

Severn Catchment Flood Management Plan and Fluvial Severn Strategy Update

June 2003

This newsletter provides an update on the current status and progress of these two strategic flood management studies for the River Severn.

Background to the projects

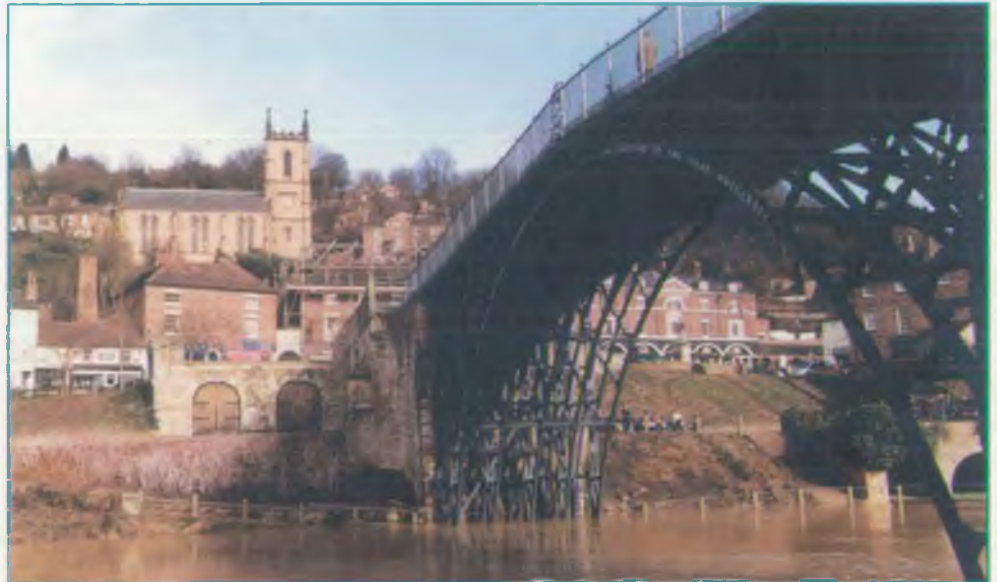
The floods of autumn 2000 were the worst since 1947 along much of the River Severn. The floods caused extensive damage to homes and businesses and much distress to individuals and families.

The Environment Agency has permissive powers to protect people and property from fluvial and tidal flooding. Money for this is raised through a levy on local authorities and from grants obtained from central government. The Agency is preparing a strategic assessment of the River Severn catchment to investigate the causes of flooding and potential flood management policies and options, through two studies: the River Severn Catchment Flood Management Plan (CFMP) and the Fluvial Severn Strategy (FSS).

The Agency and the Department for Environment, Food and Rural Affairs (Defra) take a hierarchical approach to flood management - to ensure all issues are covered at appropriate levels of detail. A strategic assessment allows the effects and impacts of flood management options to be considered on a catchment-wide or river-wide basis. A strategic approach also allows options to be considered that benefit a number of communities that might not qualify for flood alleviation schemes on an individual basis.

Both the CFMP and FSS appraise flood risk and flood management over a 50-year timescale - to ensure that study recommendations are sustainable and effective in the future. As with all flood alleviation works, the Agency must demonstrate the economic, environmental and technical justification at the appropriate level for any proposals.

The Agency is also preparing the Tidal Severn Strategy, which identifies potential flood management options for the tidal Severn between Gloucester and Avonmouth.



Ironbridge

The Severn Catchment Flood Management Plan (CFMP)

CFMPs are a new initiative, sitting at the highest level of strategy, and were introduced by the Agency and Defra following the autumn 2000 floods. Pilot studies are underway in five catchments, including the Severn. The purpose of these pilot studies is not only to produce a CFMP for the catchments in question, but also to test the draft methodologies and to improve the guidelines, for the benefit of the future CFMP programme.

The aim of the Severn CFMP is to provide a high-level assessment of flood risks and to outline a series of flood management policies for the Severn catchment. Policies will be appraised for their sustainability over the long-term - which incorporates economic, environmental, social and technical criteria.

