9.15 | Welcome, **Peter Bakony**, Hungarian Water Research Center - VITUKI, Hungary |
| 9.30 | Case study from Hungary by **István Zsuffa**: river restoration projects in Hungary |
| 9.50 | Case study from Germany by **Barbara Stammel**: "River restoration project between Neuburg and Ingolstad" |
| 10.10 | Case study from Austria by **Rudolf Hornich**: "River restoration works on the river Mur" |
| 10.30 | Participation of the ECRR in the Riversymposium 2007 & Environmental flow (conference organized within Riverfestival 2007, 31 August – 9 September 2007, Brisbane, Australia). Report by **Martin Janes**, River Restoration Centre, UK. |
| 10.50 | Coffee break |
| 11.30 | Case study from Romania by **Anca Savin**: River restoration practice in Prut River Basin - "Ciobarciu Wetland Project" |
| 11.50 | Case study from Romania by **Dan Badarau**: River restoration practice in Prut River Basin - "Elan Project" |
| 12.10 | Presentation by **Georg Rast**: "Sediment balance of the Danube river – facts and conclusions for river restoration concepts" |
| 12.30 | Case study from Austria by **Thomas Hein**: "Wetland restoration and potential effects for nutrient retention - examples from the Danube River Basin" |
| 12.50 | Lunch |
| 14.00 | Case study from Slovenia by **Kristjan Malačič**: "Naturepark Goričko: Streams are part of our national treasure" |
| 14.20 | Presentation of the 4th ECRR International Conference on River Restoration 2008, **Bruna Gumiero**, Italian Centre for River Restoration, CIRF, Italy |
| 14.30 | Discussion about further international cooperation in river restoration and the role of ECRR in this |
| 16.00 | Conclusion of the seminar |

| ***Day 1 – Saturday 29 September 2007: Field Trip*** | |
|---|---|
| 8.30-13.00 | Boat excursion to a Nature Conservation Area downstream of Budapest.<br><br>To see them with Google Earth Software go **here** and click on the blue spots in the map for some pictures. |

## DAY 1 – FRIDAY 28 SEPTEMBER 2007: SEMINAR

### 1. OPENING AND OVERVIEW OF THE ECRR *BY BART FOKKENS*

Bart Fokkens opened the ECRR seminar day and welcomed the participants. Bart introduced the ECRR network and activities briefly.

Bart Fokkens, being the present chairman of the ECRR, presented an overview of the ECRR developments in the last years. The present vision of the ECRR " Enhance river restoration as an integral part of sustainable water management throughout Europe, by connecting people and organisations working on river restoration" is still valid. The important definition in the vision is that ECRR focuses on the development of ecological restoration. River restoration is being understood as a part of sustainable water management.

The ECRR is a network provider to exchange information and experiences on river restoration.


What are the essential activities of the ECRR? Promotion of the network and functions are important. The dissemination of river restoration information by e-mail, website and the events in which people can meet each other.
The Member countries in Europe are quite well distributed. The Management Board represents a good variation of countries from the different regions in Europe. The major problems are the same over whole Europe, but certain areas for example the South of Europe faces bigger problems due to the water shortage and the number of reservoirs/dams. The ECRR

Management Board members discussed already the existing strategy and they came to the following conclusions:

- the ECRR should improve the role of network provider better. Emphasis should be put on the national networks, conferences and workshops as well as the on the observers role which is more about the (global) representation;
- the role of the ECRR as a provider of river restoration information should be enlarged by giving examples of best practices, the role of river restoration in relation to the IWRM and the WFD implementation, examples of cost-benefit analyses and good examples of awareness rising.

The legal framework of the ECRR work is diverse. All the restoration work falls under the umbrella of three main conventions (Convention on Biological Diversity, Ramsar Convention, and the Helsinki Convention as well as some specific Basin Convention.

Furthermore, there are many EU Directives which are important for river restoration issues (e.g. the Water Framework Directive, the Bird and Habitat Directive, the Nitrate Directive. The WFD is the most important directive in relation to river restoration; this creates perspectives to create more diversity in riverine habitats, to enlarge the ecological network along rivers, to contribute to a better flood management and to improve spatial Quality.
Bart is grateful to VITUKI and especially Peter Bakonyi for the organisation of this seminar.

**Bart Fokkens**
Chairman of the ECRR
**www.ecrr.org**

To download the presentation go **here**.

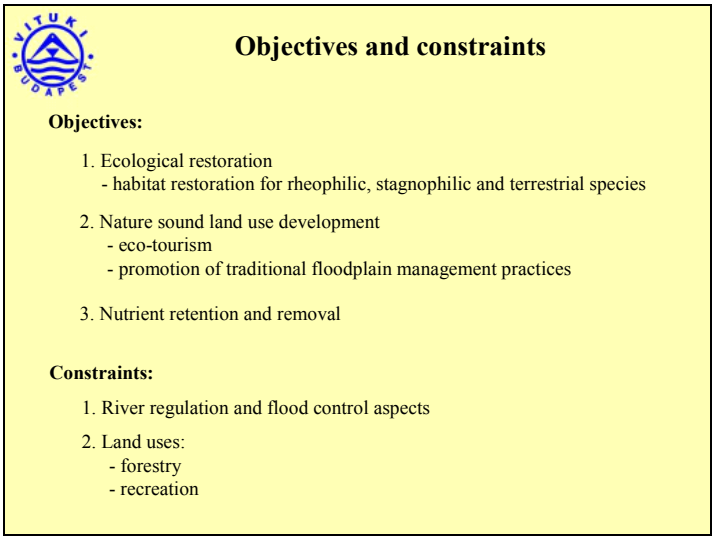
## 2. WELCOME *BY PETER BAKONYI*

Peter Bakoni, from Hungarian Water Research Center – VITUKI, welcomed all the participants of the seminar, thanking the ECRR for the opportunity of organizing the seminar in the city of Budapest.
Peter underlined the needs of river restoration in the Danube Basin as a part of sustainable water management and ecological improvement in all the countries of the Danube Basin.

**Peter Bakonyi**
Hungarian Water Research Center – VITUKI
**www.vituki.hu**

## 3. "RIVER RESTORATION PROJECTS IN HUNGARY" *BY ISTVÁN ZSUFFA*

Ecological values of floodplains of most regulated rivers have been and are still being degraded due to unfavourable changes in external factors. Changes in hydrological conditions have lead to the most dramatic degradations. Accordingly the key to ecological restoration of these systems is the restoration of the water regime, which is proposed to be achieved by means of well-designed engineering interventions. Case studies from the Hungarian Danube system are presented with the aim of providing examples for this approach.



