TIDE FACTS

Tidal River Development

Restoring Riverbanks

TIDE is an EU project which seeks to make integrated management and planning a reality in the estuaries of the Elbe, Scheldt, Humber and Weser rivers. It is partly funded by the INTERREG IV B North Sea Region Programme.

THE RIVER WESER THROUGH THE AGES

When looking over the Weser dike in the Werderland region near Bremen, the eye is attracted to the river and the mighty ships and not to the monotonous dike in the foreground. Yet it is in the latter where potential for development lies. Here, in the proximity of the village of Niederbüren, is one of the last untilled landscapes of the Bremian Weser. And soon it will look completely different.

It once already looked completely different here. Until 1875, the Weser had been a meandering river with several arms as well as small and large sandbanks.

But as the harbours in Bremen became inaccessible for ocean-going vessels due to the increasing siltation of the Weser, the largest ever correction plan was realised. The Lower Weser was straightened and the banks consolidated. Anabranches and sandbanks disappeared. This was the first time in Europe that a tidal river was enlarged on such a great scale.

Extract of a map by Christian Abraham Heineken form the year 1806
(Source: Sten, R. (1957): Das alte Büren. Carl Schünemann Verlag, Bremen)

MORE SPACE FOR NATURAL PROCESSES

As a consequence, the multifaceted river landscape of the Weser was turned into a canal-like enlarged river with flood plains limited to narrow forelands. Today, zones of shallow water, lateral areas with reduced drift and tidal influenced forelands are missing across large sections. The remaining forelands are frequently used as pastures and drained. Summer dikes or riparian walls protect the grassland against minor flooding but also constitute a barrier to the river's natural dynamics. At the Bremian Weser only exist fragments of riparian forest.

These are ecological deficits that need to be remedied in the context of European nature and water body protection efforts. The river Weser shall, where possible, be given more space for natural processes to take place so that the elements of a dynamic and multifaceted river landscape can be reestablished. The quality of life in urban areas, increases with the availabilty of nature, and so does the attractiveness of businesses located on the Weser lifeline.

RESTORATION OF A DIKE FORELAND IN WERDERLAND

The area

The restoration area of the Weser riverbanks is consolidated with stone embankments across its full length. The main dike is elevated by a sheet piling. Weakly visible in the slight relief of the stretch is the position of former ditches. Two pipe culverts drain the area.

Location: Bremen-Niederbüren (Werderland)
Area: ca. 11 ha
Length of the riparian section: 1.260 m
Max. width: 125 m
Heigth of the stretch AMSL: Ø 2,50 m

The Interreg IVB North Sea Region Programme
European Union
European Regional Development Fund

Bulbous buttercup

Yellow meadow-rue

Yellow flag iris

Typical plant species such as the bulbous buttercup (*Ranunculus bulbosus*) or the yellow meadow-rue (*Thalictrum flavum*) have not been found here for a long time. However, the presence of a small population of the highly protected yellow flag iris (*Iris pseudacorus*) in a moist hollow indicates that with increasing water inflow a quick return of species native to the flood plains can be expected.

The goal

Tidal influenced and typical biotopes for flood plains shall be developed on the foreland, which will be linked with the surrounding Natura 2000 areas of the Weser and the Werderland. As a habitat for fish, waders and water birds, a permanent water body shall be formed, which will be coupled to the tide of the River Weser for a longer period. Another focus will be the creation of silt-rich fresh water flood plains as feeding grounds for waders.

The top and the bottom of the project area are designated for the natural development of riparian forests respectively.

The area should be made more attractive for recreation. A path on the dike top and an information board will allow future visitors to better understand the development of the area.

The Feasibilty Study

A feasibility study in the frame of the TIDE project simulated several possibilities for reaching the ecological goals.

The study showed that the development of typical tidal floodplain habitats is in principle possible; dynamic processes, however, are largely limited by embankments and dike enhancement.