The Severn CFMP project commenced in March 2001. It covers the catchment from the source of the Severn in the Welsh Mountains down to Gloucester, including all its tributaries e.g. the Avon, Teme, Vyrnwy and Stour (Worcestershire).



Llanidloes

A Scoping Report was published in August 2001, which provided a description of the project and identified key issues relating to flooding within the catchment. This was issued to stakeholders and was displayed at libraries, local Agency offices and via the Internet. A period of consultation followed, to give consultees an opportunity to comment on the issues raised.



ENVIRONMENT AGENCY



071929

Following the responses to the consultation and further investigation by the project team, potential flood management policy options have been developed on a sub-catchment basis. Broad locations for options have been derived, given the topography and land-use of each sub-catchment. Examples of options are: encouraging afforestation, changing cropping practice, building defences and storage (on the river or on the floodplain - including creating wetlands).

Options are then tested within computer modelling¹. To date, initial options have been modelled for all of the Severn's tributaries to calculate likely water levels and flows. Options on the Severn itself will be modelled shortly. Model results are being compared with results for the current situation and the predicted 2050 situation. If the option is shown to be effective in reducing water levels or flows, at any point in the sub-catchment, it is considered further. So far, several of the options are showing promising results.

The next step is to examine the effect that draft flood management policy options would have on flood risk - by examining the flood extents and flood damage that would occur. New software to do this ('the Modelling and Decision Support Framework' or MDSF) was developed specifically for the CFMP projects. Economic damages caused by flooding, for the current and 2050 situations, are compared with damages that would occur if a given option was implemented. This gives an idea about whether the option would be economically worthwhile. We have run options for several of the tributaries through this process and are progressing through the rest.



Bewdley – floods November 2000

Once options have been tested for their effectiveness, they are appraised for their environmental acceptability - to determine preferred options. The Strategic Environmental Assessment team has identified the Severn catchment's environmental constraints and opportunities and developed a method to appraise options for their environmental acceptability at a strategic level.

The final stage of the CFMP is to develop overarching policies for each sub-catchment that provide a framework to implement the options. Example policies are:

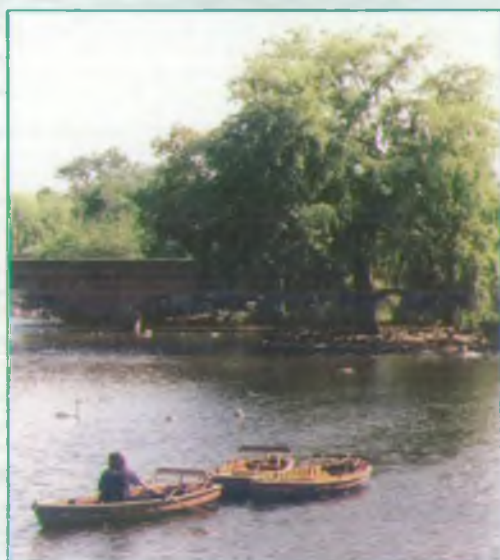
- do minimum at Location X - i.e. maintain the existing flood warning and flood defences at their current topographic level
- at Location Y, intervene to improve flood defences in order to improve the standard of flood protection in the light of climate change
- at Location Z maintain the current exposure to flooding to provide storage of floodwaters to benefit other communities
- take all opportunities, particularly in Locations A, B and C, to reduce runoff into watercourses via a series of land management changes.



Shrewsbury – floods November 2000

Work commenced on the study in January 2001. The objectives include reviewing the existing defences and their performance, assessing the effectiveness and viability of potential flood management options and providing a framework for more detailed scheme studies and capital investment.

A Scoping Report was issued for consultation to a number of stakeholders and was displayed at libraries, local Agency offices and via the Internet in February 2002. It summarised information collected and provided a summary of where, and why, flooding occurs along the Severn and how it could be managed. Comments raised in response to the Scoping Report have been reviewed and addressed during the subsequent stages of the project.