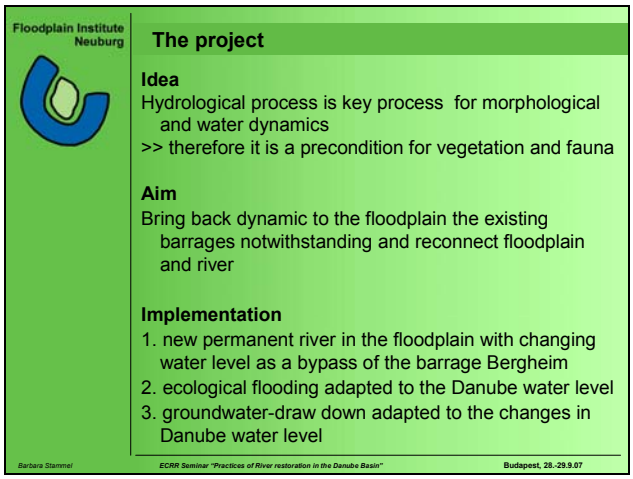

**Dr. István ZSUFFA, Dr. Géza Jolánkai**
Environmental Protection and Water Management Research Institute (VITUKI), Hungary.
**www.vituki.hu**

To download the presentation go **here**.

## 4. "RESTORING RIVER/FLOODPLAIN INTERCONNECTION TO PRESERVE RIPARIAN VEGETATION ON THE DANUBE FLOODPLAIN BETWEEN NEUBURG AND INGOLSTADT (BAVARIA/GERMANY)" *BY BARBARA STAMMEL*

The Upper Danube was embanked and straightened in the 19$^{th}$ century and nowadays flows in dikes without any contact with its floodplain except during very high floods. Additionally, in the 1970s hydro power stations in form of large dams were built, negatively influencing the river continuity and the ground water level of the floodplain. The goal of the river restoration project is to bring back new dynamics to the floodplain (water, groundwater and morphological features), which is the key process to enhance floodplain habitats and species.

The project "Restoration of riparian areas on the Danube floodplain between Neuburg and Ingolstadt (Germany)" takes place in a project area of 2100 hectares of riparian forests. Despite the changed conditions, a high biodiversity, consisting mainly of species of the hardwood riparian forest, can be conserved. The project consists of three measures: 1) a permanent flow of water (up to 5 $m^3/s$) bypassing the dam of the upper power station. The new river will develop on the floodplain, partly flowing in old oxbows, but partly eroding its way naturally; 2) controlled floodings (up to 30 $m^3/s$) of parts of the floodplain during peak discharge of the Danube (600-1100 $m^3/s$; statistically one to three times a year); 3) temporary drainage of the floodplain in summer, where the groundwater level is constantly high due to the dams.


The project, conducted by the Bavarian Water Authority, started in October 2006. Construction works will hopefully be finished by winter 2008, and in spring 2009 the first water will run through the riparian forest. The Aueninstitut (Floodplain Institute) Neuburg was founded in January 2006 to document the hydrological, morphological and biological changes in the project area.

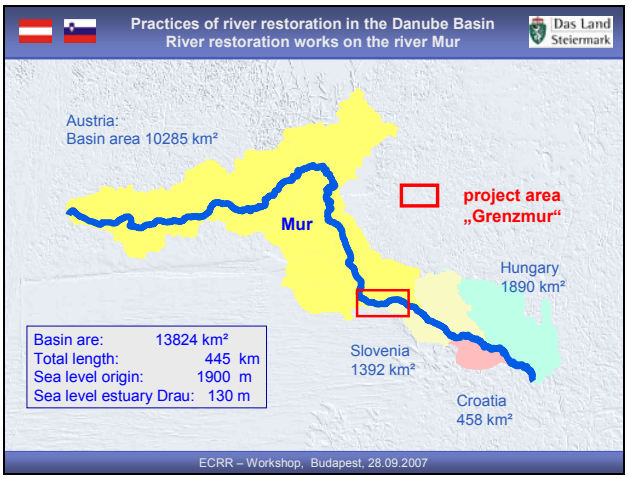
**Dr. Barbara Stammel**
Aueninstitut Neuburg
**www.aueninstitut-neuburg.de**

To download the presentation go **here**.

## 5. "RIVER RESTORATION ALONG THE BORDER SECTION OF THE RIVER MUR ("GRENZMUR")" *BY RUDOLF HORNICH*

### THE RIVER MUR – LOCATION AND CHARACTERISTIC FEATURES

The River Mur has its origin the Province of Salzburg at approx. 1,900 m a. s. l. After about 445 km, it enters the River Drava near Legrad (130 m a. s. l.) at the Croatian-Hungarian border. It drains a watershed of 13,824 km$^2$. Its shared length between the Austrian and Slovenian border is about 34 km. Systematic work along the watercourse started at the end of the 19th century. Between 1875 and 1894, the formerly braided system of the River Mur was united into a single straight river bed.
On Austrian territory, there are 28 hydroelectric power plants, which massively interfere with the bed-load regime of the "Grenzmur". A section which is particularly remarkable for its natural landscape is the border stretch with its alluvial forests. Today, this section of the River Mur, together with its alluvial forests on Austrian territory, is designated as a European Conservation Area (Natura2000).


## THE RIVER MUR AND ITS CHANGES IN THE COURSE OF HISTORY

In today's border region between the Republics of Slovenia and Austria, the River Mur occupied large parts of the valley until the end of the 19th century. In the period from 1875 to 1891, the River Mur underwent training from Graz to the Hungarian border. The aim of these measures was to discharge the average flow within a defined main bed of about 76 m in width. The frequency at which the "Grenzmur" changed its river bed in the 19$^{th}$ century is evidence of the sediment surplus which existed at that time. The river was either in a state of dynamic equilibrium or even in a state of latent aggradation. Today, the section of the River Mur at the border between Austria and Slovenia is suffering from an acute sediment deficit.

## PROBLEM

The main problem for the "Grenzmur" today has been the deepening of the river bed by approx. 1.3 m in the last 30 years. This leads to the destabilisation of existing river bank protection structures in built-up areas, the separation of old river branches in the hinterland and of their alluvial forests as well as the lowering of the adjacent groundwater level. The consequence is a significantly disturbed water balance, causing difficulties in water supply and changes in the alluvial forests and their dynamics. The main cause for the deepening of the river bed was the "Hohenburger River Regulation" at the end of the 19th century. Severing meanders and shortening the river course increased the tractive force of the river. Another cause is the chain of run-of-river power plants upstream of the border section. Plants of the older type almost completely inhibit the input of sediment into the "Grenzmur".

