

## CASE STUDY 9

# SOW & PENK INTERNAL DRAINAGE BOARD

<b>Catchment</b>	Sow & Penk
<b>Business</b>	Drainage Board
<b>Existing Land Use</b>	Mixed
<b>District Area</b>	2335ha
<b>Techniques</b>	Revised watercourse maintenance

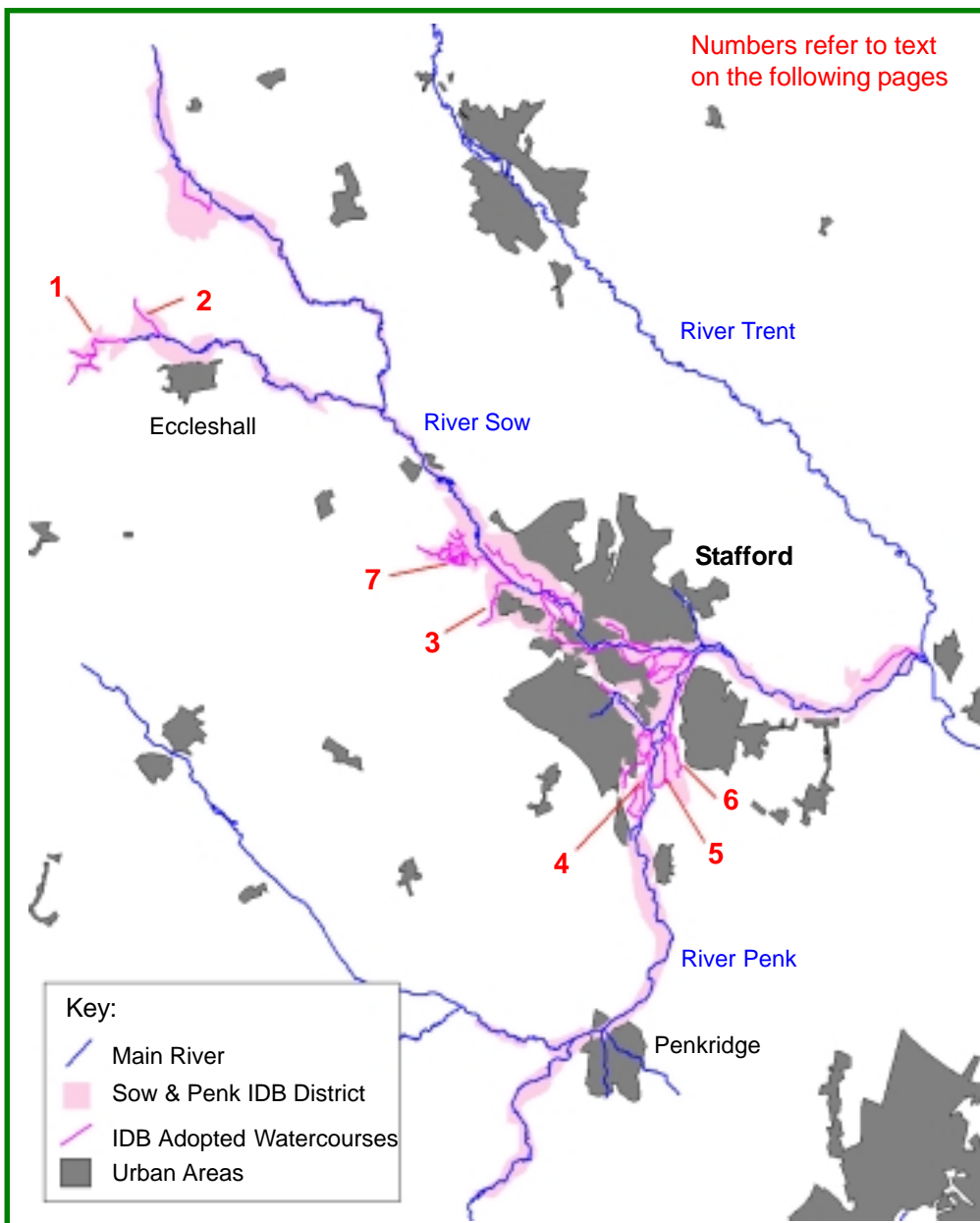
## *FARMING FLOODPLAINS for the FUTURE*

### Background

The Sow and Penk Internal Drainage Board is one of 152 such Boards across the country, charged with the provision of flood defence and land drainage in a number of key areas / catchments. Its District covers 2335ha of low lying land in the valleys of the Rivers Sow and Penk focussed around Stafford. While the responsibility for designated main river lies with the Environment Agency, the Board has powers to undertake work on any non-main river within the District. However in reality direct maintenance is limited to key arterial watercourses and drains 'adopted' by the Board, extending to just over 40km – see map.

Although responsible as a statutory consultee relating to drainage and the planning process, and for the collecting of rates from 171 rate payers, the annual maintenance of adopted watercourses is seen as the main role of the Board.

