

# NEWSLETTER

# ECRR



European Centre for River Restoration

## From the editors

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### Background

Throughout the world, the state of environment and threats to nature are causing concern. Valuable natural areas are disappearing at an alarming rate: Rain forests, coral reefs and wetlands, to name but a few. They are falling victim to human need and human greed.

It is happening in the developing world, where human need is greatest, as well as in the industrialised world, where human greed often exceeds need.

One of the greatest challenges facing us today is to end this wanton destruction of nature. In our quest for a solution, we must not consider technical measures alone. We must search for, and fight for, policies which meet the needs of the less wealthy nations while curbing the greed of the rich.

### The first steps

The first tentative steps have been taken. The 1992 UNCEP Conference in Rio has already made its mark. One of the most important things to

emerge from the conference was the declaration to preserve our global biodiversity, a declaration which now forms the framework for a great deal of international nature protection work.

As an example of more recent initiatives, the Dobris Assessment was published by the European Environment Agency in 1995. It identified 12 major environmental issues to be addressed in Europe. Among these issues is the management of freshwater ecosystems and the loss of biodiversity.

For centuries, the soil has been a major national resource in many European countries. As a result, agriculture has played a major role in shaping the European landscape.

Europe had a crying need for more arable land, and fertile soil was the most valuable resource, supporting our most important livelihood. In many countries it was regarded as an honourable challenge to reclaim land, even when the necessity for such action declined – when greed began to take over from need.

Wetlands have been transformed into arable land by drainage. Num-

erous rivers and streams have been straightened and deepened to make them more efficient in removing water from the fields.

It is very tempting to call it destruction. But we ought to look back on the activities of the past with a little more leniency. We should try to see things from the point of view of the people of that era, while at the same time using our experience to avoid similar mistakes in developing countries and poor regions currently in a similar situation.

### Seminar on nature restoration

In 1995, the Danish Ministry for Environment and Energy together with the Dutch Ministry of Agriculture arranged a seminar on the broader aspects of nature restoration in the EU.

Nature restoration is a significant measure in the struggle to improve the biodiversity of plants and mammals. However, one of the major conclusions of the seminar was that the restoration of wetlands to more a natural state may well have implications that reach far beyond the

protection of wildlife. The restoration of wetlands can safeguard the quality of our surface water and groundwater. When we restore wetlands, we also restore the natural cleaning properties that characterise natural wetlands. Moreover, if we re-establish the storage capacity of the wetlands in the upper reaches of rivers, we can also reduce the risk of serious flooding in the downstream reaches. We hinder the domino effect – and that is most assuredly a better remedy than protective dykes.

### Many new projects in Europe

Restoration of the natural properties of rivers and other wetlands is no longer the uphill struggle it was when

arable land was at a premium. Current trends in EU agricultural policies are opening up unseen opportunities for nature restoration. The last areas of nature to be harnessed into agricultural use were the wet areas along the rivers and streams. Such areas have a limited lifetime as arable land and are the first to be abandoned. They are important targets for nature restoration and many projects are under way throughout Europe. Most of them, thankfully, are being conducted with considerable support from the local population.

It is important for the future of nature restoration in the EU that some of the financial subsidies in the agricultural sector be transferred from supporting agricultural produc-

tion to supporting nature restoration in farmland. As the Danish Minister of Environment and Energy put it “EU taxpayers will demand more nature value for their money”. This would be preferable to being forced to contribute, year after year, to the short-term set-aside schemes. Denmark would welcome a subsidy model that links agricultural production to environmental initiatives.

The river authorities in many European countries have acquired expertise in river restoration. The establishment of the EU-supported European Centre for River Restoration is an encouraging sign of increased international co-operation.

# European Centre for River Restoration

There is currently widespread European interest in restoring river and floodplain ecosystems for the benefit of wildlife. At the same time, there is increasing awareness that reinstating naturally functioning river-floodplain systems may bring catchment management benefits, particularly by increasing flood-storage capacity, leading to increased nutrient retention and ameliorating low flows. Sustainable management and restoration of river and floodplain ecosystems may also reduce river maintenance costs and provide better for amenity and recreation facilities.

and implementation of EU environmental policy. The European Centre for River Restoration (ECRR) was established in 1995 as part of the joint demonstration project. The Centre is now based at the National Environmental Research Institute in Silkeborg, Denmark.