## BASIC WATER MANAGEMENT CONCEPT FOR THE "GRENZMUR"

Against the background of this problem, the Permanent Austrian-Slovenian Commission for the River Mur commissioned a basic concept in 1998 based on which decisions were to be taken to halt the trend of bed erosion. The general aim of the project was to provide decision-makers with the fundamentals to solve the water management problems in the section of the "Grenzmur" from km 95.0 to km 129.5 as well as in the immediate surroundings from the perspective of water management and water ecology.

## RESULTS OF THE STUDY

The collection and evaluation of the data on the changes of the bed of the River Mur has shown the river bed in the section of the "Grenzmur" to be unstable with a significant trend towards bed erosion. Signs of erosion are evident all along the section, varying in magnitude along the water course and reaching values of up to 130 cm since 1970. The net material output from

1970 to 2000 was calculated to be 0.9 million $m^3$. Using the sediment transport model MORMO, the likely future development of the bed of the "Grenzmur" was demonstrated. From the forecasts which are arrived at via the sediment transport model it can be inferred that bed erosion of the "Grenzmur" will continue unabatedly, unless countermeasures are taken ("business-as-usual"). As concrete solutions to the problem of river-bed deepening of the "Grenzmur" along its entire length were developed it soon became apparent that improving the sediment regime alone would not suffice. What is required instead is a combination of measures consisting of an improved sediment regime and a widening of the river. The idea is to increase the sediment-effective width to approximately twice the width of today's river.

**MEASURES**

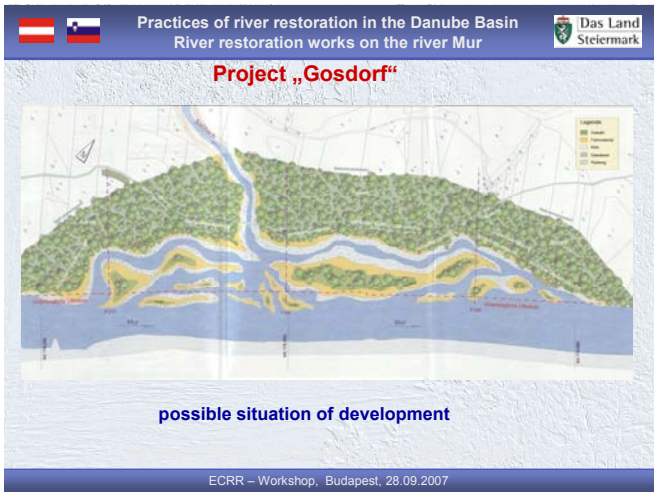
The aim of "creating a dynamic stability of the river bed" or "preventing further bed erosion" should be attained as cost-efficiently as possible. By making use of the self-development potential of the River Mur, an improvement of the situation in river engineering as well as in ecological terms is to be achieved, taking the need for flood protection into consideration as well.

From among the several options, (e.g. transverse structures, groyne fields, weirs), these requirements are met best – from a water-management and ecological point-of view - by increasing the width of the river bed to approx. 200 to 250 m.

To develop these measures, a potentials map was drawn up to evaluate the flood plain areas for their suitability to widen the river bed, with the position of the upper and lower edge of the gravel layer relative to the bottom of the River Mur being of particular relevance.

These scenarios were then checked using the sediment transport model for their effect on the river bed development for the next six decades. It became apparent that a further deepening of the river bed of the "Grenzmur" can be prevented for a period of about 60 years, if a dynamic widening of the bed width by lateral erosion can be maintained continuously over an extended period of time. The effective bed width was assumed to be about 200 m.

**PROJECT GOSDORF**




In autumn 2006, construction measures began for the widening of the river bed in the Gosdorf area. This was the first of a total of six major river bed widening projects on the Austrian and Slovenian side, which had been planned in accordance with the basic concept.

It is planned to widen the River Mur from about 85 m to twice this width over a length of about 1.1 km. This is to be achieved by machine-digging a lateral branch and transferring the material into the River Mur.

The remaining bed load is mobilised by the river itself during times of higher flow rates. From the approximately 900,000 m3 of sediment which are available and which have been deposited by the river along its sides in the alluvial forests in the course of centuries, about 105,000m3 have been reintroduced into the River Mur.

The success of these measures is checked via a monitoring programme which is run by the Vienna University of Natural Resources and Applied Life Sciences. With the help of tracer rocks (simulated bed-load material), the route taken by the introduced material is followed via

satellite navigation and documented. The morphological changes are observed via a webcam and documented as well (**http://www.zepp-cam.at/gosdorf**).
With the Gosdorf project, the River Mur is given a chance of becoming active itself. The construction measures are intended to serve as a trigger. Later on, the river itself should mobilise the gravel deposits, which have accumulated along its course, at times of higher discharge or during floods, distribute them further downstream in its bed and thus contribute towards stabilising and partly even raising the bed. Apart from the positive water engineering effects, these "re-naturalisation measures" will also be beneficial from an ecological point-of-view by creating new habitats. During their spawning season about a month ago, hundreds of nases (*Chondrostoma nasus*), which used to be extremely rare in the River Mur, entered their newly created "nurseries".
50% of the total costs of about 500,000 € are funded as an Interreg IIIA Project; the remaining part is financed by the Republic of Austria, the Province of Styria and the Municipalities.

**OUTLOOK**
Encouraged by the positive experiences and results of the pilot projects and the measures in Gosdorf so far, further river bed widening projects are planned both on the Austrian and the Slovenian side for the coming years. Their implementation is foreseen in the framework of an Interreg Project, co-funded by the EU.
All measures will be accompanied by comprehensive water-management and ecological monitoring.

**Rudolf Hornich**
Wasserwirtschaft Steiermark
**www.wasserwirtschaft.steiermark.at**

To download the presentation go **here**.

# 6. PARTICIPATION OF THE ECRR IN THE RIVERSYMPOSIUM 2007 & ENVIRONMENTAL FLOW *BY MARTIN JANES*

**RIVER*SYMPOSIUM***

The River*symposium* is one of the key annual international river management and river restoration conferences. The River*symposium* is one element of the week long Brisbane River*festival*, an initiative of the City Council and the Queensland Government. The festival aims to celebrate the river and what it means to the city; and what every river means to everyone else, worldwide.

The conference celebrates work done in Australia, and internationally. The organisers manage to achieve a good split between science/research and delivery of practical works.