While its primary function relates to land drainage and flood defence, under the Land Drainage Act 1991, the Board is required to perform its duties such that they further conservation and enhancement of the environment wherever possible. To this end, the Sow and Penk Board adopted an Environmental Policy in 2006 and has recently published its own Biodiversity Action Plan for the District.



## The Project

With the Sow and Penk IDB a key project partner, the opportunity was taken through Farming Floodplains for the Future to review its routine maintenance operations. These comprise 4 elements: annual cutting of bankside vegetation; annual cutting of all in-channel vegetation; occasional de-silting as required (the frequency of this reduced by annual vegetation management); and occasional management of trees and shrubs. The importance of some form of on-going maintenance is accepted, so the aim of the review was to trial alternative approaches intended to enhance the environment without unacceptable adverse impact on drainage function. In line with the wider Farming Floodplains for the Future project, it was agreed to focus on rural watercourses (i.e. excluding urban watercourses within Stafford), but avoid watercourses associated with the SSSIs (Sites of Special Scientific Interest) at Doxey Marshes and Rawbones Meadow, which at the time of the project were subject to major changes through Water Level Management Plans. A total of 13.2km of adopted watercourse were thus affected by changes in management (equating to about 33% of the total in the District).

None of the selected watercourses were due for de-silting or tree works during the life of the Farming Floodplains for the Future project. Further, it was deemed that standard practice for the management of bankside vegetation (one full bank and the lower part of the opposite bank cut to a sward height of 75-100mm, with banks alternated each year where access permits) was acceptable. [Some consideration was given to the opportunity for the removal of cut material (otherwise left in situ), but it was concluded that this would not be practical or cost effective.] Consequently, the changes implemented focussed on in-channel management. The timing of works (generally between late August and November) and depositing of cut material on the bank top were not altered. Generally a single change was made on each of the selected watercourses so as to try to assess specific issues and impacts, with monitoring implemented as appropriate. Details of the changes made, and implemented in both the 2008 and 2009 seasons, are set out below.

### 1 Cop Mere Drain

*[Management Approach: Minimal maintenance ; Length Affected: 1970m]*

Despite the name, this is effectively the main River Sow upstream of the head of 'main river'. Maintenance here has been restricted to the minimum necessary, trying to retain as much vegetation, geomorphological variation and woody debris as possible. Any essential elements of work have been agreed with the IDB's contractor during a walk-over survey at the beginning of each season.



Development of vegetation in Cop Mere Drain (Nov '07, Nov '08 & Nov '09)

### 2 Brocton Brook

*[Management Approach: Revised in-channel weed management ; Length Affected: 1120m]*

All vegetation surviving in the faster flowing upper section of this watercourse has been retained. As the gradient slackens, so the vegetation is managed, retaining growth notably on the inside of bends aimed at promoting a more meandering flow of water.

### 3 Doxey Brook

*[Management Approach: Revised in-channel weed management ; Length Affected: 1550m]*

Vegetation, notably on the inside of bends and in patches on alternative sides of the channel along straighter sections, has been retained to try and promote a more natural, self-sustaining, meandering flow of water in this relatively deep and faster flowing watercourse.

#### 4 Rickerscote Drain

[Management Approach: Revised in-channel weed management ; Length Affected: 2180m]

Blocks of emergent and aquatic vegetation 10 metres in length have been left un-cut every 25-30 metres along the channel. To prevent the build-up of material (both vegetation and trapped silt) that would occur if the same block were retained every year, those left in the first year have been cut in the second, but the 10 metres immediately downstream have subsequently been retained (helping to trap plant fragments, invertebrates etc. disturbed from the previously retained area). This rotational approach could be maintained indefinitely.



Rickerscote Drain as historically managed (Nov '07), and with retained blocks of vegetation (Nov '09)

#### 5 Acton Brook

[Management Approach: Revised in-channel weed management ; Length Affected: 1550m]

A continuous strip of vegetation has been retained along one side of the watercourse for its full length, equating to approximately one third the width of the channel. Although repeated in both 2008 and 2009, this approach needs to be reviewed as there is concern that the build-up of vegetation and trapped silt over time will effectively result in a permanent reduction in channel capacity and therefore drainage function.



Acton Brook as historically managed (Dec '07), and with retained margin of vegetation (Nov '08)

### Monitoring

Appropriate methodologies have been employed to try and quantify the impacts of changes in maintenance on biodiversity and hydrology (see also Issue Study 2: Monitoring).

**Biodiversity** – Surveys of ditch vegetation and indicative invertebrate groups were undertaken during summer 2008 prior to implementation of changes. These baselines were collected to standard methodologies. Due to the time taken for biological changes to be detectable the surveys have yet to be repeated.

**Hydrology** – The hydrological impact has been monitored through changes in water level at the downstream end of each section of affected watercourse. To this end, automatic water level recorders with integral dataloggers were installed in early 2008. Recording levels at frequent intervals, approximately 9 months of baseline data was collected prior to changes in maintenance being introduced, since when monitoring has been on-going. Unfortunately, the limited baseline collected means that only broad conclusions can be drawn (see 'Benefits' below).