The main aims of the ECRR are to promote sustainable river and floodplain management and restoration measures, and to ensure widespread implementation and dissemination of river-floodplain management and restoration activities. The

ECRR focuses on establishing state-of-the-art management of rivers and restoration of natural habitats in damaged rivers and their floodplains. This will be achieved through the use of the experience gathered in the European countries regarding river management and restoration concepts and methodology, as well as planning, execution and effect monitoring of restoration projects.

The aims of the Centre will be achieved through developing a European Network of relevant national institutions (see figure 1).

### Centre for River Restoration

In 1993, the EU LIFE Programme granted funds to establish a major European Demonstration Project in Denmark and the United Kingdom (see later). LIFE is an EU financial instrument that supports demonstration projects aiding the development

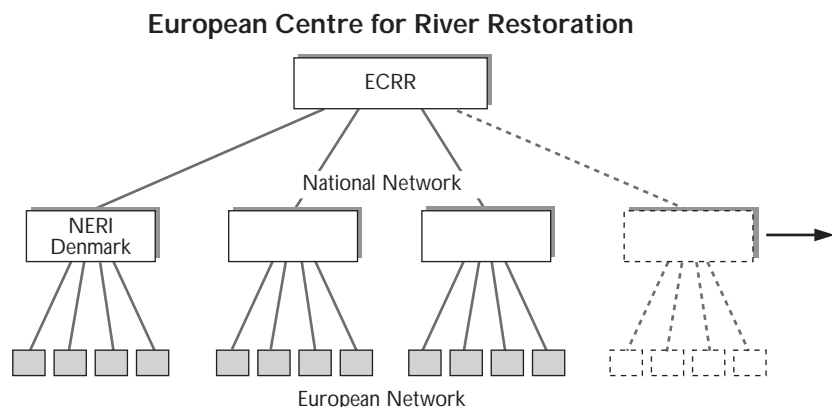


Figure 1. The European Centre for River Restoration and the European River Restoration Network.

Through a collaborative framework the ECRR and the European River Restoration Network will ensure that the experience and knowledge obtained throughout Europe concerning river and floodplain management and restoration will be collected, assessed and communicated to the European audience through newsletters, conferences, workshops, technical handbooks, videos, etc.

### River Restoration '96 Conference

In September 1996 the ECRR hosted its first international conference – River Restoration '96 – in Silkeborg, Denmark. The aim of the conference was to provide environmental managers and scientists a forum for disseminating and discussing results and experience with the planning, execution and effect monitoring of river restoration projects throughout the world. The focus was on the ecological effects of various restoration

measures in small lowland rivers, especially physical modification of watercourses and the effects this has on habitats and biota. The concept of rehabilitating streams and river system was discussed, and specific examples of rehabilitation projects were presented.

The four-day scientific programme thus covered many aspects of the restoration and management of river and catchment ecosystems, and provided some indication of the direction in which river restoration work is currently moving. In addition to plenary lectures, oral sessions and poster presentations, the programme also included a full day excursion to selected Danish stream restoration sites.

A selection of representative conference papers will be published in a peer-reviewed special issue of "Aquatic Conservation – Marine and Freshwater Ecosystems" in late summer 1997. The plenary lectures and the majority of the oral and

poster presentations will be published in proceedings form at the beginning of 1997.

### ECRR Newsletter

This newsletter is the ECRR's first English language newsletter and together with other relevant material, will be sent out once or twice a year. Hopefully, this will help the exchange of experience on river restoration and keep the flame burning for further research and monitoring, as well as provide the tools necessary for significant progress on nature restoration in the European countries.

One of the intentions with this newsletter is to enable many persons working with river restoration as possible to air their views.

You are thus invited to submit contributions concerning river restoration projects, conferences etc. to the newsletter editorial office at the ECRR.

## Viewpoint

by *Torben Moth Iversen*,  
*The Danish National Environmental Research Institute*

Biodiversity is accorded high priority on the European political agenda, as clearly reflected in the 5th Environmental Action Plan of the European Union "Towards Sustainability". Similarly, Agenda 21 from the UNCED Conference in Rio shows that biodiversity is a worldwide concern.

