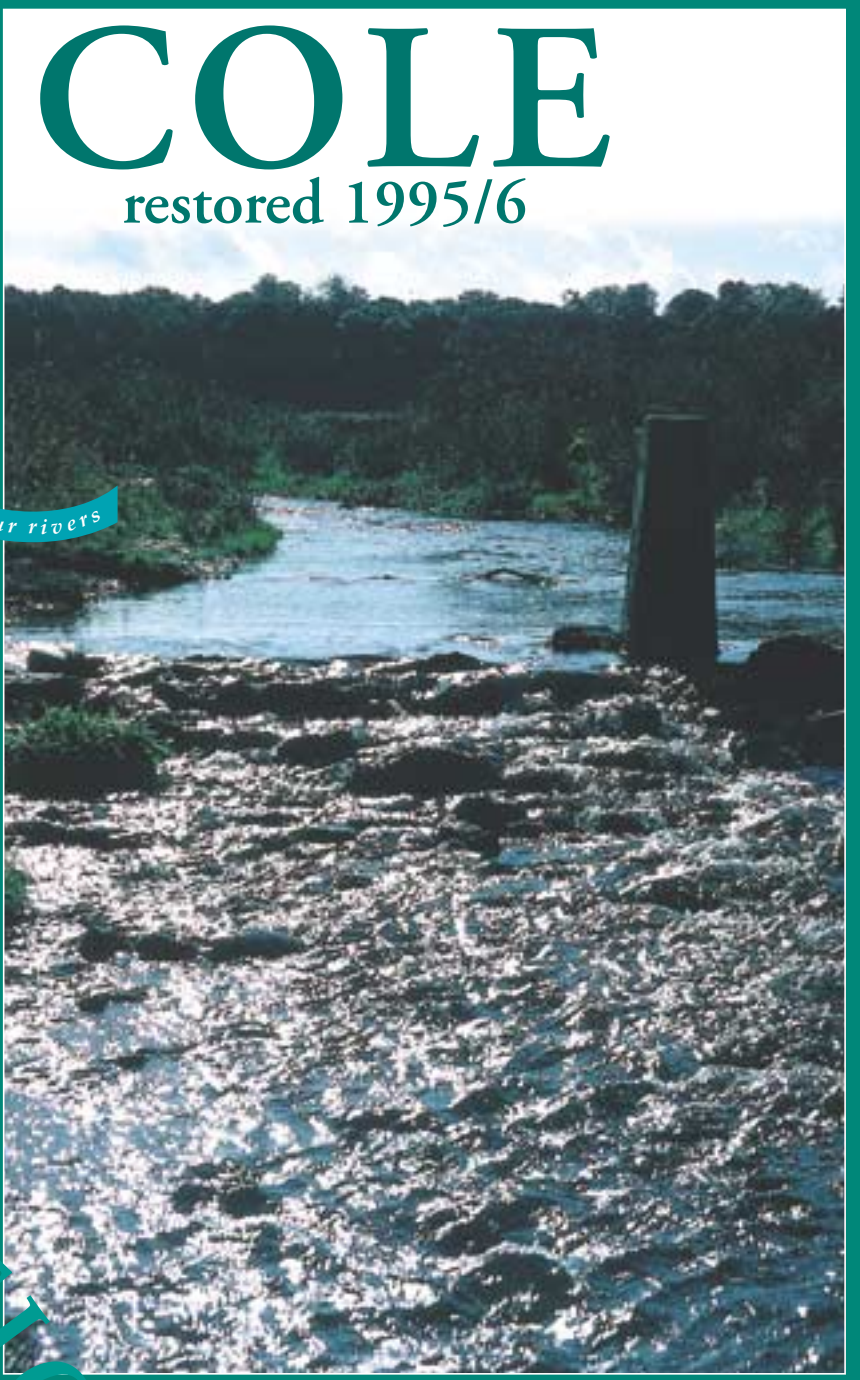
River COLE

restored 1995/6

the River Restoration Project

THE RIVER RESTORATION PROJECT

Working to restore & enhance our rivers



The river Cole restored to its old course on the historic Wilts-Berks county boundary – photo; M Janes)

Joining the River Restoration Project in partnership were the Environment Agency, The National Trust, the Countryside Commission and English Nature.

