Implementation of the WFD

Good practices as identified by the Member States

Approved by: Peter Gammeltoft

Date: 3/12/2012
Unit D1 "Protection of water resources" of DG Environment aimed to enrich the Commission's report on the implementation of the Water Framework Directive with success stories which are concrete examples of implementation. This compilation complements the 3rd Implementation report of the Water Framework Directive focusing on River Basin Management Plans ('RBMPs"), published on 14.11.2012 as one of the pillars of the "Blueprint to Safeguard Europe's Water Resources". The objective of these "success stories" or "good practices" is to provide practical examples of the first cycle of the implementation of the Water Framework Directive. The aim is to show the progress made in water management and the positive impact that implementation of the Directive has had on improving the status of the environment and the integration between water use and protection of the environment.

Unit D1 asked Member States to provide concrete examples of implementation. A wide variety of success stories and good examples have been identified by Member States and reported to the Commission. The examples submitted relate to different aspects of the Directive. The compilation has been selected in order to broadly represent the different topics addressed in the assessment of the RBMPs. The examples provided do not claim to be examples of best practice, but rather illustrative of good practices to implement the Water Framework Directive.

A summary table containing all the examples of implementation and divided according to the different topics has been prepared and shall be included on the webpage of DG Environment.

The Commission has not validated these good practices, and the views expressed in the different examples do not necessarily express the views of the European Commission.

Peter Gammeltoft, DG ENV.D1 "Protection of water resources", 14.11.2012
CONTENTS

GOVERNANCE ......................................................................................................................... 1

AUSTRIA ................................................................................................................................. 2

   National River Basin Management Plan Austria – Ensurance of timely Finalisation and
   Consistency across Administrative Borders ................................................................. 2

   River Dialogue*: communication and successful implementation ................................ 5

BELGIUM (FLANDERS) ........................................................................................................... 7

   Coordination Committee on Integrated Water Policy (CIW) : pivot of the integrated
   water management in Flanders ....................................................................................... 7

   The Flemish project ‘Living Meuse’ is together with the Dutch project ‘Meuse works’ a
   smart and innovative approach to increase the level of security against floods in Flanders
   and in the Netherlands along the Common Meuse by 2017 ............................................. 11

FRANCE ................................................................................................................................. 15

   Harmonisation of the water bodies status and objectives at international borders ....... 15

   Agreement on data exchange between France and Germany in Upper Rhine sector ...... 17

GERMANY ............................................................................................................................. 19

   Public participation before making the RBMP ............................................................. 19

   Coordination of the RBMP Upper Rhine .................................................................. 21

   WasserBLICk ............................................................................................................... 23

ICPDR ........................................................................................................................................ 25

   Implementing the EU Water Framework Directive in the Danube River Basin – fostering
   transboundary cooperation between EU and non EU countries .................................. 25

HUNGARY ............................................................................................................................... 28

   Involvement of the public in the first RBM planning process in Hungary .................... 28

   New role of ICPDR as coordination body for the implementation of WFD on Danube
   River Basin ...................................................................................................................... 30

LATVIA ...................................................................................................................................... 32

   The list of water bodies at risk approved by the governmental regulations ................. 32
LUXEMBURG...........................................................................................................34

River partnerships in Luxembourg ..........................................................................34
Sunset date for existing permits ..............................................................................36

NETHERLANDS .....................................................................................................38

The national coordination and cooperation with local, regional and national actors is institutionalised on (sub) river basin level ........................................................................38

POLAND ...................................................................................................................40

Implementation of the modern GIS tools of water management process, in line with requirements of EU directive 2000/60/EU, in the Ukrainian Bug river basin ......................40

ROMANIA ..................................................................................................................43

Bilateral RO-HU cooperation on the management of the Somes/Szamos transboundary aquifer .................................................................................................43

SLOVAKIA ...............................................................................................................45

Creation of a PLUSK information system for joint Polish-Slovak border waters based on the Water Framework Directive and the Floods Directive (Acronym PLUSK information system) ......................................................................................................45

Creating a system of contacts between institutions in the spirit of international agreements on Slovak-Hungarian border waters – stage 1 ..............................................48

UNITED KINGDOM ................................................................................................50

Catchment Based Approach ......................................................................................50

MONITORING OF SURFACE WATERS AND GROUNDWATER .............................................52

ROMANIA ..................................................................................................................53

Integrated Management of Transboundary Groundwater between Bulgaria and Romania in the Dobrudja/Dobrogea Area-Tehnical assistance to ensure transboundary groundwater management using the WFD and Groundwater Directive” (PHARE BG-RO CBC/2004/016-784.01.03) ........................................................................................................53

DESIGNATION OF HEAVILY MODIFIED WATER BODIES AND DEFINITION OF GOOD ECOLOGICAL POTENTIAL ........................................................................56

UNITED KINGDOM ................................................................................................57

River Sheaf, Sheffield - Heeley Bridge Redundant Weir Removal ................................57

ASSESSMENT OF GROUNDWATER STATUS ..................................................................60
BELGIUM (FLANDERS) .................................................................................................................. 61

A successful cross-border cooperation to manage transboundary aquifers: the case of the carboniferous limestone aquifer ................................................................................. 61

A successful cross-border cooperation to manage transboundary aquifers: the case of the phreatic groundwater in the Dutch-Flemish polder area ..................................................... 63

PROGRAMME OF MEASURES – GENERAL .................................................................................. 64

FRANCE ........................................................................................................................................... 65

Water quantity management in the context of WFD implementation ............................................. 65

MEASURES RELATED TO GROUNDWATER ................................................................................ 67

IRELAND .......................................................................................................................................... 68

Bog of the Ring Public Water Supply - A WFD Success Story ..................................................... 68

CYPRUS .......................................................................................................................................... 70

Conjunctive use of the Germasogeia Riverbed Aquifer and Germasogeia Dam for water supply ....................................................................................................................................... 70

MEASURES RELATED TO AGRICULTURE ................................................................................ 73

DENMARK ....................................................................................................................................... 74

Implementation of New Wetlands for Reduction of Nitrogen Leaching. ........................................ 74

GERMANY ......................................................................................................................................... 76

LIFE-Project WAgriCo (Water Resources Management in Co-Operation with Agriculture) ................................................................................................................................................. 76

POLAND ......................................................................................................................................... 78

Ekorob - “Ecotones for reducing diffuse pollution” ...................................................................... 78

ROMANIA ......................................................................................................................................... 81

Implementation of the project “River Basins Network on Water Framework Directive and Agriculture” in Lechința River Basin .................................................................................. 81

UNITED KINGDOM ......................................................................................................................... 83

Glastir – the new Land Management Scheme for Wales .............................................................. 83

Catchment Sensitive Farming Phase 1 & 2 Success ......................................................................... 86

Catchment Sensitive Farming – Capital Grant Scheme ................................................................ 89
CatchmentSensitiveFarming—DemonstratingtheSuccessofPartnershipWorking.....91
WorcestershireMagnificentSevern-BowBrookComponent.................................................94
EtsomeInlet,RiverCary(SomersetLevelsandMoors).........................................................97
CatchmentRestorationFundinEngland....................................................................................99
MEASURESRELATEDTOCHEMICALPOLLUTION..................................................................101
CZECHREPUBLIC.................................................................................................................102
  ReductionofhaloethersloadfromSpolchemieintheElbeRiverontheCzechterritory
  .............................................................................................................................................102
UNITED KINGDOM..................................................................................................................105
  Abandonednon-coalmineresearch,understandingimpactsanddevelopingmeasuresto
  improveWFDstatus................................................................................................................105
MEASURESRELATEDTOHYDROMORPHOLOGY.................................................................108
AUSTRIA..................................................................................................................................109
  SpatialPrioritizationofMeasurestoOptimizeResults.............................................................109
  Refurbishmentofsmallhydropowerstationsinplace..............................................................112
BELGIUM(FLANDERS)..........................................................................................................115
  LysRiverRestorationintheSeine-ScheldtConnection..............................................................115
CZECHREPUBLIC..................................................................................................................118
  JizeraRiver,Nudvojovice locality, renaturation of oxbow.......................................................118
  ImplementationofFishpassFrameworkontheLowerPartofRiverDyje(ThayaRiver)
  ...............................................................................................................................................120
GERMANY...............................................................................................................................123
  MasterPlanMigratoryFishRhine .............................................................................................123
  DonausanierungHundersingen-Binzwangen........................................................................125
  On the way to sustainability along Federal water ways..........................................................128
  DynamicDevelopmentofDanubeWetlandsbetweenNeuburgandIngolstadt..............130
  EcologicalDevelopmentConceptfortheDanubeRiverbetweenKehlheimand
  Regensburg...........................................................................................................................132
  AktionBlauPLUS(Actionblueplus).......................................................................................134
The Weir of Körösladány ........................................................................................................ 136

Development of Integrated River Basin Management in the Olt Basin as support to the implementation of the EU Water Framework Directive (WFD) ........................................... 138

Identifying problems and measures necessary for analysis of potential wetland restoration at the confluence of the Calmatui and Danube River (INTEREEG IV) ......................................... 140

Ciobarciu/ Costuleni Wetland Project is an ecological rehabilitation project in the valley of the Prut River (on the largest tributary – Jijia River) ......................................................... 142

Fish ladder and revitalisation of Ipeľský Sokolec dead arm on the river Ipeľ .................. 144
Fish ladder and revitalisation of Malé Kosihy dead arm on the river Ipeľ ............................................ 147
LIFE 07 NAT/SK/000707 Protection of populations of endangered species of bird in natural biotopes in the Danube inland delta - Activity A.2 ......................................................... 150

River Welland: Drayton – Integrated approach to catchment management ...................... 152
Fobney Island .......................................................................................................................... 155
Avon WFD funds (RRP, non natives and diffuse pollution) .................................................. 157
River Ebbw – recovering from industrial past ...................................................................... 159

Le système des redevances dans la gestion de l’eau en France ............................................ 162

Policy mix of economic and regulatory instruments introduced to reduce excessive nitrate concentrations in groundwater ................................................................. 166

The MoRe project – revitalising the river Morava: a programme of measures prepared in accordance with EU directives on water and nature protection ............................ 168
UNITED KINGDOM ............................................................................................................. 171
Torbay - tackling illegal connections ............................................................................ 171
Rivers Eden, Derwent and Kent - River Restoration Plans and Cumbria non-native species ......................................................................................................................... 178
Aqualate Mere (Lake Restoration) .................................................................................. 180

STRATEGY TO DEAL WITH WATER SCARCITY AND DROUGHTS ............................ 181

CYPRUS ............................................................................................................................. 182
Artificial recharge of the Ezousas aquifer in Cyprus with tertiary treated sewage .......... 182

FLOODS PROTECTION ...................................................................................................... 185

BELGIUM (FLANDERS) .................................................................................................... 186
The Sigma Plan is an intelligent, future-oriented project that will make Flanders safer by better protecting it against floods ......................................................................................... 186

SLOVAKIA ......................................................................................................................... 190
Suchý polder Lehota pod Vtáčnikom [Lehota pod Vtáčnikom dry polder] .................... 190
Sučany – modification of flow of Sučiansky potok stream ........................................... 193
Use of the Šurany pumping station and the Šurany polder during floods in June 2010 195
Assessment of the safety of the Krpeľany, Žilina and Hričov dams in relation to large volumes of water .............................................................................................................. 197

OTHER EXAMPLES .......................................................................................................... 200

HUNGARY ......................................................................................................................... 201
Living Danube Project – Budapest Central Wastewater Treatment Plant .................... 201
Nutrient reducing in the Danube - Wastewater Treatment Plant in North Budapest and Floodplain rehabilitation in Gemenc and Béda-Karapancsa ........................................... 203

NETHERLANDS ................................................................................................................. 205
Water body Factsheets .................................................................................................. 205

SLOVAKIA ......................................................................................................................... 206
Project WACO ................................................................................................................. 206
UNITED KINGDOM

Water Sensitive Urban Design in Wales
AUSTRIA

**NATIONAL RIVER BASIN MANAGEMENT PLAN AUSTRIA – ENSURANCE OF TIMELY FINALISATION AND CONSISTENCY ACROSS ADMINISTRATIVE BORDERS**

**Description**

**Provision / requirement EU WFD**

Article 4 obliges member states to ensure, that the requirements of the Directive for the achievement of environmental objectives and in particular all programmes of measures are coordinated for the whole of the river basin district.

**Particular challenge for Austria**

Austria is sharing the international level the River Basin District Danube with in total 19 countries, the River Basin District Rhine with 9 countries and the River Basin Elbe with 3 countries.

At the national level the federal state is sharing the competences in water management with our 9 Länder. While the steering function in terms of legislation and budgets is allocated to the federal state level, the majority of executive tasks is allocated to the Länder level. Considerations to set up separate competent river basin management authorities as in France have been abandoned in order to maintain the “one stop shop principle” in place, where the citizen can address all issues of concern (ranging e.g. from new passports, driving licences to water permits) at the appropriate level (district level, Länder level) at a single institution. The main challenge was – against this setting – to ensure timely finalisation and consistency of contents across the many administrative borders.

**Approach / solution taken**

**Legal instruments (The Austrian Water Act was amended to provide sound basis for implementation of EU Water Framework Directive)**

- Article §55 was devoted to the planning process at river basin district level as well as i.a. to the setting up of the National River Basin Management Plan (NRBMP)

- Key provisions of this article address inter alia
  - National River Basin Management Plan has to be issued by ordinance
  - Content (mirroring provisions of the EU WFD)
  - Federal Ministry of Agriculture, Forestry, Environment and Water Management is competent authority
  - International coordination has to base on bilateral transboundary water commissions and international river commissions already in place
o Precise timetable

o Detailed procedure (§55h) for drafting the NRBMP in order to overcome difficulties of shared competences at the national level in 3 steps

  - Federal level (ministry) produces a very first draft based on data and information available and forwards draft to the 9 Länder (provinces)
  - Länder have to check plausibility, to amend draft based on all the detailed information available at regional level due to their executive tasks in water management and to return amended draft within 6 months
  - Federal level (ministry) finalises NRBMP

o Public participation, Environmental Impact Assessment, etc.

**Arrangements for International Coordination**

The Austrian National River Basin Management Plan is closely embedded in a “Roof Management Plan” covering the International River Basin Districts Danube, Rhine and Elbe. These “Roof Management Plans” mainly address – apart from setting the scene for the national plans – issues of basin wide relevance and thus provide the frame for the national plans. These “Roof Plans” are drafted by the riparian countries using the International River Commissions in place; a “bottom up approach” (necessary information and data are forwarded by riparian countries) as well as a “top down approach” (significant water management issues addressed at “Roof Part level” are mirrored in the national management plans) was used.

**Experiences**

Austria is really satisfied with the experiences made at the international level as well at the national level. Timely finalisation of “Roof Parts” as well as the Austrian National River Basin Management Plan (NRBMP) as well as consistency between “Roof Part” and NRBMP has been ensured by strict project management.

Best experiences have been made in particular with the drafting of the NRBMP shared between the federal level and Länder level; this approach has ensured full consistency across the entire Austrian territory and across the national shares of Danube, Rhine and Elbe (as structure of plan, expectations of the European Commission, knowledge achieved via the CIS process was brought in by the federal state level); furthermore full consideration of all relevant information, data and experiences available within administration, including the local and regional perspective, could be ensured.
Further information
Nationaler Gewässerbewirtschaftungsplan / National River Basin Management Plan

http://wisa.lebensministerium.at/article/archive/29367/

Austrian Water Act

http://www.lebensministerium.at/wasser/wasser-oesterreich/wasserrecht_national/wasserrechtsgesetz.html
Summary description
Currently already 11,000 Austrians have discussed relevant topics about „their“ river. In July 2012 the first international dialogue for the river „Untere Salzach“ starts between Austria and Bavaria.

Description
Provision/Requirement EU WFD

Public information and consultation is one of the cornerstones of the EU Water Framework Directive. Austria has met the relevant provisions of the Directive; Austria has started - in line with the provisions of article 14 to encourage the involvement of all interested parties in the implementation of this Directive – a „River Dialogue“ in addition to the more formal steps foreseen in the Directive.

Particular challenge for Austria

High water quality and the enormous abundance of water resources characterize Austria as „water-nation“. In recent years high investments have been made in order to achieve a high standard of drinking water supply as well as of waste water disposal. As a result pollution of waters has more or less disappeared. Waters are now clean and often also transparent; all the lakes are in good bathing water quality. Nowadays a new focus is on river ecology and on achieving more natural conditions; Austrian rivers have been for centuries subject to modification of banks and straightening of river courses in order to enable use of hydropower, to protect against floods or to convert wetlands into arable land to be self-sufficient in food production. In line with the new focus on river ecology further – often very costly investments – will be necessary to achieve „good ecological status“ or „good ecological potential“; prerequisite for achieving a certain willingness to pay is to create public consciousness. Austria has a leading position in successfully implementing strategies for awareness raising in the water sector. This was the precondition for the model „River Dialogue“. The methodology was then sharpened towards the requirements of the European Water Framework Directive as well as on regionality.

Approach

„Only the one who talk to each other are capable to implement successful projects“. The River Dialogue takes this testimony as granted. It is a highly qualified method with a strong regional and individual approach. So far the dialogues managed to inform the stakeholders as well as the broad public of the specific river catchment and to raise consciousness and even more a better understanding for the hydrological measures in place respectively foreseen for the future.
The River Dialogue was started in 2008 by the Austrian Ministry of Agriculture, Forestry, Environment and Water Management in collaboration with the Federal State of Upper Austria. The 11th dialogue starting in July 2012; this dialogue is also the first international River Dialogue where the public of two states, Bavaria (Germany) and Salzburg (Austria) will discuss the measures to be taken for the river Untere Salzach, which forms the border between both states. All citizens will be invited to discuss their personal future vision for the river. It does not occur by chance that the River Dialogue is highly respected. On one hand the relationship to the „personal“ river is generally high. On the other hand the process elements were considered precisely and evaluated throughout the range of the dialogues up to now: as first step the stakeholders – like representatives of water management departments, fishery and nature conservation – present their plans for the future shape and structure of the river. In the second phase the citizens of the overall river catchment are invited to take positions within an online-inquiry. The third step is set by a local conference – the real dialogue – between public, regional stakeholders and representatives of the water management units of the ministry and the particular federal states.

What is the added value of the River Dialogues? All involved parties are active members of the process: specific topics are discussed with a strong practical reference, the public gains a broader picture of the overall context and their concerns are getting transparent for government and politicians. Summing up the River Dialogue is a benefit and a chance for all participants to gain information and discuss the individual experience. The public’s concerns are heard at the regional and federal level and considered for future measurements. Moreover the figures are in favour of the high acceptance of the River Dialogues: since the start in 2008 about 180.000 households and more than 3.000 regional stakeholders in 10 river catchments of 4 federal states (Upper Austria, Carinthia, Styria and Salzburg) were invited to take part in the dialogues. More than 11.000 people participated in the online-enquiry. About 1.300 attended the regional „River Dialogue“-conferences.

And the project continues – at present the massive conflicts at the Untere Salzach have to be managed. In a bilateral process with the Bavarian Ministry of Environment and Health the River Dialogue is implemented in order to move the discussion to a successful dialogue.

**Further information**
www.flussdialog.at
BELGIUM (FLANDERS)

COORDINATION COMMITTEE ON INTEGRATED WATER POLICY (CIW) : PIVOT OF THE INTEGRATED WATER MANAGEMENT IN FLANDERS

Summary description
The CIW is a coordination and consultative structure that searches for sustainable and supported solutions for the water problems in Flanders through a cooperation, with respect for the identity, the interests and competences of the individual members.

The past years the committee has achieved a solid and effective cooperation between all water managers and the adjacent policy fields in Flanders. The CIW made some prominent achievements concerning water legislation, policy instruments, water management planning etc.

Geographical scope
The CIW is a coordination and consultative structure for the integrated water management in the Flemish parts of the river basin districts of Scheldt and Meuse.

Timing
The CIW was established in March 2004.

Main authority/authorities or organizations
The CIW is a coordination and consultative structure between the water management authorities (regional and local) and the authorities from adjacent policy fields (spatial planning, agriculture, economy,…) in Flanders.

The CIW is composed of the leading officials of all administrative entities involved in the water management and adjacent policy fields:

- on the Flemish level the policy areas of Environment, of Transport, of Spatial Planning, of Agriculture and of Economy are represented;
- for the local water managers the umbrella organizations of Provinces, of Cities and Municipalities, of Polders and Drainage authorities;
- the umbrella organization of water companies (drinking and waste water companies) also takes part.

Description
The Flemish waters are subject to especially high pressures (due to a high population density, a dense transport infrastructure, the industry and the intensive agriculture), resulting in water pollution, flooding, water scarcity and a loss of biodiversity.

Water managers failed to come up with structural and sustainable solutions for these complicated water problems, because the authority on different parts of the water system is spread over different water managers, each with its own views.

The CIW plays a key role in the coordination of the integrated water policy in Flanders. Thanks to the CIW there is an intense cooperation among different water management authorities and adjacent policy fields (such as rural planning, agriculture and economy). The administrations keep their own competences, but through the CIW they coordinate their views and their activities on integrated water policy.

The committee's objectives are:

- to set out a common vision on integrated water management;
- to improve the cooperation between all water managers and with the adjacent policy fields;
- to strengthen and coordinate the water management based on a basin approach;
- to improve the knowledge of water systems;
- to raise the awareness of the advantages of sustainable water use;
- to encourage public participation and participation of stakeholders;
- …

Each year the committee publishes a working program, based on the regular tasks of the CIW (e.g. preparing the river basin management plans) and on suggestions of the members.

The CIW has a working structure with a committee, a secretariat and several (thematic) working groups (e.g. on water quantity, on dredging and clearing sludge, on ecological water management, …). In each working group all water managers are represented.

The CIW meets every two months. The decisions of the CIW are based on inputs from the working groups. The decisions are made by consensus. When a consensus cannot be reached immediately, the discussion continues in the working groups until a workable alternative solution is agreed upon.

If necessary additional meetings of the working group are organized or the advice of experts is asked.

The committee has a flexible working structure. The working structure can be (temporarily) adjusted or expanded when necessary.

The past years have proved that an intense cooperation pays off. Some achievements of the CIW:
Concerning water legislation and policy instruments, the CIW:

- prepared new legislation on integrated water management and the transposition of the Floods Directive and of daughter directives of the Water Framework Directive;
- worked out new tools for the integrated water management, such as the 'water test', i.e. an analysis whether or not new constructions or new activities can cause any damage to the water system;
- worked out new financial instruments for the integrated water management, such as financial compensation for land owners and land users for the creation of flood areas;
- suggested water quality objectives for surface water, groundwater and sediment;
- …

Concerning the water management planning, the CIW:

- formulated a Water Policy Document, which contains the guiding principles of the vision of the Flemish government on integrated water policy;
- coordinated the preparation of the sub-basin and local river basin management plans and of the annual sub-basin progress reporting;
- prepared the river basin management plans for Scheldt and Meuse (2008-2009)
- encouraged consultation between local water managers;
- organized the public participation and the participation of stakeholders on the draft water management plans;
- coordinated the inventory and evaluation of the heavy floods of November 2010;
- …

Concerning communication and promoting water system survey, the CIW:

- published brochures on the water management plans, flood safe building, …;
- organized several workshops for water managers and several scientific congresses;
- …
Further information
www.integraalwaterbeleid.be

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The Flemish project ‘Living Meuse’ is together with the Dutch project ‘Meuse Works’ a smart and innovative approach to increase the level of security against floods in Flanders and in the Netherlands along the Common Meuse by 2017.

Summary description
The main goal of this project is to increase the protection against flooding on both the Flemish and the Dutch side of the Common Meuse. The aim of the project is the enhancement of the security levels of 1/115 to 1/250 on both sides of the river by enlarging the riverbed without raising the winterdikes and with respect to the groundwatersystem and the habitat areas influenced by the river Meuse.

The Common Meuse is a unique part of the Meuse river. It’s a free meandering gravel river. The Meuse projects are about developing a safe, natural Meuse region.

In the process of realising this augmented protection, a lot of attention was paid to the ecosystem of the Meuse.

Geographical scope
National, river basin district, sub-basin, region, local Flanders, Common Meuse area, Meuse Basin.

The project ‘Living Meuse’ consists of different project areas, located along the gravel/rain river.

The project covers more or less 50 kilometres of river. The Meuse projects will not only make the immediate surroundings of the river and the targeted areas safer, the risks of flooding further inland are also reduced.

Timing
The dike works of the Maasdijkenplan (1978-2007) are accomplished and protect to a discharge of 3.000 m³/s (1/115 year).

- The first part of the ‘space for water’-plans will be completed in the summer of 2012. In this first range of projects the old gravel quarries are integrated in the new vision on the Common Meuse. By removing the summer dikes, by enlarging the summer bed and by integrating the old gravel lakes in the winterbed, the water levels at high flows will be lowered significantly.

Some of the realised projects are listed below:

- In 2010 the Flemish project Negenoord was realised. This pilot project tested the innovative concept developed by Flanders to combine safety, the restoration of nature and the integration of abandoned gravel quarries in the winter bed of the Meuse system.
• In the summer of 2012 a second project will be accomplished at Bichterweerd-Kogge Greend. In this project 120 hectares of valuable river related nature was realised in combination with the enhancement of the security level against floods.

• Between 2009 and 2011 3 projects (Hochter Bampd, Herbricht en Kotem-Mazenhoven) were carried out by Flanders, on demand and financed by the Dutch government. These projects were realised on the Flemish side of the Meuse because of a lack of space at the Dutch side.

- For the second part of the project, further measures are investigated in the Flemish feasibility study. The bottleneck-locations examined in the earlier feasibility study are further investigated in order to get a clear insight into the safety levels in 2050 en 2100. The first series of projects studied in the Flemish feasibility study are now being prepared.

- The Dutch government made also an inventory of actions to be taken to make sure that the protection against floods will be sufficient on the long term. By 2017 the security level on both sides of the river must be enhanced to guarantee a protection against a flood of 1/250.

Main authority/authorities or organisations
The project on the Flemish side of the Common Meuse is a realisation of the Flemish government. Waterway authority nv De Scheepvaart (DS) is leading and coordinating this project. For the nature component, they are working closely with the Agency for Nature and Forests (ANB).

In order to create a cross boundary river park with a strongly enhanced level of security and an important expansion of related river nature, nv De Scheepvaart cooperates strongly with the Dutch waterauthority Rijkswaterstaat, local governments, the gravel industry, agricultural organisations, nature associations, hunters, fishermen and the recreational sector.

The final coordination of all the different projects is done by the Flemish – Dutch Meusecommission and is based on the ‘Flemish-Dutch declaration concerning the implementation of public works along the Common Meuse’ from 3-05-2005, signed by the previous Flemish Minister of Public Works, Energy, Environment en Nature Kris Peeters, and the previous Dutch Secretary of State of Traffic and Waterways Mrs. Drs. M.H. Schultz van Haegen. The commission guards all shared interests concerning the management and policy of Common Meuse-related issues.

Description
The Common Meuse project shows how an integrated plan has been successfully developed and implemented. After the floods in 1993 and 1995, a flood protection plan was developed between 1995 en 2005. In Flanders this was the ‘Living Meuse’ project, in the Netherlands it was the ‘Meuse works’ project.
The main objective of both projects is to protect the Common Meuse basin against floods caused by the Meuse and, through dialogue and consultation with other sectors and stakeholders, combine this objective with other objectives - such as nature conservation, recreation, economy, social and agricultural goals - to the mutual benefit of all.

This project is achieved by a very close collaboration of the Dutch and the Flemish water authorities, which made it possible to realise a project of such an extend along both banks of the Common Meuse. As a result, the safety level along the Common Meuse will be raised to a protection against a flood of 1/250 in 2017, and there will be more than 3000 hectares of new nature along the river by 2023.

All projects identified within the project are developed on the basis of detailed technical analyses of the effectiveness, sustainability and feasibility of measures and also through close collaboration with experts from the other relevant policy sectors in order to maximise the potential for win-win solutions.

Throughout the entire process, particular attention was paid to various EU directives, including the Birds and Habitats Directives. The Common Meuse area contains a number of Natura 2000 sites with defined conservation objectives for species, functions and required minimum areas for different habitats. The integration of ecological objectives into the projects will lead to the restoration of several ecologically valuable habitats that are characteristic for a free flowing gravel- and rainriver. Special attention was therefore paid to the impact of the crossborder project on the fragile habitats.

Within the projects the Flood Risk Directive is also taken into account. The Flemish government composed a flood risk management plan based on historical records, together with new flood hazard and flood risk maps, taking into account aspects of costs, benefits, strategic environmental impact analysis, transboundary effects and strategies as well as the work related to the Meuse river basin management plans and communication with the public.

**Further information**

http://www.vnbm.eu

http://www.descheepvaart.be/

http://www.maaswerken.nl

http://www.rijkswaterstaat.nl/water/plannen_en_projecten/vaarwegen/maas/maas_maaswerken/deelprojecten/grensmaas/

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FRANCE

HARMONISATION OF THE WATER BODIES STATUS AND OBJECTIVES AT INTERNATIONAL BORDERS

Summary description

One challenge of the WFD implementation in an international context is to harmonise at the international borders the current status of the transboundary water bodies, and to foresee the future status of the water bodies after the implementation of the Program of Measures, with a common view. The objective was raised successfully during the redaction of international management plans, between French, German and Luxemburg authorities in the context of Mosel Saar rivers sub district and for the Rhine district.

Geographical scope

International river basin districts

Timing

The concertation and the coordination take place during 2007 - 2008 and 2009.

