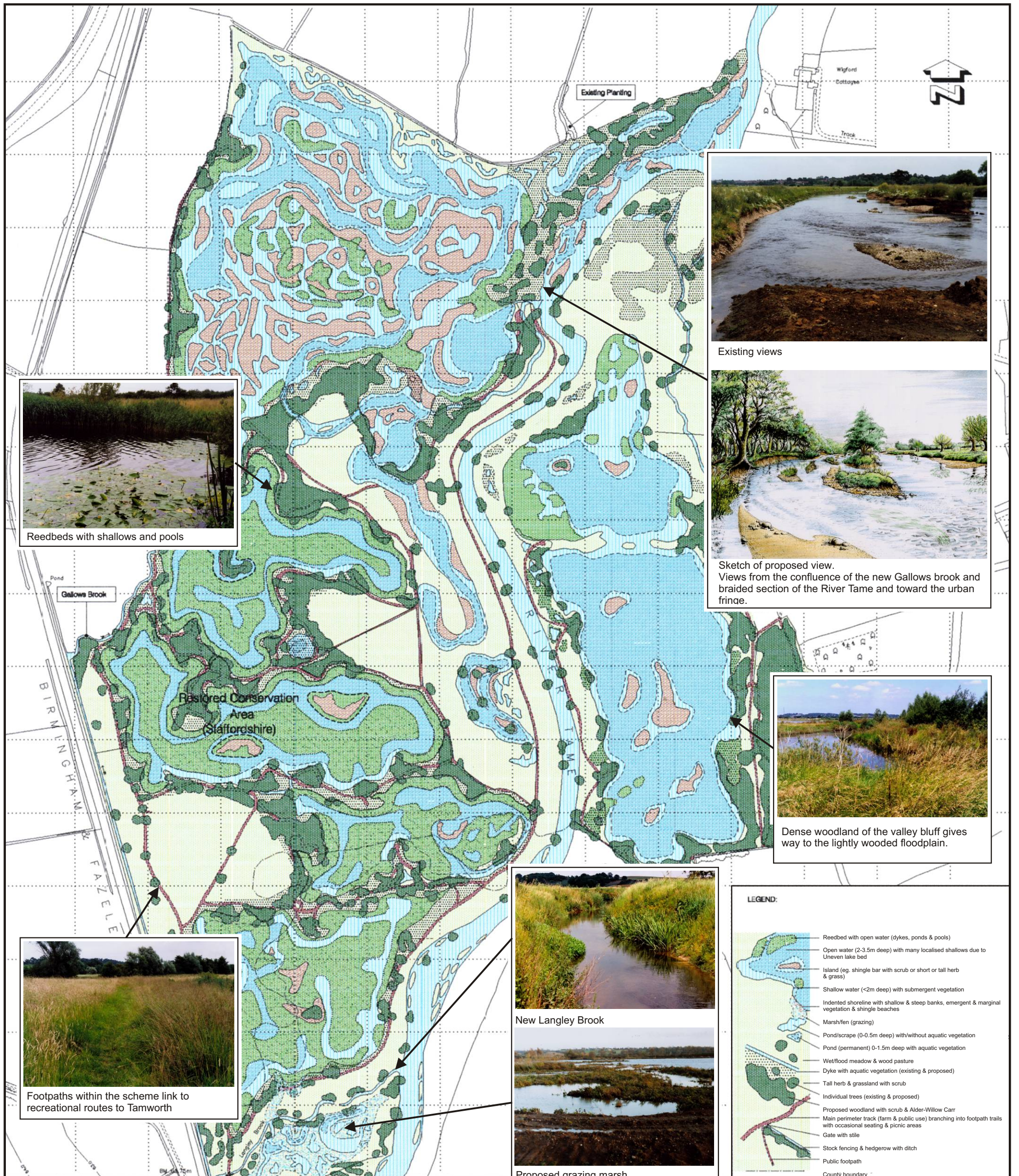


examples of floodplain  
**restoration**

**A selection of illustrated examples of  
floodplain and river channel restoration  
recently undertaken by Hanson Aggregates.**

**Sites illustrated include:**

- **BARTON,**                      **Staffordshire**
- **DITCHFORD,**                **Northamptonshire**
- **MIDDLETON HALL,**        **Staffordshire and Warwickshire**
- **REPTON,**                      **Derbyshire**
- **STANWICK,**                  **Northamptonshire**



Existing views



Sketch of proposed view. Views from the confluence of the new Gallows brook and braided section of the River Tame and toward the urban fringe.