ENVIRONMENT AGENCY

THE NATIONAL TRUST

COUNTRYSIDE COMMISSION

ENGLISH NATURE

The Cole project is one of three linked under the umbrella of the EU – LIFE programme *(see back cover)*

Life

Additional support was received from the Rivers Agency (Northern Ireland) and from Thames Water.

The quality of many rivers and their surrounding environment has been steadily degraded over recent decades. Straightened, deepened, and sometimes embanked; their valleys and floodplains intensively farmed or developed; much of their natural beauty and value to people and wildlife has been lost.

River restoration aims to reverse this process, using environmentally sensitive management techniques to create sustainable solutions which will give back much of what has been taken away.

The EU–LIFE Demonstration Project

The river Cole project is complimented by two others that demonstrate different aspects of river restoration as explained below. Further brochures are available from RRP.

All three sites were promoted as part of the EU-LIFE demonstration project entitled *River Restoration: Benefits for Integrated Catchment Management.*
The LIFE project was led by the Danish county of South Jutland who undertook the restoration of the river Brede.
RRP was responsible for the restoration of the two UK sites on behalf of the UK participants.

The monitoring programme is co-ordinated across all three sites to ensure that features that are unique to one site are studied in depth and the performance of features that are common can be compared across all three.

Other EU-LIFE project sites

RIVER SKERNE – UK

This site is located in the town of Darlington, Co Durham and demonstrates what can be achieved in an urban environment.

Photo: M James

Photo: Northumbrian Water / AirFotos

The Skerne has been straightened and enlarged to reduce flooding and to drain the surrounding urban area. Much of the floodplain has been raised by old industrial waste tipping, with gas and sewer pipes running alongside the river. As a result of these constraints, restoration opportunities were severely limited – typical of urban rivers elsewhere.

A 2km length of the river has been restored. Four new meanders have been formed in a remaining section of floodplain used as open parkland. The excess soil was used to landscape nearby steep slopes. Riverbanks have been strengthened with willow and reeds to prevent erosion. Ugly surface water outfalls have been replaced with underground chambers that intercept pollution and discharge into the river under water.

Elsewhere, where the river could not be re-meandered, it has been enhanced by re-shaping and narrowing the bed to vary the flow and to allow riverside plants to flourish. New footpaths and planting schemes complete the theme of *"bringing the countryside into town"*, which locally has been greatly appreciated.

RIVER BREDE – DENMARK

The Brede flows through farmland in the low lying county of South Jutland. It differs from the Cole in that the floodplain soils are much lighter sands and peats. Historic meanders had been removed from the river to create a totally straight course to enable intensive grassland farming.

Weirs in the river, as well as the straightening, virtually eliminated a once valuable sea trout fishery.

A 5km reach was re-meandered under the EU-LIFE project, but over 15km of the Brede have now been restored as part of a nationwide strategy to improve the environmental management of river valleys.

Photos: Sønderjyllands Amt

The scale of re-meandering is much grater than in the UK; the Brede once again sweeps from side to side along the 500m wide floodplain and seasonal flooding has been restored to the whole valley.

One unique aspect of this project is the exchange of land between farmers.

The natural regeneration of the meandering river has been rapid and the sea trout are taking advantage of this.

the River Restoration Project

The Organisation

The River Restoration Project is an independent, non-profit making organisation established in 1994 to promote the restoration of degraded rivers for enhanced bio-diversity and sustained economic use.

It draws upon the professional expertise of ecologists, engineers, biologists, geomorphologists and planners, and is advised by representatives of major UK organisations that share responsibilities for land and water management.

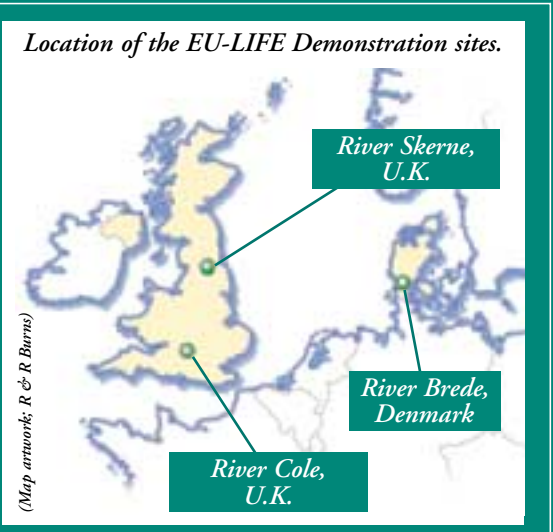
Achievements to date – Summer 1997

The RRP's principle aim has been to serve as a UK wide catalyst through which knowledge can be gained, and experience shared, to the benefit of all those who will undertake river restoration. Four targets were set:

1 Establish state of the art demonstration projects:
The three EU-LIFE projects are believed to be the most comprehensive examples of their kind in Europe today; monitoring programme results will continue to support practice and understanding elsewhere.

2 Establish partnerships for restoration:
The comprehensive partnerships developed for the EU-LIFE projects are built upon a robust framework of documentation covering common aims, legal and financial safeguards and organisational/management responsibilities etc. These partnerships are serving as a model for the guidance of others.

Location of the EU-LIFE Demonstration sites.



3 Establish a River Restoration Network:
The EU-LIFE project has led to the establishment of the European Centre for River Restoration in Denmark; RRP which serves as the UK satellite is effectively dealing with hundreds of requests each year for information, advice, and site visits. These requests come from all sections of the community and the media, at home and abroad.

4 Provide publications and training:
Some background publications on the topic are already available and comprehensive manuals, videos, papers and reports documenting the EU-LIFE projects are well advanced. RRP regularly supports training seminars and conferences organised by others.

The Future –The River Restoration Centre

After invaluable consultation with key UK institutions responsible for land and water management, RRP has been advised that it should continue to function as a UK wide catalyst for information and advice on the topic. New partnerships are being established to enable this to happen; building upon the confidence generated through the EU-LIFE partnership.

As a result, RRP will become known as the River Restoration Centre (RRC) to mark a progression from a project orientated organisation to one that will serve others through:

- Maintaining comprehensive information about the progress of river restoration and ensuring the structured dissemination of this to practitioners across the UK.
- Helping others through a network of professional advisors with up to date experience.
- Supporting the development of projects selected to further advance knowledge and understanding of restoration techniques appropriate to differing river types and situations.

The Cole prior to restoration – trees stranded well above water level by previous deepening (photo; M Janes)

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THE RIVER COLE

About the River Cole

The River Cole runs through The National Trust owned Coleshill estate, NE of Swindon on the Oxon / Wilts border. It has been extensively modified by man for a variety of reasons over the past 900 years, particularly milling. Originally the reach below the mill was simply straightened, but more recently was considerably enlarged to safeguard agricultural production and flood capacity. Above the mill the channel was realigned 200-300 years ago to form the present mill leat. This type of historical management for milling, land drainage and agriculture is typical of many other rivers in the UK.
As a result, the ecology of such rivers has suffered.

Photo: M Janes

The Objectives

- Restoration of the river and floodplain in terms of physical features, flood storage, habitat diversity and visual appearance.
- Application of innovative restoration techniques and best management practice, within a sustainable agricultural system.
- Furthering of knowledge and understanding of river restoration by monitoring to a very high degree, and by practical demonstration of the results.

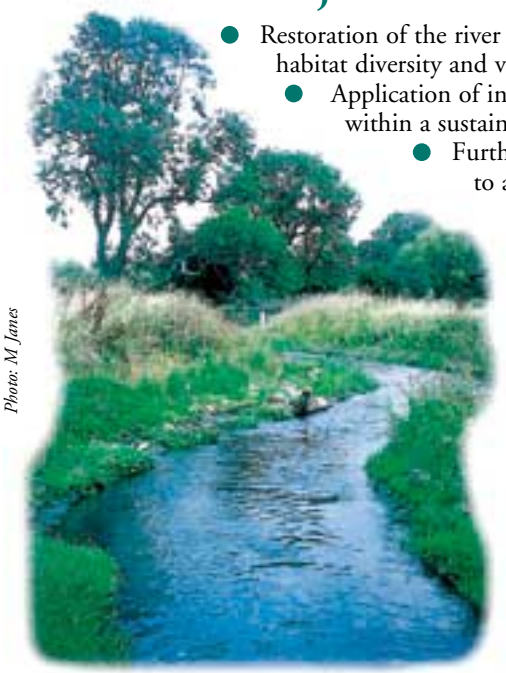


Photo: M Janes

River Cole Restoration

A detailed background study of the channel and flows within the whole catchment gave the size and shape of a typical and sustainable river. From old maps and documents it was possible to establish the upstream pre-mill leat course of the river Cole. The ditch bypassing the mill was identified as a remnant of the old course.