**OVERVIEW OF THE SYMPOSIUM**

The symposium presentations were delivered over three and a half days with additional Training sessions on the Sunday prior, and the Thursday afternoon. The training sessions were directed at Australian participants (catchment water quality tool, water transactions for environmental flows, the 'Run of the River' board game, and e-flows modules).

Given the scale of the conference and the number of delegates and presentations the format was one of plenary lectures (often two or three in the morning and a similar number after tea) with the remaining time given over to 8 parallel sessions.

On day three ECRR a 15 minute presentation was given in the main auditorium (approx. 200 audience) explaining the following topics:

- What use is a National RR Centre
- The ECRR, its history, aims and activities
- Examples from some ECRR members
    - UK RRC, activities and overview
    - Finland, restoring log floating rivers
    - Denmark, river Skjern restoration project
    - Italy CIRF, Training, workshops and publications
- ECRR goals in the next three years
- Venice 2008 conference details and invitation
- Link to Australia; proposed Australian River Restoration Centre

A number of questions were asked relating to low (e) flows in Europe, success on urban rivers, and the proposals for an Australian RRC.

**Martin Janes**
River Restoration Centre
**www.therrc.co.uk**

To download the presentation go **here**.

## 7. RIVER RESTORATION PRACTICE IN PRUT RIVER BASIN - "CIOBARCIU WETLAND PROJECT" *BY ANCA SAVIN*

The Ciobarciu Wetland Project is an ecological rehabilitation project carried out (2003 – 2006) in cooperation between the water board "Hunze en Aa's", the Romanian water management administration "Apele Romane" Prut Directorate, the institute RIZA and the foundation "Het Drentse Landschap".

The project area is in the valley of the Prut River, which is the last tributary of the Danube River. Situated in the east part of Carpathian Mountains, Prut valley has an international importance, because it is the migration route for water birds from the Danube Delta.
In the Prut basin, like everywhere in the world, human activities had a large impact on the natural water system causing severe losses to natural values and biodiversity.
Complete restoration of the original ecological conditions is impossible and would destroy the many positive results of the hydro-technical constructions.
The development of the Ciobarciu Wetland consisted in:

- Restoration of water flow in the area (Old Jijia River – which due to the hydrotechical works it was cut off from the main river)
- Developing of the wetland of 224 ha grassland, situated in an embanked zone formed by 4 polders.

The project was finalized in October 2006.
In the Ciobarciu wetland project habitats, that are characteristic for the floodplain as it existed before human intervention, have been restored.

The management of the area is aimed at getting a diverse wetland, consisting in a mosaic of water, reed land, grassland and clumps of trees.
For the management of the area it was decided that in the first year the poldes will be flooded once a year, during spring time, and then to see how the area is developing.
Although the year of 2007 was very dry and the wetland is in an early stage of development, changes are already showing.
In 2007 was realized the first fish and birds monitoring.
The fish monitoring revealed that in the wetland are: 8 fish species from which 3 are protected by Berna Convention (Leucaspius delineatus, Rhodeus sericeus and Cobitis taenia). The shallow water and the vegetation provide good reproduction opportunities for these species.

The birds monitoring revealed that in the area there are 36 species of birds from which 8 species are very important and are on the lists of the Directive for the conservation of Biodiversity or are rare species in Romania (Ardea purpurea, Ciconia nigra, Aythia fuligula, Himantopus himantopus, Aquila heliaca, Aquila clanga, Limosa limosa, Aythia nyroca).
Nest step is to make a study of flora in the wetland area.
The monitoring will support management decisions and it can provide valuable knowledge for the wetland restoration.

**Anca Savin**
Romanian Water
**http://www.ciobarciu.ro**
**http://www.apeprut.ro**

To download the presentation go **here**.

## 7. RIVER RESTORATION PRACTICE IN PRUT RIVER BASIN - "ELAN PROJECT" *BY DAN BADARAU*

The Elan Project was part of the Danube Regional Project helps to assist Danube River Basin countries to prepare new land-use and wetland policies and legislation in line with existing and emerging legislation, particularly the EU Water Framework Directive (WFD). It focuses on the protection and/or rehabilitation of rivers/wetlands and addresses common inappropriate land

uses and subsequent impacts on ecologically sensitive areas and wetlands. While targeting action at a high policy level, the output also is directed towards demonstrating pragmatic implementation of appropriate land use management on the ground through pilot activities.
The activities were focused on the development of appropriate integrated land use concepts and policies for the protection of three selected sensitive wetland areas.
The 'Lower Elan' Basin pilot site comprises an area of almost 3,300 hectares being situated immediately upstream of the confluence between the Prut and Elan Rivers. The main village of Murgeni within the Lower Elan basin lies 35 km east of the city of Barlad (Vaslui County) and 90 km north of the city of Galati (Galati County) as measured by road distance. Within the pilot project site, about 620 hectares represent the floodplain, out of which permanent wetlands cover 382 hectares (divided into 364 hectares of reed swamp and 18 hectares of water bodies). The Lower Elan wetlands are extremely important, for both people and biodiversity because of their functions for flood peak mitigation, agriculture, water supply, fisheries, and habitats for flora and fauna. (*picture 1*)
The Lower Elan floodplain is bordered by eroded hillsides used for grazing and cultivation. Excessive hillside erosion is recognized as being a major environmental threat throughout the Moldavian Plateau of eastern Romania. The Lower Elan wetlands also encourage the deposition of nutrient-rich sediments carried by the river.
Implementation of technical measures and management agreements was: soil erosion control on slopes through some land reclamation works and an-forestation of the most degraded agricultural lands, reactivating old small meanders of the Lower Elan River, planting of native Salix species along the current course, improvement of public awareness and training of local communities and landowners on best agricultural practices on slopes and floodplain rehabilitation. (*picture 2*)

*Picture 1*

*Picture 2*

**Dan Badarau**
Romanian Water
**http://www.rowater.ro/**

To download the presentation go **here**.