When biodiversity is discussed in the media, one often gets the impression that loss of biodiversity only takes place in the tropical rain forests or the terrestrial environment. This is a false picture, however, as loss of biodiversity in the aquatic environment is at least as important.

Increasing pollution by untreated or inadequately treated sewage effluent has long had a detrimental effect on the environmental quality of European rivers with resultant loss of biodiversity. Many species that are characteristic of an undisturbed environment have become rare, and some have disappeared completely.

During the last one to two decades, sewage treatment has increased markedly and river water quality has improved correspondingly. However, there has not been an equivalent improvement in the environmental quality of the rivers.

The reason for this is well known: The natural course of many streams has been radically changed through channelization for flood control, drainage of agricultural land, navigation, erosion prevention, urbanisation, etc. In Denmark, for example, only 10% of streams have maintained their natural physical properties. Revision of the Watercourse Act in 1982 made it legal to improve the physical quality of rivers through restoration, and government subsidies have enabled many river restoration projects to be undertaken. Similar activities have also taken place in other countries, in line with the 5th Environmental Action Programme, which identifies restora-

tion as an important measure for maintaining and improving European biodiversity.

Although river restoration activities are on the increase, it is my opinion that there is a general lack of necessary scientific documentation. Such documentation will help improve restoration quality. Moreover, it is important that the ecological benefits are well documented to the public, the only way to maintain and hopefully increase river restoration activities being to prove to tax payers that they get value for their money.

It is my hope that this newsletter will serve to encourage the undertaking of well documented river restoration projects throughout Europe, such projects being important as the visible results show that it is worthwhile making the effort to improve our rivers.

*Readers are encouraged to express their viewpoints in this space in concise English – max. 1 page.*

# Projects

During the last few years several river restoration projects in Denmark have been granted funds from the EU-LIFE-programme. LIFE is a European financial instrument that supports demonstration projects which aid the development and implementation of Community environmental policy. The following describes one of the major projects supported by LIFE.

## River Restoration: Benefits for Integrated Catchment Management

by Mogens Bjørn Nielsen,  
Project Leader, Geologist

### Introduction

In 1993 the EU LIFE-Programme granted funds to establish a demonstration project in connection with a major river restoration project in Denmark and the United Kingdom.

The project results in restoration, monitoring and other results for a total of about £5 mill in Denmark and the UK. The EU-funding is about £1 mill. Various local, regional and state funding supported by different funds grants the rest.

The key objectives of the project are to:

- establish a European Demonstration Project on three sites applying state-of-the-art techniques for the restoration of natural habitats in damaged rivers and their floodplains;
- demonstrate through a comprehensive monitoring programme the physical, chemical and biological effects of restoration on integrated catchment management, which benefits nature conservation, water quality, river hydrology, flood prevention and amenity;
- illustrate how to establish partnerships to facilitate achievement of common goals which cannot be achieved by single agencies alone;
- determine the cost-and-benefit of restoration schemes;
- provide a framework for determining the public perception of river restoration work;

- involve, motivate and train those who influence or undertake river management work (e.g. water managers, landowners, developers, politicians, environmental organisations); and
- widely disseminate information about river restoration using pan-European networks.

Objectives will be achieved through:

- physical restoration of river and floodplain on three river sites;
- a comprehensive monitoring programme - pre-works, during works and for two years after work completed;
- production of reports, a video, a river restoration handbook and other material on project development, implementation and effects;
- development of a network and a conference on river restoration.

The project is realised in a co-operation between several Danish and British authorities and organisations. Responsible for the project management and the international co-operation is The County Council of South Jutland (Sønderjyllands Amt).

The partners include the National Environmental Research Institute in Denmark and - in the UK - National Rivers Authority, River Restoration Project Ltd., English Nature, Darlington Borough Council, Countryside Commission, National Trust and Northumbrian Water Ltd.

### The Demonstration Sites

The project involves the restoration of three straightened or severely engineered river reaches, 2-5 km long. The sites have been chosen to be applicable to a wide range of European lowland rivers. They include water courses of a variety of sizes located in different geological substrates both in rural and urban catchments. The physical work includes both channel restoration and floodplain restoration (meander bends, wetland and riparian zones).

## River Brede, South Jutland, Denmark

A river flowing mainly in a rural, farming area to the Wadden Sea. The river has been completely straightened to drain water from its floodplain in order to support intensive grassland farming.