## 6 Deepmore Drain

[Management Approach: Water control structures ; Length Affected: 1020m]

This drain passes through the centre of Staffordshire Wildlife Trust's Radford Meadows reserve, an area (31ha) of floodplain grazing marsh on the outskirts of Stafford, managed primarily for its potential bird interest. Two simple pipe dams have been installed to permanently raise water levels associated with the site (these part funded by Natural England through the Countryside Stewardship agreement on the site). Maintenance of in-channel vegetation has continued un-altered. Minor alteration of the upstream structure has subsequently been necessary to resolve the slight backing-up of water onto neighbouring land.



Deepmore Drain (Jul '08) with one of two pipe dams installed (Oct '08), resulting in raised water levels (Jul '09)

## 7 Millian Brook and associated drains – Seighford Moor

[Management Approach: Water control structures & rotational maintenance ; Length Affected: 4220m]

This extensive network of drains is associated with Seighford Moor, a large area (28ha) of floodplain grazing marsh / lowland meadow which, subsequent to a survey undertaken for Farming Floodplains for the Future, has been designated a County Wildlife Site.

Due to its important drainage function, the main course of the Millian Brook running through the site has continued to be maintained annually as it has been historically. However two changes have been made in relation to the arterial drains:-

- 1) Three water control structures have been installed at strategic locations to allow seasonal management of water levels, aimed primarily at enhancing biodiversity (both wetland flora and potentially breeding waders). The structures comprise plastic sheet-piling dams incorporating an adjustable section that permits the holding of a high water level from December to May and a low level from June to November (to allow effective cutting and grazing of the site). Natural England part-funded the structures through the two Countryside Stewardship agreements under which the site is managed.
- 2) Maintenance of the arterial drains is being undertaken on a rotational basis in accordance with a pre-determined plan. Drains are cleared of vegetation every second or third year (depending on location and importance for drainage), this equating to approximately 40% of the drains on site being cleared in any one year.



Development of vegetation in arterial drain subject to rotational management on Seighford Moor (Oct '07, Nov '08 & Nov '09)

## Consultations.....

- Internal Drainage Board  
(All changes to routine maintenance operations had to be agreed by the 13 Board members)
- Natural England (re CSS agreements)
- Biological Records

## .....& Consents

- Land Drainage Consent (from the IDB) for water control structures



Plastic sheet piling dam raising water levels on Seighford Moor

## Future Management

- Given that the changes in management have been implemented without significant impact on drainage function or cost, it is anticipated that a more sympathetic approach to routine maintenance will continue in the future (subject to periodic review to ensure on-going effectiveness, and to deal with any practical issues). It is hoped that this approach can also be extended to other watercourses adopted by the Board, particularly those associated with the two SSSIs in the District, and some of the less sensitive sections of urban watercourse within Stafford.

## Benefits

<b>HYDROLOGICAL</b>	<p>Based on analysis of the water level monitoring data (see 'Monitoring' box) undertaken by JBA Consulting (to Mar '10), it is concluded that the changes to in-channel vegetation management regimes have not had a significant impact on either the water level or water flows within the affected drains.</p> <p>The introduction of water control structures on Deepmore Drain and Seighford Moor has clearly raised water levels within affected drains, such that during flood events there is earlier over-topping of water onto the floodplain (although any increase in flood storage is negligible). Records from dipwells in the centre of fields on Seighford Moor indicate that the structures effectively raise the water table across the peat-dominated site through the winter and spring months, to levels potentially beneficial to breeding waders.</p>
<b>HABITAT</b>	<p>Over 13km of watercourse have been maintained more sympathetically. It is anticipated that the increase in vegetation retention and associated habitat niches will result in better survival of a range of species, particularly flora and invertebrates.</p> <p>The water control structures have allowed restoration and enhancement of some 59ha of floodplain grazing marsh at Seighford Moor and Radford Meadows - a recent survey of the latter site has already suggested an increase in breeding waders.</p>
<b>IDB</b>	<p>Changes have been implemented without adverse impact on drainage function, with no major cost implications, and in a way that contributes to the Board's environmental targets.</p>
<b>FARM BUSINESS</b>	<p>There has been no reported adverse impact on riparian landowners.</p> <p>Although both farmers associated with Seighford Moor already had Countryside Stewardship agreements, for one the land was managed under the grazed pastures (P1) option only. Following installation of the water control structures, Natural England deemed this area to be eligible for the raised water level supplement (GW) (already received by the other farmer), earning an additional £1140 per year.</p>

## Costings

There have been no cost implications for the IDB from the changes in maintenance implemented – the charge made by the contractor has neither increased or decreased (other than a 'cost of living' rise). This reflects the fact that in effect almost the same length of watercourse is being maintained, and even where there are reductions (e.g. at Seighford Moor) the difficulty of access to and across the site remains.

The five water control structures installed on IDB drains cost a total of £3940, of which £1977 was funded through agri-environment capital payments, with Farming Floodplains for the Future making up the £1963 shortfall.