Main authority / authorities or organisations

Competent authorities of France, Luxembourg, Germany for Mosel Saar river basin district and of France and Germany for Upper Rhine river basin district

Description

The WFD provides that, for international district or sub-district, one coordinated management plan should be adopted. One consequence is that all competent authorities of the international district or sub district should agree not only on the current status of transboundary water bodies, but also on the future of the water bodies after the implementation of the Program of Measures. This is available for ground water and fresh water. In the practice, that means that, in a first time, for all transboundary water body, competent authorities have to share data of monitoring and evaluation of current status (quantitative and qualitative status for ground water, chemical and ecological status for fresh water). Then, after elaboration of scenarios of Program of Measures, it is necessary to evaluate their impact on the future quality of the concerned water bodies. Finally, the process needs to foresee the future status of the concerned water bodies. The challenge of this coordination was done during 2008 to December 2009, with the finalisation of:

- the international management plan for Mosel and Saar river sub district, in the frame of International Commissions for Protection of Mosel and Saar, between France, Luxemburg and Germany
- the coordination between France and Germany in the sector Upper Rhine, in view of the international management plan for the Rhine river district.

**Further information**
http://www.iksms.de/servlet/is/2874/Plan%20de%20gestion%20Moselle-Sarre%20etat%20decembre%


**Contact point**

MEDDE DEB
AGREEMENT ON DATA EXCHANGE BETWEEN FRANCE AND GERMANY IN UPPER RHINE SECTOR

Summary description
A main objective of WFD is to assess the status of water bodies. In the particular case of international water bodies, it is absolutely necessary to agree and to harmonise the status for each bank.

In the Upper Rhine sector (from Kembs to Karlsruhe), the competent authorities decided to share all data from four monitoring stations (2 French and to German ones) with two main goals:

- better knowledge of the water status
- and financial capacity enhancement.

An agreement was signed, and the exchange is now permanent.

Geographical scope
International Upper Rhine sub districts

Timing
The concertation and the coordination take place since 2007, and is always on going.

Main authority / authorities or organisations
Agence de l'Eau Rhin Meuse (France) and LfU Baden-Wurttemberg (Germany),

Description
The WFD provides that, for international district or sub-district, one coordinated management plan should be adopted. One consequence is that all competent authorities of the international district or sub district should agree not only on the current status of transboundary water bodies, but also on the future of the water bodies after the implementation of the Program of Measures.

In the Upper Rhine sector (from Kembs to Karlsruhe), the competent authorities decided to share all data from four monitoring stations (2 French and to German ones) with two main goals:

- better knowledge of the water status
- and financial capacity enhancement.

An agreement was signed, and the exchange is now permanent.
All the shared data are included in their own monitoring program, and available for public consultation on both internet systems.

**Further information**

http://www.rhin-meuse.eaufrance.fr/

**Contact point**

MEDDE DEB
GERMANY

PUBLIC PARTICIPATION BEFORE MAKING THE RBMP

Geographical scope
River Basin

Timing
Between 2006 and 2009

Main authority / authorities or organisations
Ministry of the Environment Climate Protection and the Energy Sector Baden-Württemberg

Description
Topic: Public participation in local RBMP

Reasoning for the project

Main reasons

There are many interested parties who participate from a river. The competent authority does not know all the problems and the development in a river basin management e.g. this farmer wants to sell his land near the river.

- 70% of rivers are communal rivers ➔ municipalities and other actors have to be convinced: to let people fix their own small catchments (Waterbodies) in terms of ecologic function (breeding grounds etc.)
- to combine measures with targets of other Directives (FFH)
- to get a transparent planning process
- to use experience and knowledge of local actors
- to include all actors (hydropower, farmers, local administration etc.) such getting comprehensive and broad basis for decisions
- to get less objections in formal administrative procedure
- Last but not least: Just to find out „what is possible, where is it possible“

Objectives

e.g. main objectives were:

1. Active public participation before developing the RBMP
first meeting: Information about WFD in general
second meeting: Collection of ideas and suggestions
third meeting: Presentation of the first draft

2. There have been 70 meetings all over Baden-Württemberg
followed by:
   1. Drawing up the RBMP by the competent authority
   2. Official public participation (Article 14 WFD)

Further steps
Active Public in the run-up to the RBMP 2015

Project data: 70 meetings on waterbody - level

Contact point
State Ministry of the Environment, Climate Protection and the Energy Sector, Baden-Württemberg

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COORDINATION OF THE RBMP UPPER RHINE

Main authority / authorities or organisations
Ministry of the Environment Climate Protection and the Energy Sector, Baden-Württemberg

Geographical scope
River Basin Rhine – Upper Rhine

Timing
between 2005 and 2009

Description

Topic
International coordination of the RBMP Upper Rhine

Reasoning for the project

Main reasons

- The duty of coordination

- Art. 3 WFD
  - Development of RBMP for river basins – national and/or international
  - Coordination of the requirements to achieve the environmental objectives especially necessary for the program of measures

The first level is a RBMP for the International River Basin coordinated by the International Commission for the protection of the Rhine (ICPR) – A-level.

The Upper Rhine is the border between Germany and France. On the left side France developed a RBMP for the French area and on the right site Germany (Baden-Württemberg, Hessen and Rhineland-Palatinate) drew up a RBMP for the German area. Therefore the river basin management plans had to be coordinated between France, Baden-Württemberg, Hessen and Rhineland-Palatinate on the Sub River Basin level.

Achievement of objectives

69 meetings to get the baseline study (Art. 5 WFD)

11 meetings to get the monitoring programme (Art. 8 WFD)

23 meetings to coordinate the RBMP
At each meeting between 5 and 15 persons participated

International meetings (without preparation): about 680 days / 1 person

Preparation of the meetings: about 1,200 days / 1 person

Further steps

Coordination of RBMP 2015.

Project data: 103 meetings on sub-river-basin - level

Contact point
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**WASSERBLICK**

**Main authority / authorities or organisations**
German Federal Institute for Hydrology

**Geographical scope**
National, River Basin District

**Timing**
Started in 2001, operational since 2004

**Description**
Topic: Information- and data management

**Reasoning for the project**
The focal subjects of the European Water Framework Directive are (i) the river basin districts that which are usually characterized by the spatial extent of river catchments and (ii) the river water bodies. In Germany, with its federal structure, all relevant competences of water-resources management are vested in the Federal States (the Bundesländer). However, several States usually share the management of one river basin district. Thus, it is a particular challenge to organize the handling of information and data of the independently acting water-management authorities of the Federal States so that still the necessary degree of centralized coordination is ensured.

**Objectives**
Against this situation and in view of the increasing role of data processing and data exchange the Federal government and the water administrations of the Federal States decided in 2001 to establish in Germany a common communication and data platform, the WasserBLICK, to cope with the flood of information. The operation of this Internet platform was assigned to the Federal Institute of Hydrology (BfG) that is acting as a nation-wide hydrological institute and has competences and experiences in data management. Today, central services of the WasserBLICK-System allow at any time Web-based downloads of specific data from individual Federal States in form of transboundary data products - be it statistics, cartographic representations or any other type of compiled information.

Water-related expert bodies are those who benefit in the first line from these services. The cooperative analysis of the transboundary data presentations were often the incentives for methodical coordination that is understood as a milestone in the successful implementation of pertinent European directives in Germany. Moreover, the availability of consolidated and homogenized data in full national coverage offers the Federal authorities an option to produce national information materials for policy-making and public dissemination without creating additional workload for the authorities of the Federal states. Last not least, it is thanks to this
development that Germany was able to meet the requirements of electronic reporting of diverse water-related European directives in due time without exception in the past eight years.

Further Steps

Centralized data administration, a truly sensitive issue of the present time, has made good advances in Germany also because of the success of the WasserBLICK project, so that today through this platform data and information can be managed that concern besides the Water Framework Directive four other water-related European directives (Flood Directive, Bathing Water Directive, Drinking Water Directive and Marine Strategy Directive). The success of this joint effort of the Federal government and the Federal States inspired the international commissions for the protection of the rivers Rhine and Elbe to utilize this system also as a tool in their international activities. The ever increasing digitalization of work in science, economy, administration, and practically any other field clearly demonstrated that the early decision in Germany for the consistent electronic management of data and information was correct. Now it is essential to perpetuate this development and to improve the tools so that they provide optimum support in the work of water management. The funding of the platform is shared by all those who benefit from its services.

Further information
http://www.wasserblick.net

Contact point

Dr. Ralf Busskamp, Bundesanstalt für Gewässerkunde, Am Mainzer Tor 1, 56068 Koblenz, Germany
ICPDR

IMPLEMENTING THE EU WATER FRAMEWORK DIRECTIVE IN THE DANUBE RIVER BASIN – FOSTERING TRANSBOUNDARY COOPERATION BETWEEN EU AND NON EU COUNTRIES

Summary description
The International Commission for the Protection of the Danube River (ICPDR) was established in 1998, based on the Danube River Protection Convention. Even though by the year 2000, when the WFD came into force, only two countries were members to the European Union, all 14 Danube countries, including non EU Member States, agreed to make all efforts to achieve a coordinated river basin management plan. As a result and major achievement, the 1st Danube River Basin Management Plan was adopted in 2009, based on common principles set by the WFD.

Geographical scope
Danube River Basin District, approximate area of 800,000 km2, with 19 countries in the whole basin (out of which 14 with major shares of the basin are contracting party to the ICPDR) the most international river basin in the world

Timing
Since the year 2000 when the WFD was adopted, the ICPDR is the platform for the coordination of the transboundary aspects of the WFD

Main authority/ authorities or organisations
The ICPDR is an international organisation, comprising of 15 contracting parties (14 countries and the European Union). Decisions are made by the Commission, made up of the Heads of Delegations – one for each contracting party - which meets twice a year. Most of the work of the ICPDR is done by Expert Groups, which are panels of specialists from the ICPDR contracting parties, working on various topics. In addition, observer organisations (currently 22, including representatives from different international interest and stakeholder groups as well as non-governmental organisations) are participating in meetings and contributing to the work.

Description
The International Commission for the Protection of the Danube River (ICPDR) is an International Organisation consisting of 14 cooperating states and the European Union. The work of the ICPDR is based on the Danube River Protection Convention (DRPC), signed in 1994, followed by the establishment of the organisation in 1998. Since then, the ICPDR has grown into one of the largest and most active international bodies of river basin management expertise in Europe. The ICPDR deals not only with the Danube itself, but with the whole Danube River Basin, which includes its major tributaries, transitional and coastal waters of the Black Sea as well as lakes and groundwater bodies of basin-wide importance.
The ultimate goal of the ICPDR is to implement the DRPC and to make it a living tool. Its mission is to promote and coordinate sustainable and equitable water management, including conservation, improvement and rational use of waters for the benefit of the Danube River Basin countries and their people.

When the EU Water Framework Directive (WFD) came into force in 2000, only two countries were member to the EU (Austria and Germany), for which the implementation of the Directive was a compulsory task. However, WFD Article 3 calls for the creation of international river basin districts in case the boundaries of catchments go beyond national territories. Where a river basin district extends beyond the territory of the Community, the Member States concerned shall endeavour to establish appropriate coordination with the relevant non-Member States, with the aim of achieving the objectives of the Directive throughout the river basin district.

The countries of the Danube basin, which include both EU and non EU countries, agreed in the year 2000 in the framework of the ICPDR to develop a river basin management plan for the entire basin according to the requirements of the WFD. From that time onwards the ICPDR forms a living coordination platform for the implementation of the WFD even beyond the territory of the Community.

A milestone and major achievement was that the fourteen countries of the Danube basin (eight of which are EU Member States in the meantime) have cooperated together in the frame of the ICPDR to elaborate the 1st Danube River Basin Management Plan based on WFD principles. The plan was completed in December 2009 and the published results are recognized as a leading example of cooperative efforts of countries to manage water resources. This was only possible because of the political commitment of the countries to cooperate together based on common principles set by the WFD.

The measures agreed in the Plan and which are currently under implementation will result in a considerable reduction of pollution and improvement of aquatic habitats. However, further efforts will be needed in subsequent years and in the next river basin management cycles to achieve the environmental objectives as set by the WFD. Critical will be the integration of the needed measures into the actions of other sectors (in particular navigation, energy, and agriculture), because the good status of waters cannot be achieved if these sectors do not integrate water protection actions into their initiatives. Respective activities for integration are currently ongoing in the frame of the ICPDR, next to specific activities on the adaptation of the Danube River Basin to changing climatic conditions.

**Further information**

ICPDR website: http://www.icpdr.org/

Mr. Philip Weller, ICPDR Executive Secretary

Mr. Raimund Mair, ICPDR Technical Expert on River Basin Management

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HUNGARY

INVOLVEMENT OF THE PUBLIC IN THE FIRST RBM PLANNING PROCESS IN HUNGARY

Summary description
The Hungarian PP strategy developed in 2006-2007 was applied during the preparation of the first WFD compatible river basin management plan. The strategy distinguishes four major interest groups: (1) Central and local governments, (2) NGOs, (3) Water users, (4) Professionals, which are represented in water management councils with the mandate to supervise the planning process. Written and verbal consultations took place in 2009 on the draft RBMP and thousands of comments were considered and documented in the final RBMP of the country. It was an unprecedented exercise of its kind and resulted in improved plan and raised awareness of stakeholders.

Geographical scope
National, sub-unit and local

Timing
2006-2009

Main authority/authorities or organisations
Ministry of Environment and Water Hungary

Description
For the successful implementation of the WFD a close cooperation is necessary among experts and organizations involved or interested in the river basin management planning (RBMP), in short among all stakeholders. The first WFD compatible public participation (PP) strategy for Hungary was developed in 2006-2007. It considers the European Commission’s Guidance Document No. 8 on PP, the Danube River Basin PP Strategy (ICPDR, 2003), the findings of the HarmonCOP Handbook (www.harmonicop.info) and the country’s specific characteristics. It was drafted and tested through a pilot project and fine-tuned during the first round of the WFD Article 14 consultations on the RBMP timetable and work programme in 2007.

The strategy points out that RBMP must be harmonized with all other development programs effecting water resources management. It distinguishes four major interest groups such as: (1) Central and local governmental organizations, (2) NGOs, (3) Water users, (4) Professionals and Academia. They are represented in water management councils set up according to the strategy (one national, four sub-unit and 12 local level councils), with the mandate to supervise the planning process and the involvement of the public.

Based on the strategy verbal consultation (hearings) on the draft plans took place in 2009 in the 42 RBM planning units and the four sub-units of the country. National meetings were held on nationwide issues (like thermal waters, agriculture, the role of local governments,
tourism, fishery, etc.) as well. For receiving written comments a special website was established (www.vizeink.hu), where drafts, background papers and other relevant documents were made available.

Altogether 3800 comments/remarks have been received during the consultation period (extended in view of NGOs’ request) and evaluated during the finalization of the plans. They all were documented with the response of the planners (acceptance, rejection, reasoning) in the annex.

Contact point
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NEW ROLE OF ICPDR AS COORDINATION BODY FOR THE IMPLEMENTATION OF WFD ON DANUBE RIVER BASIN

Summary description
The International Commission for the Protection of the Danube River (ICPDR) is a transnational body, which is the main coordination body to implement the WFD on river basin district level. Through its national and EU level delegates, representatives from highest ministerial levels, technical experts, and members of the civil society and of the scientific community cooperate in the ICPDR ensuring the implementation of the WFD.

Geographical scope
International river basin district

Timing
2000-

Main authority/ authorities or organisations
National Delegates of Parties as co-ordination body

Description
Hungary is lying with its whole area in the Danube basin. Sharing 19 countries its territory, the Danube basin is the most international river basin in the world and it should be regarded as a unique planning area from the point of view of the implementation of WFD.

In 1994 one year before the intention of the elaboration of WFD was communicated, the contracting parties signed the Danube River Protection Convention in Sofia. When the WFD came into force in 2000 in the Danube RBD there were only two countries being the member of the EU (Austria and Germany) and for them the implementation was a compulsory task. At that time all of those Danube countries were not yet members of the EU officially declared at ministerial level their intention to implement the WFD. From that time the convention forms a living coordinative platform for the implementation. This cooperation mechanism is also facilitating the bilateral water related collaborations in Hungary with its riparian countries.

From 2002 national delegates, representatives from highest ministerial levels, different working groups of national and technical experts, members of the civil society and of the scientific community cooperate in the ICPDR to ensure the implementation of WFD on Danube Basin District level for the water protection and sustainable use of waters. The coordination role of the ICPDR is essential for Hungary having 7 neighbouring countries. This body is an effective negotiating platform for developing common implementation together with our neighbouring countries.

Further information
www.icpdr.org
Contact point
Gyula Holló, former Water Director of HU /Gabriella Jelinek (Ministry of Rural Development, Hungary; gabriella.jelinek@vm.gov.hu)
LATVIA

THE LIST OF WATER BODIES AT RISK APPROVED BY THE GOVERNMENTAL REGULATIONS

Summary description
Latvian river basin management plans include lists of water bodies identified as being at risk of not achieving good status by 2015. As the plans were not adopted in the governmental level and therefore are not binding, it was decided to approve the lists of water bodies at risks by binding governmental regulations, so that these water bodies could be prioritised in the legislation and policy documents of the other sectors.

Geographical scope
National

Timing
Cabinet of Ministers regulations No 418 “Regulations on water bodies at risk” were approved on 31 May 2011.

Main authority/authorities and organisations
Ministry of Environmental Protection and Regional Development

Description
Latvian river basin management plans include lists of water bodies identified as being at risk of not achieving good status by 2015. They were identified, taking into account the following information:

1) Their status at the time of development of river basin management plans;
2) Pressures affecting the status of these water bodies;
3) Forecasted changes of these pressures within the time period covered by the river basin management plans;
4) Effects of the basic (mandatory) measures already provides for in the national legislation.

Basing on the precautionary principle, all water bodies, where good status might not be ensured through implementation of the basic measures only, were identified as being at risks.

Taking into account the state of the Latvian economy, it was unlikely that funding in full could be ensured for all the supplementary measures identified as necessary in the river basin management plans. Therefore it was necessary to ensure that the financial resources available would be targeted at the measures in those water bodies, which are in the greatest need; that the projects that could improve the status of water bodies at risks would be regarded as a priority. The list of water bodies at risk, approved at the governmental level, ensures that also authorities representing other sectors could refer to them in their priority
setting on used as a criterion during the public procurement procedures. Such reference is already included in the governmental regulations that describe the evaluation of the project applications related to the upgrade of wastewater treatment plants in small settlements. The Ministry of Environmental Protection and Regional Development continues the work to ensure that similar references are included in the legislation of policy papers of the other sectors as well.

**Further information**

The regulations are available on the internet:

http://www.likumi.lv/doc.php?id=231084&from=off

**Contact Point**

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LUXEMBURG

RIVER PARTNERSHIPS IN LUXEMBOURG

Summary description
The main objectives of river partnerships are to inform and to raise awareness among the public in order to improve its knowledge and understanding of the water cycle. Their mission is also to identify, through dialogue, the key problems existing in the catchment area of a river basin and to find, also through dialogue, solutions together.

River partnerships are open to anyone who wants to protect water resources and contribute to the improvement of the quality of water in the catchment area of a river basin. Hence river partnerships bring together all stakeholders (e.g. private persons, farmers, representatives of associations, municipalities or administrations) in order to identify the problems and find solutions together.

Geographical scope
Sub-basin

Timing

Main authority/authorities or organisations
Ministry of Home Affairs and the Greater Region
Water Management Agency
Concerned municipalities

Description
A river partnership generally includes a river committee and several working groups. Everyone who is interested to contribute to the river partnership can joint the river committee as well as one or more working groups.

The river committee is the governing body of the river partnership. Its role is to get an overview of the problems that exist in the catchment area of a river basin, to define objectives for the river partnership and to ensure the proper management of the partnership. The role of the working groups is to examine and discuss more in detail particular topics and, as a result, elaborate proposals for solutions to solve them.

In order to achieve the objectives defined by the river committee, the working groups elaborate, in coordination with the river committee, a program of actions. This program of actions is aimed, similar to the program of measures foreseen by the water framework
directive, at restoring, protecting and enhancing water resources of the river basin and contains a certain number of concrete measures. The actions and measures, all defined by consensus, are then implemented by the different partners based on their commitment and skills.

The funding of river partnerships is provided by the Ministry of Home Affairs and the Greater Region and the implicated municipalities. European co-funding such as financing by the European Regional Development Fund is possible for transboundary river partnerships.

At present, the following five river partnerships have been founded in Luxembourg:

- River partnership Attert (Luxembourg-Belgium)
- River partnership Alzette
- River partnership Our (Luxembourg-Belgium-Germany)
- River partnership Syr
- River partnership Uewersauer

Further information
http://attert.aquafil.net/fr/layout/index_fr.php?numlang=1
http://www.partenariatsyr.lu
http://www.crhs.eu/index.php

Contact point
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**Summary description**

Article 71(2) of the Luxembourghish law on water (*Loi du 19 décembre 2008 relative à l’eau*) states that permits issued on the basis of legislation repealed under article 72 of the law on water are valid until December 22, 2012 except for permits foreseeing a shorter period of validity. Existing permits dealing with abstraction, hydropower installations, emissions etc. therefore cease to be valid after December 22, 2012, i.e., the date when the programmes of measures should be in force.

**Geographical scope**
National

**Timing**
Ongoing

**Main authority / authorities or organisations**
Ministry for Home Affairs and the Greater Region
Water Management Agency

**Description**
Article 23 of the Luxembourghish law on water states which activities are subject to authorization. These activities include, among others, water abstraction from surface water and groundwater, the direct or indirect discharge of solid or gaseous substances as well as liquids in surface water and groundwater and all works likely to change the water flow regime or to have a harmful influence on aquatic fauna and flora. Permits are delivered by the Minister dealing with water management, currently the Minister for Home Affairs and the Greater Region.

In order to conform permits issued prior to the implementation of the 2008 law on water and based on legislation repealed under this new law to the new provisions, they have to be revised and, if necessary, adapted. If the owner of a permit doesn’t submit a request for a new permit under the regulations of the 2008 law on water, the permit ceases to be valid after December 22, 2012.

**Further information**


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NETHERLANDS

THE NATIONAL COORDINATION AND COOPERATION WITH LOCAL, REGIONAL AND NATIONAL ACTORS IS INSTITUTIONALISED ON (SUB) RIVER BASIN LEVEL.

Summary description

On the national level every (sub) River Basin has its own structure of deliberation with local- and regional authorities. This structure exists of regional civil service consultation (RAO) and regional administrative consultation (RBO) in which Municipalities, Water boards, Provinces and the State are represented. All chairs of the RBO’s are represented in the national administrative committee Regions (Stuurgroep Water), in which the State Secretary represents the State. Other stakeholders are cooperating via regional stakeholder meetings which exist in every sub basin and have an advisory role. This has proven to be a sound way of national coordination and cooperation.

Geographical scope

National, river basin district, sub-basin, region, local.

Timing

Still in place, since somewhere around 2003

Main authority/ authorities or organisations

Ministry for Infrastructure and the Environment, Ministry of Economic affairs, Agriculture and Innovation, Provinces, Water Boards, Municipalities.

Description

On the national level every (sub) River Basin has its own structure of deliberation with local- and regional authorities. This structure exists of regional civil service consultation (RAO) and regional administrative consultation (RBO) in which Municipalities, Water boards, Provinces and the State are represented. All chairs of the RBO’s are represented in the national administrative committee Regions (Stuurgroep Water), in which the State Secretary represents the State. Other stakeholders are cooperating via regional stakeholder meetings which exist in every sub basin and have an advisory role. This has proven to be a sound way of national coordination and cooperation.

Further information

http://www.helpdeskwater.nl/onderwerpen/wetgeving-beleid/kaderrichtlijn-water/uitvoering/
Evaluation of the implementation process of the WFD by the Technical University of Delft:
http://ikregeer.nl/documenten/blg-88610

Contact point

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Summary description
Flowing from central Ukraine to the west, passing along the Ukraine-Polish and Polish-Belarusian border and into Poland, the Bug lies on an international river basin extending beyond the boundaries of the EU. During the year 2011, the Regional Water Management Authority in Warsaw (RZGW w Warszawie) has driven the project “Implementation of the modern GIS tools of water management process, in line with requirements of EU directive 2000/60/EU, in the Ukrainian Bug river basin”. The project aimed to promote the EU water management approach in the Ukrainian part of the Bug river basin by accompanying the Ukrainian authority called Western Bug Basin Water Resources Department (ZBBUVR Łuck) in the implementation of the first WFD planning steps, and allowing it to perform the next tasks.

The project has been funded by the development Aid Program Polish Aid from the Ministry of Foreign Affairs of the Republic of Poland.

Geographical scope
Poland - Ukraina, Vistula basin district, Bug river basin

Timing
2011

Main authority / authorities or organisations
RZGW w Warszawie, ZBBUVR Łuck

Description
Flowing from central Ukraine to the west, passing along the Ukraine-Polish and Polish-Belarusian border and into Poland, the Bug lies on an international river basin extending beyond the boundaries of the EU. During the year 2011, the Regional Water Management Authority in Warsaw (RZGW w Warszawie) has driven the project “Implementation of the modern GIS tools of water management process, in line with requirements of EU directive 2000/60/EU, in the Ukrainian Bug river basin”. The project has been funded by the development Aid Program Polish Aid from the Ministry of Foreign Affairs of the Republic of Poland. The direct beneficiary of the project was the Western Bug Basin Water Resources Department (ZBBUVR Łuck) based in Ukraine. The project aimed to promote the EU water management approach in the Ukrainian part of the Bug river basin by accompanying
ZBBUVR Luck in the implementation of the first WFD planning steps, and allowing it to perform the next tasks.

The project supported also the harmonization of Ukrainian legislation with the principles of the Water Framework Directive, especially in the fields of public participation and water quality classification.

The results of the project are as follows:

- 1) the identification of anthropogenic pressures and impacts on the water quality of the Bug River basin in Ukraine, as a fundamental step of the water management process,
- 2) ensuring the autonomy of the beneficiary for further steps of the water management process,
- 3) strengthening the local interest and involving the public (government administration, local governments, NGOs) in the process of water management,
- 4) the promotion of a transparent planning process in water management - involving all stakeholders.

In order to accomplish these 4 goals, the project plans the following measures:

- 1) indentifying the anthropogenic pressures and impacts and their impact on water status, as a fundamental step in the planning cycle according to the principles of the Water Framework Directive,
- 2) training staff in the field of Geographic Information Systems for the employees of the beneficiary, to enable the implementation of further water management steps,
- 3) supplying computers and software in the field of Geographic Information System (GIS)
- 4) organization of a conference on European water policy and the presentation of results of the identification of pressures and impacts in the Ukrainian Bug river basin.

**Further information**

http://rdwbugua.blogspot.com/

**Contact point**

Louis Courseau

Specialist - Planning of Water Uses

Regional Water Management Authority in Warsaw

(RZGW w Warszawie)
ROMANIA

BILATERAL RO-HU COOPERATION ON THE MANAGEMENT OF THE SOMES/SZAMOS TRANSBOUNDARY AQUIFER

Summary description
The cooperation for the management of the Somes/Szamos transboundary aquifer is taking place in the frame of the RO-HU bilateral agreement for the protection and sustainable use of transboundary waters. The steps undertaken to date relate to the delineation of the groundwater body, exchange of methodologies used in the two countries, assessment of the qualitative and chemical status.

Geographical scope
River basin district; International sub-basin

Timing
Since 2007

Main authority / authorities or organizations
Ministry of Environment and Forests, Romania
Ministry of Environment and Water, Hungary
National Administration “Apele Romane”
National Institute of Hydrology and Water Management, Romania
Somes-Tisa Water Basin Administration

Description
The cooperation for the management of the Somes/Szamos transboundary aquifer is taking place in the frame of the RO-HU bilateral agreement for the protection and sustainable use of transboundary waters, in the RO-HU Hydrotechnical Commission, Water Framework Directive Working Group.

Experts from the two countries have defined and harmonized the Somes/Szamos aggregated transboundary groundwater body, which comprises of 4 groundwater bodies on the Hungarian side (HU_sp.2.1.2, HU_p. 2.1.2, HU_sp.2.3.2, and HU_p2.3.2) and 2 groundwater bodies on the Romanian side (ROSO01 and ROSO13). A common GIS databases related to the groundwater body was created.

The experts also exchanged information on the methodologies used for determining the natural background values and the threshold values, and also for the assessment of the chemical and quantitative quality status (both methodologies are in agreement with EU
guidelines). Somes/Szamos groundwater body was assessed as having a good qualitative status (although on the Hungarian territory a downward trend in water levels in the monitoring wells was observed) and a good chemical status.

The cooperation will continue in order to prevent deterioration and improve the quality and quantity of the groundwater in order to preserve the good status.

**Contact point**

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Summary description
The project involved developing tools and information modules to make available information on the status of water bodies for cross-border management of river basins in the interests of improving decisions associated with achieving good status and the sustainable use of water. The project has created a system for exchanging, processing and making available land-related information on the environment and databases within the territory of Slovak-Polish cross-border river basins. The system has created, at various usage levels, for institutions concerned with the management of river basins and flood protection and also for the general public on both sides of the border, planning instruments and analytical modules and databases which work with Geographical Information Systems tools for territorial analysis.

A bilingual Internet portal has been created; it processes, publishes and interprets information on the environment and the results of planning done under Directive 2000/60/EC of the European Parliament and of the Council establishing a framework for Community action in the field of water policy; it also creates a foundation for achieving the tasks set out in Directive 2007/60/EC of the European Parliament and of the Council on the assessment and management of flood risks, simply by applying the basic principle of exchanging relevant information between appropriate bodies within the territory of the international river basins.

Geographical area
The international Vistula river basin – Dunajec and Poprad sub-basins

The international Danube river basin – Váh and Orava sub-basins
**Timing**
Project implementation: July 2009 – September 2011

**Main authority / authorities or organizations**
Principal project partner
REGIONALNY ZARZĄD GOSPODARKI WODNEJ W KRAKOWIE [Krakow Regional Water Management Authority]

Cross-border project partner
SLOVENSKÝ VODOHOSPODÁRSKY PODNIK, štátny podnik [state enterprise]

**Description**
The system was created to do the following:

- collect data on river basin management in Poland and Slovakia;
- integrate data within the project area;
- analyse water management balances on the basis of experience in this area;
- design and implement tools under the PLUSK system to achieve a balance on the basis of GIS;
- design and implementation of PLUSK tools to support river basin management in the PLUSK project area.