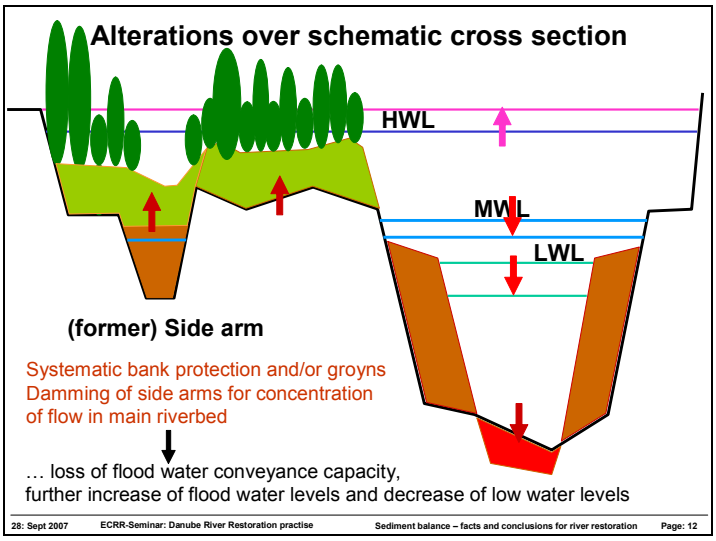
## 8. "SEDIMENT BALANCE OF THE DANUBE RIVER – FACTS AND CONCLUSIONS FOR RIVER RESTORATION CONCEPTS" *BY GEORG RAST*

Georg presented some notes taken from the case study "Assessment of the balance and management of sediments in the waterway Danube" where was discussed the problems related to the navigation development, the sediment extraction and channel incision along the Danube and selected tributaries that caused a general alterations of the river specially due to:

- Systematic bank protection and/or groyns
- Damming of side arms for concentration of flow in main riverbed

These are the main causes of the incision of riverbed, of the decrease of low and even mean water levels subsidence of groyns and bank reinforcements and of the increased maintenance.
Some approaches were suggested in the project Danube East of Vienna, where the key restoration interventions were:

- Re-opening of former side arms
- Reduction of bank reinforcements
- Shortening of groyns
- Armouring of river bed




**Georg Rast**
WWF Germany
**http://www.wwf.de**

To download the presentation go **here**.

## 9. "WETLAND RESTORATION AND POTENTIAL EFFECTS FOR NUTRIENT RETENTION - EXAMPLES FROM THE DANUBE RIVER BASIN" *BY THOMAS HEIN*

Nutrient enrichment has grown in importance over the last decades because progressive eutrophication appears in increased biomass of algae, species change or loss and also dissolved oxygen depletion, leading to severe loss of ecosystem functions. This loss causes concurrent also a degradation of many ecosystem services like drinking water supply, self purification capacity or food resource basis. Insufficient water treatment (point sources) and non-point sources (e.g. runoff from agriculture/irrigation) in the catchment affect the water quality of river stretches and downstream areas, even coastal areas.

In the Danube River Basin (DRB) over the last 150 years there has been a loss of 80% of Danube wetlands due to canalisation, drainage and rededication. Land use change in concert with nutrient pollution and the hydromorphological alterations caused increased pressures by nutrient loads in the DRB and along the Black Sea coast. The ongoing degradation of Black Sea coastal areas has led to a number of scientific and management activities to reduce the nutrient input from the Danube (UNDP/GEF Danube Pollution Reduction Program Report, 1999; Kroiss et al., 2005). To prevent further destruction and enhance restoration measures of the Danube River and its wetlands several documents and policies were developed, also in close connection to the European Water Framework Directive. In order to strengthen the understanding of the role of riverine wetlands in nutrient reduction and therefore relieve the Black Sea, further investigations and activities were proposed as part of the UNDP/GEF Danube Regional Project (**www.undp-drp.org**). One activity of this project was the work package Monitoring and Assessment of Nutrient Retention Capacities of Riverine Wetlands.

The objectives of this DRP study were to summarize the current policies and the role of wetlands herein and also the current knowledge on nutrient retention capacity in wetlands with an analysis of case studies from the DRB in detail. A questionnaire helped to identify the

potential of nutrient retention functions in riverine wetland management approaches by evaluating recent, running and near-future restoration projects. Recent established demonstration projects showed how different aspects of nutrient retention were implemented in wetland management projects.

In riverine wetlands the diversity of aquatic and semi-aquatic habitats and the intense interaction with subsurface waters and sediment/soil complexes foster nutrient retention processes. According to the nutrient spiralling concept[1], this situation results in a high cycling rate with increased nutrient transformation and retention due to physical, chemical and biological processes. As a consequence riverine wetlands react conservative to nutrient additions - often referred to as a buffering capacity, thus providing stability to the running water ecosystems.

For demonstration of this buffering capacity in relation to the hydrological exchange conditions two riverine wetlands in the Danube River stretch between Vienna and the Slovakian border (river km 1920 - 1880) – a 40km floodplain section - have been compared (Fig.1): a more isolated floodplain segment, only getting filled during high flows, and a more dynamic one integrated in the riverine flow above mean flows which has been restored in 1996.

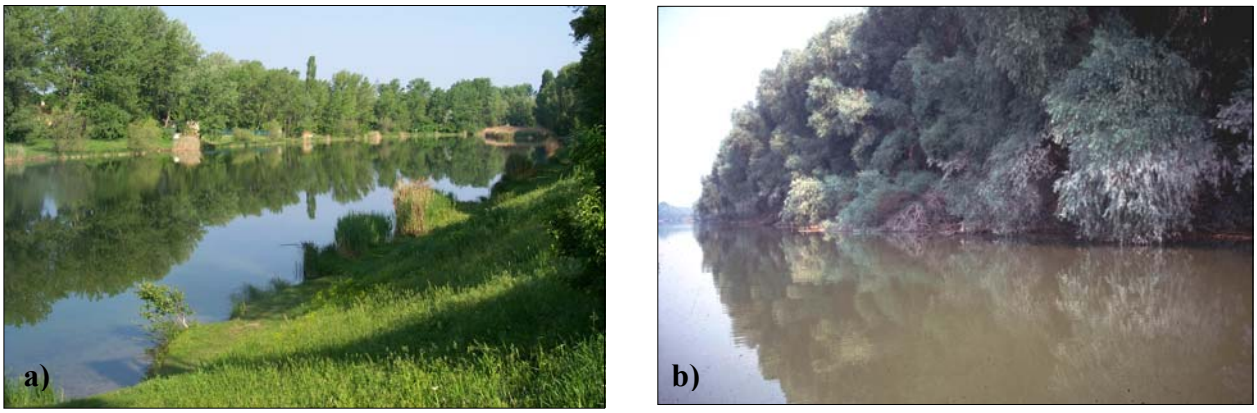



Figure 1: The Lobau (a) represents the isolated wetland and has an area of 2160ha. It is severed upstream from the main channel after the main regulation of the Danube in the 19th century. Above mean water level (~1900m$^3$/s) the floodplain fragment is connected to the main channel only at its downstream end. Regelsbrunn (b) is the example of the re-connected wetland. It is dominated by a former river channel with a total length of 10km. The connectivity with the Danube was enhanced by lowering the embankments and by artificial dike openings in different inflow areas providing surface connection at water levels 0.5m below mean water.