Already in 1994 the construction work on the site in River Brede was finished. The restoration site is situated just downstream a 3.5 km 1991-restored reach. In 1995 the construction work was continued further 5 km downstream resulting in a total restoration of approximately 12.5 km stream with meanders and wetter adjacent meadows. Also small lakes, ponds and a large moor have been restored in the catchment of River Brede. In the stream itself gravel for spawning grounds mainly for Sea Trout and Salmon has been laid out. More than 10 weirs and obstacles for free fauna passage have been eliminated in the catchment.

## River Skerne, Darlington, North East England

River Skerne – a tributary to River Tees - flows through the centre of the city of Darlington. River Skerne has lost most of its flood plain to urbanisation or ancient industrial tipping. The 2 km reach is located in the upstream edge of the town, where a small remnant of flood plain has survived and is utilised as tightly mown parkland each side of the straight river. This is bordered by residential housing that suffers occasional flooding.

In the summer of 1995 a meandering river channel was restored to the remnant flood plain and the spoil gained from this work utilised to re-contour the valley sides to provide more natural land forms. Numerous surface water sewerage outfalls were reconstructed to intercept the discharge of polluting silts and oils. The physical reconstruction of the river enables the parkland to be developed as a natural wetland wildlife area providing considerably enhanced amenity for local people.



Figure 2. The River Brede near Løgumkloster during restoration. The new meanders have been dug and the former channelized path has not yet been filled in.

This work is completed by enhancements to the lower half of the reach, that is dominated by tipping right up to the river banks.

### River Cole, Oxfordshire-Wiltshire border, Southern England

A small tributary of the River Thames with its headwaters in the urban fringes of the large town of Swindon. In the upper half of the 2 km long project reach the river has been straightened and impounded to serve a watermill. Below the mill a straight channel has more recently been widened to support arable crops and intensive grass production on the flood plain. During the summer of 1995 the channel below the mill was reformed on a remeandering course to restore historic water levels and flood frequencies that should lead to the reinstatement of once abundant fritillary meadows. Upstream of the mill the impounded water levels have been raised further to create wet pasture and the flow of the river restored to its ancient meandering river course.

### The Monitoring Programme

A crucial component of this project is the comprehensive monitoring programme. The findings are eagerly awaited by politicians, river managers

and environmentalists alike since all need to know what benefits arise from the efforts now being made to restore or rehabilitate degraded river systems.

A key requirement of the project is to utilise objective scientific methods to demonstrate the change from highly modified, and almost certainly impoverished, conditions to much more natural physical, chemical and biological conditions following the completion of the works. At all sites changes in the following are being monitored:

- Physical nature of the channels (including sediments and hydrology)
- Water chemistry.
- Plant communities.
- Macroinvertebrates communities.
- Fisheries ecology.
- Landscape change and improvement.

Key environmental areas are also subject of more detailed studies and focus on:

- Water quality improvements (including the potential to permanently reduce concentrations of pollutants like nitrates).
- Flood defence, including the possibility of using floodplain to intercept storm run-off, store floodwater and reduce erosion.
- Recreation and amenity benefits.

### Communicating the Benefits of Restoration

An important part is the establishment of an EU-network of contacts with organisations, river managers and others with interests in river restoration. Secondly, a European Centre for River Restoration has been established at the National Environmental Research Institute in Silkeborg, Denmark as part of this project (see elsewhere).

In 1994 the construction work on the LIFE site of the Danish River Brede was finished. The main physical work on the two British sites – River Cole and River Skerne – was completed in November 1995.

Monitoring on all three sites was started before the construction work and will continue at least until 1997. The interest has been so great that long-term monitoring of many aspects is assured. Reports to EU will be made in the beginning of 1997 and supporting documents and reports are currently being made.

*Everybody has the opportunity to have restoration projects presented in this space, written in concise English – max. 1 page.*

More information on the river restoration project is available from:

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# Conferences and publications

## International conferences

The Centre has received information about the following international conferences with relevance for river restoration. Further information can be obtained through the Centre or through the e-mail addresses mentioned.