The integrated PLUSK system enables the use of an up-to-date database of water sources and the analysis and evaluation of the way river basins are used. The system supports decision-making in the field of water management. The system also creates a better flow of...
information relating to water stocks between water management institutions and local authority entities. PLUSK also fulfils another important function: it makes available information on the status of river basins and on the stocks within them, acting partly as a public portal, through which it enables access to information on the water environment and an exchange of information through thematic forums.

The PLUSK system is an innovative GIS application allowing the integration of alternative calculations of water management balances with a map. Modelling is based on differentiated original data. In calculations and analyses it is also important to take account of spatial data (land models, topography, orthophoto maps) and land cover data (Corine Land Cover) which determine the flow direction of water in river basins.

The result of the work done under the project is a bilingual Internet portal which processes, displays and makes available information on the environment and the result of work done as part of the implementation of the Water Framework Directive and the Floods Directive.

The system also includes an indicative flood line generator as an analytical tool created in the GIS environment to provide a quick indicative prediction of the extent of flooding. By means of web services the tool is available to all interested parties as an analytical starting point for an expert assessment of the possible flood risk, as part of a proper expert assessment by water management specialists. Using an absolute water level measurement or a relative water level measurement (water depth) defined in a definition point, the system generates, using GIS tools, an indicative maximum forecast of the extent of flooding.

Further information
www.plusk.eu

Contact point
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CREATING A SYSTEM OF CONTACTS BETWEEN INSTITUTIONS IN THE SPIRIT OF INTERNATIONAL AGREEMENTS ON SLOVAK-HUNGARIAN BORDER WATERS – STAGE 1

Summary description
The project contributed to the drafting of a joint water management plan in the border region of Medzibodrožie; this may improve living conditions for the local population and conditions for farming businesses, industry, tourism and the environment in this transboundary area.

Geographical area
Borsod-Abaúj-Zemplén – Košice region

Timing
1 March 2010 to 8 November 2010

Main authority / authorities or organizations
Northern Hungarian Directorate for the Protection of the Environment and Water, Miskolc (ÉKÖVIZIG)

Description
The project has increased the level of professional cooperation between project partners and has deepened the exchange of experience in flood protection, hydrology, drainage of internal waters, monitoring of surface waters, the provision of and protection of water resources and integrated water management complying with the Water Framework Directive (WFD). Two three-day workshops (training sessions on communication) were held in English as part of the project; these increased the linguistic knowledge of the participants, particularly in specialist terminology. In the course of 2010 four three-day specialist seminars were held (two in Slovakia and two in Hungary) on river basin water management, flood protection and managing internal waters in compliance with the WFD, combined with a visit to interesting water management structures.

The final report and the recommendations arising from the specialist seminars can assist the work of the Slovak-Hungarian border commission for the Tisza and its tributaries. Cooperation was in the form of a pilot project and its results will be available for use by specialists in other cross-border regions for water management planning purposes.

Further information
One significant benefit of the project is the opening of the Infobod [Infopoint], equipped with computers on both the Slovak and Hungarian sides, which enables information to be provided to the public and contributes to an exchange of information between project partners. In the event of flooding or accidents the Infobod information can be made available to civil protection professionals.

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UNITED KINGDOM

CATCHMENT BASED APPROACH

Summary description
A Catchment Based Approach (CaBA) is a holistic method of managing land and water. The aim is to develop a clear understanding of the pressures facing a catchment by involving a range of interested parties from across the private and public sectors to share knowledge and information and jointly make decisions that develops a strategy for action that balances environmental, economic and social demands in an integrated and sustainable way.

Geographical scope
The catchment approach will be a national initiative contributing to the UK’s implementation of the WFD but is driven by a bottom up approach with locally devised catchment or sub-catchment plans feeding into 2nd Cycle River Basin Management Planning.

Timing
• Pilot phase will run from August 2011 to December 2012
• Pilot Evaluation Reports – March 2013
• National Rollout – May/June 2013
• Catchment groups plans feed into 2nd Cycle River Basin Management Plans - 2015

Main authority/authorities or organisations

Description of the example
The concept of a catchment approach is to bring together land and water management within a single integrated framework to balance environmental, economic and social demands at a water catchment scale in a sustainable way. There can be many different and conflicting pressures facing ecosystems, being tackled by a broad range of stakeholders; this approach adopts a holistic style in the form of a catchment plan developed collaboratively by all those with an interest in their catchment to align actions and funding within a balanced, coherent and coordinated strategy.

Integrated catchment management cannot be a prescriptive process because each catchment will face different pressures and unique local circumstances. Defra and its delivery bodies will work with, and through, a broad range of stakeholders within a catchment to utilise their local knowledge and expertise to inform the development of a catchment plan which will create a proposal for action based on collective consensus and partnership working. Informed by this local intelligence, this will allow those involved to better target available incentive and advice mechanisms to deliver improvements more effectively. And, by directly involving and working through contributing third parties it will reduce the need for additional
regulation as compliance to existing legislation will be elicited through additional voluntary action.

Defra is also working to enhance the process by mapping all of the available mechanisms, measures and baseline regulations which catchment groups may employ to bring it together into a clear framework and suite of tools which can be used to draw down into catchments.

The pilot phase will run from August 2011 to December 2012. There are 25 pilot catchment groups being formally evaluated; ten are facilitated by the Environment Agency and the remaining fifteen are being led by a range of stakeholders from water companies and local authorities to a variety of environmental NGOs. The evaluation of the pilots will inform how Defra rolls out the catchment approach within a national framework from 2013 onward.

Further information
- Environment Agency website:
- Cascade Consulting Pilot Evaluation Project:
  http://www.cascadeconsulting.co.uk/projects/defra

Contact point
Richard Cole, Department for Environment, Food and Rural Affairs, richard.cole@defra.gsi.gov.uk, 0207 238
MONITORING OF SURFACE WATERS AND GROUNDWATER
**Summary description**

The major goal of the joint BG-RO groundwater monitoring programme of the transboundary aquifers in Dobrogea area is to apply the requirements of Article 8 of Water Framework Directive 2000/60/EC.

The groundwater monitoring will facilitate the process of groundwater management and will further contribute to determine and overcame negative qualitative and quantitative trends.

The joint monitoring programme is a bilateral activity between two border countries (BG and RO), in the line of the EU WFD and UN Helsinki Convention on the protection and use the transboundary water courses and international lakes (1992). Key elements of this programme will be BG-RO coordination issues joint transboundary activities and approval by so called „Border Groundwater Coordination Committee between Bulgaria and Romania”.

**Geographical scope**

The project has River Basin District and a regional scope.

**Timing**

The project duration is 12 months between November 2006 – November 2007

**Main authority/authorities or organisations**

RO: Ministry of Environment and sustainable Development, National Institute of Hidrology and Water Management, National Administration Romanian Waters - Dobrogea - Litoral Water Basin Administration, Constanta


This project was implemented by EPTISA International–Spain, DHI Water&Environment-Denmark - Czech Republic.

**Description**

The project area named Dobroega Plateau is located in the NE corner in Bulgaria, with a surface area about 9534 km². The Black Sea coastal line of Bulgarian part of the project is 182 km long.
The project area named Dobrogea is located in the SE corner of Romania with a surface area of about 4,492 km². The Black Sea coast line of Romanian part of the project area is 66 km long.

The transboundary groundwater occupies an area of 14,027 km², shared between Bulgaria and Romania.

The over-riding objective of the joint monitoring programme is to achieve the objectives of the WFD, "Good GW Status" and to preserve "Good Status" where such already exists. Three types of monitoring are specified and described in the program.

The present program includes all groundwater monitoring activities required for the purposes of the WFD.

GW management objectives

Bulgaria in Romania should implement the measures necessary to prevent or limit the input of pollutants (mostly nitrates) into the Upper Jurassic-Lower Cretaceons Aquifer as a major source of drinking water supply, irrigation and industrial water supply for the local communities.

Monitoring objectives

Bulgaria and Romania should provide a reliable assessment of the quantitative status of all transboundary GW bodies belonging to Neogen (Sarmatian) aquifer and Upper Jurassic-Lower Cretaceons aquifer in Dobrogea area including assessment of the available groundwater resource.

The groundwater monitoring programmes is established for:

- a quantitative monitoring network
- a surveillance water monitoring network
- an operational monitoring network
- Appropriate monitoring to support the achievement of protected area objectives e.g. drinking water and habitats protected area.

In Romania, the actual network for quantitative monitoring is formed by four wells: two in Upper aquifer-Sarmatian located in Albesti II well field, Albesti-Vartop well field and other two wells in Lower aquifer Jurassic-Cretaceons located in Negru Voda well and Baneasa well field.

In all four wells, automatic stations with real time data transmission were installed.

Contact point

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Constanta, Romania
DESIGNATION OF HEAVILY MODIFIED WATER BODIES AND DEFINITION OF GOOD ECOLOGICAL POTENTIAL
UNITED KINGDOM

RIVER SHEAF, SHEFFIELD - HEELEY BRIDGE REDUNDANT WEIR REMOVAL

Summary description
Weir removal and wider restoration improvements in an urban area of Sheffield. Mitigation measures for a heavily modified water body:

Set-up site compound and install silt control measures.

Shoal removal upstream of existing Upper and Lower weirs.

Removal of the Upper weir, including the fish pass structure.

Gabion slope - removal of broken gabion mattresses

Concrete slope - create a low flow channel through this slope.

Geographical scope
Local level – Grid Ref: SK 35128, 85148

Water body ID - GB104027057750


Timing
October 2011

Main authority/authorities or organisations

Environment Agency.

Complementary work was undertaken by Sheffield City Council and Friends of Millhouses Park in partnership with the Environment Agency.

Defra provided the funding.

Description
The site works for this project included the removal of the upper weir, shoal removal, and the construction of a low flow channel to assist fish passage. This project implemented several mitigation measures for this heavily modified water body.

This work has created a more natural river channel by completely removing the upper weir. This goes some way to restoring the former habitat and river bed levels. We have also removed shoal deposits from this part of the river to reduce flood risk.

The project cost £20,000 and was funded by money from the Defra WFD allocation.

The river was once grossly polluted and lifeless, and the renewed movement of aquatic life along the river will be beneficial to other wildlife such as herons and otters. We also expect brown trout, which is a conservation species, endangered native crayfish and other small species such as bullhead will really benefit from this work.

In 2010 a new fish pass was built for the downstream weir at Heeley Bridge to replace the previous one which had been damaged. The Environment Agency, Friends of Millhouses Park, and Sheffield City Council constructed a new channel to bypass two weirs on the River Sheaf at Millhouses Park.
Figure 4 Reprofiled more natural channel on completion of works.

Further information

Project Manager: Simon Hinkins, simon.hinkins@environment-agency.gov.uk

Case study compiled by: Rachel Moseley, rachel.moseley@environment-agency.gov.uk

Map / Plan of project available.

Contact point

Jeff Pacey, River Basin Programme Manager,

Environment Agency

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ASSESSMENT OF GROUNDWATER STATUS
A SUCCESSFUL CROSS-BORDER COOPERATION TO MANAGE TRANSBOUNDARY AQUIFERS: THE CASE OF THE CARBONIFEROUS LIMESTONE AQUIFER

Summary description
Trilateral cooperation between France, Wallonia and Flanders in order to attain a sustainable management of the carboniferous limestone aquifer: a common study on the carboniferous limestone aquifer was initiated with on the one hand the objective to have a better comprehension of the aquifer (hydrogeology and chemical processes) and on the other hand to develop a policy document for a sustainable joint management of this transboundary aquifer and to extend the cooperation agreement on this aquifer which exists since 1996-1997 between Wallonia and Flanders.

This action is part of the Interreg IVB NWE ScaldWIN project.

Geographical scope
Carboniferous limestone aquifer, which extends from the north of France to the Walloon province of Hainaut and the south of the Flemish province of West-Flanders.

The carboniferous limestone aquifer is a deep aquifer which suffers from overexploitation.

Timing
2009-2012: study, 2013: cooperation agreement

Main authority/authorities or organisations
Lille Métropole Communauté Urbaine (LMCU) - France = project leader, Direction générale opérationnelle Agriculture, Ressources naturelles et Environnement (DGARNE) – Walloon region, Vlaamse Milieumaatschappij (VMM) – Flemish region

Description
The objective of this study is to make available the basic geologic data, to take away uncertainties with regard to the geologic structure, to identify recharge areas, to characterise the qualitative and the quantitative aspects of the carboniferous limestone aquifer, which will result in a policy document for a sustainable management of the transboundary aquifer.

This study includes a.o. following aspects:

- the collection of geologic, hydrogeological, hydrographical and climatologic data;
- the collection of new data (installing piezometers, monitoring of groundwater levels, water analysis, …);
- processing the collected data;
- the development of a conceptual scheme;
- the elaboration of a digital model, which allows to manage the aquifer actively and to guarantee sustainability;
- carrying out a cost-effectiveness analysis;
- the development of a web-animation.

Further information
www.scaldwin.org ; www.isc-cie.org

Contact point
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A SUCCESSFUL CROSS-BORDER COOPERATION TO MANAGE TRANSBOUNDARY AQUIFERS: THE CASE OF THE PHREATIC GROUNDWATER IN THE DUTCH-FLEMISH POLDER AREA

Summary description
Bilateral cooperation between the Province of Zeeland (NL) and the Flemish region to attain a sustainable groundwater management in the polder area: a common study on the phreatic groundwater in the Dutch-Flemish polder area was initiated with on the one hand the objective to have a better comprehension of the historical and future evolution of the salinization of this area and on the other hand to develop a policy document for a sustainable joint management of this transboundary aquifer by the Province of Zeeland and Flanders.

This action is part of the Interreg IVB NWE ScaldWIN project.

Geographical scope
Cross-border polder area shared by the Flemish region and the Province of Zeeland.

The phreatic groundwater in this area suffers from salinization.

Timing
2009-2012: study, 2013: cooperation agreement

Main authority/authorities or organisations
Vlaamse Milieumaatschappij (VMM) – Flemish region, Provincie Zeeland – The Netherlands

Description
Firstly, additional observation wells have been installed in order to have a better idea of the current level of salinization in this area. Secondly, a modelling study is being executed in order to show the historical and future evolution of the salinization level, taking into account climate change and sea level rise.

Further information
www.scaldwin.org ; www.isc-cie.org

Contact point
Flemish region: Didier D’hont, VMM, Afdeling Operationeel Waterbeheer, d.dhont@vmm.be, 0032 (0)2 663 21 40
PROGRAMME OF MEASURES – GENERAL
FRANCE

WATER QUANTITY MANAGEMENT IN THE CONTEXT OF WFD IMPLEMENTATION

Summary description
Implementation of a global approach to adapt water abstraction to water availability at river basin level

Geographical scope
National territory

Timing
From now on to 2021 – depending on WFD environmental objectives

Main authority/authorities or organisations
Ministry of ecology
District State Authorities
Regional State Authorities
Water agencies

Description
Abstraction licences used to be issued on a “first come first served” basis in France but this approach changed since the water law of 2006 that introduced the concept of "balanced water resource management" and the fact that, in respect of WFD, total abstractions can not be higher than available water resources at river basin level.

Following that law, river basins and groundwater units with quantitative problems have been listed. Studies have been carried out in order to calculate the maximum volume of water per year that can be abstracted per basin or unit, taking into account real water availability. These studies have been called "abstractable volume" studies.

These studies are completed in the Loire Bretagne district, in the Adour Garonne district and are still in process in the Rhone Méditerranée & Corse district.

The next step of this process is to revise individual licences (volume of each abstraction) so that the total volume of abstractions licensed does not exceed the total volume of "abstractable water" calculated in the study. The national objective is to revise all licences by 2014 or
2017 / 2021 if the result of the study shows that the volumes of abstraction licensed need to be reduced by more than 30%, and in respect of WFD environmental objectives.

This approach is already in place in some territories where local problems occur on a regular basis (Beauce region in the parisian basin since 2006 and in the Vienne departement since recently).

In addition to the definition of “abstractable volumes” and revision of authorizations, rules for collective management of water dedicated to irrigation have been put in place. Some organisms in charge of this collective management are being designated and officially authorized to distribute the available and authorized volume to farmers who irrigate at river basin scale. This is a way to optimize rules of water distribution among farmers and water management in case of drought.

**Contact point**
Ministry of ecology, sustainable development and energy

Office Groundwater and water resource Unit

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MEASURES RELATED TO GROUNDWATER
Summary description
The area surrounding a public water supply abstraction, in operation since 2003, showed evidence of declining groundwater level as a result of the abstraction. The groundwater body was flagged as being at risk of failing its quantitative WFD objectives in 2005 and was classified as being at Poor Quantitative Status in 2009. The Environmental Protection Agency consulted with Fingal County Council and remedial water infrastructure works were instigated to help reduce the abstraction volume and address the falling groundwater levels. In the WFD River Basin Management Plans, an extended deadline of 2021 was sought to meet the Good Quantitative Status objective for that groundwater body. A reduction in abstraction rate in 2010 and 2011 has resulted in a general recovery in groundwater levels since their lowest levels in 2008-2009. It is now envisaged that the groundwater body will meet the Good Quantitative Status objective in 2015.

Geographical scope
Regional (groundwater body scale)

Timing
2003-2011

Main authority/ authorities or organisations
Fingal County Council & Environmental Protection Agency

Description
In July 2003 Fingal County Council brought into operation a significant Public Drinking Water Supply (PWS) abstraction wellfield at Bog of the Ring in County Dublin. Subsequent monitoring in the area showed evidence of declining groundwater levels as a result of the PWS abstractions. In 2005, the WFD Characterisation identified the groundwater body as being at risk of failing its objectives because of groundwater abstraction. The average abstraction volume increased in the period 2003 to 2005, which was followed by a relatively steady level of abstraction, at greater than 3,500 m3/d, from 2005 to 2009 (Figure 1). Figure 1 also shows the general groundwater level decline in Observation Well 2 Deep (OW2D) from 2003 to 2009. This well is located within the wellfield and the trend in water levels is indicative of the level of impact from the PWS abstraction.

In 2009 the associated groundwater body was classified as being at Poor Quantitative Status because the groundwater levels were still falling and were the result of groundwater abstractions. The Environmental Protection Agency consulted with the County Council and remedial measures were instigated by the County Council to reduce the abstraction volume and address the falling groundwater levels. There was uncertainty relating to how quickly
those remedial works could be completed and how the groundwater levels would respond. Therefore, in the WFD River Basin Management Plans, an extended deadline of 2021 was sought to meet the Good Quantitative Status objective for that groundwater body.

The County Council were able to reduce the average abstraction volume to <3,000 m$^3$/d in 2010 and <2,500 m$^3$/d in 2011. This was achieved through improvements in the supply distribution network and an improved abstraction regime. Consequently the County Council has been able to manage its water resources in a more efficient and sustainable manner. Figure 1 shows that there has been a general recovery in groundwater levels since their lowest levels in 2008-2009, which is attributed to the reduction in abstraction volume. It is now envisaged that the groundwater body will meet the Good Quantitative Status objective in 2015.

![Groundwater level monitoring data for OW2D presented with trends in abstraction for the Bog of the Ring PWS](image)

**Figure 5** Groundwater level monitoring data for OW2D presented with trends in abstraction for the Bog of the Ring PWS

**Contact point**

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Summary description
Germasogeia was the first aquifer in Cyprus used as a natural water treatment plant. Germasogeia is the most intensively exploited aquifer in Cyprus. In 1996 up to 9 mcm of groundwater were extracted from this small aquifer, whose area is only 3 km² and its total fresh water capacity is in the order of only 3.5 mcm.

Geographical scope
South part of Cyprus, at Germasogeia aquifer.

Timing
Surface water from the Germasogeia and Kouris dams is being released in the riverbed since 1982 for recharge of the aquifer.

Main authority/authorities or organisations
Cyprus, The Water Development Department

Description

CONTEXT Germasogeia is a typical river alluvial aquifer in Cyprus developed along the Germasogeia river valley extending between the Germasogeia dam and the coast. Since the construction of the dam in 1969 the recharge of the aquifer depends on controlled releases from the dam and its spills. During the last twenty years the dam spilled only a few times.

PROBLEM Germasogeia was the first aquifer in Cyprus used as a natural water treatment plant. Surface water from the Germasogeia and Kouris dams is being released in the riverbed since 1982 for recharge of the aquifer. After natural purification (SAT - Soil Aquifer Treatment), the “treated” groundwater is pumped for the domestic water supply of Limassol town, the surrounding villages, and the tourist zone. This aquifer is the only source of domestic water supply of the surrounding villages and the tourist zone. The Germasogeia aquifer is the most intensively exploited aquifer in Cyprus.

In 1996 up to 9 million cubic meters (mcm) of groundwater were extracted from this small aquifer, whose area is only 3 km² and its total fresh water capacity (based on average water level) is in the order of only 3.5 mcm.

Fast urbanization and tourist development in the area are causing rapid deterioration of this highly susceptible aquifer thus seriously endangering its future.

DESCRIPTION
The upstream part of the river alluvial aquifer i.e. the part near the dam consists of gravel and coarse sand. The permeability in this section is very high. The permeability gradually reduces downstream because of an increase in the content of fine materials such as fine sands and silts.

Figure 6

Hydrological Conditions

The hydrogeological regime and the water balance of the aquifer are “regulated” by controlled releases from the dam into the river valley to meet the expected demand for domestic water supply. The main targets of the aquifer’s “regulation” are: a) to cover water demand with groundwater of acceptable quality, b) to protect the aquifer from sea intrusion, and c) to minimize groundwater losses to the sea.

Around 23 boreholes operate in the aquifer today for domestic water supply. Yields of these boreholes vary from 50 to 200 m³/hour. Average extraction from the aquifer over the last ten years was 6.4 mcm/year.

RESULTS/PERSPECTIVES/BENEFITS Germasogeia was the first aquifer in Cyprus used as a natural water treatment plant. Germasogeia is the most intensively exploited aquifer in Cyprus. In 1996 up to 9 mcm of groundwater were extracted from this small aquifer, whose area is only 3 km² and its total fresh water capacity is in the order of only 3.5 mcm.

Today with the recharge management adopted we maintain a balance in the inflow and outflow of the aquifer, prevent sea water intrusion and at the same time, use the aquifer as the treatment plan of the water released from the Germasogeia and Kouris dams.
**LESSONS LEARNED** Conjunctive use of surface and ground water resources. Up to 9 mcm of groundwater were extracted from this small aquifer, whose area is only 3 km² and its total fresh water capacity is in the order of only 3.5 mcm.

**Further information**

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MEASURES RELATED TO AGRICULTURE
DENMARK

IMPLEMENTATION OF NEW WETLANDS FOR REDUCTION OF NITROGEN LEACHING.

Summary description
The Danish Government has launched an initiative to establish wetlands in order to reduce the leaching of nitrogen from agriculture.

Reduction targets are set in the River Basin Management Plans (RBMPs) elaborated in accordance with the Water Framework Directive (WFD). Regional targets for river basins have been derived from these plans. Regional steering committees established between the municipalities concerned are responsible for the identification and implementation of concrete projects for the achievement of the targets for reduction of nitrogen leaching.

The project budgets have been calculated on the basis of experienced average cost per kilo nitrogen retained and average cost per hectare wetland established. The specific projects are granted by the state which also assures quality and effectiveness of the projects.

Geographical scope
National to local level

Main authority/authorities or organisations
Nature Agency (Ministry of the Environment) and municipalities

Description
In 2009 the Ministry of Environment and Local Government Denmark (Member Authority of the Municipalities) agreed that up to 10,000 hectares of wetlands shall be established during 2010-2015 in order to remove 1,130 tonnes of nitrogen per year. This nitrogen removal will contribute to the achievement of the WFD objectives in Denmark. In connection with the agreement financial resources were set aside, totalling some 976 million DKK. The funds are provided partly by the European Agricultural Fund for Rural Development and partly by the Danish national budget.

For the implementation of the agreement sub-targets have been established for and the accompanying economy allocated to 15 sub-districts (main catchment areas) in accordance with the RBMPs. Furthermore, the RBMPs prescribes a specific implementation at sub-basin level.
In as much as the boundaries of the sub-districts does not correspond with the boundaries of the municipalities, the municipalities within each sub-district organise themselves in Water Catchment Committees (WCC). The responsibility remains with these committees to organise the wetland projects necessary to meet the targets of the RBMP for the period 2010 – 2015. It is up to the WCC to select projects that provide the required nitrogen reduction within the allocated budget, respecting set requirements regarding cost effectiveness and reduction efficiency.

The WCCs must maintain a long list of potential projects to achieve the goals. Abolished projects must be substituted by others. In this way the state can always monitor the progress and be assured that enough projects remain to achieve the targets. The WCCs can thus organise its efforts in accordance with local conditions.

The WCC appoints a municipality to be in charge of the implementation of a selected project. The municipality applies for funds for and conducts a feasibility study of the project and subsequently for the implementation. Thus, while there is a regional responsibility of planning the overall project effort at the river basin level, there is a local responsibility in each project undertaken. This ensures a local contact to landowners.

Municipalities can receive grants for full funding of the proposed projects, provided that all standard requirements are met, but only for activities strictly necessary to obtain the nitrogen reduction. Other aspects such as nature conservation or recreation may be combined with the nitrogen reduction, but must be financed the municipality itself.

Progress is monitored by a Steering Committee with representatives from the Ministry of the Environment, the Ministry of Food, Agriculture and Fisheries, and Local Government Denmark. The Committee addresses any issue arising from the implementation of the programme and reports to the political decision makers in their respective organisations.

In general wetlands are considered an effective way of reducing nitrogen leaching. In addition, wetland projects are implemented in agricultural areas of the least economic importance. Therefore it is often possible to obtain support from the landowners. This model, where the state sets targets and budgets and the local level is responsible for the detailed decision making, ensures a smooth cooperation between authorities and landowners.

**Further information**

www.vandprojekter.dk (only Danish)

**Contact point**

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GERMANY

LIFE-PROJECT WAGriCo (WATER RESOURCES MANAGEMENT IN CO-OPERATION WITH AGRICULTURE)

Main authority/authorities or organisations

NLWKN (Lower Saxony Water Management, Coastal Defence and Nature Conservation Agency), MU (Ministry of environment, energy and climate protection, Lower Saxony), UKWIR (UK Water Industry Research Ltd).

Geographical scope

Ems, Weser and Elbe river basins (DE) and Frome, Piddle and Wey river basin (UK)

Timing

2005 - 2008

Description

Topic: Water Resources Management in Co-Operation with Agriculture

Reasoning for the project

Main reason was the need to develop an effective and accepted programme of measures to minimize the impact of nutrient input from agriculture because this is the most important reason for groundwater bodies in Lower Saxony to fail the objective of WFD.

Objectives

main objectives were:

- to develop innovative on-going co-operation with local stakeholders through working groups
- to demonstrate the use of programmes of water protection measures integrated in agricultural production processes and land use planning to achieve and/or sustain good water quality aiding the water protection objectives set out in Articles 4 and 7 of the Water Framework Directive (WFD)
- to develop methods to determine the impact of measures on emissions via nutrient efficiency on the basis of agricultural accounting methods
- to scale up the environmental impacts of the measures to large regions with the aid of an integrated proven agro-economic and hydrological model

Following concepts were developed:

- the programmes of measures is integrated in agro-environmental programmes
• an advisory service for farmers is established to enhance water protection

The project was realized within the European LIFE Program during 2005 – 2008 with an overall budget of 5,2 Mio. €.

**Project data:** **Project area:** 400,000 ha

**Further information**

www.wagrico.de

**Contact point**

Ministry of environment, energy and climate protection (MU), Lower Saxony

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**POLAND**

**EKOROB - “ECOTONES FOR REDUCING DIFFUSE POLLUTION”**

**Summary description**
Diffuse pollution, which currently constitutes 50% of runoff of nutrient compounds from the territory of Poland to the Baltic Sea, so far has not been sufficiently considered in the water management plans. Thus in order to achieve good ecological status as required by the Water Framework Directive, the European Regional Centre for Ecohydrology and the Regional Board of Water Management in Warsaw have decided to develop a consistent programme of innovative solutions using ecosystem biotechnologies based on the ecohydrological bases of watershed management in order to reduce diffuse pollution in the Pilica basin in a sustainable manner, which will contribute to achieving good ecological status of water in the Sulejów Reservoir. This goal will be accomplished under the project entitled “Ecotones for reducing diffuse pollution” (EKOROB) implemented under the LIFE+ Environment Policy and Governance Programme, LIFE08 ENV/PL/000519.

**Geographical scope**
Poland, Vistula basin district, Pilica river basin

**Timing**
2010 - 2014

**Main authority / authorities or organisations**
Regional Water Management Authority in Warsaw, European Regional Centre for Ecohydrology under the auspices of UNESCO

**Description**
The main causes of the eutrophication of water bodies are discharge of pollution, mainly nutrients: nitrogen and phosphorus, from both point sources (e.g. sewage treatment plants) and diffuse sources. The diffuse sources of pollution are estimated today to account for 50% of the runoff of nutrient compounds from the territory of Poland. The measures to be undertaken under the project concentrate on diffuse pollution mainly generated by agricultural activities. One of the tools instrumental in protecting water ecosystems from diffuse pollution is making use of the potential of ecotones.

The goal of the project is setting up a program of activities for reducing diffuse pollution in the basin of the Pilica River by means of cost-effective ecohydrologic methods, that will help achieve a good ecological status of water in the Sulejowski Reservoir.

Another goal is preparation of a manual for optimal ecotone formation, with special attention being paid to the effectiveness of diffuse pollution removal and formation of biodiversity.
It is planned to construct, calibrate and optimize typologically diversified ecotones using vegetation communities that have their habitat in the Pilica River basin. While constructing the ecotones, it is planned to use, as an innovative element, so-called „denitrification walls” that constitute a barrier protecting from the inflow of nitrates from agricultural drainage area, but also from areas unprovided with the sewer systems.

One of the project goals is creation of a demosite that will present the possibilities of introducing the proposed measures in other areas. The demosite will comprise ecotones constructed in the direct drainage area of the Sulejowski Reservoir. It is planned to install a network of piezometers for monitoring the quality of underground water that indicates the performance of the ecotones. The demosite will be used to train specialists, as well as pupils, students, and the local community.