The results of this case study show the striking difference in the nutrient retention function and changes due to the restoration of the hydrological exchange conditions.
The highest nitrate retention in the hydrological dynamic site is found at lower discharges, whereas in the Lobau the highest retention is found at elevated water levels close to bankful flows.

[1] Newbold, J.D. 1992. Cycles and spirals of nutrients, Pages 379-408 *in* P. Calow and GE. Petts, eds. The rivers handbook: Hydrological and ecological principles. Blackwell Scientific, Boston, Massachusetts, USA.

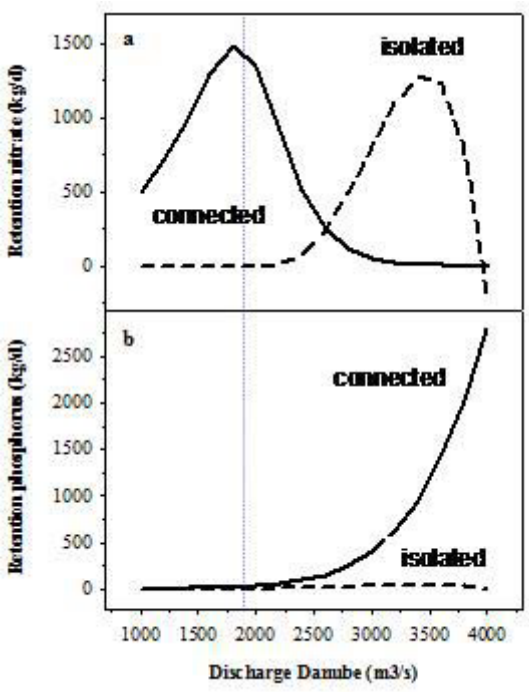



Figure 2: Relationship of the discharge in the Danube and the retention capacity for nitrate (a), phosphors (b) in the connected wetland (solide line) and the isolated one (dashed line) based on mass balance calculations of the input and output of the respective wetland areas. Mean water discharge is marked with the blue dotted line.

The phosphorus retention increased with discharge in the dynamic wetland, but the isolated site (Lobau) does not show large retention capacities for phosphorus (Fig.2).
These results demonstrate the broad variability of nutrient retention for P and N and highlight the role of hydrological exchange conditions controlling this function in riverine wetlands. Appreciating the high value of wetlands in terms of nutrient retention also means to consider the risks involved, such as accumulation of sediments (terrestrialization) and toxic substances in any management activity.

To answer the question how wetland functions, especially nutrient retention is implemented in these wetland management plans, an inventory was conducted. This inventory of nutrient retention capacities of riverine wetlands with a questionnaire had the aim to develop and demonstrate a methodology to support a harmonised assessment and monitoring of nutrient retention in the Danube River Basin. The implementation of complete inventory and creation of a full database was not the objective but rather to keep the approach simple for demonstration purposes.
The collected information should enable the assessment of wetland nutrient retention capacity and enable the comparison of wetlands in terms of nutrient retention efficiency. The questionnaire was sent to 44 wetland restoration projects or wetland areas within the DRB and 17 responses were received. The detailed results are found in the Technical Guidance report **http://www.undp-drp.org/drp/themes_wetlands.html**.

The conclusion of all these partial results is to proceed by integrating this guideline on nutrient retention with other aspects in a general wise use guideline with the aim of a sustainable wetland management approach. Our work points to the fact that the integration of wetland management in River Basin Management is urgently needed, as well as the catchment perspective for a sustainable management of wetlands. For a future River Basin Management Plan for the Danube river basin we suggest the continuation of monitoring the demonstration sites to follow long term effects and also to combine the efforts in the light of the Water Framework Directive.

Elisabeth Bondar-Kunze[1,2], Peter Whalley[3], Matthias Zessner[4] & Thomas Hein[1,2]

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[4]*Technical University Vienna, Institute for Water Quality, Resources and Waste Management, Karlsplatz 13 / 226, A-1040 Vienna, Austria*

**Thomas Hein** and **Elisabeth Bondar-Kunze**
Universität für Bodenkultur Wien
**www.boku.ac.at**

To download the presentation go **here**.

## 10. "NATUREPARK GORIČKO: WATERWAYS (STREAMS AND CREEKS) ARE PART OF OUR NATIONAL TREASURE" BY *KRISTJAN MALAČIČ*

In the extreme northeast of Slovenia, between the small part of the Pannonian Plain, that belongs to Slovenia and Austrian-Hungarian border, lies the Goričko Nature Park. It was established on the 9th of October 2003 and so became a part of the Three Country Park Goričko-Raab-Örség (Slovenia-Austria-Hungary).

Why Goričko Nature Park? The varied cultural landscape is of the highest value (meadows, fields, hedges, forests...) and it is mostly cultivated extensively. Because of this art of cultivation, Goričko is an area with a high biodiversity, although in this region there are not so "completely natural" habitats. Moreover, almost the whole area of the park is a Natura 2000 area.

Recently more and more problems are occuring. The extensive art of agriculture is abandoning, this is why many areas are now being overgrown. On the other side the agriculture is getting more and more intensified.

The Goricko Region waterways consist of many small creeks and streams, however there are no large rivers. This presents unique problems, because some of them were regulated in the past. Although the waterways are made up of small streams and creeks, they are very important to the local ecosystem. This is why it is important to repair past mistakes.
In the Goričko Nature park, there were three projects to date:

- Experts studies for management plan of Ledava and lake (Interreg IIIA SLO-AT); ecomorphological studies for ecoremediation in upper tream flow of Ledava - Limnos, JZ KPG
- Life Natura: Project title: Conservation of otter population (*Lutra lutra*) in Goričko; Aqualutra
- Ecoremediation in nature protected areas in Slovenija and Hungary - case on Mala Krka (Interreg IIIA - SLO-HU); Limnos

Ecoremediation of Mala Krka:
The aim was to improve the water quality and to slow down the stream. This was achieved by construction of artificial water terraces. The water dynamics was improved by making the artificial meanders. Waterbanks were prevented from erosion by making willow tree stumps and replanting trees.
Ecoremediations or renaturations of degraded waterways are necessary. Only the time will show how efficient they will be: this is why the permanent monitoring is indispensable. With this intervention the first (but very important) step was taken. However, we can pride ourselves with still good preserved waterways in this area. Dense population of otter, European crayfish, lamprey and some fish, important for Natura 2000, demonstrates this.