Reedbeds with shallows and pools



Dense woodland of the valley bluff gives way to the lightly wooded floodplain.



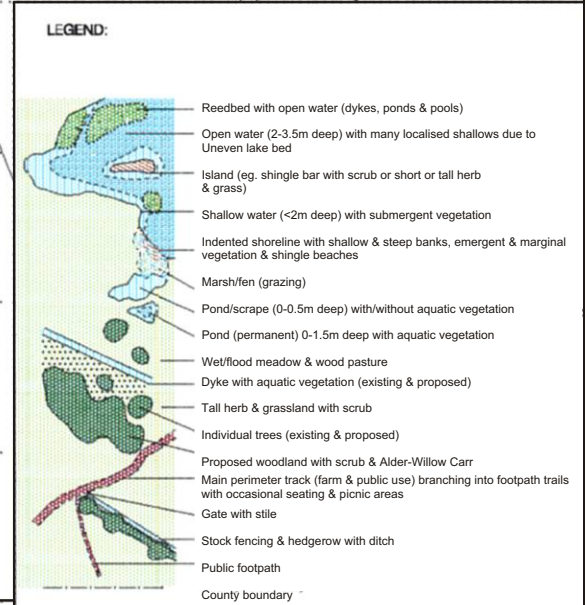
Footpaths within the scheme link to recreational routes to Tamworth



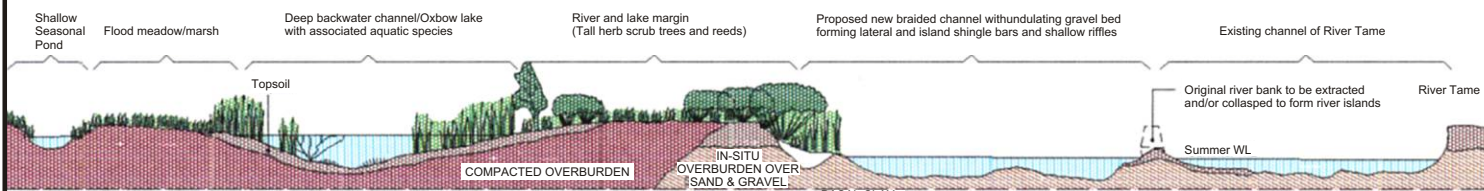
New Langley Brook



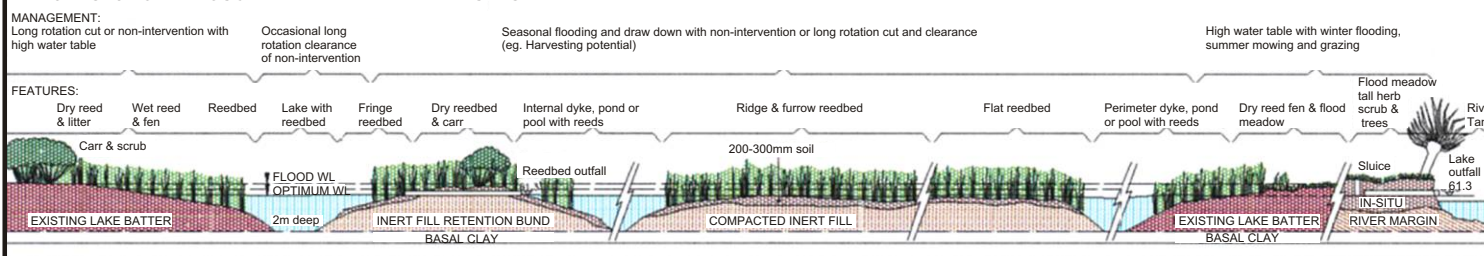
Proposed grazing marsh



TYPICAL SECTION OF PROPOSED WETLAND AND WIDER RIVER CHANNEL



TYPICAL SECTION THROUGH LAKE AND REEDED FEATURES



**Hanson**  
Hanson Aggregates

**MIDDLETON HALL**  
**Floodplain restoration scheme**



The landform restoration scheme was based on the application of the principles of river channel geomorphology, to produce as natural a riverscape as possible, therefore reversing the impact of certain modern river management practices.