For diffusion pollution to be successfully reduced it is necessary to raise the environmental awareness of a local community. Building of the ecotones within the reservoir area and in the river valleys still awaits the necessary acceptance. In order to demonstrate that the ecotones not only do not impede, but simply facilitate recreation, it is planned to set up proper infrastructure, for instance, by providing paths and jetties within the area of the constructed ecotones.

Another key factor that is crucial to success is involvement of the local authorities, associations and investors. The project assumes the establishment of Multi-Stakeholders Platform to ensure their cooperation during the course of the project, and continued activity after its completion.

Expected achievements:

• Increased social awareness and acceptance of the proposed solutions.

• Establishment of multi-stakeholder platform that will engage them into joint actions focusing on the drainage area of the Sulejowski Reservoir with a view to reducing diffusion pollution and ensuring a good ecological status of the Reservoir.

Further information

http://en.ekorob.pl/

Contact point

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ROMANIA

IMPLEMENTATION OF THE PROJECT “RIVER BASINS NETWORK ON WATER FRAMEWORK DIRECTIVE AND AGRICULTURE” IN LECHIŢA RIVER BASIN

Summary description
The overall objective of the network is to provide practical examples of good practice in River Basin Management Plans. The network members will evaluate measures used in their respective Plan of Measures through sharing of field experiences, case studies and comparative studies.

Geographical scope
Sub basin level

Timing
2011-2012. The project is on-going

Main authority/authorities or organisations
Mures Basin Administration, National Administration “Apele Romane”, JRC Institute of Environment and Sustainability, DG Environment

Description
The network will develop and improve the Catalogue of Measures and, on this basis, the feeding of a database on WFD agricultural measures. JRC will develop this database that shall be used by any interested party through different adapted tools (web pages, maps, etc.).

To achieve these objectives, the network members will evaluate measures used in their respective Plan of Measures through sharing of field experiences, case studies, and comparative studies, focusing on:

- Ex-post assessment of cost and effectiveness
- Financial, technical, social and legal aspects of the measures

Identification of obstacles and constraints related to the implementation of the agricultural measures (e.g. organisation and methods of implementation, acceptance and involvement of stakeholders in process, costs and effects) and how they have been addressed.

Until now, the measures implemented address the following:

- Buffer strips creation
- Application of techniques of manure

Many EU river basins are involved in this network.
Each one will fill one or more factsheets according to their area of interest, corresponding to one or more measures from the Plan of Measures. On this basis the database on WFD agricultural measures will be developed, with measures already implemented.

This will be an important instrument for sharing experience between the EU member states.

Further information

http://agrienv.jrc.ec.europa.eu

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UNITED KINGDOM

GLASTIR – THE NEW LAND MANAGEMENT SCHEME FOR WALES

Summary description
Working with Welsh Government to ensure that Glastir (the land management scheme for Wales) will help achieve WFD objectives.

Geographical scope
National - Wales

Timing
2011 and ongoing

Main authority/authorities or organisations
Environment Agency Wales, Countryside Council for Wales, Welsh Government

Description
Glastir and the Water Framework Directive
Glastir pays for the delivery of a range of specified environmental goods and services that are aimed to help combat climate change, improve water management and maintain and enhance biodiversity. This marks a departure from previous schemes.

WFD has been fundamental to the development of the water management component of Glastir and as such Glastir marks a significant step forward for meeting WFD objectives.

Welsh Government (WG) has worked with Environment Agency Wales (EAW) and Countryside Council for Wales (CCW) to ensure that water management (water quality and quantity) is tackled appropriately. This takes place through different elements of Glastir:

All-Wales Element (AWE)
Farmers are paid to deliver a range of prescriptions, including options to address water quality. All farms in Wales are eligible to apply for this whole farm scheme.

Targeted Element (TE)
The TE is a part farm scheme and is available for farms in priority areas only. These areas include water management, soil carbon and biodiversity. In the first two years of the scheme, Welsh Government’s focus is on delivery for water and carbon.

Priority areas have been identified for water management based on statutory requirements, including WFD, and Special Area of Conservation (SAC) commitments in conjunction with the river basin management plans. For water quality, areas were identified where there was evidence of diffuse pollution from agriculture.

For the top water quality priority areas (water bodies with a 2015 deadline) it is a requirement for each farm entering the scheme to have a Water Management Plan and a Nutrient Management Plan. These reports, based on visits by EAW, provide recommendations for the farm that will lead to improvements in water quality. The reports form the basis of the TE agreement and farmers will have to select prescriptions that will address the key problems identified.

In the lower water quality priority areas, although water is not given as great an emphasis, water prescriptions will still be required as part of the agreement.

ACRES

The ACRES capital grant scheme has several components, including manure and slurry efficiency. Any applications for this component are prioritised if the farm is in the top water quality priority areas. This ensures major capital items are funded in areas where improvements in water quality are needed most.

Further information

Glastir – the new Land Management Scheme for Wales

From 2012, Glastir replaces the existing five agri-environment schemes in Wales (Tir Gofal, Tir Cynnal, Tir Mynydd, Organic Farming and Better Woodlands for Wales).


Contact point

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**Summary description**

The first five years of the England Catchment Sensitive Farming Delivery Initiative (ECSFDI) have been evaluated. Drawing on results from the different elements of our evaluation, there is clear evidence to demonstrate that the initiative has met its primary objectives, to:

- increase awareness amongst rural land managers and stakeholders of the impact of diffuse water pollution from agriculture
- improve soil and land management practices amongst farmers within Priority Catchments
- reduce the pollution of water caused by farming within Priority Catchments

**Geographical scope**

England

**Timing**

The evaluation covers the first 5 years of the project (2006-2011), and will continue until the end of the project’s term.

**Main authority/authorities or organisations**

Catchment Sensitive Farming is a project delivered in partnership between Natural England, Environment Agency and Defra.

**Description**

Farmer engagement was highly effective, with some 9,023 farm holdings receiving advice directly. This represents 17 per cent of all farm holdings within Priority Catchments (38 per cent by area) and 45 per cent within targeted sub-catchments (62 per cent by area).

Over 80 per cent of farmers receiving ECSFDI advice confirmed their knowledge of water pollution had increased and that they had taken, or intended taking, action to reduce water pollution. Over 90 per cent indicated the ECSFDI was the best way to learn about water pollution. Despite this increased awareness and understanding, there remains only limited acceptance from farmers that agriculture makes a significant contribution to water pollution.

To date, the key drivers for change have been the financial incentives of free advice, reduced costs (for example, by more accurately calculating fertiliser applications) and grants.

The ECSFDI has brought about significant improvements to soil and land management practices through voluntary uptake of advice and a capital grant scheme. 93,360 farm-specific
recommendations have been made for improving soil and land management, with an uptake rate of over 50 per cent.

Implementation of control measures resulted solely from ECSFDI advice in most instances (83 per cent). For the remainder, implementation was also influenced by one or more incentives, other schemes or initiatives. The Nitrates Action Programme, Environmental Stewardship and ECSFDI Capital Grant Scheme were most significant; the latter contributing towards £29 million of farm improvements.

Uptake of control measures providing a cost saving to the farmer was only slightly higher than for those with an associated cost. This indicates that the ECSFDI is helping target and accelerate changes that might be expected through general trends towards improved farm practice, whilst also delivering significant additional changes.

Modelling indicates that improvements in management practices will result in significant reductions in pollutant losses. Reductions from the first four years of the ECSFDI are generally predicted to be between 5 and 10 per cent across Target Areas, but can be up to 36 per cent. These reductions translate into in-river decreases in pollutant concentrations of similar magnitude. Responses vary for different pollutants and Priority Catchments, due to variation in advice delivery and uptake and the significance of agricultural pollutant sources.

For an advisory initiative to provide a comprehensive evaluation of its performance using monitored and modelled data is unique. The results make an important contribution to addressing uncertainty over the uptake and resulting benefits of ECSFDI advice and demonstrate that voluntary advice can make a significant contribution to reducing diffuse water pollution from agriculture. Communication of the benefits will be important to secure future buy-in of stakeholders (especially farmers).

Evaluation will remain a core element of the next phase of the ECSFDI. The approach developed can also inform how other initiatives are effectively evaluated, from the detailed design of, for example, water quality monitoring programmes to the use of an overall “weight of evidence” approach.

**Further information**

www.naturalengland.org.uk/csf
Contact point

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Contact point
Emma Lyons, NW River Basin Co-ordinator, Natural England. emma.lyons@naturalengland.org.uk

Summary description
The effects of funded improvements on water quality, using the CSF Capital Grant Scheme. An £8k capital grant was secured to address specific DWPA issues on a small (50ha) mixed farm in the North West of England.

Geographical scope
Sub-basin (Ribble Catchment)

Timing
The work took place during the 2011/12 financial year.

Main authority/authorities or organisations
Catchment Sensitive Farming is a project delivered in partnership by Natural England, Environment Agency and Defra.

Description
Catchment Sensitive Farming is an advice delivery programme that raises awareness of diffuse water pollution from agriculture (DWPA) and encourages farmers to take voluntary action to tackle DWPA. For the past four years the programme has been supported by a Capital Grant Scheme which funds capital items that reduce DWPA on farms.

In the financial year 2011/12 the maximum grant available per farm holding is £10,000. This contributes 50% towards the total cost of capital work done on the farm to reduce pollution risk and improve business efficiency. A total of £10.5 million has been available in the 2011/12 year, which has increased from £5 million in 2007/08 and a total of 1600 farmers are expected to benefit from grants in this year.

Blackfield End Farm is located near Preston. It is an average sized farm for the Ribble catchment at 50ha with mixed beef and sheep, 40 suckler cows and 250 ewes. During the winter months most of the livestock are brought in from the fields and housed.

Working closely with the local Catchment Sensitive Farming Officer (CSFO) an £8k capital grant was secured to address specific DWPA issues. Rainwater gutters were installed on roofs
diverting rainwater away from the yard areas and into new underground drainage. The uneven yard which had been difficult to keep clean was concreted, creating an even surface which is easier to maintain clear of mud and muck.

To detect changes in water quality, rainfall levels and turbidity readings were recorded in a farm ditch approximately 175m below the farm yard. Deployed in November 2009 a month of baseline data was collected before installation of CGS works had commenced. Monitoring continued until May 2010, when the farm ditch dried up due to insufficient rainfall.

**Before CGS installation**

November was the wettest month during the investigation with 91.4mm of rain recorded on site. Turbidity spikes regularly exceed 200 NTU and average turbidity readings are 38.5 NTU. As expected spikes clearly correspond with rainfall events as rain water washes mud and muck into the farm ditch.

**After CGS installation**

30mm of rain fell in February and the number and magnitude of turbidity spikes are greatly reduced. Average turbidity levels were again lower (6.8 NTU).

Overall the investigation showed a clear reduction in turbidity levels. Run-off from the farm yard has been reduced through a combination of diverting clean rainwater away from the yard area and creating an even base enabling the yard to be kept clear of mud and muck.

The reduction in the number and magnitude of turbidity spikes provides evidence that the CGS works have reduced levels of DWPA from the farm. The extent of the reduction is not easily quantified as runoff is intricately linked with rainfall events which declined across the course of this study.

**Further information**

www.naturalengland.org.uk/csf

**Contact point**

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**CATCHMENT SENSITIVE FARMING – DEMONSTRATING THE SUCCESS OF PARTNERSHIP WORKING**

**Summary description**
The Nene Catchment Partnership was set up in April 2009 with the Environment Agency and River Nene Regional Park Community Interest Company (RNRP), to address issues with sediment, phosphorous and pesticides in the Upper Nene and on the River Ise SSSI, the largest tributary of the River Nene. Catchment Sensitive Farming (CSF) approached the River Nene Regional Park, who were already funding a project called Revital-Ise, with the aim of enhancing biodiversity, improve the landscape and increase access and recreation. The CSF funding meant that the Revital-Ise advisers were able to undertake dedicated visits to discuss and address diffuse pollution issues with farmers

**Geographical scope**
River Basin District

**Timing**
The partnership was set up in April 2009

**Main authority/authorities or organisations**
Catchment Sensitive Farming is a project delivered in partnership by Natural England, Environment Agency and Defra. This partnership also includes the River Nene Regional Park and Anglian Water.

Description of the example  
In the short time the project has been up and running, over 50 1:1 advisory visits to farmers in the area have been carried out by RNRP, and Environment Agency Environment Officers who have swapped their regulatory duties for advisory ones to support the project.

Farmers are already making changes: at The Farm, Wilby, livestock were damaging the banks of the Swanspool Brook through drinking from the stream and entering the watercourse to eat the aquatic vegetation. The area is known to be home to one of the last colonies of water vole in Northamptonshire and the livestock were causing damage to the habitat. A CSF advisory visit recommended that the livestock were fenced out of the river and on the strength of this, the farmer consented to having the fencing erected and the Environment Agency were able to provide the funding for the capital works. Even after only a couple of weeks, the farmer said that it had made a great difference to the river, as previously, the cattle would eat the aquatic vegetation first.

The Nene Catchment Partnership has also been able to extend and support the advice work and land management changes which had already been started by the Revital-Ise project. Revital-Ise had worked with the farmer at Dovecote Farm, Upper Heyford to restore an
arable field adjacent to the River Nene to a wildflower meadow, using a HLS agreement. This former arable field of 13.5ha was regularly flooded, washing sediment, nutrients and pesticides such as Metaldehyde into the river. During summer 2010 the Nene Catchment Partnership arranged an evening farm walk for other farmers to see the newly created wildflower meadow with a view to encouraging more of them to consider it as an option for their own land. The event was also supported by the Floodplain Meadows Partnership project and the seed manufacturer, Emorsgate Seeds. The Nene Catchment Partnership has been able to provide 1-1 support and advice to farmers following on from this event to help restore more floodplain meadow along the River Nene.

Other partners have taken the opportunity to consolidate what the Nene Catchment Partnership can offer with regard to engaging farmers in the local area by supporting the project in other ways. The Nene Catchment Partnership has been working with the Metaldehyde Stewardship Group (MSG) to help them test the stewardship approach to reducing Metaldehyde levels in the Pitsford Reservoir catchment, a sub-catchment in the project area. To compliment the Get Pelletwise promotion which MSG is undertaking, the Nene Catchment Partnership held a Metaldehyde awareness event and has offered Slug Pelleting Seminar training sessions to farmers in the catchment, which provide farmers with the qualification they need to apply slug pellets.

Anglian Water has also supported the Nene Catchment Partnership by offering a tour of the Pitsford Water Treatment Works. This has given farmers a real insight into the issues facing water companies, particularly with regard to removal of Metaldehyde. As part of their AMP5 investigations, Anglian Water have also chosen the Pitsford Reservoir catchment to pilot their modelling work, testing different scenarios to improve the quality of the water entering their treatment works. The link to the farming community which the Nene Catchment Partnership provides for them is invaluable to ensure the scenarios they are testing can actually be implemented.

In only a short time, we have seen changes to land management and to farmers attitudes towards diffuse pollution, as well as new partners wanting to offer support to the aims of the project. The Nene Catchment Partnership is without question demonstrating many of the benefits envisaged during the development of partnership working within the CSF programme.

Further information
www.naturalengland.org.uk/csf

Contact point
Summary description
The Worcestershire Magnificent Severn is tackling the reasons for failures on a number of water bodies in Worcestershire through advice and guidance and actual works in the field.

We're working closely with the Worcestershire Wildlife Trust and a network of local farmers, Parish Councils, land owners and managers to improve soil management. Changing from arable to other land uses, better ditch and drain management, education and engagement are key to the solution. We're also looking to reprofile the channel to improve the diversity of habitats.

Geographical scope
Severn RBD, Worcestershire, Bow Brook

Timing
Work has taken place between September 2011 and March 2012

Main authority/authorities or organisations
Environment Agency, Worcestershire Wildlife Trust, Network of Local Farmers, Parish Council, Land owners

Description
The Bow Brook is generally a rural watercourse which 'fails' on several criteria. Fisheries status is 'moderate' but should be good, Ecology is poor, water quality is high in phosphorous but low in phytobenthos (plants on the riverbed).

The brook has in the past been deepened for agricultural drainage purposes. The brook still drains through a mainly arable catchment, which increases water quality problems through run-off. The local sewage treatment works is typical of a small rural settlement and discharges into the brook, where it is slow moving and heavily silted.

- Outcome of the project include:
  - Length of field worked on adjacent to brook 3,262m
  - Cattle drinkers
  - 4 scrapes
  - 16,275m (for invert habitats and sediment trapping from land run off) fish refuges
• 700m2 (2.53 hectares) arable to grassland
• 300m of invasive species eradicated
• Erosion matting 175m
• Hedgerow planting 160 m
• all to reduce sediment run off

• Land owners aware of Water Framework Directive and water quality issues
• Partners aware of Water Framework Directive issues
• Community engagement
• 6 University dissertations being carried out on project

Photos: the process of changing farmland into wetlands with a network of shallow ponds. It will stop farm runoff that currently discharges directly into the Bow Brook.

Figure 7

Figure 8
Further information

Project manager:
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Contact point
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Etsome Inlet, River Cary (Somerset Levels and Moors)

**Summary description**
WFD funding has been used to split fund a project to replace an inlet that was taking too much flow and was subject to vandalism, which was affecting the ecology downstream.

**Geographical scope**
River Cary (Somerset Levels and Moors) near Somerton

**Timing**
Month of February 2012

**Main authority/authorities or organisations**
Environment Agency and Internal Drainage Board

**Description**
The Etsome Inlet, a structure owned and operated by the Internal Drainage Board (IDB) was replaced in late February 2012.

This inlet had previously removed an unregulated volume of water from the River Cary, near Somerton, to supply water for agricultural purposes on an adjacent moor. This was causing a significant impact on the downstream river ecology (up to 6km), especially during the summer months. The structure was also in disrepair and prone to third-party interference.

We entered into a partnership with the IDB to drive forward on-the-ground improvements, by agreeing to match fund this replacement using Water Framework Directive (WFD) project money. Total costs came to £16,000.

It is hoped that the new structure will improve the flow in the river, increase water levels to sustain the aquatic environment, less risk of low flow summer fish kills and an improvement to its WFD status.

**Further information**
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**Contact point**
Ben Bunting, River Basin Programme Manager,
CATCHMENT RESTORATION FUND IN ENGLAND

Summary description
A new, national funding mechanism for third sector / civil society groups for local river restoration projects in England that help improve water body status through projects that restore rivers and tackle diffuse pollution. Up to £10m p.a is available for three years.

Geographical scope
The fund is open to projects that are entirely in any of England’s 11 river basin districts.

Timing
The fund launched in 2012. Projects to be delivered in 2012/13, 2013/14 and 2014/15. There are several rounds for applicants to submit.

Main authority/authorities or organisations
The Department for Environment, Food and Rural Affairs (Defra) established made new funding available and has overall responsibility for the management of the Fund.

• The Environment Agency is responsible for administering the Fund.
• The River Restoration Centre has provided the technical appraisal of projects.
• River Basin District Panels have provided local intelligence on each project.
• Individual project bids have come from Rivers Trusts, Wildlife Trusts, RSPB, River Restoration organisations, Waterways societies, Universities,

Description
Since 1990s, we have made good progress in tackling the major polluting and abstraction pressures. This has made it clearer that we also need to focus on problems where individual responsibility is harder to assign: tackling diffuse sources of pollution and the legacy of alterations that society has made to the shape and connectivity of water channels. Since many of these pressures on the water environment have no clear responsible polluter, we need public funds to tackle the problems they cause

To tackle these diffuse pollution problems, we recognise that this will involve getting all polluters involved and we see the civil society route as an effective way to do this.

This is why we have created the Catchment Restoration Fund, as a means to encourage smaller organisations to join together with a lead applicant to develop and foster greater
partnership working. This in turn, will promote an integrated approach to catchment management.

There is now, for the first time, a single, dedicated funding mechanism for river restoration projects in England. The fund will make £10m p.a. available for three years.

**Further information**

For details on the Fund, visit the Environment Agency’s website: http://www.environment-agency.gov.uk/research/planning/136182.aspx

**Contact point**

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Jerry Gallop, Environment Agency, jeremy.gallop@environment-agency.gov.uk
MEASURES RELATED TO CHEMICAL POLLUTION
CZECH REPUBLIC

REDUCTION OF HALOETHERS LOAD FROM SPOLCHEMIE IN THE ELBE RIVER ON THE CZECH TERRITORY

Summary description
The Elbe River pollution with high concentrations of haloethers (TCPE) from Spolchemie, which was found as a result of regular water quality monitoring in 2005 year, was the trigger point for acceptance and realization remedial provision leading to a significant reduction of the input of this pollution. Fundamental reduction was reached till 2007 year. Germany declared the necessity of further reduction of TCPE pollution for drinking water quality securing. Consecutive activity of International commission for the Elbe protection (MKOL), Povodí Labe and manufacturing provisions of Spolchemie lead to reduction of year TCPE emission to 0,5 ton/year with concentration values in the Elbe River bellow detection limit. With this measure, suitable conditions in the Elbe river for abstraction of surface water used for drinking water use on the Germany territory.

Geographical scope
The Elbe River basin, River basin district = coordination district “The Ohre River and Lower Elbe (ODL), the Elbe River Sub-basin, Ustecky region, cadastral area Nestemice, locality Nestemice, Water body 14521020, ID of measure - OH 100109

Timing
Start of project: 2008 Project finishing: 2009

Main authority/authorities or organisations
- Povodí Labe, statni podnik, Vita Nejedleho 951, 500 03 Hradec Kralove, Czech Republic
- Severočeská vodárenská společnost, a.s. Přítkovská 1689, Teplice, Czech Republic
- Spolchemie, a.s., Revoluční 1930/86, Ústí nad Labem

Description
Based on regular monitoring of the Elbe River water quality, that is harmonized in “The International Monitoring Program,” higher concentrations of haloethers (TCPE) were found in the monitoring profile Hrensko/Schmilka in 2005 year. Thanks to an effort of MKOL and constructive cooperation of regional authorities, Povodi Labe and generator of this pollution (Spolchemie, a.s. Usti nad Labem) it was significantly reduced (see Figure 9 - haloethers).

This provision fulfills the aim of Measure OH 100109 on limitation alternatively cessation of dangerous substances input within water body 14521020 – The Elbe River till the confluence with Jilovsky stream.

Waste water from Spolchemie is transferred to the central WWTP in Usti nad Labem – locality Nestemice, where is outlet to the Elbe River – limits for waste water disposal are therefore specified in the permit for WWTP operated by “Severoceske vodovody a kanalizace, a.s.”

Based on requirements of German side raised in MKOL meetings of working group for Water framework directive implementation in the Elbe River basin (WFD), progressive provisions in Spolchemie production process have started. These provisions resulted in reduction of the load of pollution discharged in parameter TCPE from 3 tons/year (2008 year) firstly to 0,9 ton/year and then finally to 0,5 ton/year (2009 year), i.e. the reduction for more than 80%. At the same time, acceptable concentration value “p” of TCPE was decreased to 0,15 mg/l. Significant improvement of the Elbe River water quality was reached in TCMP parameter, and so proper condition with respect to the Elbe River surface water abstraction for drinking purposes realized in the Germany territory.
Contact point
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ABANDONED NON-COAL MINE RESEARCH, UNDERSTANDING IMPACTS AND DEVELOPING MEASURES TO IMPROVE WFD STATUS.

Summary description
Defra and the Environment Agency have initiated 3 research projects to help us understand the impact of discharges from abandoned metal mines on water body status and to develop sustainable solutions for their treatment.

Geographical scope
National – England and Wales

Timing
1. Prioritisation of abandoned non-coal mines impacts on the environment (April 2007 to March 2009)
2. Ecological Indicators of Abandoned Mine Pollution (November 2009 – April 2012)

Main authority/authorities or organisations
The Department of Environment Food and Rural Affairs, Environment Agency and the Coal Authority as the delivery agent.

Description
In the UK, Non Coal Abandoned Mines (NOCAMs) are a highly significant source of water pollution. Defra and the Environment Agency (EA) have initiated 3 research projects to enable the EA to put in place measures in order to meet Water Framework Directive objectives.

1. In March 2009 a two year research project was finalised with the key aims of identifying and prioritising water bodies impacted by NOCAMs causing pollution in England and Wales. The research also looked at options for remediation and assessed the risks of uncontrolled minewater outbreaks to the environment. The main findings are that:

- 7% of water bodies in England and Wales are affected by discharges from NOCAMs;
- 19 water bodies are at risk of sudden minewater outburst
- Approximately half the total annual load of heavy metals (lead, zinc, cadmium and arsenic) discharged to rivers can be attributed to NOCAM discharges.
In a separate study, overall benefits of £500m have been estimated for completing the investigations and remediation work for the 117 priority impacted water bodies identified as a priority in England and Wales, at a cost of £175m to £290m.

2. A second research project investigated why some rivers impacted by NOCAMs have good biological status despite failing conventional and bioavailability-based EQS for metals, particularly zinc. The research will help the UK determine water quality targets for remediation of NOCAM discharges and potentially assist the development of “alternative objectives” for water bodies which support a healthy ecosystem even though metal concentrations are higher than the EQS.

3. Zinc is the most common pollutant at NOCAMs, and is one of the most difficult metals to remove by passive methods. Newcastle University have developed “compost bioreactors” which remove zinc (and cadmium and lead) using pilot-scale systems at mine sites (Nenthead and Cwm Rheidol). These reactors contain a mixture of compost, anaerobically digested sewage sludge and either limestone or cockle shells. Naturally occurring bacteria raise the pH and generate sulphide from sulphate in the mine water. Metals are removed from the mine water by sorption onto the media and precipitation as metal sulphides. The long-term performance of these reactors is being tested but at least 70% of the zinc and cadmium is being removed along with more than 90% of lead. The project will publish engineering design guidelines for low-energy (passive) treatment of metal rich waters at the end of 2012.

The outputs of this research are now being used by the EA to inform River Basin Management Plans and to put measures in place. For example in 2009/10, Defra funded the EA and Coal Authority(CA) to investigate the feasibility of building a minewater treatment plant for the abandoned ironstone mines at Saltburn (Cleveland, England). The mines discharge over 100 tonnes of iron yearly, severely impairing the ecological status of the river. The investigations showed that up to 99% of the iron could be removed by a treatment plant. The cost of remediation would be between £4m and £7m over a 25 year period, but the net benefit to the local economy would be around £10.5m. Based on this assessment, Defra is now funding the CA to build the treatment plant. Once up and running in 2014 it is expected that the Saltburn Gill will return to good ecological status within a year.

This work is part of a national programme to deal with NOCAM pollution in priority rivers that aims to introduce interventions in 4 water bodies and identify feasible interventions for a further 9 by 2015.

**Further information**

SC30136: Prioritisation of abandoned non-coal mine impacts on the environment

The national picture:


Future management of abandoned non-coal mine water discharges:

SC090024/R1: Mitigation of pollution from abandoned metal mines literature review

Extended summary:


**Contact point**

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MEASURES RELATED TO HYDROMORPHOLOGY
Description

Provision / requirement EU WFD

Good ecological status in all water bodies until 2015 according to WFD

Particular challenge for Austria

The particular challenges for Austria are the huge extent of remediation measures necessary to achieve the goals of the WFD as well as to cope with permits in place with either no expiry date or a long duration.

60% of the river water bodies are not in a good ecological status; in most cases good status is failed due to deficits in the “Biological Quality Element Fish”.

The main reasons for failing good status are hydromorphological alterations due to actions taken in the last 2 centuries - e.g. for flood protection, for use of hydropower, respectively for achieving self sufficiency of food production after periods of famine following the 2 world wars.

Restoring ecological status of all water bodies by 2015 is not possible due to reasons of:

- Technical feasibility: more than 20,000 continuity interruptions, more than 2,500 hydroelectricity plants with ecological insufficient minimum flow and also thousands of kilometres of straightened banks… pose great challenges with regard to planning, availability of land as well as authorisation of measures and thus require extensive technical and administrative efforts;

- Disproportionate costs: in case of rivers with a catchment >100 km2 for measures on restoration of continuity investment costs of up to 300 to 500 Million € and for morphological measures costs of nearly 1 Billion € have been estimated. For rivers with a catchment of <100 km2 costs will be in the same magnitude. Primarily, regional authorities and communities have to bear the costs. Further costs are foreseen due to losses in hydro power generation.

- Limiting natural factors: recovery of complex ecological systems takes time, especially the time for re-colonisation of restored habitats or dynamic morphological processes are difficult to estimate.

Approach / solution taken
The challenges lined out in the chapter above require tailor made solution. Just formal solutions without positive effects on the environment such as rather soft classification or an extensive designation of water bodies as heavily modified (in Austria only 10% of our water bodies have been classified as heavily modified) were abandoned already at an early stage. Instead, a methodology for classification based on ambitious scientific evidence, a step by step approach phasing necessary actions for 3 management cycles based on a long term ecological concept (thus extending the deadline for achieving good status – as explicitly allowed by the WFD by 2 cycles until 2027) as well as a legal instrument allowing to take actions without addressing each individual permit separately are used.

**Legal instruments for the implementation of the program of measures**

- The Austrian Water Act was amended due to the needs for the WFD implementation.
- River continuity was defined as state of the art and technology in the Water Act.
- The Austrian Water Act authorises the Länder to issue legal regulations (ordinances) with the aim to oblige all holders of permits to submit projects related to continuity and ecological minimum flow within a given time frame. Thus the existing permits do not have to be changed case by case but with a single legal regulation. This approach has been used by 5 Länder.
- Financial support schemes for restoration measures were installed.

