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SESSION 06 MAINTAINING AND ENHANCING EUROPEAN BIODIVERSITY

RIVER KENNET CATCHMENT – A STRATEGIC APPROACH TO RESTORATION AND ASSESSMENT

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The Kennet catchment restoration strategy:

The River Kennet is one of the largest tributaries of the River Thames with a catchment area of 1164 square km. The catchment is mostly rural but over the past few decades has seen a substantial increase has a number of large urban conurbations at Reading, Newbury, Hungerford and Marlborough. The river rises in the Marlborough Downs and flows south then east to join the River Thames in Reading. The upper and middle reaches of the Kennet flow over chalk, giving the river its particular character. The River Lambourn joins the Kennet at Newbury and also flows over chalk. The Kennet and Avon canal runs parallel with the River Kennet downstream from Hungerford. For some sections the river and canal share the same channel. The Lambourn and sections of the Kennet have been designated as Sites of Special Scientific Interest (SSSI) because they are outstanding examples of chalk stream flora and fauna, the Lambourn is also designated as a European Special Area of Conservation (SAC). The Lambourn and Kennet SSSIs are in unfavourable condition partly due to physical modifications. In order to address this failure a strategic approach to whole river restoration has been applied. The approach has been based upon identifying key habitat features, linking geomorphology and ecology and a phased implementation that encourages natural recovery.

The strategic "whole river" approach will:

- Identify key habitat features linking fluvial geomorphology & ecology
- Have a phased approach
- Include targeted monitoring
- Address WFD obligations and climate change adaptation

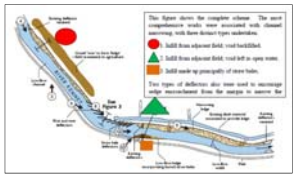
Results – the early years:

Early restoration work was undertaken in the by Thames Water Plc between 1999 and 2002.

In 2011 Nigel Holmes reviewed 6 of the early projects including restoration work at Dunsford Mill. The project included:

- River narrowing,
- Ledge creation
- Flow deflectors – post & wire & experimental straw bales
- Experimental planting of *Phragmites*.

1999 Source: Nigel Holmes 2011



1999 Source: Nigel Holmes 2011

Conclusions:

- "as built" state was as planned
- overall view in 2011 was that the projects were a success.

Lessons Learnt:

- Ledges still intact & narrowing the channel – extensive growth of *Ranunculus*.
- Deflectors worked in the short term but now rotten & defunct.
- Adaptive management was undertaken by land manager - including tree work & replacement deflectors

1999 Source: Nigel Holmes 2011

Results – the middle years:

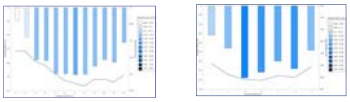
An example of the projects undertaken is at Hunts Green Fishery Undertaken by Cain Bio-Engineering, 2006 with the aims:

1) To return the reach to 'favourable' condition i.e.
   - Re-establish *Ranunclus* community
   - Re-establish hydromorphological dynamics
   - Increase velocity and diversity of flows
   - Increase habitat heterogeneity
2) Combat signal crayfish infestation i.e.
   - Reduce length of burrowable banks
   - Reduce crayfish habitat

Source: Cain Bio-Engineering Source: **Austen Poll**

Study: Assess hydromorphological change & macro-invertebrate response by comparing the restored section with unrestored (control) sections.

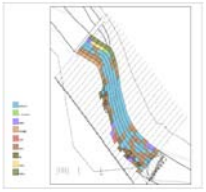
- Hydrological profiles - channel narrowing increased maximum & average velocity
- Substrate comparison – increase of gravel
- Increased heterogeneity – habitat patchiness
- Increase in *Ranunculus*.
- Increased biotic scores – LIFE & PSI



Source: Poll (2012) *Post-Restoration Assessment on the River Lambourn: Impacts on Hydromorphology, Habitat and macroinvertebrate Community* MSc Thesis

Study: Assess the impacts of restoration on plants and habitats by comparing the restored section with unrestored (control) sections.

- Channel narrowing increased flow velocity, increased scour & reducing silt.
- Flow deflectors & gravel riffles created variation in flow types & increased habitat heterogeneity.
- Bank stabilisation decreased due to signal crayfish burrows & reduced in-put of fine sediment
- Increased richness of in-channel flora in comparison with the control reach.



Vegetation Mapping

Source: Jarque (2012) *Post-restoration assessment of the River Lambourn: impact on the macrophytes and habitat* MSc Thesis

Lessons Learnt so far:

- The importance of thinking about post project appraisal at the start:
- The need for clear project aims & objectives
- The need for clear monitoring aims & objectives
- Have decent baseline information
- Inform adaptive management
- Share the lesson's learnt
- Follow: PRAGMO

Practical River Restoration Appraisal Guidance for Monitoring Options (PRAGMO)

Future work:

A scientific approach to the monitoring of future schemes by incorporating post project appraisal at the start of projects.

This will include

- Habitat mapping – functional/biotope
- Invertebrate monitoring
- Plant surveys
- Replicated Before-After-Control-Impact
- Study sites:
  - Lambourn at Welford
  - Lambourn at Weston
  - Kennet at Eastridge

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