

Audit of 20 Rehabilitation Projects  
Environment Agency  
Thames Region

By *the* RIVER RESTORATION CENTRE



1998

# Audit of 20 Rehabilitation Projects

## Environment Agency

### Thames Region

#### Projects Audited

Bear Brook - Aylesbury  
River Blackwater – Nr. Frimley  
River Chess – Nr. Chesham  
River Cole – Sevenhampton  
River Colne – Watford  
River Crane – Twickenham  
River Dun – Froxfield  
Gatwick Stream – Crawley  
Kyd Brook – Nr Bromley  
River Mole – Westhumble  
River Pool - Catford  
River Ravensbourne – Bromley  
River Roding - Redbridge  
River Thame – Winchendon  
River Thames – Clifton Hampden  
Doctor's and Skinner's islands  
London Yard, Isle of Dogs  
Shiplake lock  
Sonning Bridge  
River Windrush - Worsham

Janes, M. D. and Holmes, N. T. H.  
River Restoration Centre  
1998

The River Restoration Centre  
Silsoe Campus  
Silsoe  
BEDS MK45  
Tel. 01525 863341

## **Thames Rehabilitation Projects**

The Environment Agency (Thames Region) has for many years promoted nature conservation through its Flood Defence Committee, redressing some of the adverse legacies of past schemes. In doing so it collaborates with other Agency functions and external organisations.

This year a series of 'audits' were undertaken, by RRC, of projects carried out primarily since 1989 mostly through the Thames Region's Flood Defence Enhancement Programme, as well as those promoted through fisheries, conservation and landscape architects sections. Twenty projects from small enhancements to more complex restoration schemes were chosen which demonstrate examples of best-practice, innovation and design improvements within river management. The audits give an independent review of some of the region's extensive array of rehabilitation schemes.

Accompanied site visits were made for all projects following consultation and information gathering with the key staff involved. These visits enabled the scope of works, and subsequent development since completion, to be seen and assessed against objectives. This information formed the basis of RRC's audits which were presented as a series of short reports containing the following:

General/catchment information;  
Background;  
Objectives;  
Works carried out;  
Success/lessons;  
Overall conclusion;  
Recommendations for the site;  
Recommendations/considerations for future application;  
Costs;  
Available information;  
Key personnel.  
Accompanying photographs

## **Lessons Learnt**

Some lessons learnt from these 'audits' are summarised below. These may help other practitioners plan restoration projects and ensure that data are collected before, during and after implementation of future schemes in such a way as to extend the pool of knowledge and experience of river restoration techniques.

### **Channel Design**

- Design of groynes/deflectors is critical to avoid creating new bank erosion problems and ensure that, in low-flow conditions, flow is concentrated sufficiently to create and sustain habitat diversity.
- Successful placement of self-cleaning gravel riffles is highly dependent on sediment sizing and riffle design (e.g., size, shape, gradient, etc).
- It is impossible to be totally accurate in setting the height of berms – common sense and calculations of water levels need to be used together.
- River narrowing can be achieved, whilst retaining flood capacity, by in-filling part of the low-flow width with material from the bank slopes.
- On-site expertise is invaluable – part art and part science – and must be able to adapt to on-site conditions – costs incurred through additional supervision are usually justified by the end result.
- Berms should accrete silt and therefore may eventually dry out. These may act as effective low-flow channel narrowers. This needs to be considered at design stage.
- Getting the size, shape, angle, water-, etc. of deflectors, groynes, etc. is critical.
- Keying in securely to existing stable banks is vital for all works, especially on wave-affected reaches.

## **Integrated Design Planning**

- Fishery, ecology and landscape interests must be integrated in all schemes at the start of the planning process, not as 'late entry add-ons.'
- Ecological benefits should not be over-shadowed by lack of consideration and effort in landscape design, e.g., by unnecessary, unsightly, engineering structures.
- Assessing the potential benefits that could accrue from capital investment in restoration projects needs to take account of how these will be dependent on future management of the site.
- Attention to visual amenity must be an integral part of the planning process if the full benefits of the works are to be achieved - e.g. channel narrowing and bank re-profiling are visually less effective if old spoil levees remain on the bank tops.