Landforming allowed for the dynamic processes of erosion, transportation and deposition.



River islands of varied substrate and vegetation cover bring considerable visual and habitat improvement.



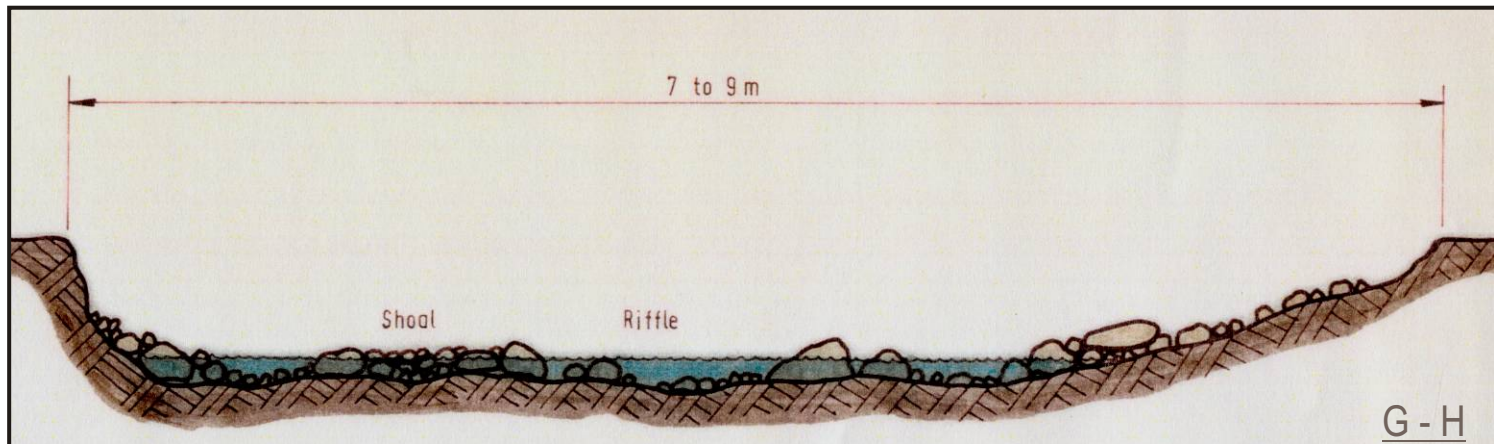
Shingle bars bring visual interest to the river as well as providing wildlife habitats. Riffles producing a degree of white water improve water and habitat quality.