**Kristjan Malačič**
Naturepark Goričko
**http://www.park-goricko.org/sl/prvastran.asp**

To download the presentation go **here**.

# 11. PRESENTATION OF THE 4TH ECRR INTERNATIONAL CONFERENCE ON RIVER RESTORATION 2008 *BY BRUNA GUMIERO*

River restoration has become an issue at the top of the agenda for water Authorities and river managers in Europe, especially but not only due to the Water Framework Directive (2000/60/EEC) which aims at improving the status of fluvial ecosystems in a broad, integrated, ecological perspective. At the same time RR is an important tool to implement other directives, such as 91/676/EEC (Nitrates), 92/43/EEC (Habitat), 2006/7/EC (Bathing Water Directive) and the upcoming Floods Directive.
Ecological river restoration is a challenging topic and involves a wide range of themes concerning planning strategy, implementation and project appraisal for a number of different types of river systems including upland, lowland and urban rivers. Topic areas addressed include ecology, hydrology, geomorphology and economics as, to be successful, restoration of freshwater ecosystems must incorporate all of these subjects within a holistic framework. Introducing the term and concept of river restoration at the policy level would bring into the discussion the worldwide experience on the subject, with its ideas, knowledge from applied research, methodologies and techniques.
The conference will specially focus on real-world experiences of projects/plans, including their ex-ante and post evaluation and will link the applied researches from academic to the practical world and is organized in collaboration with a number of international partners: FAO, UNESCO, WWF, INBO, River Restoration Centre and National Centre for Water Management, The Netherlands.
The 4$^{th}$ ECRR international conference on river restoration will be held in Venice, San Servolo Island, the 16-21 June 2008.


The Scientific and Technical Committee approved the following thematic sessions:

1. Biodiversity and restoration of hydromorphological processes
2. Basin Scale Restoration for fisheries rehabilitation: planning and monitoring
3. River Restoration and EU Directives
4. Flood Risk and River Restoration
5. Geomorphic processes:

   A. *Restoration and management of physical processes and sediments;*
   B. *Restoring 'Working Rivers' in Mediterranean Climates: What's their Ecological Potential?*
6. Evaluating and monitoring success in River Restoration plans/projects
7. Key issues and challenges in Decision Making Processes to implement River Restoration
8. Ecohydrology
   A. *Water quality;*
   B. *Environmental flow/hydropower*
9. Urban rivers
10. Large dams and River Restoration
11. Open sessions
   A. *Transboundary cooperation;*
   B. *Protected areas;*
   C. *Ecological Network;*
   D. *Protecting natural reference sites;*
   E. *linking hydrology, geomorphology and ecology within the river corridors.*

In the afternoon of the 2nd and 3rd day (17-18 June 2008) workshops will be organized in order to foster the discussion on specific themes.

The ECRR wishes to collaborate with organizations and individuals operating in river restoration related sectors and can profitably share experiences and create synergies, thus increasing the opportunities for river restoration at a global scale.

For more information, please visit **http://www.ecrr.org/conf08.htm** or contact the ECRR executive secretary, Francesco Pra Levis at the addresses in the end of this newsletter.

**Bruna Gumiero**
Italian centre for River Restoration (CIRF)
**www.cirf.org**

To download the presentation go **here**.

# DAY 1 – SATURDAY 29 SEPTEMBER 2007: FIELD TRIP

## WASHLAND FOREST ON HÁROS ISLAND NATURE CONSERVATION AREA

It is a territory of 56 hectare situated in the central area of Budapest in the XXII-th district across the Háros bank of the Danube.

This island has stopped being an island, since the control of the Danube in 1911 connected it with the right bank of the Danube, but at the same time military barracks were built in the northern part of the island, which defended the washland forests of Háros better than any regulations. Although the island is not open for the public, because of the sensitivity of the washland associations dwelling in a small area, but walking along the Danube on the Buda side it is still visible that the flora and fauna of the island is characterized by jungle like richness (just a few steps from a shopping center and busy roads!).

Almost all the items of washland succession are present on the island – from the plants of the silted riverbank through the willow scrub, soft-wooded willow-poplar gallery forests to the oak-ash-elm hard-wooded forests of high-level areas. The flora of the area is characterized by such herbaceous plants as the summer snowflake, the yellow flag, the alpine squill, the lily-of-the-valley etc.

The real specialty – which can be observed from the bank – is the so called hanging leaf-litter often developing among twenty m tall trees. The trailers of creepers making the forest impenetrable, the trailers of (*Calystegia sepium*), hops, grape vine (*Vitis silvestris*), riverbank grape /frost grape (*Vitis riparia*), and the hybrids of grape vine create a second 'layer of soil' between the trees by catching the falling leaves and they get humified in decades. In this jungle like habitat a very special and rare fauna evolved – mainly insect fauna – several species of which can only be traced here in Hungary.

Danube bank on the left and Háros Island on the right.

Peace and relax in the Háros Island

Vegetation along the Danube banks

The little lakes of the island sometimes covered with water all the year round as a result of the flooding of the Danube, provide ideal habitats for a rich amphibian and reptile fauna. The avifauna of the area is also valuable, more than a hundred species have been counted, the black woodpecker, the Eurasian wryneck, the hobby, the tawny owl (howlet), and the grasshopper warble and the little ringed plover hatch in the forest. During migration period the black stork or the great white heron and other heron species are not rare, either.

Text was taken from Google Earth Community.

## 2. RIVER RESTORATION CENTRE - 8th ANNUAL NETWORK CONFERENCE - University of Exeter, Exeter, 16th-17th April 2008

Restoring Back is Not the Way Forward: achieving a functioning ecosystem in the contemporary landscape with reference to the trajectory of change.
The following themes have been chosen for this years conference:

- Demonstration of new restoration projects from inception to completion – How best to implement projects, what are the good practice techniques and how are they performing?
- Monitoring and project appraisal - Does designing for habitat improvement objectives, compared to putting geomorphological process first, affect the final restoration or enhancement result? Where, and what, is the evidence for restoration success?

- Social and economic indicators for river restoration – Do urban setting schemes improve well-being and how do we encourage planners and developers to embrace river restoration?
- Climate change and river restoration – How do we adapt our approach to river restoration to take account of predicted changes in weather patterns?

The main aim of this conference is to provide a forum for discussion. Make this your opportunity to voice your opinions on how we can deliver sustainable river restoration.

