

DELIVERING GOOD ECOLOGICAL QUALITY AND FLOOD RISK MANAGEMENT AT LEAST COST: THE ROLE OF TARGETED MAINTENANCE, & MILL OPERATING PROTOCOLS WITHIN A RIVER RESTORATION STRATEGY

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Background

- The River Wensum is a chalk river and one of 31 whole river SSSIs in England and Wales, and is currently in 'unfavourable' condition. It is also one of 16 English rivers designated as a Special Area of Conservation (SAC).
- Atkins has been commissioned by the Environment Agency (EA) to produce Feasibility and Environmental Scoping Reports to implement the River Wensum Restoration Strategy over its entire 71 km length.
- 14 mills owned privately or by the EA, impound up to two-thirds of the Wensum's length.
- An extensive network of Internal Drainage Board (IDB) drains discharge into the river, and the EA receives a precept for maintenance.
- 4 villages are also at risk of flooding within the main river floodplain.

River Restoration



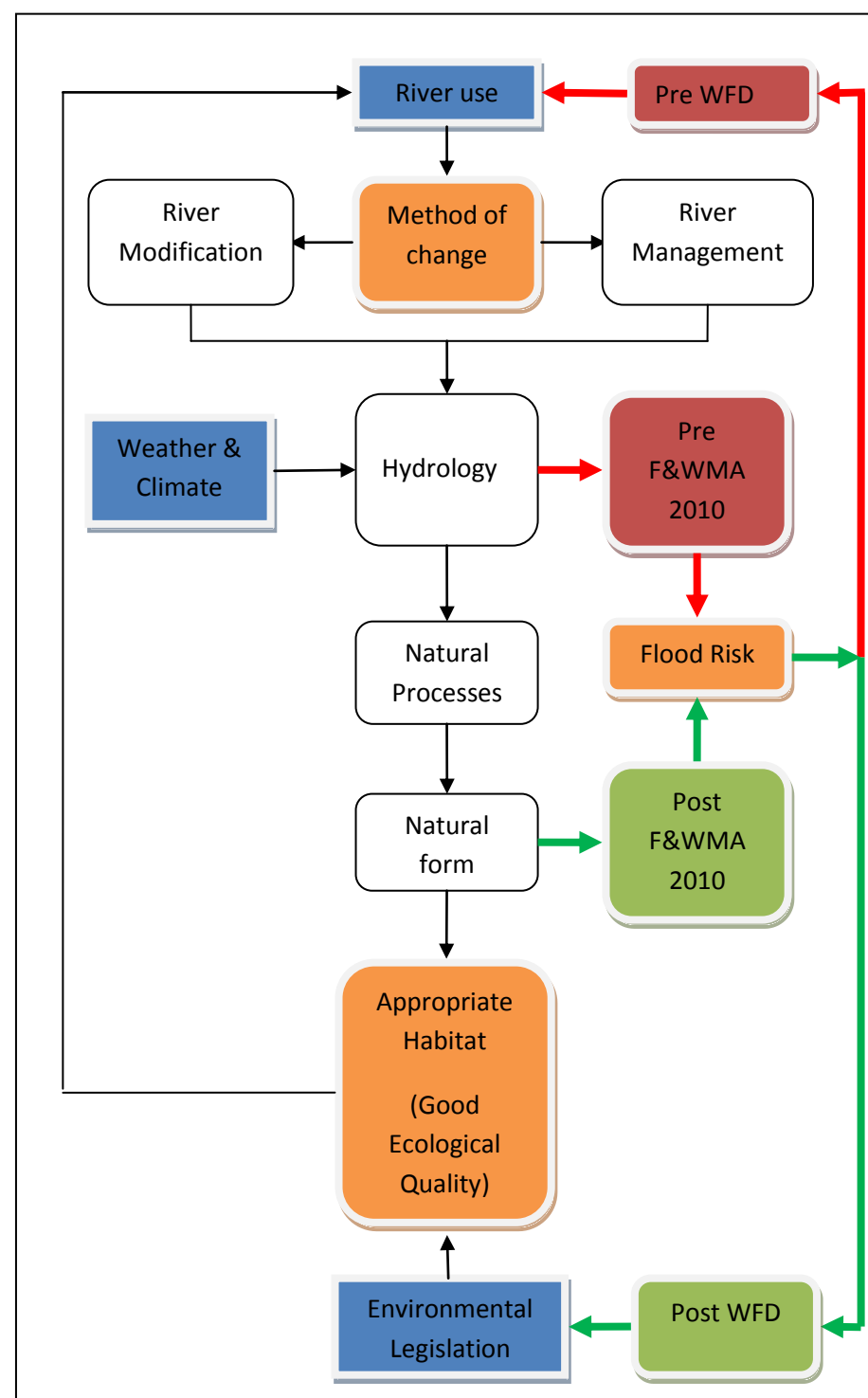
The outline designs in the Feasibility Reports have allowed an easier selection of sites for river restoration. However, to achieve sustainable and affordable improvements to **natural form** and **processes** to the whole river, the Feasibility

Reports conclude that physical restoration (**river modification**) does not solely provide the best solution to improving SSSI condition and meeting Water Framework Directive (WFD) objectives as they only affect short stretches of river.

This is due to the greater frequency of small changes in the river due to **river management** leading to greater impact on **natural processes** than the infrequent large changes due to restoration projects. As a result, Protocols have been developed for dealing with water level control structures to reduce impoundment, and flood risk maintenance to sustain natural conveyance.

Mills Operating Protocol: MOP

With 14 mills affecting about 47km, focus on structures operation was seen as a way forward, as total removal is both politically and financially difficult.



Conceptual model of relationship between flood risk & ecological quality

This is particularly so as the EA are responsible for operation of 6 mills, and discussion with private operators also showed that they would welcome greater dialogue between themselves and the EA.



The Protocol establishes a communications chain down the river between the EA and the Operators, to allow appropriate operation under all flows, thus controlling whole river **flood risk**. This also allows the management of the backwater length to reduce the amount of inappropriate habitat, and use the ponded length for sediment trapping to improve **appropriate habitat** downstream of the mills.

Targeted Maintenance Protocol: TaMP

With the 14 mills and 4 flood risk zones, combined with 1 major surface water abstraction point, and 34 bridges, the Wensum is a managed system, like most English rivers.



The areas of maintenance or **river management** are predictable: the protocol identifies these and allocates any arisings such as fallen trees to the rest of the river as mitigation. With ongoing maintenance is ongoing mitigation; this provides a beneficial **method of change**

which over the long term can provide more than occasional **river modification** through river restoration.

Summary

As **methods of change** both MOP & TaMP provide a way of aligning the performance specifications of EA Strategic Asset Management Plans (SAMPs) with delivery actions under the WFD in River Basin Management Plans (RBMPs). This manages **flood risk** without the need for any budget growth.