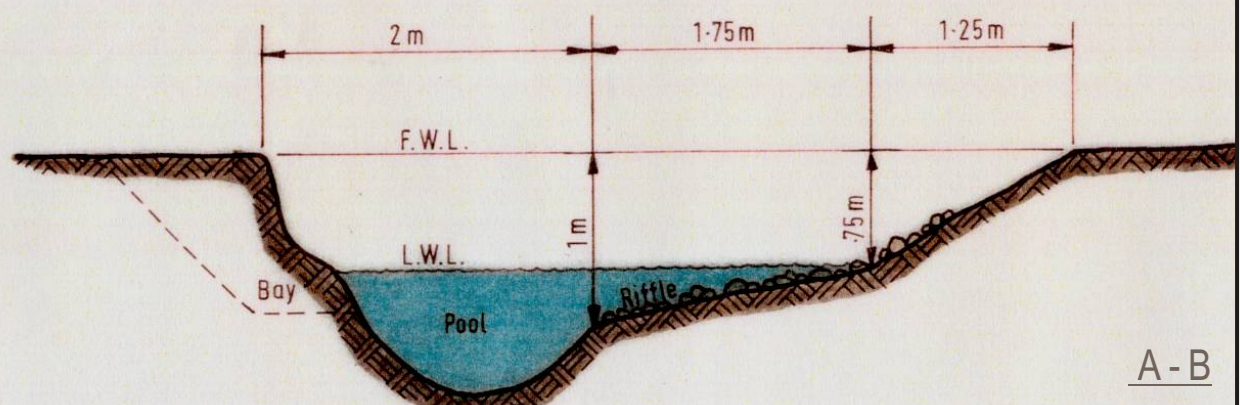
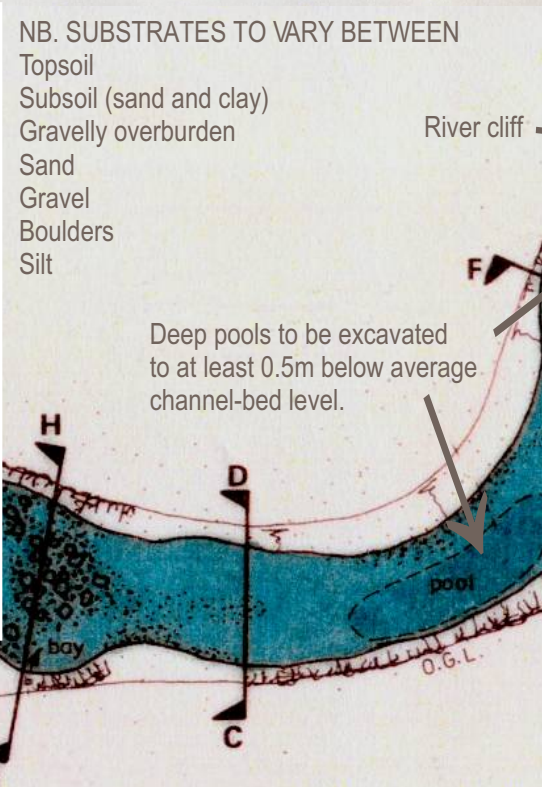
River banks and shorelines of varied slope angles and substrate create an equally diverse range of plant and animal habitat.