For more information about the centre, this conference and details of previous events refer to the website: **www.therrc.co.uk**, email at: **rrc@therrc.co.uk** or call 0044 01234 752979

## 3. COURSE "MesoHABSIM: INSTREAM DATA COLLECTION AND MODELING" - MADRID, 10-14 December 2007

A new flow management and river restoration tool with quantifiable endpoints as solid ecological background.
This is a in depth practical course that will teach the basics of data collection, data processing, and habitat modelling within the MesoHABSIM approach.
Main topics will be:

- Define habitat restoration endpoints;
- Estimate reference fish fauna;
- Conduct stream habitat mapping;
- Grid-electrofishing;
- Compute multivariate habitat suitability criteria for native fish species,
- Create habitat suitability maps;
- Create habitat flow rating curves and habitat time series analysis (UCUT curves)
- Develop flow augmentation scenarios;
- Simulate habitat improvement measures.

Location: ETSI Montes, Ciudad Universitaria, 28040-Madrid, Spain.
For registration Information visit:
**www.montes.upm.es**
**www.rushingrivers.org/courses/courses.htm**

## 4. NEW SOFTWARE AVAILABLE: BASIC RIVER AND LAKE WATER QUALITY MODEL

Dr. Jolánkai Géza informs that the software "Basic river water quality models, WQMCAL version 1.1" is freely available through UNESCO and it can be downloaded from the following websites. This software will aid university teachers and students in teaching respectively, and learning the basis of river water quality modelling.

**http://webworld.unesco.org/ihp_db/publications/GenericView.asp?KEY=414**

**http://portal.unesco.org/en/ev.php-URL_ID=39385&URL_DO=DO_TOPIC&URL_SECTION=201.html**

**www.mfk.unideb.hu/jolankai**

# 5. PUBLICATIONS (find more on the ECRR website!)

**Europe's environment — The fourth assessment**

The latest in a **series of assessments of the pan-European environment** published over the past 15 years by the EEA, the report assesses environmental progress in 53 countries — an area with a total population of more than 870 million people. The region includes: Eastern Europe, Caucasus and Central Asia (EECCA), South Eastern Europe (SEE), as well as Western and Central Europe (WCE). The report highlights priority areas such as:

- **environment-related health concerns** (issues related to air quality, inland waters, soil, hazardous chemicals);
- **climate change**;
- **biodiversity loss**;
- **overuse of marine resources**;
- the current patterns of **production and consumption**; and
- pressures caused by **economic activities** (agriculture, tourism, transport, energy).

Improved implementation of existing policies and the setting of clear, realistic targets is a key recommendation of the report. However, a shared environmental information system is also urgently required to deal with a prevailing lack of reliable, accessible and comparable environmental information across the pan-European region.

Download the **fourth assessment report**, its **executive summary** and a **powerpoint presentation** with the key messages.

**The pan-European environment: glimpses into an uncertain future**

The report aims at contributing to the discussion about plausible future development relevant to the wider European region and to stimulate medium to long-term thinking in policy-making circles.

**Halting the loss of biodiversity by 2010: proposal for a first set of indicators to monitor progress in Europe**

This report documents the achievements of the first phase (2005–2007) of the Streamlining European 2010 Biodiversity Indicators (SEBI 2010) project on the development of indicators to monitor progress towards, and help achieve the European target to halt the loss of biodiversity by 2010.

# 6. TOP NEWS (find more on the ECRR website!)

**Tisza River Basin a European Model for Ministerial Action**

The five ministers responsible for water management in Ukraine, Romania, Slovakia, Hungary and Serbia announced their support for actions protecting the Tisza River Basin from pollution, floods and drought. The announcement was made at a 14:00 press conference today during the second day of the Sixth 'Environment for Europe Conference' in Belgrade, Serbia.

**New Life brochure: Best LIFE Environment Projects 2006-2007**

Some of the LIFE-Environment projects are just that little bit better than the rest. Indeed, they can be held up as models for others as to what a successful, innovative, well-designed and executed project should look like. With this in mind, the Commission has selected, for the third time, a group of 22 of the most outstanding LIFE Environment projects. Best LIFE Environment Projects 2006-2007 tells the story of each of these outstanding initiatives. Few of them are also related to River Management.

**Two other softwares are available:**

- **Wallingford Software launches hydraulic modelling software for the water industry: InfoWorks SD and InfoWorks 2D**
- **FloodWorks v8.5 delivers more effective flood forecast management**

## 7. EVENTS (November 2007 – December 2007)

**Water and Climate Task Force: 1st meeting**
22/23 November 2007 – Bonn, GERMANY

**Workshop "Water culture and water conflict in the Mediterranean Area"**
22/26 November 2007 – Hammamet-Médenine, TUNISIA

**Symposium: Reintroduction of Atlantic salmon in rivers - a new approach**
27/29 November 2007 – Maastricht, THE NETHERLANDS

**Ist World Aqua Congress**
28/30 November 2007 – New Delhi, INDIA

**AWRA 43rd annual water resources conference**
27/29 November 2007 – Maastricht, THE NETHERLANDS

**Groundwater Quality 2007 Securing Groundwater Quality in Urban and Industrial Environments**
2/7 December 2007 - Fremantle, Western Australia, AUSTRALIA

Constructed wetlands conference
5/6 December 2007 - University of Edinburgh, SCOTLAND
For further information contact **events@iema.net**.

**Regional workshop: "Environmental knowledge and information exchange in the Mediterranean"**
5/6 December 2007 - Rome, ITALY

**The 4th Conference of the Water Directors of the Euro-Mediterranean and Southeastern European Countries**
10/11 December 2007 - Ljubljana, SLOVENIA

**Euromed and South-East European water Directors conference**
10/11 December 2007 - Alexandria – EGYPT

**Can water resources be sustained in drylands? Challenges: present and future**
10/12 December 2007 - Amman, JORDAN

**Understanding and Applying Environmental Flows**
18/20 December 2007 - Sheperdstown, WV, USA

# 8. BECOME A MEMBER!

**Joining the ECRR is FREE!**

Acting as an international network the ECRR is pleased to get contributions from its members: they are all very welcomed to provide us information on projects, events, news, training courses, etc.
The ECRR newsletter, for example, is thought as a tool (available to all members) for advertising to an international platform the outcomes of the project, important events worldwide, new publications, etc.

As a member of the ECRR, you will:

- keep on receiving a monthly newsletter with the most recent international information related to river restoration (conferences, projects, policy document, funding opportunities...);
- have the opportunity to share your experiences and spread the results of your projects;
- become a part of a network of people and institutions involved in river restoration and sustainable river management at European level, find partners for your project proposals and develop joint activities;

**To Become a member of the ECRR fill in the application form in our website.**

For request of information please contact

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