The preferred alternative

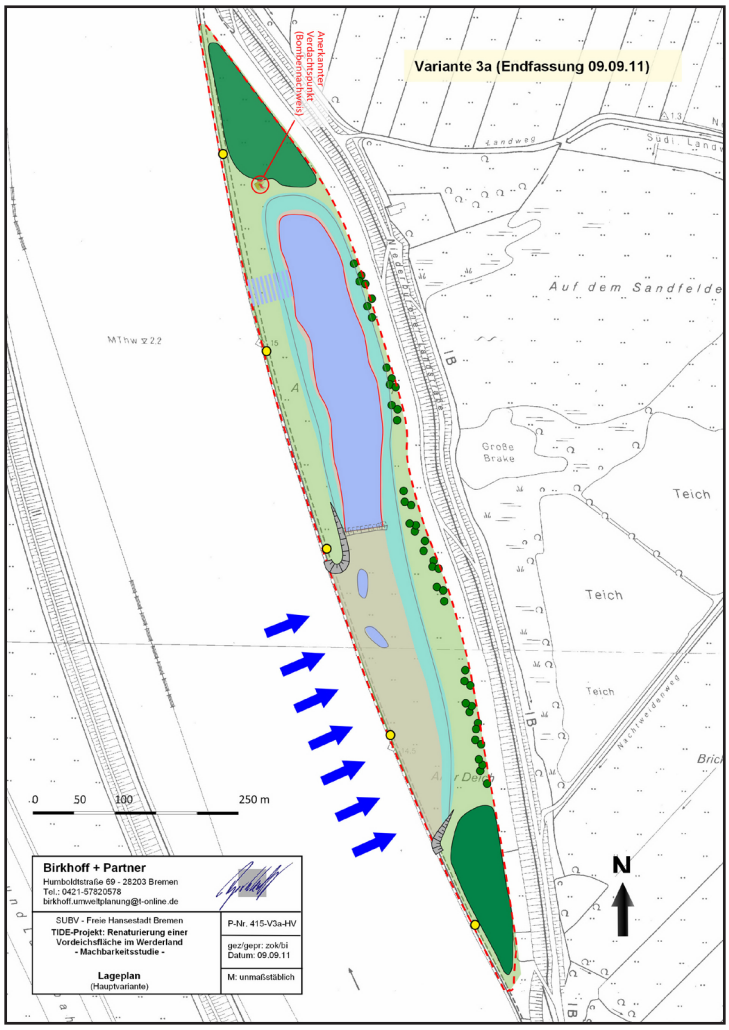
In collaboration with a group of experts and local organizations in charge of coastal protection, waterways and shipping administration and nature conservation, the following preferred alternative was devised out of several:

- The existing embankments will be lowered to about 2.4 m below mean high-water level on a length of approx. 350 m.
- The terrain will be shaped so that a large part of the area will remain under one metre below mean high-water level, whereby the establishment of freshwater flood plains will be encouraged in the long term.
- In the northern part a 2 ha large water body at least 1.5 m depth will be trenched. Permanent water retention will be ensured through a low overflow dam which will be heightened through siltation.
- Both pipe culverts will be removed.

The study recommends leaving the development of riparian forest mostly to nature itself. To speed up the process, willow cuttings will be planted in patches. In order to avoid a loss of sediment in the initial period that would have an impact on shipping, reeds harvested in the region will be embedded. Parallel to the dike, willow shrubs (*Salix spec.*) will be planted for dike protection. Here, flotsam will be caught which will enhance structural variety for the benefit of insects and small animals. The remaining parts will be left to natural processes. Agricultural use of the foreland will be abandoned. At the riverbanks and the foot of the dike, narrow stretches of meadow intended for maintaining shipping signals and the dike will be kept open through occasional mowing.

People coming to the River Weser for recreation and nature observation will soon be able to see what a segment of the river looked like originally.

Feasibility study: Birkhoff & Partner (Bremen)
Awarding authority: The Senator for Environment, Construction and Transport (SUBV) of the Free Hanseatic City of Bremen
Planned implementation period: from 2013
Estimated costs: 1.3 m EUR (without land acquisition)
Implementing organizations: Bremian Dike Association



Restoration plans for the Werderland area of the Weser
(Source: Birkhoff & Partner: 2011)