**Stepwise approach for a nation-wide achievement of objectives**

Hydromorphological measures will be taken in steps within spatially defined areas:

- 1st WFD cycle (until 2015): Priority rivers for measures (see below)
- 2nd WFD cycle (until 2021): all other water bodies with catchment area > 100 km²
- 3rd WFD cycle (until 2027): water bodies with catchment area < 100 km²

**Priority Rivers with key measures in first WFD cycle**

In the first WFD cycle (until 2015) measures focus on those priority rivers which are defined by the habitat of the medium distance migratory fish species nase, barbel and Danube salmon. These larger rivers are the main migration corridors but are unfortunately heavily impacted by hydromorphological pressures; almost no water bodies in high status and just a few in good status do exist. Here measures for morphological and continuity restoration are
considered to have the most significant positive effect on the ecological status of these rivers as well as on adjoining smaller rivers, in particular as “good ecological status” is failed in most cases due to deficits in the Biological Quality Element Fish. The long-term ecological concept behind this prioritisation of measures is that restoration of river continuity for free migration of fish is seen as a prerequisite for achieving good status in the entire river basin and will ensure success in the long run. Ecological status will be improved by 2015, even though further measures (e.g. restoration of straightened banks) may be necessary to achieve fully the goal of good status.

![Figure 10](image1.png)

**Figure 10:** All rivers with a catchment area > 100 km²

![Figure 11](image2.png)

**Figure 11:** Priority area for measures in first WFD cycle

**Further information**
Nationaler Gewässerbewirtschaftungsplan / National River Basin Management Plan

http://wisa.lebensministerium.at/article/archive/29367/
REFURBISHMENT OF SMALL HYDROPOWER STATIONS IN PLACE

Win – Win incentive package enhances generation of hydropower while accelerating restoration of river ecology at the same time.

Description
Provision / requirement EU WFD

Article 4 obliges member states to protect, enhance and restore all bodies of surface waters with the aim of achieving good surface water status until 2015; prerequisites for good status are inter alia river continuity and appropriate environmental flows.

Particular challenge for Austria

Austria has been using hydropower as well as aiming for a protection of its population against natural hazards for more than 2 centuries. As a consequence around 60% of rivers are failing good status because of hydromorphological alterations due to flood protection works as well as a high number of (small) hydropower stations and weirs in place. To restore all water bodies needs time (remediation of negative impacts of efforts taken in more than 2 centuries cannot be achieved within a single management cycle of just 6 years for very obvious reasons, please see also Austrian success story No. 2) and considerable resources as well as incentives to enhance willingness of stakeholders to invest in remediation measures. Against this background also approaches have been looked for, which work on a voluntary basis thus adding up to the system of legal obligations in place described in more detail in the previous success story.

Approach / solution taken

A win – win incentive package was put in place to enhance production of renewable energy from small hydropower while improving ecological status of rivers at the same time. The strictly voluntary approach was set up in Upper Austria first.

Cornerstones of this incentive package were:

- Small hydro power owners get preliminary advise about the optimization potential and ecological measures by independent experts; costs are met entirely by the program, thus providing a very attractive incentive

- In follow up steps more detailed studies / projects are set up with a focus on enhanced production of electricity as well as on ecological issues whenever

  - a small hydro power plant already in place is refurbished
- a new small hydro power plant is put in place
- Limited financial incentives are provided for follow up steps
- 25% maximum (one-time) of overall costs, respectively with a maximum of 50,000 Euro per hydro power plant/owner

**Achievements of the Incentive package of Upper Austria (Summer 2009)**

- Financial incentives have triggered a broad range of refurbishment actions as well as new small hydropower plants while improving at the same time ecological status of rivers
- 258 small hydro power plants (out of a total of initially 560 hydro power stations) have been modernized respectively 56 plants have been completely newly installed (2004-2009)
- The incentive package triggered a total investment of 45 million Euros with the help of around 5 million Euros
- The electricity production has been increased on average by more than 40%
- Total increase in electricity production: 76 GWh/year
- Considerable ecological improvements of rivers (fish migration aids, environmental flows, etc. which ensure river continuity and free migration of fish what is seen – underlined by recent studies - as a prerequisite for achieving good status in the entire river basin) have been achieved on a voluntary basis; this accelerated considerably restoration of surface water bodies in Upper Austria.

![Figure 12: © Energie AG Oberösterreich (refurbished hydropower plant with fish ladder)](image)
Due to success achieved this incentive package has been mirrored by other provinces such as Lower Austria (there with around 480 small hydro power plants and an annual production of 460 Million kWh in place).

Further information
http://www.kleinwasserkraft.at/index.php?option=com_content&task=view&id=238&Itemid=88
**LYS RIVER RESTORATION IN THE SEINE-SCHELDT CONNECTION**

**Summary description**
The Seine-Scheldt project is a priority project in the Trans-European Transport Network and will provide a high-capacity link from the Seine basin to these of the Scheldt. The project includes the restoration of the river Lys, a Flemish river which is a heavy modified water body. The project will restore the contact between the canalised and natural Lys and its valley. It includes different phases. The river restoration provides a good balance of economy, ecology and spatial quality in the whole project.

**Geographical scope**
Flanders, Scheldt Basin, River Lys

**Timing**
Part of Inland navigation: 2009 – 2016

Realisation of missing links and elimination of bottlenecks.

Building of locks and bridges, the creation of mooring places,…

Part of River restoration: 2008-2027

- River restoration: 2016 – 2021: Embankments and fish passages
- River restoration: 2009 – 2027: connection meanders, excavate meanders, dredging meanders, landscaping and winter bed projects

**Main authority/ authorities or organisations**
Inland navigation

Waterwegen en Zeekanaal NV

International Partners: EU (TEN-T), Voies Navigables de France, Service publique de Wallonie

River restoration ;

Waterwegen en Zeekanaal NV - Waterways and Seachannel NV

Agentschap voor Natuur en Bos – Agency for Nature and Forests

Instituut voor Natuur en Bosonderzoek - Research Institute for Nature and Forest

Vlaamse Landmaatschappij - Flemish Land Agency
Description
The Seine-Scheldt project is one of the priority projects of the TEN-T programme. The Seine-Scheldt link will connect the Seine basin with the Scheldt basin. A new canal will be constructed between Compiègne and Cambrai on French territory and navigability improvements, allowing class Vb on the waterway, will be realised between Deûlémont and Ghent, mainly on Flemish territory.

In Belgium, the river Lys, which is 55 kilometres long, forms a part of that link. In the past, this river was canalised and many of the old branches of the river were cut off from the new river. The dynamic system of the river and its valley and moreover the whole landscape was totally changed as a result.

According to the Water Frame Directive, every Member State must establish a framework for the protection of freshwater bodies in order to secure water supplies as well as to enhance water quality and to mitigate effects of floods and droughts. As a result, the Flemish government decided to incorporate the implementation of the directive directly into the Seine-Scheldt programme, under the name of “Lys river restoration”.

River restoration is defined as the total set of actions that lead to the restoration of natural conditions and natural processes that are essential for the dynamic balance of the river ecosystem. It is built from specific geomorphological components, such as a meandering river, natural embankments and a winter bed which only floods at high water levels, thus creating spawning and breeding places for fauna and good conditions for typical river flora.

The vision of the Lys river restoration project is the Lys as a green valley, containing the canalised Lys as a hard backbone and the natural, meandering Lys as the soft backbone. The canalised Lys is important for economic functions as transportation and industry, and technical functions, such as flood risk management. Although the canalised Lys is the hard backbone of the river, its embankments are constructed according to environmental approaches.

For the meandering Lys, two major objectives are formulated: the protection of the historical landscape on the one hand, and the restoration of the ecological values on the other hand. This more natural meandering Lys will aim to provide the soft functions of the river system, such as recreation, ecology and agriculture. In developing the related opportunities, the overall continuity alongside the Lys river was always be kept in mind.

The overall program was tackled as an “integrated area directed policy study”. The methodology consists of different stages, all of which focus on the incorporation of different points of view, whether ecological, economical or technical. Although interviewing all possible stakeholders is very time consuming, the total time spent on the study and on the execution of the program will be far less than would be the case when using conventional techniques.

The costs for the part of river restoration are 110 million.
Further information
http://www.seineschelde.be/

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**CZECH REPUBLIC**

**JIZERA RIVER, NUDVOJOVICE LOCALITY, RENATURATION OF OXBOW**

**Summary description**
Nudvojovice oxbow restoration includes dredging of sediments, reconstruction of bank vegetation including extermination if invasive plants, and connection of oxbow to the Jizera River bed with shallow, broad-base ditch (i.e. watering of oxbow during higher water levels in the Jizera River bed and prevention of oxbow draining during very low discharges in the Jizera River). Project increases bio-diversity in landscape and will contribute to the aim to achieve good ecological status of water.

**Geographical scope**
The Elbe River basin, River basin district = coordination district „The Upper and Middle Elbe (HSL)“, the Jizera River Sub-basin, Liberec region, cadastral area Turnov, locality Nudvojovice, Water body 11185000, ID of measure – LA 110155

**Timing**
Start of project: 2.3.2012 Project finishing: 30.11.2012

**Main authority/authorities or organisations**
Povodi Labe, statni podnik, (River Board Elbe, state enterprise), Vita Nejedleho 951, 500 03 Hradec Kralove, Czech Republic

**Description**
Nudvojovice oxbow restoration is required by Nature protection authorities in order to stop natural process of oxbows’ perish in river meadows. The goal is to restore oxbow to the status when, as valuable landscape part, it will create shelter (refuge) to various plant and animal species, and so contribute to the increase of landscape bio-diversity. The aim of WFD to achieve good ecological status of water and river meadows is fulfilled.

The project includes three basic components – reconstruction of present bank vegetation along oxbow, dredging of sediments from oxbow, and connection of oxbow to the Jizera River.

Reconstruction of present bank vegetation is based in extermination of invasive plants (Reynoutria japonica) and in vegetation improvement including with plant of new, native species of trees and bushes.

Sediments will be removed from a half of oxbow area up to the depth of the original river bed level. Restoration of all the succession phases in oxbow will such be achieved.

Oxbow connection to the Jizera River bed is created with shallow, broad-base ditch (i.e. watering of oxbow during higher water levels in the Jizera River bed and prevention of oxbow draining during very low discharges in the Jizera River).
Project with total costs 5,6 mill. CZK significantly contributes to restoration of original, native biotopes and conditions in the Jizera River meadow. Because the Jizera River is an significant right-hand tributary of the Elbe River, the project will have an effect to step-by-step achievement of good ecological status of rivers within the Elbe River basin, and will contribute to enlivening of the Elbe River too.

**Contact point**
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contact person: Vaclav Jirasek (mailto:jirasek@pla.cz, tel.:+420 495 088 610)
IMPLEMENTATION OF FISH PASS FRAMEWORK ON THE LOWER PART OF RIVER DYJE (THAYA RIVER)

Summary description
The lower part of the Dyje (Thaya) River from its confluence with the Morava River forms first the border between the Czech Republic and Austria and then it continues through the Břeclav town to the dam of the Nové Mlýny water storage reservoirs. Thanks to non-existence of migration barriers in the Morava River, with regard to migration, this part is connected with the main flow of the Danube River. The first barriers for the fish migrating from the Danube River are found just in this first lower part of the Dyje River. To ensure fish migration, it was necessary to build fish passages in the weir in Břeclav on the kilometre 26.77, in the Jambor’ sill in Lednice on the kilometre 35.612, and in the controlled weir in Bulhary on the kilometre 39.876. A fragmentation of the lower part of the Dyje River was removed in total length of 46 km and the migration path from the Danube River was extended by 20 km.

Geographical scope
Morava River basin (the region of the Dyje /Thaya/ River basin) that is part of the Danube River basin (Black Sea drainage area). Region of South Moravia, Břeclav area, Czech Republic, lower reaches of the Dyje River from the state border (confluence with the Morava River) to the dam of the Nové Mlýny water storage reservoir.

Timing
Preparation of the migration concept in the lower reaches of the Dyje (Thaya) River; Phare Project „Improvement of water management situation and fish environment in the lower reaches of the Morava and Dyje Rivers “ (Restoration of Fish Habitat and Hydrological Condition of the Lower Morava/Dyje Rivers PEC No.85.320031, EU OSS No. 98-5154.00), 1999

Construction of fish passage in the weir in Břeclav, Programme of revitalization of river systems „Dyje, km 26.770 – Fish passage in the weir in Břeclav“, 2005

Construction of fish passage in the controlled weir Bulhary (a condition of constructing the small hydroelectric power station Bulhary), Programme of revitalization of river systems „Dyje, km 39.872 – Fish passage in the weir in Bulhary“, 2007

Construction of fish passage through the Jambor’ sill in Lednice, Operational programme Environment, „Dyje, km 35.612 – ensuring migration through the Jambor’ sill“, 2010

Main authority/ authorities or organisations
Povodí Moravy, s.p, Drevarska 11, 601 75 Brno, Czech Republic;

Nature Conservation Agency of the Czech Republic (Programme of revitalization of river systems), Kaplanova 1931/1, 148 00 Praha 11 Chodov, Czech Republic;
Description
Ensuring fish migration in the Dyje (Thaya) River basin faces rather different issues compared with those resolved by water managers in the other areas of the Czech Republic or other parts of Europe. Despite the fact that with regard to migration, the Dyje River is connected with the Danube River through the Morava River, the passage through the Danube River to Black Sea is still long and including many barriers. Compared with other river basins of the Czech Republic, diadromous fish migrating for long distances between salt and fresh water is not so much important when ensuring migration compared to potamodromous fish having its whole life cycle in river freshwater. Despite this fact, we can see also in case of this fish, a significant need of migration. It concerns especially penetration of genetically authochthonous species from the main flow of the Danube River further to the territory of the Czech Republic (for example, sterlet, zingel, Volga pikeperch, ziege, white eye bream) and reaching localities with better conditions for protected fish species (ide, wild form of common carp, ziege, white eye bream, mud fish, Danubian spined loach, etc.). For the phytophilous fish (northern pike, common rudd, tench, silver bream, crucium carp, common carp, wels catfish, European perch, zander), it is necessary to make access to the parts with floodplains suitable for spawning as well as to the parts with a gravel character of river bottom suitable for reproduction of litophylous rheophil species (European chub, asp, common nase, common barbel, or burbot). From this point of view, the area of the right-bank floodplain between the village Bulhary and Horní les is the key part in the lower reaches of the Dyje River. In this locality, in the floodplain separated by the flow regulation, almost ten kilometres of the original riverbed of the Dyje River and other eight and half kilometres of its branch “Zámecká Dyje” have been preserved. This locality is able to provide a sufficient shelter and reproduction conditions not only for phytophilous fish. Migrating fish was prevented from reaching this locality by three barriers: the weir in Břeclav, Jambor’ sill in Lednice, and controlled weir in Bulhary. A migration concept and proposal of general parameters of fish passages in this part were prepared in the year 1999 within a Phare project where Povodí Moravy, s.p. was its coordinator. When designing the parameters of fish passages, specific migration abilities and limitation of potamal fish were considered. Apart from migration, a selected construction of fish passage results in a suitable environment and shelters for rheophil fish. In the year 2005, Povodí Moravy, s.p., under the contribution of the Program of revitalization of river systems, constructed a fish passage in the controlled weir in Břeclav. From the side of Povodí Moravy, s.p., a condition of building a small hydroelectric power station in the controlled weir in Břeclav was a simultaneous construction of fish passage of the required parameters. This fish passage was, again with the contribution of the Programme of revitalization of river systems, constructed in the year 2007. The whole process was completed in the year 2010 by constructing fish passage through the Jambor’ sill in Lednice, at that time, already with the contribution of the Operational programme Environment.
For the fish passage in the weir in Břeclav, a semi-natural construction of boulder platform (waterfall) damped by irregular 18 lines of isolated boulders placed in the riverbed with the added side platform directed towards stilling basin. The fish passage does not compete with the existing small hydroelectric power station, on the contrary, it uses the outflow from this small hydroelectric power station to increase the attractiveness of fish entry to the passage. Not only the fish migrating in the direction of the main proud attractiveness but also the fish seeking access from the area of weir stilling basin is allowed to enter the fish passage. To eliminate sediment deposition in the area closed between the fish passage and the left bank, and the depositions on the flow into the small hydroelectric power station, a concrete body of the fixed weir in the part between the fish passage and the left bank was replaced by a flap closure serving flushing of the area. With regard to the location close to municipal train, a stone cover of the visible constructions was designed. Longitudinal slope of the fish passage is 1:20 (side platform 1:15), width of the fish passage is 10 m, and length 74.31 m, flow through the fish passage is set at 3.0 m³/s. In the fish passage, there are installed 32 lines of isolated boulders resulting in a maximum height difference of 10 cm of water levels.

The height water level difference in the area under the weir and above the weir of the controlled weir in Bulhary is overcome by a boulder platform located in the bypass on the right bank. Apart from the connection of the area under the weir and the area above the weir, the fish passage is connected also with the fragments of the original riverbed. In this way, not only longitudinal migration is ensured but also a connection with lateral migration is created. A suitable combination of entry to the fish passage and outflow from the small hydroelectric power station results in the increased flow attractiveness of the fish passage and thus also in its higher efficiency. Clear width of the fish passage runs from 4.00 to 6.00 m, isolated boulders are placed in the fish passage always in the groups of three contributory lines, a design flow through the fish passage is set at 2.00 m³/s.

Migration through the Jambor’ sill is ensured by the fish passage of the boulder platform type placed in the flow. The fish passage goes through the weir body on the left bank. At the place of the passage, the existing weir body is removed to the foundation gap. The fish passage is located only in the area above the weir, entry to the passage is located just under the weir, the last lines of stones are directed in the way they allow also the entry of fish from the area under the weir along the weir body and heading of outflow jet to the centre of flow. Clear width of the fish passage is 4.00 m, the length including entries and exits 31.00 m; in the fish passage, 10 lines of isolated boulders are placed, the distance between the boulder lines is 2.20 m. In the cross-section, the fish passage is shaped in such way that minimum depth in the marginal part of channel at the bank is 0.20 m and 0.60 m in the part at the guiding wall. A design flow at minimum flow is 1.00 m³/s.

**Contact point**

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GERMANY

MASTER PLAN MIGRATORY FISH RHINE

Geographical scope
Rhine River Basin

Timing
Conference of Rhine Ministers confirmed its intent to gradually restore river continuity in the Rhine as far as Basel and in the waters under the salmon programme, October 2007; Comprehensive Fish-Ecological Analysis including an Assessment of the Effectiveness of on-going and planned Measures in the Rhine Catchment with Respect to the Reintroduction of Migratory Fish, May 2009; decision on Master plan December 2009; Measures in the Master plan are part of the river basin management plans on international and national level, December 2009; step by step implementation of the measures until 2027, implementation is on-going

Main authority/ authorities or organisations
Federal Ministry for the Environment, Nature Conservation and Nuclear Safety

Description
Topic: Restoring River continuity, migratory fish

Reasoning for the project
The ICPR (International Commission for the Protection of the Rhine) is coordinating the implementation of the „Salmon 2000” programme since 1987 aimed at re-settling salmon, sea trout and other anadromous migratory fish species in the Rhine system. The programme „Rhine 2020” represents a continuation of these efforts. The Atlantic salmon is the flagship specie, also with regard to public awareness raising. The implementation of the WFD in the Rhine basin intensified the discussions on this issue due to the objective “good ecological status”. ICPR, which only covers the Rhine riparian countries, expanded its cooperation to the other countries, which are not ICPR parties, to cover the whole basin according to the WFD.

The main objective is to indicate, how self-sustaining, as stable populations of migratory fish can again be settled in the Rhine catchment as far the Basel area within both reasonable time and costs

Following approaches were developed:

- Analysing already implemented measures in the past and their effects; especially establishment of fish passes and restocking measures (50 Mio. € since 1990). More than 5,000 salmon returned to the Rhine catchment by end 2008.
- Waters in the Rhine catchment with good spawning and juvenile habitats for migratory fish have been identified as re-settling programme waters; these are the waters measures concentrate on.

- Measures planned by the countries for anadromous migratory fish in the different sections of the Rhine, main stream and tributaries. Priority measures based on aspects of efficiency (proportionality), technical feasibility and financing possibilities, implementation until 2015, 2021 or 2027. Mainly fish passes and habitat improvements are planned as well as eel protection measures.

Implementation process is regularly checked and reported on ICPR level and on the homepage:

See report on Progress on Implementing the Master Plan Migratory Fish during 2010.

See regularly updated information about “salmon is progressing”, on returners in the Rhine sections, also spawning individuals.

Estimated costs of the implementation of the master plan until 2027 amount 528 Mio. €

Further steps

Further checking of the implementation progress

Updating – if necessary – in the preparation process for the next RBMP according to the WFD

Project data: Project area: so called programme water bodies in the basin, see maps in the Master plan;

Pictures or graphs: see under the links below, e.g. video of the first salmon in the new fish pass on the Mosel in Coblenz in March 2012 http://www.iksr.org/index.php?id=353

Further information

http://www.iksr.org/uploads/media/179_e.pdf (master plan),
http://www.iksr.org/uploads/media/190_e.pdf (progress report);
http://www.iksr.org/index.php?id=351$L=3$ (salmon is progressing),

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Phone: 0049 228 99 305 2521
DONAUSANIERUNG HUNDERSINGEN-BINZWANGEN

Geographical scope
River Basin, regional

Timing
Plan approval 2008; implementation until 2012

Description
Topic: Ecological Development, River Restoration

Reasoning for the project
In the late 19th and early 20th century Danube river was regulated with the intention to provide additional settlement and agricultural area and to minimize the negative impacts of previous floods. In consequence the river was straightened in wide areas of the catchment. This resulted in a structural and biological depleted river with remarkable erosion. In 1992 the Federal State of Baden-Württemberg launched the Integrated Danube Program (IDP) to improve both ecology and flood protection in the Danube river basin. Hundersingen-Binzwangen is one project of the IDP and a good example for the fact that objectives of the WFD and the FD are not necessarily contradictory. At the same time the project is a successful story for the implementation of the WFD. This is due to the fact that a natural river segment with a length of 2.7 km was developed and sufficient area for the dynamical development of the ecosystem could be provided.

Objectives
The main objectives were:

- River restoration, improvement of structural deficits
- Reactivation of floodplains and flood retention areas
- Development of natural habitats for various species
- Public participation and information

The state of Baden-Württemberg purchased a total area of 100 ha for the project Hundersingen-Binzwangen. This was necessary as for the project the old riverbed was shifted and extended by approximately 400 m in length and 40 m in width. The new riverbed has an alternating structure and thus yields to a diverse flow regime providing habitats for different species. Great attention was drawn to the objective to allow a dynamical development of the
river. A result of the former sole erosion is that the new riverbed is 2.5 m higher. This enables at the same time that old retention areas now can be activated during floods.

During the construction time and the different development stages of the project information for the public was provided. Beside different events a so-called “Lernort” has been realized. On a natural trail along the river information on different aspects e.g. scope of the project, history, floods, biodiversity etc. are provided.

**Project data:** Project area: 80 ha; river stretch: 2.7 km;
Further information
http://www.rp-tuebingen.de/servlet/PB/menu/1157077/index.html

Contact point:
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Dr. Steffen Ochs
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Phone: 0049-711 126-1524
Geographical scope

National, Germany

Timing

Concepts finalized 2010 and 2012; implementation is under way

Main authority/ authorities or organisations

Federal Ministry of Transport, Building and Urban Development (BMVBS)

Description

Topic: Improving ecological conditions along federal water ways

Reasoning for the project

It is the aim of the Federal Ministry of Transport, Building and Urban Development (BMVBS) and its subordinate authorities (Waterway and Shipping Administration – WSV; Federal Institute of Hydrology- BfG; Federal Institute of Hydraulic Engineering - BAW) to find solutions for the sustainable development of the federal waterways which will make it possible to have an economically viable and competitive shipping sector and fulfil environmental requirements at the same time and which will strengthen the positive environmental effects of the interrelated vessel/waterway system. To achieve the targets stipulated in the Water Framework Directive along federal waterways it is in particular important to carry out structural improvements such as measures to assure longitudinal continuity and the creation of attractive habitats along the banks which will enhance the ecological value of these waterways. Following the 2010 amendment of the German water legislation, the Federal Waterways Administration (WSV) is now not only responsible for the maintenance of waterways but also has the legal obligation to preserve and restore the ecological continuity of waterways for aquatic fauna at barrages. Partners of the Federal Ministry of Transport, Building and Urban Development (BMVBS) on its way to implementing the task are the Federal Environment Ministry, the German Federal States, environment and shipping-related NGOs and electricity companies.

Ecological Development Concepts

In July 2010 the BMVBS published its "Framework Concept on Maintenance – maintenance of federal waterways for navigation and water management purposes" (Rahmenkonzept Unterhaltung - Verkehrliche und wasserwirtschaftliche Unterhaltung der Bundeswasserstraßen). It provides an extensive technical and legal framework for the maintenance of waterways based on the objectives of the WFD.
Moreover, in 2010 the federal concept on prioritising continuity measures along federal waterways was launched. It prioritises projects which need to be completed across the whole system of federal inland waterways with the aim of carrying them out efficiently in economic and ecologic terms. As a first major milestone of the project, a comprehensive package on fish passages for upward movement of fish was adopted in February 2012. The project will be implemented in three phases which are explicitly based on the management cycles of the WFD and in the course of which fish passes will be installed at 250 barrages. The first implementation phase foresees 46 projects for the construction of fish passes for upward movement.

In order to fulfil the objectives of the WFD in the course of maintaining federal waterways and restoring their ecological continuity, the waterways administration will need additional resources of at least 125 Mio Euro per year in the medium term.

Further steps

The next management cycles according to the WFD call for successive planning and implementation of further ecological measures along federal waterways which will continuously take account of practical and R&D findings. Further steps will include measures to improve downward movement of fish and sediment at barrages. A further challenge is the accommodation of requirements arising from the WFD, nature conservation directives and infrastructure planning as a whole.

Project data: Project area: 357,121 km²; length of inland waterways: 7,350 km;

Pictures or graphs:

Further information

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**Dynamic Development of Danube Wetlands between Neuburg and Ingolstadt**

**Geographical scope**
National, Danube River Basin in Bavaria

**Timing**
Finalized; implemented between 2006 and 2010

**Main authority/authorities or organisations**
Regional Office for Water Management Ingolstadt

**Description**

**Topic**
Hydromorphological alterations, interruption of river continuity, disconnection of wetlands

**Reasoning for the project**

The floodplain of the Danube river between Neuburg and Ingolstadt in Bavaria covering an area of 2,100 ha is one of the largest remaining alluvial forests in Germany. Due to the straightening of the Danube river course in the 19th century and the construction of two weirs in the Danube at Bergheim and Ingolstadt in the 20th century the natural dynamics in the floodplain got lost. Inundations of the flood plain were restricted to major flood events and the natural fluctuations of the groundwater table formerly in the range of several meters were reduced to some decimetres. The two dams interrupted the continuity of the Danube River for aquatic life. The recovery of the Danube floodplain between Neuburg and Ingolstadt is of high importance for protecting biodiversity and ecosystem services. The area is protected by the EU Birds and Habitats Directive and still keeps about 500 species on the red list of threatened or endangered species.

**Objectives of the project**

Restoration of the former natural floodplains, in order to re-integrate the river with the floodplain (lateral continuity) and restore the biological continuity of the Danube (longitudinal continuity).

**Measures**

1. Bypass waters in the floodplain

   Construction of a water outlet with a capacity of max. 5 m³ / s at the Bergheim barrage, including a fish bypass channel. The water is directed from the Danube river in a system of
several new build and some remaining creeks within the floodplain. The water flow returns to the Danube by several ways. Thus, the biological continuity of the Danube at the Bergheim weir is restored. Within the riparian forest a new 8 km river habitat has been created.

2. Ecological flooding of the wetlands

Restoration of an existing spillway at Bergheim weir. Up to 25 m³/s water flow is directed by this outlet in the floodplains. Thus in future about 100 ha of lowland forest will be flooded frequently again. The water is recharged into the Danube river by several waterways. The aim of this ecological flooding system is to restore a natural water dynamic within the wetlands again.

3. Artificial control of the groundwater table

The impoundment of the Danube by the Ingolstadt weir has raised the groundwater level. In order to restore the originally existing natural ground water fluctuations the level of the water table is dropped artificially in times of low water flow in the Danube river through a system of existing drainage ditches connected by new build channel of 1.5 km length. The flow control is managed by several new constructions within the connecting channel and the impoundment dam of the Danube river.

4. The project is attended by an intensive ecosystem monitoring programme covering vegetation, numerous animal species, soil and water. The on-going monitoring will be used for a review of the efficiency of the measures taken.

Project data: Project area: 2100 ha; investments: ca. 15 Mio. Euro

Further information
http://www.wwa-in.bayern.de/projekte_und_programme/donauauen/kurz/index.htm

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ECOLOGICAL DEVELOPMENT CONCEPT FOR THE DANUBE RIVER BETWEEN KEHLHEIM AND REGENSBURG

Geographical scope
National, Danube River Basin in Bavaria

Timing
Concept finalized 2009; implementation is on-going

Main authority/authorities or organisations
Regional Office for Water Management Landshut

Description
Topic: Ecological Development Concept for the restoration of wetlands / floodplains

Reasoning for the project
In the past the natural structures of the Danube river and its floodplains were modified significantly by many river engineering operations, especially for navigation. Despite considerable losses in space and quality the Danube river between Regensburg and Bad Abbach still is of European importance for nature and wildlife conservation and was therefore included into the EU Natura 2000 network of protected areas. The Danube river in this relatively narrow valley stretch still changes continuously the shorelines, forming new side arms or river islands. The wetlands still keep many backwaters and oxbows remaining from former cut-off side arms of the Danube.

Ecological Development Concept (EDC)
A river development plan and a habitat management plan are processed simultaneously as integrated water management and nature conservation planning tools, usable for the implementation of the Water Framework Directive and the Habitats Directive. Compared to individual plans, coordinated planning offers an added value of planning in depth and quality. The efficiency of financial resources for environmental planning is optimized. The objectives of the Ecological Development Concept are:

- Space for the River and riparian zones for natural development. The flood areas are to be used in an environmentally friendly manner.

- Habitats for plants and animals: In areas, which are particularly important for the protection of rare animal and plant species, such as many remaining oxbow arms, extensive land use shall be achieved. Habitat quality shall be enhanced by measures like de-silting backwaters and re-connecting them to the main river.
- Space for recreation: The Danube Valley has a nationally significant role as a recreation area. In particular the bike trails along the river are very popular. Disturbances of the ecosystem by leisure uses shall be minimized by targeted information and guidance.