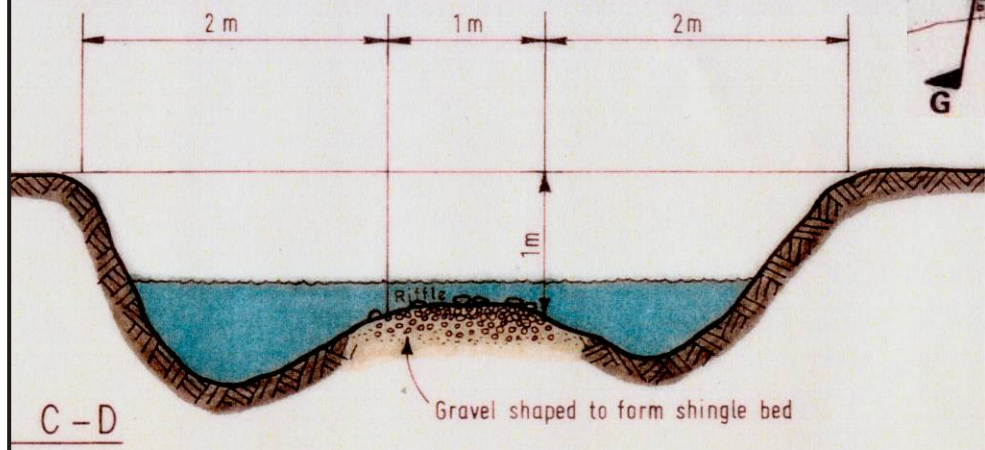
## RIVER BRAIDING FEATURES



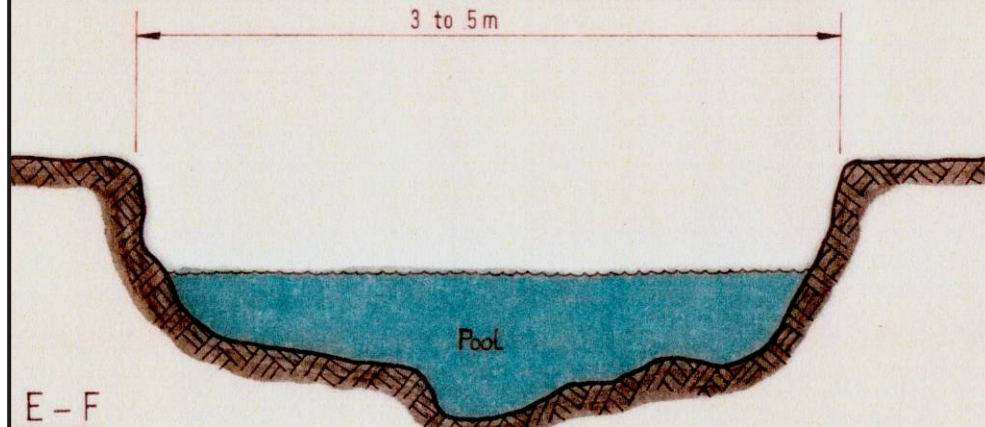
G - H



A - B



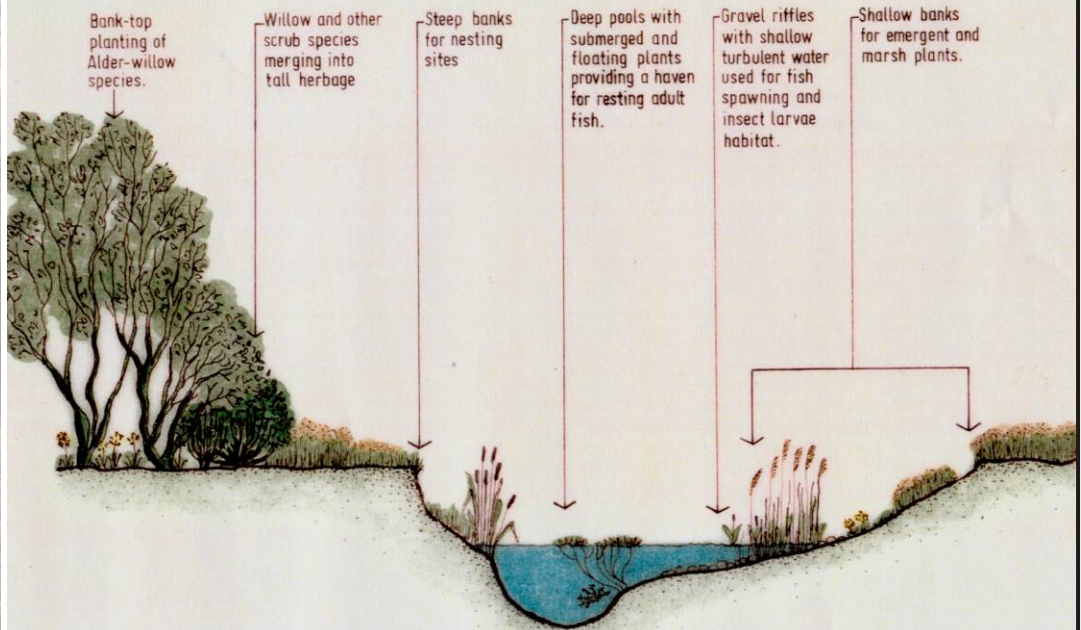
C - D



E - F



Riffle (shoal) pool and cliff



SECTION A-B Showing the varied bank and bed profile proposed, with its associated habitat and vegetation



Restoration of water areas into linear river-like features not only presents a more visually acceptable water restoration, but also creates a more beneficial wildlife habitat framework.



Backwaters with meanders, multi-stage channels, levees, low terraces and sandbanks are some of the natural features associated with less managed floodplains.



Diversity of vegetation and habitats can result from varied water inputs; via backwaters fed direct from a river, a brook tributary, groundwater or just flooding.

## **MEANDERING BACKWATERS (Landform)**



The early stages of wet floodplain woodland development - Pioneer tree, sedge and grass species rapidly colonise the gravel and soil banks and islands of 'riverine' features.

## **MEANDERING BACKWATERS (Vegetation)**



Complex and varied landforms and substrates that are subjected to natural seasonal water level fluctuations are resulting in equally diverse wildlife habitats.