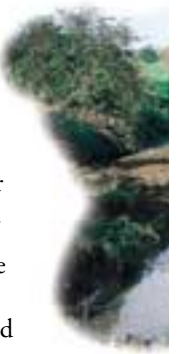
The river was reinstated on the original buried course by excavating a smaller meandering channel and profiling the bed and banks to more natural shapes.

Downstream of the mill, mature trees were perched well above the bed of the old channel, due to a dredging scheme carried about 25 years ago which removed 1m of clay from the river bed. This general bed lowering also served to reduce the water table in the adjacent floodplain fields.

Here the bed level, water level and flood regime of 25 years ago were restored by:

- Cutting a smaller channel 1.2 m above the bed of the old channel.
- Meandering across the old channel keeping mature riverside trees.
- Filling the old course whilst leaving deep backwater pools.

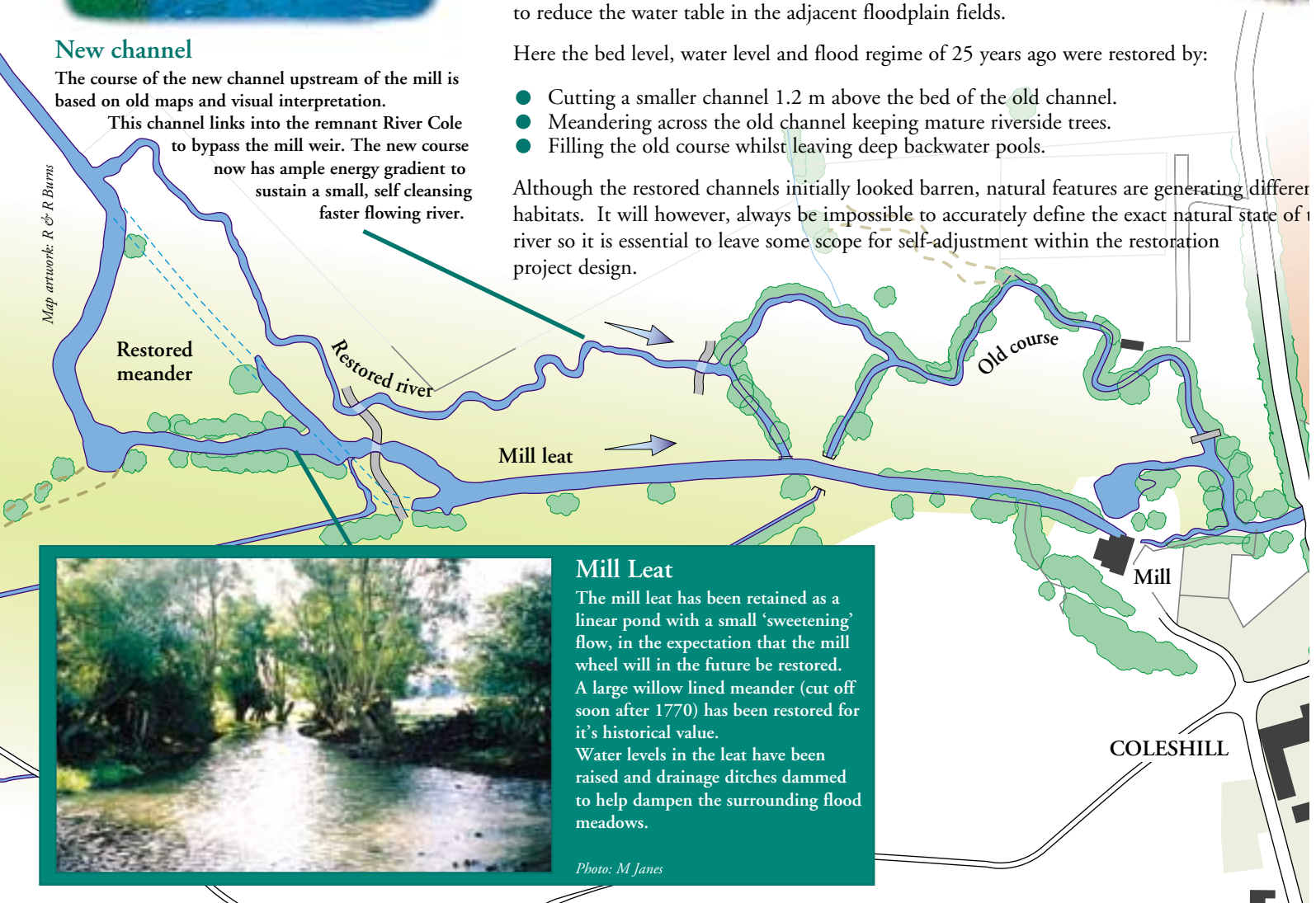
Although the restored channels initially looked barren, natural features are generating differen habitats. It will however, always be impossible to accurately define the exact natural state of t river so it is essential to leave some scope for self-adjustment within the restoration project design.