Recommendations for measures are given based on an comprehensive ecological analysis of water structures, plants, animals and habitats and a technical review of the river embankments and the land use in the floodplains;

- River development for the Danube river
- Maintenance and restoration of typical structures in the flood plains
- Conservation and enhancement of habitats for significant species
- Restoration of hardwood and softwood in alluvial forests.

Further steps

Based on the EDC detailed management and development objectives will be worked out for the entire project area, e. g. for the Danube island near Bad Abbach. The experts are planning together with various stakeholders in agriculture, fisheries, navigation and tourism and in the municipalities. Concepts shall be developed for:

1. Construction and maintenance works of local water authorities or the authorities for navigation
2. Compensation measures for communal development schemes
3. Purchase of land
4. Voluntary agreements (based on compensation and incentives).

Project data: Project area: 844 ha; river stretch: 33 km;

Further information
http://www.wwa-la.bayern.de/projekte_und_programme/gewaesserausbau/donau/index.htm

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**AKTION BLAU PLUS (ACTION BLUE PLUS)**

**Geographical scope**
Germany, Rhineland-Palatinate

**Timing**
Concept finalized 2012; implementation up to now until 2027

**Main authority/ authorities or organisations**
MULEWF

**Description**

**Topic:** River restoration concept in consideration of other factors like tourism, flood control, environmental education or urban development

**Reasoning for the project**

Since 1995 the Action blue is the most important programm for river restoration in the state of Rhineland-Palatinate. Between 1995 and 2011 920 restoration projects with cost in the amount of 200 million were realized.

The new Action blue PLUS will increase acceptance by the local authority and the general public.

**Objectives**
- 90% government aid
- 10% of the cost have to payed the local authority
- We try to combine river restoration measures with urban development measures, environmental education programms..
- We try to involve other stakeholder (e.g. farmers or fisher)

**Following concepts were developed:**
- The University of Koblenz-Landau is developing the new concept of the Action blue PLUS
- We try to establish public participation

**Following measures have been taken, achievements are expected:**
As a pilot project the river Queich will be restored in cooperation with a local secondary school and the University of Koblenz-Landau. A natural trail will be built along the Queich.

The cost of the project amounts to:

We try to put 100-120 projects with about 15 -20 million Euro per annum into practice

Further steps

The University of Koblenz-Landau will finish their work until 12/2012. The pilot project at the river Quich will be finished up to 2014.

Project data: Action blue PLUS: Rhineland-Palatinate, pilot project: river Queich in Landau;

Further information
www.aktion-blau.de oder www.wasser.rlp.de

Contact point
Ministerium für Umwelt, Landwirtschaft, Ernährung, Weinbau und Forsten Rheinland-Pfalz (MULEWF)

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**THE WEIR OF KÖRÖSLADÁNY**

**Summary description**
The project aims to ameliorate the middle section of the Sebes-Körös and the lower section of the river Berettyó. On these river sections the natural spawning possibilities of the typical local fish stocks improves significantly. These river sections will form the ecological part of the three Körös rivers (Fekete-Körös, Fehér-Körös, Sebes-Körös) without this barrage at Körösladány.

**Geographical scope**
Danube river basin, Hungary, Sebes-Körös sub-basin, Körösladány

**Timing**
The project started in July 2009 and ended in July 2011

**Main authority/authorities or organisations**
Körös Water and Environment Directorate

**Description**
The Hungarian Great Plain is often an arid area during the summer period. For the reduction of agricultural losses numerous weirs were built in the 1960s and 1970s to feed irrigation canals.

On the river Sebes-Körös, the weir of Körösladány was built in 1977. This weir ensures the water supply of 11000 ha land. The height of the weir is variable between 1.5 and 5.5 meter, which means a barrier for fish.

To help the fish migration a project was dedicated to aim a better ecological status of the Sebes-Körös, according the EU Water Framework Directive and the Convention on Biological Diversity.

The fish channel is an artificial, slightly sinuous river bed with spillovers, parallel to the Sebes-Körös river.

**Building steps:**

1. Fish channel in earth canal with needed intermittent bed slope, spillovers and relaxing lakes.
2. Water velocity ragulator on the upper part of the canal, 5 locks and a closing system.
3. Spillovers of ashlars with variable water levels.
4. Bait water channel on the lower section for speed up water and so allure fish into the fish channel.

**Further information**
http://www.kovizig.hu/eu-palyazatok/05-korosladany/kepgaleria.html

**Contact point**
National Institute for Environment, Dr. Perger László, perger.laszlo@vkki.hu, 0036-1-225-44-00
ROMANIA

DEVELOPMENT OF INTEGRATED RIVER BASIN MANAGEMENT IN THE OLT BASIN AS SUPPORT TO THE IMPLEMENTATION OF THE EU WATER FRAMEWORK DIRECTIVE (WFD)

Summary description
The project took place in Hartibaciu river basin, having as the main objective the establishment of a strategic guidance document in order to achieve an appropriate plan of measures to address the hydro-morphological alterations in the focused area. The guidance document that resulted from the project includes two parts: part I Process Support (introduction, organizational set up, establishing objectives, establishment of the plan of measures) and part II Technical reference (feasibility study of proposed restoration measures)

Geographical scope
sub-basin Hartibaciu

Timing
January 2008 - January 2010

Main authority/authorities or organisations
- National Administration "Apele Romane” (ANAR)-Olt Water Basin Administration
- National Institute for Research and Development for Environment Protection (ICIM)
- SORESMA Flemish, the water unit of the nature and environmental protection department of the Province of East-Flanders

Description
This project aims to support the implementation of the WFD through capacity building in order to improve management of hydro-morphological alterations in the Olt river basin. The strategy consists of 3 main points: organizational setup, how to determine the objectives, and how to translate the objectives into a set of measures. In consultation with the different stakeholders, the project was defined and the organisation established.

As the result of an inventory, it was concluded that Hartibaciu is a river that went through a lot of hydro-morphological changes and the major problems were: loss of natural flooding areas, too much non-natural bank reinforcement and straightening of the river. Further some constructions need to be bypassed to allow a longitudinal connectivity of the river and make sure that fish species can live in the Hartibaciu. A plan that included proposals for river restoration was presented within a meeting with the participation of a broad diversity of
stakeholders: local municipalities, companies, NGOs, environmental agencies, funding bodies, foundations, water and forest directorates, district administration bodies etc. Stakeholders were interested in continuation and implementation of the plan; the project was seen as a strong sign of authorities interest for the Hartibaciu River and a promise in further environmental and economic development in the area. Nature protection and biodiversity preservation was seen as a way to improve the touristic potential of the area; the link with traditional activities, habits and culture was also considered.

For the project success, a strategic guidelines draft was produced, including the two project parts: Part I - The Process Support contains: the introduction, the organizational set up, establishing objectives, establishment of the plan of measures, describing the hydromorphological evaluation of the Hartibaciu river and Part II - Technical reference, including a feasibility study of proposed restoration measures (natural bank reinforcement, fish passages, floodplain restoration, restoration of meandering rivers, general conclusions).

Further information

http://www.icim.ro/proiecte/prezentare/wfden.html

Contact point

Eng. Vasile Bojan – Head of Olt Basin Management Plan Office, Olt Water Basin Administration, vasile.bojan@dao.rowater.ro, tel.+40250/739881
IDENTIFYING PROBLEMS AND MEASURES NECESSARY FOR ANALYSIS OF POTENTIAL WETLAND RESTORATION AT THE CONFLUENCE OF THE CALMATUI AND DANUBE RIVER (INTEREEG IV)

Summary description
Identifying problems, developing a model (guide) for restoration of wetlands that can be applied at regional level (based on a MasterPlan and an Action Plan) Restoration of the potential wetland at the confluence of the Calmatui and Danube River, dissemination of the results, information, participation and consultation of the public and stakeholders.

Geographical scope
Regional level

Timing
January 2010 – March 2013

Main authority/authorities or organisations
Buzau Ialomita Water Basin Administration, Local County of Bertestii de Jos, Danube Delta National Institute for Research and Development Tulcea

Description of the project
The wetland proposed to be restored is located in the flood plain of the lower part of Calmatui watercourse, at the confluence of the Calmatui and Danube River, in the south-east of Romania. The area has approx. 100 hectares.

The project has to be promoted because in the area were occurred essential changes of biotical and abiotical parameters due to hydroameliorative works and anthropic pressures (damming, uniform plantation of hybrid poplars, agricultural cultures and grazing).

Actual situation. Wetlands habitats have been drastically affected in the last years due to the straightening of river course and conversion of wetlands into agricultural lands.

PROJECT PURPOSE:
- strengthening the ecological values in this area
- wetlands and natural processes restoration
- better understanding of perturbing factors and the possibility of reducing the negative aspects of the climate in the area

PROJECT EXPECTATIONS:
- innovative approach to stimulate and develop the regional economy and tourism sector by means of several benefits offered by water areas for tourists;
- contribution to water management system in the region (thus contributing to implementation of EU Water Framework Directive/ WFD);
-creating opportunities for recreation and ecotourism by improving the attractiveness of the area (nature and recreation) and also by the development of some local industries (from exploitation of local materials such as reed).

**Current stage of project:** under implementation

- the MasterPlan is in progress: will be developed for the case study located at the confluence of the Calmatui River and Danube River and will include measures for the sustainable rebuilt in terms of natural processes and to improve the living standard of inhabitants due to their involvement in tourism development and new activities and crafts;

- the Action Plan is in progress: it will contain objectives and actions quantified in time, space and cost.

**Contact point**

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Ciobarciu/ Costuleni Wetland Project is an ecological rehabilitation project in the valley of the Prut River (on the largest tributary – Jijia River).

Summary description
The Ciobarciu/ Costuleni Wetland Project contributes to the restoration of the wetland values of the Prut River valley.

An area of 224 ha grassland was brought from farmers and developed into a wetland. In this way a first step was made in the restoration of wetland values in the Prut valley and in the development of expertise in the field of ecological restoration. The dissemination of these experiences was also part of the project.

Geographical scope
Local project with implications at sub-basin level

Timing
The project was implemented between 2003 and 2006.

Main authority/authorities or organisations
- the National Administration "Apele Romane", Prut Water Basin Administration in Iasi, Romania.
- the institute Rijkswaterstaat-RIZA Lelystad, the Netherlands,
- the foundation "Het Drentse Landschap", Assen, the Netherlands;
- Dutch water board Hunze & Aa’s

Description
Situation at starting point
The flow of the rivers (Jijia and Prut) has been regulated. The Jijia River is led into the Prut River through a channel at Chiperesti. The remaining part of this river (now called the Old Jijia –with a length of 56 km is a small stream, mainly fed by some very small tributaries which have only an intermittent flow. The former floodplain is protected by dikes along the Prut and is never flooded anymore. The land in the floodplain was developed for arrable land.

Since the political changes in 1989 the agriculture in the floodplain has become less intense. Extensive grazing has replaced arable farming on many places. The irrigation system is not in use anymore and the drainage system functions only partially. Water shortage and salinisation are growing problems. Of the original richness of plant and animal species and the original landscape only very little remained.

Objectives:
- Development of the Ciobarciu (previously called Costuleni) wetland
- Restoration of water flow in the Old Jijia River
- Building knowledge and experience in the field of ecological restoration
- Building knowledge and experience in the field of interactive planning and stakeholder participation
- Dissemination of experience in the field of ecological restoration

At the end of the project a Symposium was organised in Iasi with the people from all the Water Directorates from Romania and also with the specialists from the Netherlands.

The Ciobarcușu wetland offers a number of benefits:

- The project is situated in the Prut valley which is an important route for migratory birds from the Danube Delta;
- Specific types of natural vegetation can develop again in the wetland;

The project has applied certain methods and approaches that are considered innovative at the time:

- Purchasing land for ecological restoration
- Developing the project in a participatory way

The project was implemented before the adoption of the River Basin Management Plan, but applies the WFD principles such as:

- Improve the lateral connectivity – before the human intervention the area was flooded almost every year. The project developed a wetland, recreating on a surface larger than 200 ha the biodiversity from the past.
- Public participation – the project is the result of a participatory process. The land purchase was a difficult process because more than 400 land owners were involved. The wetland was designed step by step, in meetings, with the people living in the area.

Further information

http://www.ciobarcușu.ro/

Contact point
Water Basin Administration Prut-Bârlad

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**SLOVAKIA**

**FISH LADDER AND REVITALISATION OF IPEĽŠKÝ SOKOLEC DEAD ARM ON THE RIVER IPEĽ**

**Summary description**
The construction of the Ipeľšký Sokolec fish ladder and the revitalisation of the dead arm of the Ipeľ were done to remove the barrier to fish migration created by the building of a weir. The revitalised dead arm ensures favourable living conditions for aquatic organisms (aquatic fauna and flora and bank vegetation). Since the fish ladder (which comprises the revitalised dead arm, the ladder itself, and an inflow structure) is located on the territory of both Hungary and Slovakia, an agreement was reached between the Slovak government and the Hungarian government, on the basis of diplomatic notes of 4 February 2008 and 23 December 2008, for the temporary use of part of the national territory of the Slovak Republic to build and operate a fish ladder in the municipalities of Ipolytölgyes and Malé Kosihy. As agreed in the conclusions of the 157th meeting of the Ipeľ working group, following agreement between representatives of the Slovak Water Management Company’s Banská Bystrica Branch Office and the Central Danube Valley Directorate for Environmental Protection and Water Management, the operator of all structures connected with the fish ladder on the Ipeľ in the Ipeľšký Sokolec area will be the Slovak Water Management Company, Banská Bystrica Branch Office, Lower Hron and Lower Ipeľ river basin authority, at Kohárho 44, 984 01 Levice.

**Geographical scope**
Hron river basin, Ipeľ sub-basin 4-24, hydrological code number 4-24-03, Nitra region, Levice district, Ipeľšký Sokolec municipality.

**Timing**

The construction of the fish ladder and the revitalisation of the dead river arm was carried out by Hungary in 2007.

**Main authority/authorities or organisations**
The need to build the fish ladders to ensure continuity of migration routes for riverine animals at the Ipeľšký Sokolec weir was agreed at a meeting of the working group of the Ipeľ Cross-border Waters Commission (KHV) in Budapest. The Hungarian delegation to the Ipeľ KHV working group drew up technical design options for the fish ladder and the
revitalisation of the dead arm. In 2003 project documentation was drawn up for the option selected.

The fish ladder was built with the financial assistance of the EU’s INTERREG IIIA funds.

Construction site owner: Central Danube Valley Directorate for Environmental Protection and Water Management 1088 Budapest, Rákoczi út 4, Stimm Gábor – head of VVO

Operator: Central Danube Valley Directorate for Environmental Protection and Water Management 1088 Budapest, Rákoczi út 4,

II. Szakaszmérnökség 2660 Balassagyarmat, Kóvári út 22

Description
The river Ipeľ has a total length, to its confluence with the Danube, of 212.43 km, of which 123 km forms the border between Slovakia and Hungary. Neighbouring states have expressed an interest in protecting the area along the Ipeľ in the past (mainly its settlements and agricultural land), but interventions have been sporadic and uncoordinated. The need to protect the Ipeľ river basin area from flooding has grown in urgency in proportion to the economic development of the area, and with the increase in essential resources located in the Ipeľ valley floor, particularly with the development of agriculture.

In flood protection terms the Ipeľ is one of the relatively more exposed rivers.

Floods used to affect the area every year and because of the nature of the terrain in the valley floor, the floodwater remained in the inundated area for several months. The circumstances, priorities and requirements of the region, and the fact that there was an unmodified drainage regime in the river basin, led to the start of a comprehensive process to modify the Ipeľ after 1966. The modification of the river improved protection against floods but also accelerated drainage and, in periods of low water, reduced groundwater levels. In order to meet the needs of water users, especially for irrigation, it was decided to build transverse structures – weirs – which were designed so that any deficit in natural flow on the Ipeľ was replaced by pumping water from the Danube (this function is not currently available). A further function of the weirs is to raise the water level in the Ipeľ and thus to allow infiltration into soil horizons in the fields of the valley floor. A serious negative aspect of the weirs that have been built is the fact that they create a barrier which the aquatic fauna is not able to cross. When the weirs were built, the issue of ensuring continuity of migration routes for aquatic animals was underestimated. Weirs create uncrossable barriers and restrict the movement of fish. Restricting migration causes a reduction in the density of populations of species whose spawning areas are above the weir, reduces the ecological production of fish above and below the weir and can lead to the genetic weakening of populations enclosed in the reach above the weir. In these circumstances inbreeding occurs (causing genetic degradation), and this has a detrimental impact on the quality of the population affected (reduced growth, lower fertility, etc). To remove the barrier to migration a fish ladder has been built on the Ipeľský Sokolec weir; its design takes into account requirements on the Slovak and Hungarian sides and also the fact that the weir is situated on a boundary water and within the Danube-Ipeľ National
The fish ladder is essential for the free migration of fish. It was created by linking the upper and lower levels of the weir, which in turn allows the migration of aquatic animals and ensures the parallel continuity of flow required in the approved Strategy for the Implementation of the Water Framework Directive.

**Contact point:**

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II. Szakaszmérnökség 2660 Balassagyarmat, Kóvári út 22

Tel.: 35 300644
Fax : 35 300329

Contact person: Gábor Stimm – head of VVO [Water Damage Prevention and Water Regulation Department], mobile telephone: 30 9318421
FISH LADDER AND REVITALISATION OF MALÉ KOSIHY DEAD ARM ON THE RIVER IPEĽ

Summary description
The fish ladder and the revitalisation of the dead arm are situated on the left side of the Malé Kosihy weir. They were built to overcome the barrier to fish migration created by the building of the weir. The revitalised dead arm ensures favourable living conditions for aquatic organisms (aquatic fauna and flora and bank vegetation). Since the fish ladder (which comprises the revitalised dead arm, the ladder itself, and an inflow structure) is located on the territory of both Hungary and Slovakia, an agreement was reached between the Slovak government and the Hungarian government, on the basis of diplomatic notes of 4 February 2008 and 23 December 2008, for the temporary use of part of the national territory of the Slovak Republic to build and operate a fish ladder in the municipalities of Ipolytölgyes and Malé Kosihy. As agreed in the conclusions of the 157th meeting of the Ipeľ working group, following agreement between representatives of the Slovak Water Management Company’s Banská Bystrica Branch Office and the Central Danube Valley Directorate for Environmental Protection and Water Management, the operator of all structures connected with the fish ladder on the Ipeľ in the Ipeľský Sokolec area will be the Slovak Water Management Company, Banská Bystrica Branch Office, Lower Hron and Lower Ipeľ river basin authority, at Koháryho 44, 984 01 Levice.

Geographical scope
Hron river basin, Ipeľ sub-basin 4-24, hydrological code number 4-24-03, Nitra region, Levice district, Malé Kosihy municipality.

Timing
For the building of Malé Kosihy fish ladder planning permission was issued on both the Hungarian and Slovak sides of the river.


On 19 December 2008 the State Water Administration Department of the Regional Environment Office in Nitra issued Decision No 2008/00010 granting planning permission to build a fish ladder and revitalise the dead arm of the Ipeľ in the area of Malé Kosihy and Ipolytölgyes. This decision gives the Banská Bystrica Branch Office of the Slovak Water Management Company additional permission to build a fish ladder and revitalise the dead arm of the Ipeľ in the Malé Kosihy and Ipolytölgyes area for the structures on Slovak territory.

Main authority/authorities or organisations
The need to build the fish ladders to ensure continuity of migration routes for riverine animals at the Ipeľský Sokolec weir was agreed at a meeting of the working group of the Ipeľ
Cross-border Waters Commission (KHV) in Budapest. The Hungarian delegation to the Ipeľ KHV working group drew up technical design options for the fish ladder and the revitalisation of the dead arm. In 2003 project documentation was drawn up for the option selected.

The fish ladder was built with the financial assistance of the EU’s INTERREG IIIA funds.

Construction contractor: ÉDUVÍZ Kft. Győr

Operator: Slovak Water Management Company, Banská Bystrica Branch Office

**Description**

The river Ipeľ has a total length, to its confluence with the Danube, of 212.43 km, of which 123 km forms the border between Slovakia and Hungary. Neighbouring states have expressed an interest in protecting the area along the Ipeľ in the past (mainly its settlements and agricultural land), but interventions have been sporadic and uncoordinated. The need to protect the Ipeľ river basin area from flooding has grown in urgency in proportion to the economic development of the area, and with the increase in essential resources located in the Ipeľ valley floor, particularly with the development of agriculture.

In flood protection terms the Ipeľ is one of the relatively more exposed rivers.

Floods used to affect the area every year and because of the nature of the terrain in the valley floor, the floodwater remained in the inundated area for several months. The circumstances, priorities and requirements of the region, and the fact that there was an unmodified drainage regime in the river basin, led to the start of a comprehensive process to modify the Ipeľ after 1966. The modification of the river improved protection against floods but also accelerated drainage and, in periods of low water, reduced groundwater levels. In order to meet the needs of water users, especially for irrigation, it was decided to build transverse structures – weirs – which were designed so that any deficit in natural flow on the Ipeľ was replaced by pumping water from the Danube (this function is not currently available). A further function of the weirs is to raise the water level in the Ipeľ and thus to allow infiltration into soil horizons in the fields of the valley floor. A serious negative aspect of the weirs that have been built is the fact that they create a barrier which the aquatic fauna is not able to cross. When the weirs were built, the issue of ensuring continuity of migration routes for aquatic animals was underestimated. Weirs create uncrossable barriers and restrict the movement of fish. Restricting migration causes a reduction in the density of populations of species whose spawning areas are above the weir, reduces the ecological production of fish above and below the weir and can lead to the genetic weakening of populations enclosed in the reach above the weir. In these circumstances inbreeding occurs (causing genetic degradation), and this has a detrimental impact on the quality of the population affected (reduced growth, lower fertility, etc). To remove the barrier to migration a fish ladder has been built on the Ipeľský Sokolec weir; its design takes into account requirements on the Slovak and Hungarian sides and also the fact that the weir is situated on a boundary water and within the Danube-Ipeľ National Park. The fish ladder is essential for the free migration of fish. It was created by linking the upper and lower levels of the weir, which in turn allows the migration of aquatic animals and

**Contact point**


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II. Szakaszmenôség 2660 Balassagyarmat, Kóvári út 22

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Contact person: Gábor Stimm – head of VVO [Water Damage Prevention and Water Regulation Department], mobile telephone: 30 9318421
Summary description
Intentional inundation of the Istragov area of the left-bank flood zone of the Danube at approximately river kilometre 1816.5

Geographical scope
Danube river catchment, Gabčíkovo cadastral territory, Istragov area – flood zone

Timing
January to March 2012

Main authority/authorities or organisations
Vodohospodárska výstavba, š.p. Bratislava

Description
In this project the following structures were built:

SO 49-02-01 bank reinforcement and deepening of river arm
SO 49-02-02 closure of side-arm
SO 49-02-03 road modification
SO 49-02-04 pipe sluice
SO 49-02-05 embankment
SO 49-02-06 fish refuges (overwintering refuges)

The building work adds to the existing support system for the river arm system, where the Istragov marsh area had not been dealt with. Water reaches this area from the right-bank seepage channel of the Gabčíkovo dam complex through a release structure at kilometre 17.26 of the seepage channel, and gravitationally through a system of channels and dry river arms of the Danube to a manually operated embankment outflow release mechanism and the Dedinský ostrov pumping station at kilometre 50.530 of the left-bank protective embankment of the Danube.

The main river arm should be filled year-round (with a flow of 1 m³/s in summer and 0.5 m³/s in winter). In summer the level at the embankment sluice will be 114.0 to 114.3 m above sea level (Bpv – Baltic) and any excess water will flow out under the weir and through the pipe sluice to the side-arm of the left bank part of the flood zone of the main arm. The
artificial flooding will enable the revitalisation of the Istragov marsh and create good conditions for floodplain bird species.

The project was designed and built by Vodohospodárska výstavba, š.p. of Bratislava.

Further information
The Gabčíkovo dam complex manager is involved in flooding the system of channels and river arms in this project. The inundation of this area is not yet complete; certain operations are still underway to supply water to the site in question.

Contact point
UNITED KINGDOM

RIVER WELLAND: DRAYTON – INTEGRATED APPROACH TO CATCHMENT MANAGEMENT

Summary description
To ensure that the river meets WFD objectives in the future the Welland is now one of 10 catchments across England where an integrated approach to catchment management is being piloted. The pilot includes the implementation of a series of river enhancement projects and one of these is the scheme at Drayton.

Geographical scope
River Welland, Anglian Downstream of Ashley Gauging Weir. Upstream grid ref: SP819916 Approx. 1700m length.

Timing
Early winter 2011

Main authority/authorities or organisations
The scheme was implemented by the Environment Agency with the co-operation and agreement of the adjacent landowners (Matthew and Melanie Robinson and Alister Brooke-Clarke) and in-kind support from the Welland Rivers Trust and the Wild Trout Trust.

Description
During the 1970s the River Welland was significantly modified. The natural river morphology was altered to improve land drainage and flood water discharge. The river was deepened; many meanders, pools, riffles and glides were removed; and the river was constricted within high, straight banks. High winter flood flows and poor land management practices now cause significant bank erosion and sedimentation. Prior to modification a high proportion of these nutrient-rich sediments would have been deposited on the floodplain, providing rich grazing pasture, but, as a result of the flood defence works, a large proportion of these sediments now remain in the channel, degrading habitats including fish spawning gravels. As a result the River Welland is currently failing to meet the WFD objective of “good ecological status” because of high phosphate levels and poor fish populations.

A survey determined that the main objectives of the enhancement scheme were to:

- Reduce the impact of sediment inputs as a result of erosion caused by livestock
- Create a greater diversity of in-stream habitats through the manipulation of flows
- Encourage the river to meander within its confined trapezoidal channel
- Consolidate woody debris to reduce flood risk whilst retaining the beneficial effects of natural flow deflection
- Improve fish spawning habitat by introducing gravels to augment existing and create new runs and riffles
- Manage older trees, in particular willows, to prevent future collapse
- Plant new trees and shrubs to provide shade for livestock and improved cover for fish

A scheme based on these objectives was prepared by the Environment Agency and Ecology Link as a demonstration project to trial a number of river enhancement techniques.

The following techniques were used during the project:

**In channel modification**

- *Flow Deflectors:* Faggot bundles, woody debris and coir roll deflectors have been used to increase localised flows.
- *Channel Narrowing/Pinching:* The natural channel narrowing caused by marginal vegetation has been consolidated in places

**Erosion control**

- *Bank Protection:* Short sections of bank, where erosion was most severe as a result of undercutting during high flows, have been protected using large stone revetment. Elsewhere coir rolls, some of which have been pre-seeded/planted, have been used to control erosion at the toe of the bank and encourage rapid establishment of marginal wetland vegetation.
- *Cattle Drinkers:* New cattle drinkers have been installed in each of the fields adjacent to the river.
- *Fencing:* Fencing will significantly reduce bank erosion and slumping and enable the stabilisation of existing exposed areas through colonisation by terrestrial vegetation.

**Gravel Introduction:** Although the majority of the reach has a gravel bed, mixed gravels between 10 and 40mm in diameter have been introduced in places to create and enhance existing runs and riffles. These gravels also provide improved opportunities for spawning fish and habitat for invertebrates.
Tree Management: Woody debris is providing natural channel pinching in places, but this has potential implications for flood defence. Excessive amounts of woody debris has been removed and used to provide flow deflection and channel pinching; collected into piles to provide additional deadwood habitat; and some of the larger material has been used to construct an artificial otter holt.

Tree Planting: Groups of native trees and shrubs have been planted along the river bank to provide shade over the channel to further diversify the in-channel habitat and provide refuges for fish.

Future Projects: A fish and eel pass is required at Ashley Gauging Weir.

Further information

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Case study available with further details including photos.

Contact point

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**FOBNEY ISLAND**

**Summary description**

£737k collaborative project to:

- reconnect artificial water body to main river
- created 5ha of new and improved habitat
- addresses WFD failures: fish and invertebrates.

**Geographical scope**

Reading Berkshire, 5 hectares.

**Timing**

Started September 2011

**Main authority/authorities or organisations**

Environment Agency, Reading Borough Council, Thames Water and the Thames Rivers Restoration Trust

**Description**

Fobney Island, in Reading is being transformed into a wetland haven for nature.

The project will see the island turned into a rich new wetland and wildflower hay-meadow habitat. The site is expected to attract a vast array of wildlife, including birds, bats, water voles, and otters. These works, together with river restoration on the River Kennet, will make the island a more enjoyable place for people to visit, especially for bird watchers and anglers.

The river restoration works will include restoring 310 metres of the River Kennet and introducing new river gravels to the channel to create ‘riffles’. Gravel riffles provide the perfect breeding ground for fish, as well as an ideal habitat for invertebrate life to thrive. These are essential for fish spawning, in particular for chub, dace and barbel who lay their eggs in the gravel beds. Emerging fry find shelter amongst the gravel during early stages of their development. A new backwater will be created to provide vital refuge habitat for young fish fry.

A circular walk will also be created at the site, with views across the new wetland features, which will help to make the site more accessible and attractive to visitors. The scheme will also include two bird hides with views across the new wetlands. Information boards at the site entrance points will provide information about the Wetland Park and its wildlife.
The council will continue to manage and maintain the island after the work and will also be looking to volunteers to help with maintenance. A Friends of Fobney Island volunteer group will be established with support from the project partners to help maintain the site and provide on-going educational opportunities.

**Further information and Contact point**
Joe Stevens, River Basin Programme Manager, Environment Agency
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AVON WFD FUNDS (RRP, NON NATIVES AND DIFFUSE POLLUTION)

Summary description
Government funding to take forward a whole river restoration plan for an internationally important river and working in partnership to implement actions.

Geographical scope
The River Avon, Hampshire

Timing
Some restoration projects took place during 2010/12 and others will continue into 2014/15.