Oxbow lakes created in river margins promote a more natural floodplain character and a rare habitat, including fen communities.

Where possible, larger lakes are fragmented with islands and spits and enclosed with shallows merging into complex marshland, for broodrearing and wader habitat.



**LAKES AND ISLANDS**





Seasonal ponds filled by floodwaters are frequently used as breeding sites by amphibians, within the first year of restoration.



Permanent ponds often support a small fish population, exploited by duck, herons and kingfishers.



The maximisation of water edge length is achieved by elongate ponds and particularly complex microtopography for scrapes and marshes. The result of flood inundation and draw down is a constantly changing extensive shoreline and this also arises from some erosion and local deposition of mud.

Mud for wader feeding is always exposed somewhere within the wetland because of the irregular landform surface.



Restoration to reduced levels has often been necessary to avoid summer drying.

## PONDS, SHALLOWS, SCRAPES AND MARSHES



Gently sloping shorelines provide an ideal foothold for aquatics and marginals.

The lack of vegetation in deep water, fast flows, and on inundated mud and gravel shorelines, benefits many species.



Establishment of large reedswamps and reedbeds on carefully detailed landforms.



Natural regeneration of carr over the irregular wetland surface.

Marsh plant diversity reflects the variations in microtopography and types of substrate.



The lightly wooded character of floodplain woodland is developing in response to the varied landform.



Planting of native species include Black Poplar.

First year growth on 'pollard stakes' within floodmeadow river margins.

## FLOODPLAIN VEGETATION



Permanent and seasonal ponds within wet woodland promote species diversity, including that from wood decay within flood debris.



Varied microtopography, substrate, decompaction and water table ensure diversity.



Standing, surface or buried dead wood boosts rapid development of fungi, moss, lichen, invertebrates - beetles, snails etc.



Natural regeneration is encouraged and selective felling creates glades and gaps for ground flora introduction and more dead wood habitat.



Detailed attention to woodland floor preparation is followed by planting in 'natural' patterns.

## NATIVE BROAD-LEAVED WOODLAND



Reduced levels ensure a high water table for permanent or seasonal ponds, marshes and flood meadows.



Natural flooding and draw down is encouraged for successful wetland restoration. The erosion and deposition that occurs also naturalises the new landforms.

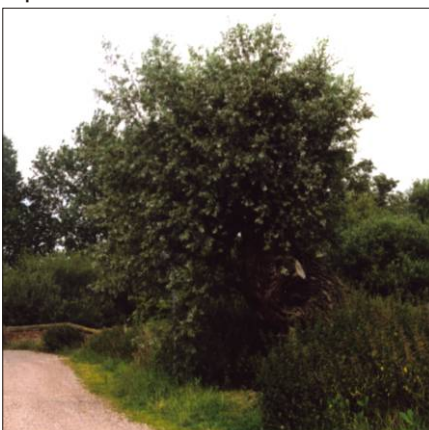


Varied management: A newly mown hay meadow alongside natural regeneration of scrub and woodland.



Tussock grassland for nesting habitat via low intensity floodmeadow grazing.

Overgrown pollard trees are repollarded.





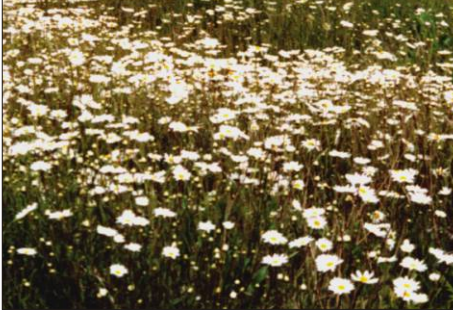
Dense bankside vegetation transplanted into new channels boosts the habitat value. This example is now used by otters.



Replicated natural river features improve water quality and benefit invertebrate and fish populations.



Shallows with aquatics support many species including grass snakes, newts and frogs.



Developing flower meadow.



Tall herb and grass species.



Sand martin cliff formed from coarse silt.



Deadwood kept and introduced to woodland areas.



Specific species are encouraged.



'Flood debris' as natural cover for constructed otter holts.