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East Chisenbury Fly Fishing Club
River restoration report.
Part II – Installation and Post-restoration appraisal

Introduction: This report follows on from the part I case study download which covers the background and design elements of this project..

3.0 Installation Methodology

3.1. Bank Construction

Bearing in mind the key design objectives set out in Part I, the installation got underway by marking out the sinuous outer bank line in accordance with the plan.

This was achieved by laying down a line of recently-pollarded boughs from a stand of over-mature, on-site willow trees. These were carefully selected to form a continuous 'toe' of Large Woody Debris (LWD). Log width and shape was based on the depth of water and required bank alignment at each location.

Fig.7a (above) The same structure 12 months later. This illustrates the way in which protruding sections of LWD & CWD can be combined with coirnet access banks to create sustainable marginal habitats.

Fig.7 Mark out the line of the new bank face 'toe' using carefully selected woody material, where available. This can be live or dead depending on need and is not species critical.

Bearing in mind that channel narrowing and re-alignment works positively effect water depths and flow speeds, these 'soon-to-be-submerged' logs will provide a vital niche substrate for various invertebrates and aquatic plant species such as 'olive' nymphs (Baetis spp,) freshwater shrimp (Gammarus spp) , Willow Moss (Fontinalis spp) and Starwort (*Callatriche spp*). LWD also provides an essential spawning substrate for various coarse fish species and and egg-laying sites for terrestrial insects with an aquatic larval stage. For this reason and in order to assist the life cycle of up-winged flies, it is important to ensure that emergent 'spurs' are left protruding above average summer water levels at regular intervals as indicated above. (Nb.These spurs are identified 'A' & 'B' in Figs 7 & &a

above. The dotted line in Fig 7 shows the alignment of the 'soon-to-be installed 'coirnet' bank access will be re-identified later in the post-restoration appraisal.)

Fig.8a Detail of sinuous 'coirnet' log bank during the final stages of back-filling.

Fig.8 Sinuosity can be achieved by the careful selection of on-site woody material.

The soil-retaining capacity of the new bank is achieved by the use of a multi-ply 'Coirnet' product developed 'in-house' by CBE Ltd. This was developed to deliver sustainability in a variety of fluvial environments where traditional soft engineering techniques on their own, have only proved effective in the short to medium term.

Fig.9a One of the key benefits of 'Coirnet' is its ability to retain a slurry-like backfill material with virtually no release of sediments into the channel. This makes it ideal for use in sensitive environments where salmonid spawning activities may be compromised by major earth-moving activities.

Fig.9 CBE's 'Coirnet' bank revetments being in-filled to form a new low-level riparian flood berm. The borrow pit being excavated to the rear will be retained as an off-line pond.

Fig.10a -26/08/06 Brushwood sediment trap with developing marginal vegetation 11 months after installation.

Fig.10 26-03-06 Spring 2006 Brushwood marginal mattress with light organic sediment accretions 6 months after installation. The anticipated heavy inorganic accretions failed to materialise due to a drought winter and almost total lack of floods.

Fig10c *Iris pseudacorus (Yellow Flag Iris)* emerging through the deep sand deposits. Colonisation of marginal vegetation is expected to be rapid in this valuable wetland habitat.

Fig.10b – 03/02/07 - The brushwood sediment trap has now accreted substantially with fine inorganic sand following a succession of winter flood events.

At the time of writing, (26/02/07) yet another flood has over-topped the berm (seen right of shot in fig 10b), and sediment is still accreting onto the main marginal mattress area. The expectation is that the upper sand level seen above will be emergent when the high winter flows recede back to normal summer levels.
The emergent plants (*Butomus, Sparganium, Iris)* seen in fig 10a above are now buried in up to 600mm deep of accreted material. Some of them are now starting to emerge through the deposits (fig 10c) and are expected to rapidly colonise the entire area by October 2007.

4.0 Post-restoration appraisal against key project objectives

4.1 Key design objectives were to:

- **Fig.11** re-introduce variation to the rivers width

- **Fig.12** re-introduce variation to the flow types

Fig.12a Spur from LWD creating turbulence and flow variation. See also Fig 11 above. Flow variation influences substrate distribution and associated niches

Fig.13a Detail of Fig 13 showing fine woody debris interface between the marginal mattress and scoured gravels. This is an excellent niche for *Gammarus* shrimp and Brook Lamprey *Lampetra.*

- **Fig.13** re-create hydro-morphological features compatible with BAP species habitat requirements.

- **Fig.14** vary the substrate types and distribution at key locations within the channel

Fig 15a – Composite LWD/Coirnet Bank revetment.

- **Fig.15** incorporate coarse woody debris (CWD) & large woody debris (LWD) into the new banks and margins at key locations.

Fig.16a Marginal pond habitat in riparian zone.

- **Fig 16** - Create a sustainable, flood-friendly, bio-diverse riparian zone.

Ends

Nb. Project up-date to follow in May 2007 - Please see case study download 3 or sign up for newsletter report.