### Fish telemetry in Europe

– CREMA – La Rochelle, France  
7-11 April, 1997

*The conference exchanges ideas on telemetry techniques used in Europe.*  
e-mail: GCLAIREA@ifremer.fr  
or: ALMONTER@ifremer.fr

### Reservoir management and water supply – an integrated system

– IWSA/IAWQ Joint specialist conference. – Prague, Czech Republic 19-23 May, 1997

*The conference aims to bring together the whole spectrum of interested disciplines to exchange knowledge and experiences of the supply of proper drinking water.*  
e-mail: PETRDOL@marvin.jcu.cz

### North American Benthological Society 45th Annual Meeting

– San Marcos, Texas, USA  
26-30 May, 1997

*The purpose of the meeting is to promote better understanding of the biotic communities of lakes and stream bottoms and their role in aquatic ecosystems.*

### Implementing and advancing fish passage technology

– Monterey, California, USA  
25-29 August, 1997

*The goal of the symposium is to present technical and policy advances in fish passage for improved fish protection world-wide.*  
e-mail: ODEHM@external.umass.edu

### Engineering the aquatic environment – 2nd international symposium on ecology and engineering (ISEE)

– Fremantle, Western Australia  
10-12 November, 1997

*The programme focus on scientific processes underlying problems of the aquatic environment, the incorporation of these processes and the engineering solutions of the problems and case studies of solution attempts.*

e-mail: SLY@cwr.uwa.edu.au  
or: A-HADIBH@utmkl.utm.my

## New publications

*Eiseltová, M. & Biggs, J. (eds.): Restoration of stream ecosystems – an integrated catchment approach. – IWRB Publications 37. 170 pp.*

*Hansen, H.O. (ed.) (1996): River restoration – Danish experience and examples. – Ministry of Environment and Energy, National Environmental Research Institute, Denmark. 99 pp. \**

*Hansen, H.O. & Madsen, B.L. (eds.): River Restoration 96: Programme, abstracts and participants. – National Environmental Research Institute, Denmark. 88 pp. \**

*Kristensen, P. & Hansen, H.O. (eds.) (1994): European rivers and lakes – Assessment of their environmental state. – European Environment Agency, Copenhagen, Denmark. 122 pp.*

*Madsen, B.L. (1995): Danish Watercourses – Ten years with the new watercourse act. – Ministry of Environment and Energy, Danish EPA. Miljønyt no. 11. 208 pp. \**

*Madsen, B.L. (1995): Miljø-Tema no. 11: Rehabilitating Danish Streams – Ministry of Environment and Energy, Danish EPA. 28 pp. \**

*Madsen, B.L. (1995): Miljø-Tema no. 8: Farmers and Nature. – Ministry of Environment and Energy, Danish EPA. 28 pp. \**

*Madsen, B.L. (1995): Miljø-Tema no. 9: Agricultor y Naturaleza. – El Ministerio Danis del Medio Ambiente y Energia, La Direccion General Danesa del Medio Ambiente. 28 pp. \**

*Madsen, B.L. (1995): A riverkeeper's field book – A nature guide and field book. – Ministry of Environment and Energy, Danish EPA. 56 pp. \**

*Madsen, B.L. (1996): Los arroyos – 10 años con la nueva Ley de Arroyos: Una coleccion de ejemplos de mantenimiento y restauracion.. – La Direccion General del Medio Ambiente de Dinamarca. Miljønyt no. 21. 217 pp. \**

*Møller, H.S. (ed.) (1995): Nature Restoration in the European Union. Proceedings of a Seminar Denmark 29-31 May 1995. – Ministry of Environment and Energy, The National Forest and Nature Agency, Denmark. 130 pp.*

*\*: Free copies can be obtained from ECRR as long as they are in stock*

## New videos

*Frandsen, S.B. (1996): New meanders of the River Gudenå – A river restoration project.*

*Frandsen, S.B. (1996): Restoration of watercourses in Vejle County.*

*Madsen, B.L. (1995): Care for your beck – A film on the importance of careful maintenance in small streams. \**

*Madsen, B.L. (1996): A natural fringe benefit – A film on stream margins. \**

*Madsen, B.L. (1996): Freedom regained – A film on stream restoration in Denmark. \**

*\*: Free copies can be obtained from ECRR as long as they are in stock. Remember to note which VHS-format you require (PAL, SECAM or NTSC)*