New channel

The course of the new channel upstream of the mill is based on old maps and visual interpretation. This channel links into the remnant River Cole to bypass the mill weir. The new course now has ample energy gradient to sustain a small, self cleansing faster flowing river.

Map artwork: R & R Burns



Mill Leat

The mill leat has been retained as a linear pond with a small 'sweetening' flow, in the expectation that the mill wheel will in the future be restored. A large willow lined meander (cut off soon after 1770) has been restored for it's historical value. Water levels in the leat have been raised and drainage ditches dammed to help dampen the surrounding flood meadows.

Photo: M Janes

AT COLESHILL

Backwaters and habitats

Whilst much of the old river Cole was infilled, some parts were kept as backwaters to provide a different habitat to the fast flowing, newly restored course.

These areas are over 1m deeper than the new river (the meanders having been cut at a higher level), and are important for fish, plants and invertebrates.

Reedbed

A small linear reedbed has been constructed and planted on a wide berm adjacent to the new course. The reedbed is fed by an agricultural field ditch with a high nutrient content. Although this feature has been designed as a habitat reedbed, it also offers some 'buffering' of the ditch water before it enters the river.

Photo: M Janes

Fritillary meadow

A small meadow of rare Snake's Head Fritillaries survives here but it has been drying out over the past 25 years. An adjacent field (previously arable) has been re-sown with a meadow grass mixture and an existing shallow gully has been linked back to the river to restore seasonal flooding. Both fields will be farmed as traditional hay meadows.

Riverbank Cliffs

Photo: M Janes

Channel adjustment

In creating a different course for the River Cole some natural adjustment was allowed for. This gives the river the chance to form the small irregularities present in all rivers, as well as the more regular pool and riffles, vertical riverbank cliffs and gravel beaches.

Monitoring and Benefits

Photo: M Janes

The Monitoring Programme

A full background study was carried out to make certain that the river and the surrounding area was thoroughly understood before any plans were drawn. This information will allow comparisons to be made with the changes resulting from the works.

A comprehensive monitoring programme has been running since the start of the project and will be extended to cover at least four years post-project.

Photo: Colin Platt

Early Results

- **Flooding:** The designed shallow flooding of grass fields lets silt settle on fields, with less in the river.
- **Low Flows:** Far less of a problem in the smaller, faster flowing river.
- **River Features:** Larger number of natural cliffs, gravel shoals, pools etc.
- **Wildlife:** Some returning species have already been recorded with more expected as the site matures.
- **Water Quality:** No change recorded but should improve as plants develop.
- **Landscape:** River now a pleasure to see and hear; flower rich meadows still to establish.
- **Public Survey:** 70% of local people understand and approve of what has been achieved; others wait and see.

Swans nesting at restored meander in mill leat
(photo; M Janes)

Photo: M Janes

Wider Benefits

The knowledge and experience gained means that others can be more confident about organising, funding, designing and implementing future projects.

In addition, the project improves understanding about the contribution that river restoration can make towards:

- Better management of floods, droughts and water quality.
- Achieving governmental strategies for improved bio-diversity, Common Agricultural Policy reforms and for agri-environmental support schemes.

Scientific monitoring of fish numbers
(photo; M Janes)