Main authority/authorities or organisations

Description
The River Avon and its major tributaries are some of the finest chalk rivers in Europe and support a wide range of fish, bird, mammal and plant species. They are designated as a Special Area of Conservation and a Special Site of Scientific Interest (SSSI).

Sections of the River Avon are currently in poor or moderate ecological status under the Water Framework Directive and are failing the SSSI objectives because of invasive plant species, diffuse pollution, discharges, abstraction, morphology and water level management issues. Continued implementation of a whole-river restoration plan is also needed to address the effects of historic land drainage work on the physical function and form of the river system.

Partnerships between Natural England, the Environment Agency, Wessex Water, the Wiltshire and Hampshire & Isle of Wight Wildlife Trusts, the Wessex Chalk Stream and Rivers Trust and the National Farmers Union are using WFD funding, including funding from the Environment Agency, to take forward a whole river restoration plan, work to remove non-native plant species, and initiatives to address run-off from tracks and roads.

The partners, in collaboration with local fishing clubs and landowners are implementing an extensive programme of works to restore the channel morphology using WFD funds including funding from the Environment Agency. A strategy for tree planting and management adjacent to the river and placing large bits of woody debris in the river channel is being developed and implemented to address one of the key issues contributing to poor channel morphology. In the long term, the trees and woody debris will act as river
engineers- providing valuable habitat for fish, helping to reshape the river so it is more varied, and keeping water temperatures down in summer, which is vital for salmon.

The Environment Agency and Natural England are also using WFD funds to identify and address sources of sediment from roads and tracks, in order to reduce the amount of sediment reaching the river. This will help improve water quality and ensure the gravel river bed stays clean, both of which are critical for the rare chalk river plants, insects and fish that depend on the River Avon.

**Further information and Contact point**
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**RIVER EBBW – RECOVERING FROM INDUSTRIAL PAST**

**Summary description**
Working in partnership to address barriers to fish migration and sewage pressures in the River Ebbw catchment.

**Geographical scope**
River Ebbw Catchment, South East valleys management catchment Severn River Basin District.

**Timing**
2011 and ongoing

**Main authority/authorities or organisations**
Environment Agency Wales & South East Valleys Rivers Trust.

**Description**
There have been major improvements in water quality over recent decades following the closure of the collieries and then Ebbw Vale steelworks along with improvements to the Western Valley trunk sewer.

However the status is still only moderate due to the quality of its fish populations, primarily as a result of barriers to migration, with the additional pressure of sewage issues in this densely populated catchment.

Fisheries walkover assessments identified 83 barriers, 18 of which were impassable to migratory fish. Through the Salmon for Tomorrow project and the Sustainable Fisheries Programme, fish pass work at Bassaleg and Coed Celyn means fish can now access approximately 70% of the catchment.

![Figure 16 Coed Celyn weir before 'Rocky Ramp'](image1)

![Figure 17 Coed Celyn weir after 'Rocky Ramp'](image2)

![Figure 18](image3)
In 2012 we are planning further major easements to three impassable weirs and in partnership with South East Wales Rivers Trust (SEWRT) we will make a culvert and a further 6 barriers upstream passable, so that by 2013 approximately 90% of the catchment will be accessible. To complement this, we will be working with SEWRT to carry out habitat improvement works, riparian tree work, invasive plant control, fencing and improving in stream features such as gravel traps.

While barriers are the main reason for failure, an ammonia failure in one of the water bodies in 2010 demonstrates the pressure from sewage and a walkover survey in 2011 identified point sources such as this overflowing manhole that will also need to be addressed by working in partnership with the water company.

**Further information**
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MEASURES RELATED TO ARTICLE 9 (WATER PRICING POLICIES)
**FRANCE**

*LE SYSTÈME DES REDEVANCES DANS LA GESTION DE L’EAU EN FRANCE*

**Summary description**
La France a mis en place un système de redevances collectées par les agences de l’eau qui sert à financer les actions contribuant au bon état. Ces redevances constituent un système de tarification incitative et contribuant à la récupération des coûts répondant à la mise en œuvre de l’article 9 de la DCE.

**Geographical scope**
France

**Description**

**Contexte institutionnel : la gouvernance de l’eau en France**


**Objectif des redevances agences :**

Les redevances perçues par les agences de l'eau contribuent à la mise en œuvre de l'article 9 de la DCE, en particulier :

- une tarification incitative (les assiettes et les taux des redevances permettent d'envoyer un signal-prix aux utilisateurs de l'eau) ;

- le principe de la récupération des coûts, en particulier des coûts pour l'environnement et pour la ressource (les redevances agences appliquent non-seulement le principe de pollueur-payeur, mais aussi d'utilisateur-payeur). Ainsi, le budget des Agences de l’eau provient des redevances sur les prélèvements et les rejets de tous les usagers qui affectent la qualité des eaux ou en modifient le régime. Le taux de certaines redevances est modulé en fonction des usages et de la fragilité du milieu.

L’objectif des redevances perçues par les Agences de l’eau est donc d’internaliser les coûts environnementaux, en incitant les usagers de l’eau à supporter eux-mêmes le coût lié à leurs rejets polluants ou leurs prélèvements sur la ressource en eau.

Les redevances agences répondent également au principe de « l'eau paie l'eau ». Ces redevances prennent la forme de taxes affectées à l’eau ce qui signifie que, non seulement elles sont perçues sur des activités qui impactent les ressources en eau, mais aussi que le produit de ces taxes est affecté à des actions de préservation des ressources en eau.
### Types de redevances:

<table>
<thead>
<tr>
<th>Type de redevances</th>
<th>Assiette</th>
<th>Usages concernés</th>
<th>Externalité traitée</th>
<th>Montant s en 2009 (en M€)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Prélèvement sur la ressource en eau</td>
<td>Volume prélevé</td>
<td>Tous usages (pour l’hydroélectricité, la hauteur de chute entre dans le calcul de la redevance)</td>
<td>Conflits d’usage (coût de la rareté)</td>
<td>329,5</td>
</tr>
<tr>
<td>Pollution domestique</td>
<td>Volume d’eau facturé</td>
<td>Domestique ou assimilé domestique</td>
<td>Pollutions</td>
<td>832,0</td>
</tr>
<tr>
<td>Pollution non domestique</td>
<td>Somme des éléments de pollution contenus dans les effluents industriels (DCO, DBO5, MES, TOX, Metox, AOX)</td>
<td>Industries</td>
<td>Pollutions</td>
<td>74,9</td>
</tr>
<tr>
<td></td>
<td>Nombre d’animaux détenus pour les éleveurs de bétail</td>
<td>Agriculture</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pollution diffuse</td>
<td>Masse de substances contenues dans les produits phytopharmaceutique s ou dans les semences traitées au moyen de ces produits</td>
<td>Agriculture</td>
<td>Pollutions par produits phytosanitaires</td>
<td>53,1</td>
</tr>
<tr>
<td>Protection du milieu</td>
<td>Pêche (amateur ou professionnelle) en eau douce</td>
<td>Réduction du stock de poissons</td>
<td>9,6</td>
<td></td>
</tr>
<tr>
<td>Modernisation des réseaux</td>
<td>Volume d’eau potable</td>
<td>tous usagers raccordés à un système d’assainissement collectif</td>
<td>595,0</td>
<td></td>
</tr>
<tr>
<td>Stockage en période d’étiage</td>
<td>Volume de la retenue d’eau</td>
<td>Propriétaires de retenues sur les cours d’eau</td>
<td>Baisse du débit des cours d’eau</td>
<td>0,1</td>
</tr>
<tr>
<td>Obstacles sur les cours d’eau</td>
<td>L’assiette intègre le dénivelé de part et d’autre de l'ouvrage ainsi que ses caractéristiques physiques.</td>
<td></td>
<td>Blocage du transit sédimentaire et de la migration des poissons</td>
<td>0,2</td>
</tr>
</tbody>
</table>
Les taux des redevances sont pour certains fixés (C’est par exemple le cas de la redevance pour pollution diffuses et de la redevance élevage) et pour d’autres plafonnés (c’est le cas par exemple de la redevance pour pollution d’origine domestique et de la redevance pour prélèvement sur la ressource en eau) au niveau national par le Parlement. Les taux plafonnés au niveau national sont ensuite fixés dans chaque bassin par le Conseil d'administration de l’Agence après avis conforme du Comité de bassin, en fonction des priorités et des objectifs de qualité locaux fixés dans le SDAGE et les SAGE.

Les redevances qui touchent les ménages sont perçues via la facture d'eau payée au service public d'eau et d'assainissement. Les ménages s’acquittent donc d'une facture d'eau comportant trois grands éléments : la rémunération du service de l'eau (production et distribution), la rémunération de l'assainissement (collecte et traitement des eaux usées), les taxes et redevances. La part des taxes et redevances agences correspond en moyenne à 18% de la facture d'eau et d'assainissement pour les ménages (données 2007).

Bibliographie :

O. Bommelaer, J. Devaux et al, 2012, Le financement de la gestion des ressources en eau en France (actualisation), Etudes et Documents n°62, MEDDTL/CGDD

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ADDITIONAL MEASURES IN PROTECTED AREAS
GERMANY

*Policy mix of economic and regulatory instruments introduced to reduce excessive nitrate concentrations in groundwater*

**Main Authority/authorities or organisation**
Ministry of the Environment Climate Protection and the Energy Sector Baden-Württemberg

**Geographical scope**
River Basin Rhine and Danube - level waterbodies

**Timing**
Between 1988 and 2012

**Description**

**Topic:** Policy mix of economic and regulatory instruments introduced to reduce excessive nitrate concentrations in groundwater

**Reasoning for the project**

**Main reasons**
Reduction of nitrates and pesticides leaking into groundwater bodies.

**Objectives**

The policy mix consists of the following instruments:

- Water Abstraction Charges

  The water abstraction charge relates with the following instruments mainly via the implementation and institutional process leading to their design. The compensation payments and the water abstraction charge are legally unconnected.

- Agricultural regulations in drinking-water Protected Areas and Compensatory Payments (SchALVO)

  The SchALVO was introduced 1988. The SchALVO increases the standards of agricultural practices in drinking-water protection areas with higher nitrate concentrations in the groundwater to reduce nitrates and pesticides leaking into groundwater bodies. The SchALVO regulations are compulsory and exceed the level of good agricultural practice. Therefore the farmers affected get a compensatory payment.

- Market Relief and Cultural Landscape Compensation (MEKA)

  The MEKA program was introduced in 1992. It is co-financed by the Pillar II payments from the European Common Agricultural Policy (CAP), which are implemented via the Action and Development Plan for the Rural Area of Baden-Württemberg (MEPL).
MEKA provides an incentive for farmers, via compensation payments, to implement voluntary environmentally sound agricultural practices, which exceed the level of good agricultural practice.

In contrast to the SchALVO, participation in the MEKA program is voluntary. Farmers can chose from a toolbox of measures suitable to their own way of farming. Most of the MEKA- measures aim to the reduction of nitrates and pesticides leaking into the groundwater.

SchALVO and MEKA are categorized as “supplementary measures” within the WFD and are framed by federal legislation on agricultural practices.

The change in agricultural practise, as a result of the SchALVO and MEKA, resulted in a decrease of nitrate concentrations. From 1994 to 2012, the anthropogenic nitrate concentrations decreased by 24% across the state of Baden-Württemberg.

Further steps
Evaluation of the Measures due to the GAP-Reform 2014

Project data:
26% of the area of Baden-Württemberg are water protection areas
MEKA measures in about 70% of the area of Baden-Württemberg

Contact point
State Ministry of the Environment, Climate Protection and the Energy Sector, Baden-Württemberg

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SLOVAKIA

THE MoRE PROJECT – REVITALISING THE RIVER MORAVA: A PROGRAMME OF MEASURES PREPARED IN ACCORDANCE WITH EU DIRECTIVES ON WATER AND NATURE PROTECTION

Description
The area covered by the project begins at the confluence of the rivers Morava and Thaya [Czech/Slovak: Dyje] at river kilometre 69.00 and extends as far as the settlement of Malé Leváre pri Morave at river kilometre 53.00. The restoration of this section is based on a joint Slovak-Austrian strategy drawn up for the whole border area as part of the BGM II project. Its main objective is to maintain the original character of the lowland meandering river and to restore the ecosystem to the target state of dynamic equilibrium featuring the formation and decline of representative, diverse biotopes typical of natural floodplain zones. This objective can be achieved by gradually renewing the interaction between river bed processes and the flood zone, which have become isolated from each other through the modification of the river. The objectives of the project are in line with the requirements of the EU Water Framework Directive (achieving good ecological status), which sets out the framework for Community water management measures, and with the need to maintain a favourable status under the EU Directive on the protection of biotopes, animals and plants. This objective will support the aims of the trilateral Ramsar-protected Morava-Dyje floodplain site.

Geographical scope
Morava river basin, sub-basin 4-17-02 -001, -004, -005, -006, -008, Záhorie region; site: flood zone of the Morava river at river kilometres 53 to 69.

Timing
Duration of the scheme: 1 September 2010 to 31 May 2013

Principal authority/authorities or organisations
Main project partner: Via donau – Österreichische Wasserstraßen-Ges mbH

Work tranches:

1 – Information and publicity
2 – Feasibility study
3 – Detailed planning of measures
4 – Abiotic and biotic monitoring
5 – Synthesis
6 – Project management

Support fund: European Regional Development Fund (ERDF)
Operational programme: Cross-Border Cooperation Programme

Slovakia – Austria 2007-2013

Total budget: EUR 526 593.40

Main project partner: Via donau – Österreichische Wasserstraßen-Ges mbH

Project partners:

• Water Management Research Institute
• Slovenský vodohospodársky podnik, š.p
• Slovak Academy of Sciences – Institute of Zoology
• National Nature Protection Authority of the Slovak Republic – Záhorie Protected Landscape Area (CHKO)

Co-financing at national level:

Ministry of Agriculture and Rural Development
(MPRV SR)

Further information
http://www.etc-more.eu

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UNITED KINGDOM

TORBAY - TACKLING ILLEGAL CONNECTIONS

Summary description
An urban diffuse pollution project, tackling illegal connections

Geographical scope
Torbay

Timing
2011

Main authority/authorities or organisations
Environment Agency, Torbay Council

Description
- Improve stream and bathing water quality
- Work with relevant departments within South West Water and Torbay Council to improve working practices, solve pollution problems and promote key messages.
- Work with business to minimise impact on water quality.
- Promote successes

Environmental outcomes delivered:
- Over 130 illegal connections resolved
- 7500 cubic metres of polluted water removed from Torbay bathing waters each year
- Education, e.g. Leaflets with council tax bills
- Training for Building Control, tradesmen, developers, highways, street scene
- Improved working relationships between partners.
- Cleaner water for people to bathe in

Lessons learnt:
- Good partnership working with high level commitment from the partners was essential
- Need local on-the-ground knowledge, e.g. SWW's knowledge of sewage network and local officers who know their patch
- Need to target major pollution sources and not be sidetracked by small discharges.
- Requirement to share intelligence within a no blame culture.
- Property owners have paid for remediation of illegal connections with very few requiring enforcement.
- Focus on delivering outcomes using a light-touch enforcement approach
- Education/engagement is key to stop future misconnections
- Involve and engage with others who impact on water quality, e.g. street cleaners, plumbers, developers
- Good communications helped maintain partnership, e.g. monthly updates, regular project board meetings and workshops

**Contact point**
Jonathan Bailey

Environment Agency
THE FYLDE PENINSULA WATER MANAGEMENT PARTNERSHIP: A PARTNERSHIP THAT DELIVERS WFD, FLOODS DIRECTIVE AND REVISED BATHING WATER DIRECTIVE.

Summary description
The Fylde Peninsula suffers from significant water management issues; poor Bathing Waters and water quality, lack of capacity in the drainage network and surface and coastal flooding. A partnership was established in 2011 to develop a programme to deliver improvements and drive a change in sustainable water management.

The partnership is delivering a work programme that includes:

- trialling innovative technologies to improve water quality
- developing sustainable drainage plan for the three authorities
- delivering community engagement through ‘Beachcare’ project
- working with businesses to improve environmental performance.

Geographical scope
Across 3 Local Authorities in the North West river basin district.

Timing
Partnership established Summer 2011

Water Management Action Plan for 25 year time horizon

Actions currently ongoing

Main authority/authorities or organisations
- Environment Agency
- Blackpool Borough Council
- Wyre Borough Council
- Fylde Borough Council
- Lancashire County Council
- United Utilities
- Keep Britain Tidy

Description
Background
The Fylde Peninsula, is home to one of Britain’s most popular coastal destinations. It has a population of 320,000, but attracts over 10 million visitors/tourists each year.

There is significant development along the coastline, and inland pressures from farming and urbanisation mean the Peninsula suffers from poor water quality. During 2011 the peninsula contained half of the bathing waters in England that failed to meet guideline standards of the current Bathing Waters Directive. Predictions under the revised Directive indicate all but one of the bathing waters will fail to meet sufficient.

WFD Water bodies = 32  (Good=17, Moderate=14, Poor=1)
BW s = 8  BW at risk of failing rBWD=7

Flooding is also a major issue; 30,000 properties are at risk from fluvial and coastal flooding and an additional 6,500 from surface water flooding.

The combined drainage and sewer network is over capacity giving rise to additional flooding and water quality issues. These capacity issues have led to economic implications as developments have been constrained. Local strategies indicate a need for a further 6,000 houses by 2026, which will only increase the pressure on the drainage infrastructure.

In 2011, in acknowledgement that a significant change and approach in water management is required, a water management partnership was established.

Objectives of water management partnership

- work together to develop a strong evidence base which helps us to identify and agree the environmental priorities for the Fylde Peninsula.
- use this evidence to demonstrate how environmental improvements can deliver real and lasting social and economic outcomes
- cooperate to identify and deliver innovative solutions
- unlock new funding streams and line up investment plans to deliver real value for money and more for the environment
- develop an agreed programme of works that delivers real and lasting change
Environmental Outcomes

1. Reduce the number of properties at risk from flooding
2. Meet revised Bathing Water Directive sufficient classification at all 8 Bathing Waters
3. Deliver improvements in the 14 moderate and 1 poor water body under the WFD

Obstacles and how these were overcome

Taking a partnership approach was essential to reduce Institutional challenges. Through working and sharing resources and skills we have driven a collective approach that meets all partners organisational aims.

Significant investments and improvements in Bathing Water quality have already been made in the area, however to meet the improved increased standards a different approach is required. Working in partnerships has helped identify different approaches to deliver improvements

Achievements to date

- Partnership established and partners fully signed up to objectives
- 25 year Work Programme developed (May 2012)
- Misconnections investigations have identified outfalls that are causing contamination. Plan in place to improve these underway
- Sustainable drainage plan being developed, with exemplar schemes identified to roll out
- Communications plan and strategy developed
- Beachcare community participation engaged large numbers of local population and interest groups.

Future achievements

1. Project started to drive business improvements (water efficiency, waste minisation, improved drainage) across SMEs in the Fylde (ongoing till December 2012)
2. Testing the installation of Smart Sponges as a method of reducing bacterial load in bathing waters within the drainage network across the three authorities (ongoing)

Costs

The partnership was set up initial through existing resources. Since then funding has been sought from partners to deliver various strands of the work. Currently standing at over £300K.

Crucially, a key approach is redirecting existing initiatives and resources to deliver improvements.

Importance for the water management in the basin and for achieving water policy objectives.

The partnership approach is driving a whole environment approach, where improvements inland will drive improvements in bathing water quality.

Figure 19

Figure 20
Further information
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Contact point
Gill Hill, River Basin Programme Manager,
Environment Agency
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Summary description
Government funding to develop whole river restoration plans and initiate demonstration projects on internationally important sites, and Working in partnership to implement actions.

Geographical scope
The Rivers Eden, Derwent and Kent in Cumbria, North West England

Timing
Restoration projects took place during 2011/12 and are continuing into 2014.

Main authority/authorities or organisations

Description
The Rivers Eden, Derwent and Kent, and several Cumbrian lakes are internationally important sites designated as SACs for the freshwater habitats and species that they support. Whole river restoration plans were completed for the Rivers Kent, Derwent and Eden in 2010. They set out a vision of how the rivers would function in a more natural state, with detailed plans suggesting how stretches could be managed to make them more functional physically and ecologically.

To meet their Natura Protected Area and WFD objectives a range of pressures need to be addressed, including water quality and land management issues, the impacts of historic land drainage work on the physical function and form of rivers, and the advance of non-native plant species.

Immediate implementation action was needed for the long-term sustainability of the river. Government had allocated to Natural England and to Environment Agency ring-fenced pots of funding specifically for the delivery of WFD. Therefore, Natural England was able to allocate funding from this to develop plans and initiate demonstration projects.

To continue implementation, the Environment Agency used its funding to develop a pilot collaborative restoration project with Natural England, the Environment Agency and the Eden, Derwent and South Cumbria River Trusts. Detailed designs have been developed and negotiations with land managers undertaken.
The resulting restoration work will improve the rivers for the important habitats and species that depend on them, and show people how river re-naturalisation works in practice.

Natural England has also allocated funding to help develop a Cumbria freshwater bio-security plan in partnership with the Environment Agency and the South Cumbria Rivers Trust and carry out initial action on the ground to tackle non-native invasive freshwater plants and animals. The funding has made an important contribution to managing freshwater non-native species in a coordinated and sustained way. This is a vital step in preventing non-native species upsetting the delicate balance of plants, insects and fish that Cumbrian lakes and rivers are renowned for.

**Further information and Contact point**

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**AQUALATE MERE (LAKE RESTORATION)**

**Summary description**
Government funding to implement restoration activity on a lake in an internationally important wetland complex.

**Geographical scope**
Aqualate Mere (largest natural lake in the Midlands with a surface area of 75 ha).

**Timing**
Some restoration projects took place during 2011/12 and others continue into 2012/13.

**Main authority/authorities or organisations**
Natural England

**Description**
Aqualate Mere is the largest of the natural lakes in the Meres and Mosses area and within the Midlands, with a surface area of 75 ha. Together with 150 ha of dependant fen, grazing marsh, bog and wet woodland habitat, it forms an internationally important wetland complex with Ramsar, Site of Special Scientific Interest (SSSI) and National Nature Reserve status.

Aqualate has suffered from a history of nutrient enrichment and silt accumulation, largely due to overflow from the Shropshire Union canal. It is currently in poor ecological status under WFD and is failing its SSSI objectives because of high nutrient concentrations and lack of characteristic plant species. Despite significant reduction in external nutrient loads the lake has shown little improvement in water quality due to internal nutrient release from phosphorus rich sediments. This has resulted in an impoverished aquatic plant community, algal blooms, deoxygenation and resultant fish kills downstream. The deep sediments have also resulted in a shallowing of the lake, threatening the future of the open water habitat.

Previous investigations indicate that a 1-1.5m layer of accumulated phosphate rich silt requires removal in order to increase water depth and reduce internal nutrients. Natural England WFD funds are being used at Aqualate Mere to carry out work to restore the lake. This year preparations are being made prior to commencement of desilting, such as applying for planning permission, carrying out ecological surveys and constructing access roads. It is envisaged that once the desilting is complete, the open water depth will be restored and nutrient levels much decreased, providing the basis for ecological recovery of the lake following historical enrichment.

**Further information and Contact point**
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180
STRATEGY TO DEAL WITH WATER SCARCITY AND DROUGHTS
ARTIFICIAL RECHARGE OF THE EZOUSAS AQUIFER IN CYPRUS WITH TERTIARY TREATED SEWAGE.

Summary description
Groundwater is used extensively in Cyprus for water supply and irrigation. Disinfected tertiary treated water, is being used for artificially recharging the Ezousas aquifer with low quality (natural high sulphate and boron concentrations) water and then is utilised for irrigation purposes and at the same time seawater intrusion is being controlled.

Geographical scope
Western part of Cyprus, at Ezousas aquifer.

Timing
The aquifer is being recharged with tertiary treated effluent since 2004

Main authority/authorities or organisations
Cyprus, The Water Development Department


Description

PROBLEM

Ezousas is a river alluvial aquifer, developed along the Ezousas river valley, in Pafos District. An 18 million cubic meters (mcm) capacity dam, the Kannaviou dam, was constructed on this river approximately 26 km upstream of the coast. The dam covers part of the local irrigation demand and some quantities of water are being diverted by pipeline to Asprokremmos Water Treatment Plant for domestic use in Pafos town and several villages. The Ezousas aquifer extends from the coast to the Kannaviou dam site.
The coastal part of the aquifer, stretching up to eight kilometers from the coast, is utilized as a natural reservoir for storage and reuse of the tertiary treated sewage from Pafos town (about 3 Km west of Gerokkipou village). Treated water recharges the aquifer through specially constructed shallow ponds. This water, after natural purification, is pumped again from the aquifer for irrigation in the Pafos Project area. The average sulfate concentration in both surface and groundwater is approximately 450 mg/l. High boron concentration has also been measured in this aquifer.

**Land use**

Land use is mainly agricultural with predominant crops being citrus trees. The intensive nature of the agriculture and the use of fertilizers in the area are endangering the groundwater quality in coastal plain.

**Chemical composition of the groundwater**

There are indications of increasing nitrate concentration and localized problems of seawater intrusion appear in a few coastal zones. The elevation of the impervious base of the coastal aquifer is generally above mean sea level. In few places where the elevation of the impervious base is below sea level, seawater intrusion problems appeared. The average sulfate concentration in both surface and groundwater is approximately 450 mg/l. High boron concentration has also been measured in this aquifer.

**Discharge and abstraction data**

About 20 private boreholes and wells operate in the coastal area today and their yield ranges from 1 to 20 m³/hour. Many of these boreholes have been drilled in the last twenty years. Dry years and water deficits in the last twenty years have forced abstraction to increase.
The operation of the artificial recharge scheme.

Tertiary treated water, which is also disinfected, is pumped from the treatment plant to five shallow ponds in turns. The water level in each pond reaches up to 0.5 m from where it slowly seeps into the ground. Water is pumped from the aquifer into a canal (open channel) at a ratio of 1:20 (aquifer water to dam water). The canal carries water from Asprokremmos dam (See Figure above) to the Pafos irrigation scheme, which is 3 km west of the Geroskipou village, and passes across the Ezousas aquifer. Water from the aquifer is pumped from the already existing wells, which are located 100 m to 1000 m downstream of the recharge ponds. Pumping is carried out strategically so that retention time in the aquifer is maximised.

RESULTS/PERSPECTIVES/BENEFITS

Disinfected tertiary treated water, is being used for artificially recharging an aquifer with low quality (natural high sulphate and boron concentrations) water and then is utilised for irrigation purposes and at the same time seawater intrusion is being controlled.

LESSONS LEARNED

- Artificial recharge with effluence water is a good case study, which can be applied in areas with similar geological conditions suffering from droughts.
- Conjunctive use of surface and groundwater.
- Saving of equal quantities of fresh water for domestic use.

Further information


Contact point

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FLOODS PROTECTION
BELGIUM (FLANDERS)

THE SIGMA PLAN IS AN INTELLIGENT, FUTURE-ORIENTED PROJECT THAT WILL MAKE FLANDERS SAFER BY BETTER PROTECTING IT AGAINST FLOODS.

Summary description
Better protecting Flanders against flooding by the Scheldt and its tributaries. This is the Sigma Plan’s starting point. At the same time, the Sigma Plan will make the ecosystem of the Scheldt robust. Exceptional European nature is being created around the resilient Scheldt, a place hikers can enjoy to the full. Commercial use of the river and shipping also remain guaranteed. Thus, the Sigma is about developing a safe, natural and economically attractive Scheldt region.

Geographical scope
Flanders, Sea Scheldt area, Scheldt Basin.

The Sigma Plan consists of different project areas, distributed across a large part of Flanders. These projects areas are located along the tidal rivers: the Scheldt and its tributaries the Durme, the Rupel, the Nete, the Small Nete, the Big Nete, the Dijle, the Zenne and the Demer.

Some 260 kilometers of river are involved in the project. The Sigma Plan will not only make the immediate surroundings of the rivers and the project areas safer. The likelihood of flooding further inland is also reduced.

Timing
- The dike works and flood control areas of the original plan (1978-2005) are almost complete. Only the flood control area (FCA) Kruibeke-Basel-Rupelmonde will be completed around 2013. This project is the largest of the 13 flood control areas in the Scheldt basin. Once operational, the FCA alone will provide for a fivefold increase in the protection of Flanders against floods from the Scheldt and its tributaries. Part of the flood control area will be set up as a flood control area with reduced tides, another part as a wetland. The project will provide a boost to the nature of the Scheldt region: no less than 300 hectares of mud flats and marshes, 150 hectares of meadow bird area and 92 hectares of alder marsh forests will be added.

- The full realisation of the updated Sigma Plan (°2005) extends to 2030. New projects are being started every five years. The first series of projects is now being executed, and others are being prepared.

- In March 2006, The Lippenbroek Project (Hamme) was put into service. This pilot project was to test the innovative concept developed by Flanders to combine safety and the restoration of nature.

- Antwerp stands at the threshold of the largest renovation ever of its Scheldt quays. Protecting Antwerp better against future floods is the central reason for reconstructing the
Scheldt quays. The city government is also using the opportunity to give the quays a facelift. The implementing of the safety measures start in June 2012.

- The Kalken Marshes (Berlare, Laarne, Wetteren and Wichelen) will receive an enchanting nature reserve of almost 1000 hectares, and more elbow room. A limited part is being set up as a flood control area. One sub-project, a depoldering is first foreseen and has started in 2012.

- This year (2012), the Vlassenbroek Polder (Dendermonde) will give the Scheldt all the space it needs. It will become flood control area, part of which with reduced tides. By creating wetlands and a tidal nature area, a wide range of typical river landscapes will develop

- Between Werchter and Mechelen (Bonheiden and Haacht), the Dijle valley will receive various flood control areas. A part of the 200 hectares will be used for the development of a 70-hectare wetland. The development has started in 2012.

- The Sigma Plan wishes to make the Durme (Hamme, Temse, Waasmunster, Zele, Lokeren) tidal areas safer, and at the same time to restore their original natural values.