## **Material Selection**

- Non-degradable geo-textiles may be over-kill where only *initial* edge stability is needed in advance of vegetation growth and earth stabilisation – far better to use bio-degradable materials.
- Geotextile (Nicospan) can be an effective alternative to sheet piling, and is suitable for holding soft silt in place where back-fill is very fine.
- Planted coir rolls provide a very effective 'soft face' habitat in association with low-level piling/bag work required for additional strength.
- Berms retained by hurdles, faggots and spiling are unsightly if well above water level, especially if back-fill settles. The *temporary* use and removal of such materials, when the back-fill has consolidated may be appropriate.
- Bare Enkamat is visually disastrous.
- Using river silts to form ledges, without holding in place with a membrane, risks early flood washout.

## **Vegetation Establishment**

- Vegetation growth is an essential ingredient in successful channel narrowing, both for sustainable natural habitat creation/recovery and visual amenity. The design should plan to allow plant growth to determine the width of the low-flow channel, commensurate with flow character.
- Where wide impounded reaches are rehabilitated by removing downstream control structures, channel narrowing often occurs naturally over time, without the need of expensive and interventionist engineering.
- In over-deepened, over-wide channels with little marginal habitat, vegetation growth can begin the processes of wet ledge development and narrowing through simple re-profiling of the banks.
- Visual impact of bank reinforcements, e.g., faggots or hurdles, can be reduced by back-filling with reeds, turf or seeded topsoil.
- If plant plugs are to be successfully established on banks, timing and after-care maintenance is essential.
- Tree planting as part of, or after, a scheme must take into account shading and future management implications.
- Rank vegetation growth on re-profiled banks can be avoided by not re-topsoiling and so help establishment of low-maintenance grass mixes.
- Allow/plan for vegetation growth on margins/berms/ledges to help determine the low-flow width. Very important part of recovery of 'naturalness'.
- Steep stone banks will be poor for marginal vegetation recovery, which is important in shaping the flow, creating habitats and visual aesthetics, etc.

## **Monitoring**

- Scheme objectives must be clearly documented prior to construction to facilitate useful auditing.

- Pre-scheme surveys and photographs are invaluable for future reference.
- Long-term monitoring is needed at many sites to determine if the objectives of restoration are achieved and to establish the time-scale of change.
- Simple monitoring by regular photography can show the rate of vegetation establishment and changes to longevity of measures introduced for rehabilitation.
- Good photographic and technical specifications of all projects are essential if they are to give confidence to others and be replicated in future schemes.
- After-care monitoring, and the provision of resources to undertake minor modifications and enhancements, can provide better value for money than new works.
- Advances in setting up and assessing the results of monitoring programmes for biota (especially fish) are needed if the benefits of restoration are to be identified in a more quantifiable way.
- Narrowing using hurdles, geo-textiles, etc. need to be inspected periodically after completion to ensure they are not exposed or non-functional due to erosion/degradation, etc. In common with many restoration works, this should be part of after-care monitoring and resources made available for minor necessary adjustments (or things missed before) - these resources may provide better value for money than new works.

### The Future

1. The audits were retrospective, not planned as part of the project planning process. All future projects should be planned with clear auditable objectives to make their appraisal more objective.
2. The audits were of a general nature, primarily observations and very qualitative. Long-term monitoring may enable future quantitative to be presented.
3. The projects were assessed for gross changes and commented on flora, fauna and habitat. Future audits should also comprise geomorphological audit and comparisons of Habitat Quality Assessment before and after, using RHS.
4. There is a need to develop an improved standard auditing methodology.
5. Basic data from ALL rehabilitation projects should as a matter of course be logged with RRC for entry onto the Projects Inventory. This will ensure a good range of schemes can be selected for audit, and also help develop future audit strategies based on instantly available data.

The Environment Agency is planning to support the River Restoration Centre and will very shortly produce a report on rehabilitation initiatives. The report recommends:

- On ALL occasions where significant river/riparian/floodplain habitat rehabilitation is initiated by the Environment Agency (e.g. during Maintenance, Capital, Conservation or Fishery schemes) a **Project form** should be filled in. *This should take no more than 10 minutes* if undertaken as a routine action as part of project promotion, implementation and reporting.
- Where significant river/riparian/floodplain habitat rehabilitation is achieved by external bodies on works requiring consent from the Environment Agency, a **Summary form** should be used to detail the project on ALL occasions.
- A **National Centre** for receiving the above information is desirable.
- Within two years a simple computerised database system for inputting and accessing such data should be in place.

The RRC database 'Project' and 'Summary' Proformas are attached which can be copied for use or further copies requested from RRC