- In the Hedwige-Prosper Project, the Scheldt is given free reign. The two polders on both sides of the border between Belgium and the Netherlands are being depoldered for 465 hectares and returned to nature.

- The project areas Nete, small Nete, big Nete valley, Dijle estuary, Bastenakkers and Demer valley are being prepared for execution from 2015. Other projects will be added in the future.

Main authority/ authorities or organisations
The Sigma Plan is a realisation of the Flemish government. Waterway authority Waterwegen en Zeekanaal (W&Z) is leading and coordinating the project. For the nature component, they are working closely with the Agency for Nature and Forests (ANB).

In order to create a multifunctional waterway with much to offer society, W&Z calls upon the services of other partners. The Flemish Land Agency (VLM) assists in developing the supporting agricultural policy. The Spatial Planning, Housing Policy and Built Heritage Department contributes to the spatial translation of the Sigma Plan. W&Z also involves local governments, agricultural organisations, nature associations, hunters, fishermen, tourism and the hotel and catering industry in the realisation of the Sigma Plan.

Description
The new Sigma Plan is an example of how an integrated plan has been successfully developed and implemented. After the disastrous floods in 1976, a flood protection plan was developed, called ‘Sigma Plan’. As scientific knowledge evolved, an updated Sigma Plan was developed in 2005.
The objective remains the same: to protect the Scheldt basin against floods caused by the North Sea and, through dialogue and consultation with other sectors and stakeholders, combine this objective with other objectives—such as nature conservation and recreation—to the mutual benefit of all.

This lead to the adoption of the Sigma plan which provides a development framework that maintains a balance between environmental, economical, societal and agricultural evaluations. All projects identified within the Sigma Plan have been developed on the basis not only of detailed technical analyses of the effectiveness and feasibility of measures but also through close collaboration with experts from the other relevant policy sectors in order to maximise the potential for win-win solutions.

The Sigma Plan is also a part of the Development Plan 2010. This is a joint package of measures and projects in Flanders and the Netherlands working on a safer, more accessible and more natural Scheldt. The main objective of the Development Plan is sustainable and balanced development with an eye for all functions.

Throughout the entire process, particular attention was paid to various EU directives, including:

- **Birds and Habitats Directives**: the Scheldt estuary is a Natura 2000 site with defined conservation objectives for species, functions and required minimum areas of different habitats. Special attention was therefore paid in every planning step to the Natura 2000 goals and the nature component of the Sigma Plan is now specifically designed to reach the Natura 2000 conservation objectives.

- **Compliance with the Flood Risk Directive**: historical records, together with new flood hazard and flood risk maps, were used to prepare a flood risk management plan, taking into account aspects of costs, benefits, strategic environmental impact analysis, transboundary effects and strategies as well as the work related to the WFD river basin management plans and communication with the public.

The ratification of the integrated Sigma Plan by the Flemish government paved the way for a Long Term Vision for the Schelde (LTVS) estuary in the Flemish part of the Scheldt estuary, which aims to integrate as much as possible the transport and flooding objectives with the requirements and objectives of the WFD and Bird and Habitat Directives. This plan sets quality targets for the condition of the estuary by the year 2030 and the management measures required to achieve them.

The concept agreed upon involves the controlled inundation during dangerous water levels in the tidal river. The original Scheldt dike will become an overflow dike where the rising waters are directed into a controlled area until the Scheldt level allows drainage via an outlet. The integration of ecological objectives into the Sigma Plan will also lead to the restoration of several ecologically valuable habitats (500 ha of mudflats, 1500 ha of tidal marshes, 1500 ha of grassland, 2000 ha of reed and riparian zones and 400 ha of marsh woodland).
MONEOS is an integrated monitoring plan designed to follow up the evolution of the ecosystem ecological status, safety against floods and accessibility. An integrated evaluation system is being developed to assess distance to LTVS targets as well as the WFD ecological status and the improvement in the conservation status of habitats and species protected under the Birds and Habitats Directives.

**Further information**
http://www.sigmaplan.be


**Contact point**
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SLOVAKIA

**Suchý polder Lehota pod Vtáčnikom [Lehota pod Vtáčníkem dry polder]**

**Summary description**

The ‘Lehota pod Vtáčníkom – vybudovanie suchého poldra’ [Construction of a dry polder in Lehota pod Vtáčníkom] construction project was carried out on the basis of an agreement reached on 16 December 2002 between the Ministry of Agriculture and the Swiss Agency for Development and Cooperation at the Swiss Ministry of Foreign Affairs, for the funding of preventive measures in flood-stricken areas and on the basis of a related contractual appendix of 27 May 2003.

The dry polder was built to capture flood waters by creating a water catchment reservoir with a volume of 54 000 m³. The polder was created by damming the valley above the settlement of Lehota pod Vtáčníkom with an earth dam made from local materials. An associated concrete structure on the dam channels normal and flood waters. At normal flow levels water exits through an unembanked opening at the bottom having dimensions of 150 x 100 cm, to a value of Q=0.043 m³/s. At higher flow levels the polder begins to fill. If the polder fills completely waters begins to escape across the overflow lip (245.6m above sea-level) of a safety overflow.

Water flowing through this opening and over the overflow is directed through the body of the dam by an opening 1.2m wide and 1.8-2.1m high. At the end of the opening is a spillway 0.5m high and 6.0m long. Beyond the spillway are semi-circular outflow wings. There are concrete steps on both sides of the outflow wings. A water level indicator is set into the left side of the stepway. On the other side of the structure is a waste channel strengthened with a stone bed on concrete.

**Height of the polder:**

- Spot height of the lowest point of the valley: 420.8m above sea-level
- Spot height of dam crown: 426.6m above sea-level
- Flood surface: 1.5 ha
- Dam length: 347m
- Dam height at crown: 4.0m

**Geographical scope**

- Hydro Order Code: 4-21-11
- Name of watercourse: 498 – Suchý
- Partial river catchment: Váh – Nitra - Lehotský potok – Suchý
- Region: Horná Nitra

190
- Site: Lehota pod Vtáčnikom cadastral territory
- Googlemap coordinates: 48.689229,18.611913

Timing
- Last floods before construction: 22-23 June 1999, 1-13 August 2002
- Start of construction: 16 June 2003
- Completion of construction: 30 November 2004
- Capture of floodwaters since polder in operation:
  - 21 March 2005 – photographic documentation available
  - 27 March 2006
  - 4 August 2008
  - 25 May 2010 – photographic documentation available
  - 2 June 2010
  - 20 July 2011

Main authority/authorities or organisations
- Owner and operator of the water engineering structure: SVP, š.p. [Slovak Water Management Company, state enterprise], Piešťany branch, Upper Nitra administrative authority in Topoľčany, water management operations section
- Project drawn up by: VODOTIKA, a. s. Bratislava
- Works carried out by: SVP, š. p., Piešťany office, Upper Nitra Catchment facility in Topoľčany, sub-contractor HYDRO, s. r. o. Topoľčany.

Description
At the site in question - the mountain settlement of Lehota pod Vtáčníkom - regular flooding occurred at times of high precipitation. The Suchý stream flows through the centre of the built-up part of the municipality and is partly modified and culverted (on the section in the centre of the municipality underneath the road and at the confluence with an unnamed tributary) but not able to handle floodwaters. The construction of a dry polder catchment above the town was a suitable solution.

Construction began on 16 June 2003 and was completed on 30 November 2004.

The total cost of construction was EUR 757 863.54 (ex. VAT), of which EUR 207 859.09 came from own resources and EUR 550 004.45 from the Swiss government (ex. VAT).

Further information
From the hydrological structures manager of SVP, š.p., Piešťany branch office, Upper Nitra administrative authority in Topoľčany.

**Contact point**
Lehota pod Vtáčnikom

municipal office telephone number: 046/5469173,5469115

mayor: Ján Cipov

district: Prievidza

region: Trenčín
**SUČANY – MODIFICATION OF FLOW OF SÚČIANSKY POTOK STREAM**

**Summary description**

In the municipality of Sučany in the Martin district there are two watercourses – Sučiansky potok and Brezinský potok – which have been difficult to manage since they were transferred to our organisation in 1994 from the State Agricultural Improvement Administration [Štátna melioračná správa]. Quite regularly, twice a year (when there is a sudden increase in water flow during summer storms and in the thaw after winter) the streams used to burst their banks and threaten nearby family homes and farm buildings. These buildings are often located on the bank-line of the stream, which is only 50 to 70cm wide in places. In this case the river bed was not capable of draining even Q1, annual = 0.350 m³/s. On both water courses, the capacity problem lies not only in an insufficient breadth, but also in an unfavourable gradient, since in some local sections the gradient approaches zero. Despite regular operational measures including removing sediment from the bed, it was not possible to eliminate flooding to a degree that prevents damage.

Since the proximity of residential housing and farm buildings did not allow a capacity increase by widening, it was necessary to protect the municipality by capturing precipitation waters above Sučany using polder reservoirs on the Brezinský potok left-tributary.

The construction work to create three polders and modify the Sučiansky potok stream through the built-up area began in 2003 and the structure was put into permanent use in October 2004. It was funded with a contribution from the Swiss Ministry of Foreign Affairs. The total volume of water held when the polder is at full capacity is 43 950 m³.

**Geographical scope**

The hydrological river basin of the Váh river, the partial river basins of the Sučiansky potok and Brezinský potok, Turiec region, Sučany

**Timing**

Implementation of works in 2003 and 2004

**Main authority/ authorities or organisations**

SVP, š. p., Banská Štiavnica, Piešťany branch office, Upper Váh Catchment Administrative Authority, Ružomberok

**Description**

The municipality of Sučany currently comprises 4 600 inhabitants, predominantly housed in individual housing units. In the past family houses and farm buildings were built along both banks of the stream, and planning permission was issued in a manner which allowed buildings to be sited right up to the bank-line. Despite the regular occurrence of flooding, the planning offices failed to respect the hydrological requirements of the water course in terms of the safe drainage of floodwaters. The existing reinforcement of the banks was done in a desultory manner at the same time as the area was settled. The gradual increase in the population and the density of buildings, which brought with it the narrowing of the stream bed, caused a situation in which the channel was not able to drain even Q1-annual. The last two floods recorded before the implementation of the ‘modification of flow of Sučiansky
potok stream’ project were in 2002. At that time the roads and immovable property in the individual housing unit settlement area in the part of the town parallel to the Sučiansky potok and Brezinský potok streams was inundated. Since the housing area reaches as far as the bank-line, the watercourse manager was unable to carry out maintenance by removing river-bed material to increase the flow capacity, or to carry out repairs or reinforcement of the banks. The regulation of flows to Q50 to Q100 in the form of an investment project did not enter into consideration since increasing capacity would entail removing the functional buildings of the built-up area. The only realistic and suitable solution was therefore to build polders above the town.

The drainage conditions of the Sučiansky potok have been addressed with two types of measure:

The first measure was an increase in capacity at the most critical locations in the built-up area.

The second measure was the reconstruction of existing retention reservoirs and an increase in the capacity of the retention volume in the three polders. These polders are located outside the built-up area of the municipalities of Sučany and Turčianska Štiavnička.

Martin District Office Decision No ŽP 2003/01255-vod.Ma of 16 July 2003 gave permission for the creation of hydrological works. In July 2003 the building site was transferred to the contractor. The works consisted of the following structures: SO 01 Turčianska Štiavnička polder, SO 02 Za tehelňou polder, SO 03 Pod skalou polder, SO 04 modification of Sučiansky potok in built-up area.

The total financial cost of the investment project was SKK 11.7m in 2004.

The hydrological works were carried out in conformity with the approved Sučiansky and Brezinský potok Works Code. Since completion of the works in 2004 only one case has been recorded of all polders filling to their maximum level and thus of the unregulated drainage of excess water through the emergency spillways. The result of this was localised breaking of banks in the built-up area; no damage was caused, however.

Although the 8-year monitoring period is short, the investment project has clearly had a positive impact on the protection of the built-up area of the Sučany municipality.

**Contact point**

Ján Vykoč, SVP, š.p. [Slovak Water Management Company, state enterprise], Piešťany branch office, Upper Váh Catchment Administrative Authority, Ružomberok, jan.vykroc@svp.sk, 044/432 83 74-6, 0914/325 863
**USE OF THE ŠURANY PUMPING STATION AND THE ŠURANY POLDER DURING FLOODS IN JUNE 2010**

**Summary description**

The use of an area as a dry polder to capture excess water in order to protect the town of Šurany and the use of a pumping station for excess water as a release structure for the polder during flooding in June 2010, thereby protecting settlements from the threat of the rivers Nitra and Žitava breaking their protective embankments.

**Geographical scope**

Váh river basin, 4 – 21 – 12

partial river basin: Nitra,

region: Nové Zámky district

site: Šurany

**Timing**

1–11 June 2010

**Main authority/ authorities or organisations**

SVP š.p., Piešťany branch office, Lower Nitra Catchment Administrative Authority, Nitra

**Description**

The original purpose of the station was to pump excess water into a recipient – the river Nitra. During the flood episode of 1-11 June 2010 floodwaters exceeded levels previously reached in the Nitra and Žitava river basins. Around the confluence of the Žitava and the Nitra there was a slowing of water flow and a significant increase in the level of both rivers; this led to multiple breaches of the protective embankments. For instance, the embankment on the right bank of the Nitra was exceeded by around 30-40cm. Since access to the inundated stretch of the Dyke was possible only by helicopter, repairing the dyke was a particularly complicated and slow task. Faced with this situation, SVP š.p. decided to use the exit sluice-gate of the Šurany pumping station as a dry polder release mechanism. Earth was heaped onto the Ondrochov – Mojzesovo asphalt road to create the missing upper embankment of the polder, and a gradual filling of the polder began. An area with a volume of around 3 to 5 million cubic metres was used. This operation led in a short period of time to a reduction of around 40-50cm in the level of the Nitra, which enabled the placing of flood-protection sandbags on the embankments and facilitated the repair work on the embankments at this location. The experience of this flood event has shown how necessary – indeed, essential – it is to have a space to retain the necessary volume of water in a short period of time.
Contact point
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ASSESSMENT OF THE SAFETY OF THE KRPEĽANY, ŽILINA AND HRICOV DAMS IN RELATION TO LARGE VOLUMES OF WATER

Summary description
Flood protection is a key water management task in Slovakia. The experiences of recent years have led us to conclude that flood protection really is a pressing issue. For this reason we added the above project to the list of scientific and technical tasks to be undertaken by the Ministry of the Environment; tackling these jobs means dealing with flood protection in the context of dam operation.

The main aim of the project was to assess how the Orava and Liptovská Mara dams work together to retain large quantities of water on the river Váh, and their effectiveness in relation to the dams at Krpeľany, Žilina and Hričov, and a general analysis of conditions governing the convergence of flood waves from the Orava and Váh rivers. The ultimate objective of the whole set of tasks is to prepare a hydrological and technological basis for an overarching operational code for managing the entire system of dams on the River Váh.

On the basis of the results of analyses carried out and conclusions published, we can say that the Krpeľany, Žilina and Hričov dams under assessment meet flood protection criteria and their own technical safety criteria.

Geographical scope
- the drainage characteristics of the Orava river basin and the Liptov reach of the Váh river basin;
- the drainage characteristics of the Váh river basin from Krpeľany to Hričov.

Timing
The example project encompasses a series of different scientific and technical tasks related to flood protection issues in the Váh river basin. These were addressed by the Water Management Research Institute (VÚVH) in Bratislava between 2003 and 2006, not only as part of the current project, which was made up of three stages corresponding to the years from 2004 to 2006, but also as part of direct commissions by the Piešťany Branch Office of the Slovak Water Management Company.

Main authority/authorities or organisations
Ministry of the Environment/ Slovak Water Management Company, Piešťany Branch Office

Description
In terms of floodwater convergence, and thereby the concentration of large volumes of water, the confluence of the Orava and Váh rivers at Kraľovany has a very unfavourable configuration in the context of the Váh river basin as a whole. There are several direct reasons for this. The first and most important is that the two watercourses are roughly equal in size at this point: they have almost the same river basin surface area and the length of the watercourses in both is roughly the same. This inevitably means that their floodwater high points meet each other at almost the same time.
An important factor complicating the analysis of floodwater convergence – and its ‘predictability’ or ‘calculability’ – in this area, is the relatively large area and fragmented nature of the river basin, with significantly different drainage characteristics (comparing the Orava and the Váh) and climatic conditions. From this perspective the extent and differentiation of the precipitation causing the flooding have a very significant effect on the relationship of the two rivers at the confluence. This has both a positive and a negative aspect. On the positive side, the probability that the entire river basin will be hit by heavy rain over a short period is relatively low; the probability of extremely large floodwaters arising is also low – even the biggest flood event in 100 years did not give rise to a ‘full hit’.

The main aim of the research task submitted was to assess how the Orava and Liptovská Mara dams work together to retain large quantities of water on the river Váh, and their effectiveness in relation to the dams at Krpeľany, Žilina and Hričov, and to provide a general analysis of flood wave convergence conditions on the Orava and Váh rivers. Our analysis of the convergence of floodwaters was based on the prevailing operating conditions of both dams following the updating of their operating codes in 2003 and 2004; however, the natural (unregulated) convergence regime on both watercourses was also investigated as a reference analysis.

The aim of this task was to assess whether, in the context of the two dams operating together, there was a dynamic link between them which could lead to a synchronisation of the convergence of floodwater highpoints at the confluence of the Orava and Váh above the Krpeľany dam. In addressing this question the dynamics of tributaries from the intermediate river basin were also analysed and taken into account.

A further aim was to prepare comprehensive documentary material on the regime of large water volumes on the Váh to address other sections of the watercourse or other dams on the Váh cascade from Hričov downwards that are directly and closely linked to the section in question.

The ultimate objective of the whole set of tasks, including those already mentioned and others planned later, is to prepare a hydrological and technological basis for an overarching operating code for managing the entire system of dams on the river Váh.

On the basis of the results of analyses carried out and conclusions published, we can say that all three dams assessed - the Krpeľany, Žilina and Hričov dams - meet flood protection and technical safety criteria.

**Further information**
For further information: Výskumný ústav vodného hospodárstva (Water Management Research Institute - VÚVH), Nábrežie arm. gen. L. Svobodu 5, 812 49 Bratislava, Project No. II.4.2.11, Bratislava, December 2006.

**Contact point**
OTHER EXAMPLES
HUNGARY

Living Danube Project – Budapest Central Wastewater Treatment Plant

Contact point
National Institute for Environment, Dr. Perger László, perger.laszlo@vkki.hu, 0036-1-225-44-00

Summary description
The project was the biggest environmental investment in Central-Europe ongoing since 2004. It included the establishment of the Budapest Central Wastewater Treatment Plant.

Geographical scope
Hungary, Danube river basin district

Timing
The project started in 2004 and ended in August 2010

Main authority/authorities or organisations
Municipality of Budapest

Description
This project was the biggest environmental investment in Central-Europe ongoing since 2004. It included the establishment of the Budapest Central Wastewater Treatment Plant, the capacity increasing of 3 pumping plants (the Ferencváros, the Kelenföld, and the Albertfalva pumping plants), as well as the building of the main sewer channels of Buda. It also included the building of the twin pipes under the Danube, and the flood bank to protect the Plant, as well as the new connecting road which helps service the operation.

The collected wastewater runs into 2 jacked twin pipelines to reach the central wastewater treatment plant. This required the expansion and full modernization of three existing pumping stations. The Ferencváros pumping station collecting the sewage of several districts of Pest (Districts V, VI, VII, VIII, IX, X, XIII, XIV and XX), the second one was the Albertfalva pumping station that collects the waste water from Újbuda and a part of Budafok-Nagytétény. The last one was the Kelenföld pumping station, which collects all the wastewater of Buda from Districts I, II and XII and partly from Óbuda to feed it to the Central Wastewater Treatment Plant at Csepel.

In order for the Kelenföld Pumping Station to be able to receive the wastewater from the north- and central sections of Buda, the Buda Main Collector had to be built. This runs all the way south from Zsigmond Square in Óbuda to the pumping station in Kelenföld, which is nearly 7 km long.

The daily capacity of the biological treatment in the Budapest Central Wastewater Treatment Plant corresponds to 1 600 000 population equivalent pollution load and the plant is capable to receive 350 000 cubic metres of waste water per day.
According to the original plans, the disinfected and odourless sludge produced at the Budapest Central Wastewater Treatment Plant would have been transferred via public roads to the Cséry Composting Plant in District XVIII to a newly built totally closed composting plant, to make compost suitable for agricultural usage. This solution was discarded, partly because of the protests of citizens and the local authority of District XVIII and partly because of the change in the preferences of the EU regarding the method of sludge disposal and transport. Currently the sludge is treated in plants outside of the city as a temporary measure. By 2012, Budapest prepares a comprehensive and long term plan for the complete disposal and utilization of wastewater sludge created in the capital; it takes into account energy and environmental aspects in a complex fashion.

Further information
http://bkszt.hu/

Contact point
National Institute for Environment, Dr. Perger László, perger.laszlo@vkki.hu, 0036-1-225-44-00
**NUTRIENT REDUCING IN THE DANUBE - WASTEWATER TREATMENT PLANT IN NORTH BUDAPEST AND FLOODPLAIN REHABILITATION IN GEMENC AND BÉDA-KARAPANCSA**

**Summary description**
In the growth of underwater plants, phosphorus (phosphate) and nitrogen (nitrate and ammonium) play an essential role. Important sources of these substances are water purification systems, outpours from fields and human settlements, and also artificial fertilizers. The project aims to raise the quality level of the water in the Danube and the Black Sea by reducing the nutrient emission at Budapest, the biggest pollutant in Hungary. The other area of the project was at Gemenc and Béda-Karapancsa, in southern Hungary, where raising of the nutrient absorbents were the target.

**Geographical scope**
Hungary, Danube river basin, Budapest and Lower Danube (right side) sub-basin

**Timing**
The Wastewater TP in North-Pest project started in February 2009 and ended in Mars 2011 October

The Gemenc and Béda-Karapancsa project started in October 2009 and ended in December 2011 October

**Main authority/authorities or organisations**
Municipality of Budapest

South Transdanubian Environment and Water Directorate

**Description**
1. Wastewater Treatment Plant in North Budapest

The Danube is closely linked to the life of Budapest. The water supply of the almost 2 million people is built on the river. An amount of 500-600 thousand cubic metres of sewage water is produced and returned every day to the Danube. The North-Pest Wastewater Treatment Plant receives 200 000 cubic metres of the total amount.

As a result of the development of the North-Pest Wastewater Treatment Plant the quality of the water returned to the river will increase significantly due to biological treatment and nutrition removal. The plant will remove the nutrients of 160 000 cubic metres of water on a daily basis. The nitrogen load decreases by 32 %, while the phosphorous load by 17%.

2. Floodplain rehabilitation in Gemenc and Béda-Karapancsa
The water of the Danube has incredibly high value of nutrients, which is the main cause of water logging, low oxygen levels and in the end of the damage of the ecosystem. The Danubian floodplains of Gemenc and Béda-Karapancsa are wet habitats with a rich diversity of species. They are situated along the Danube that has a lot of free water stock. Due to insufficient water regulation on the floodplains these areas are threatened by drought.

The area has the above mentioned double environmental problems. The solution is to run water from the Danube to the areas of environmental importance to help lessen the water shortage. Thanks to the measures the floodplains’ ecosystem absorb the nutrients and the quality of the water in the Danube rises.

The project was funded by the World Bank. The project aimed to raise the water quality of the Danube and its whole watershed, including the Black Sea. At local level it meant the establishment of a better functioning floodplain by directing water to the area of Gemenc and Béda-Karapancsa. The improved water quality makes an opportunity to ameliorate the ecosystem, raise the aesthetic and recreational quality of the area and to reanimate old farming methods.

The main aim of this project was to reduce the nutrients of the water with a better water regulation system of the floodplains, anabranches and oxbows. In the project the more frequent and heavier flooding possibilities of oxbow lakes were especially significant to make because their ecosystem is capable to absorb nutrients and phosphorous in a notable quantity. It also helps to lessen the eutrophication and nutrient-load of the Black Sea, just like to develop the habitats around and along the river Danube. The nutrient retaining capacity raises from 3800 tons to 5500 tons, in case of the phosphorous the efficiency increases by 40 %. The rehabilitation included ten water systems in the area of Gemenc and Béda-Karapancsa. The interventions included dredging and the building of several hydraulic structures. Among the achievements of the project the progress of the forest and wood management, the improvement of fishing and eco-tourism can be taken into account too.

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NETHERLANDS

WATER BODY FACTSHEETS

Summary description
For every WFD water body a factsheet has been derived. These factsheets hold all WFD relevant information; from delineation to measures and status. These are updated by the competent authority, at least once a year (but can be updated throughout the year). From 2013 these factsheets will be made public every year to increase transparancy.

Geographical scope
National, river basin district, sub-basin, region, local.

Timing
Ongoing since 2011

Main authority/authorities or organisations
Ministry for Infrastructure and the Environment, Provinces, Water Boards, Municipalities

Description
For every WFD water body a factsheet has been derived. These factsheets hold all WFD relevant information; from delineation to measures and status. These are updated by the competent authority, at least once a year (but can be updated throughout the year). From 2013 these factsheets will be made public every year to increase transparancy.

Further information
Coming in 2013.

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SLOVAKIA

PROJECT WACO

Summary description
International cooperation project between Košice Branch Office of the Slovak Water Management Company and the Dutch Water Bank involving a cooperative water management partnership in integrated water basin management, with public participation, river engineering, technical and ecological aspects and an exchange of experience in using EU funds and implementing the Water Framework Directive.

Geographical scope
Košice region

Timing
1 January 2009 to 31 December 2011

Main authority/authorities or organisations
Regge en Dinkel Water Board

Description
The project consisted of five sub-projects:

- Comprehensive water management on the right bank of the river Ondava.

The main goal of this sub-project was to re-evaluate and optimise the water management system in a pilot area and propose effective measures that would be beneficial for water management and have an equally positive impact on the social and economic development of the area, while also taking ecological aspects into account. A sustainable management plan is to be drawn up on the basis of the measures proposed.

The Slovak Water Management Company’s Košice branch office has created a long-term plan for this area, in cooperation with various interested parties, including businesses and the people who live and work in this area.

- Consultations on EU funds

Sub-project 4.2 was an integral part of sub-project 4.1 from the very beginning. From the start of sub-project 4.1 it had to be clear what the conditions for EU support would be. In addition to specific options, the possibility of support from the EU (or other funds) was investigated as well.

- Delineating watercourse inundation zones

Requisite data were collected during the project. The Terebľa watercourse, with a total length of 14 km (the section of interest runs from river kilometre 0.0-11.0) was chosen as the pilot watercourse for establishing inundation zones. The Slovak partner sent all available data for
the water course (maps, general information, n-year waters and cross sections at selected locations and Q1-Q100 water levels) to our Dutch partner, which proposed a strategy.

- Communication and exchange of information on the implementation of the Water Framework Directive

A communication strategy was formulated for the ‘Comprehensive water management on the right bank of the river Ondava’ project, contingent on the situation in project 4.1.

As part of the communication strategies a brochure about the Slovak Water Management Company was published, two seminars on communication strategies were held in partner organisations and an informative water map and accompanying guidebook entitled ‘Cesty vody na východe’ [Water routes in the east] was published. The Dutch were sent information on the process in place to implement the Water Framework Directive in Slovakia.

- Study on the development of hydrological and ecological aspects of the river Latorica

The aim of the project was to compile data that could be used in projects to rehabilitate rivers in the Regge en Dinkel Water Board area. Data was collected and evaluated and the current state of the river was described.

**Contact point**

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Water Sensitive Urban Design in Wales

Summary description
Water Sensitive Urban Design (WSUD) is an interdisciplinary and partnership approach to address WFD issues for urban water bodies and those affected by urban pollution.

Geographical scope
WSUD programme in Wales is at a national level with pilot projects at the sub-catchment level.

Timing
CIRIA Scoping Study and Business Case – first workshop in Cardiff March 2012
WSUD Pilot Valleys to Coast (social housing) – to be completed May 2012
WSUD Pilot Cardiff – to be completed July 2012

Main authority/authorities or organisations
Environment Agency Wales, Dwr Cymru Welsh Water, Cardiff County Council, Bridgend County Council, Valleys to Coast Housing Association

Description of the example
Water Sensitive Urban Design (WSUD) is a holistic approach to planning/retrofitting development within the limits of the water environment which has been implemented in Australia. WSUD provides an interdisciplinary and partnership approach to address WFD issues for urban water bodies and those affected by urban pollution.

WSUD delivers an integrated approach to water management that recognises ecosystem services and creates environmentally engaged communities. WSUD provides an opportunity to bring together a broader range of practitioners to both retrofit existing spaces and ensure new development maximises ecosystem services. WSUD can more cost effectively deliver environmental outcomes across the range of functions delivered by EAW, water companies, and local authorities.

A number of opportunities for WSUD are being taken forward in Wales including:

• We’ve co-funded with CIRIA and water companies a WSUD scoping study and business case. The first workshop in Cardiff was successful in getting stakeholder support and starting to develop a vision for Wales. This will deliver key outputs to support the Welsh Government’s forthcoming water strategy and provide a framework to guide their water policy.

• We’re working with Dwr Cymru Welsh Water (DCWW) and Valleys to Coast Housing Association to undertake a scoping study for a social housing pilot. This can lead to wider benefits with 16% of properties in Wales are social housing. Benefits will include less
combined sewer overflow pollution incidents, less sewer and surface water flooding, improved biodiversity and quality of runoff to the main river, and reduce demand for water through water efficiency.

• We’re also working with DCWW and Cardiff County Council to co-fund a scoping study for a WSUD pilot in the centre of Cardiff (£20,000). This will quantify benefits from reduced sewerage spills from the main pumping station, reduced sewer and surface water flooding, improved biodiversity and quality of runoff to the Taff, and reduce demand for water through water efficiency

Further information
• CIRIA Scoping Study http://www.ciria.org/documents/WSUD/WSUD/index.html

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