Stratford upon Avon – the Avon is included in the catchment of the Severn

Fluvial Severn Strategy (FSS)

Beneath the CFMP is the Fluvial Severn Strategy (FSS). This takes forward the policies identified in the CFMP and develops preferred **flood management options** for locations along the corridor of the River Severn itself, down to Gloucester.

¹ Modelling is an established means of predicting where flood risks exist and the effects of options on these risks both now and in the future. It can help to understand the catchment's response to changes in climate and landuse.

Models have been developed for the FSS to test preferred flood management options. The models are more detailed than the CFMP tributary models.

Potential options include:

- new storage areas, including on the Severn's tributaries
- altering the existing operating systems at Vyrnwy and Clywedog
- changing the existing volume of storage within the argaes (upstream of Shrewsbury)
- altering existing weirs around Worcester and Gloucester
- removing floodplain obstacles which may restrict flow pathways
- dredging and de-silting
- constructing diversion channels around built-up areas
- rural land management changes, particularly in the headwaters, to control runoff
- constructing new flood defences (walls/embankments) in urban areas
- restoring wetlands to promote catchment storage
- afforestation (putting woodlands back)
- realigning or removing existing flood defences to optimise floodplain storage and flow

Locations that may be technically feasible for these options have been identified - the options are due to be tested within the models shortly. Model runs of the current situation and the predicted 2050 situation are well underway.

Timescales for the studies

The Modelling and Decision Support Framework (MDSF) software for the CFMP relies on good quality digital data to represent the topography of each catchment. Unfortunately, the data originally proposed for the five pilot studies was subsequently found to be unsuitable, and the Agency commissioned a further data set. This unforeseen technical problem has led to a delay in the preparation of the CFMP. It has been difficult to predict exactly when the new data would be available for use, and consequently, until now, it has not been possible to predict a revised completion date. These problems have now been largely resolved - 50% of the necessary topographic data has now been received, and the technical analysis for these areas is nearing completion.



Worcester

Delays in the CFMP have caused a knock-on delay to the FSS, as policies identified in the CFMP feed into the FSS. Completion and calibration of computer models being used for the FSS has also been more time-consuming than we had hoped. But such teething-problems are to be expected when developing new and radical study methodologies like this.

For both projects, the team has continued consultation and liaison with key organisations as developments have occurred.

Draft documents for both the FSS and CFMP are now due to be published and issued to consultees and interested parties, in Spring 2004. The final CFMP and FSS are programmed for completion by Summer 2004.

Consultation responses from both projects

Some of the main issues raised by consultees were:

The importance of environmental constraints

Sensitive sites that represent an environmental constraint must be taken into account when developing locations for flood management options. Particular concerns were to: protect existing habitat (particularly designated sites such as wetlands - Ramsar sites), protect heritage assets (such as Ironbridge Gorge World Heritage Site) and protect recreational assets to ensure that river users' access is not affected. Consideration of the sustainability of options is also important.

The effect of development, SuDS and drainage

Several consultees noted that urban development might adversely affect flooding, i.e. through increasing the rate of rainwater runoff. Some consultees felt that improving drainage systems, incorporating Sustainable Drainage Systems (SuDS) and dredging, may present a potential improvement via reducing runoff and increasing conveyance of floodwaters. Others stated that SuDS would not present a sustainable solution, as they require a long-term maintenance commitment and that improved drainage has worsened the existing flooding situation.



The floodplain around Tewkesbury floods regularly as part of the river's natural processes



Driving through floodwater can be extremely perilous

Changes in land management

Several consultees highlighted land management change as a means to reduce flooding and create environmental opportunities at the same time. Land management changes proposed include: re-creating wetlands, moorland and floodplain woodlands, increasing afforestation, incorporating flood management objectives into Countryside Stewardship Schemes² and changing agricultural practices e.g. cropping, stocking.

Model results to date show great variation in the effectiveness of these options in managing flood risk. Options that do not seem to be effective, based on our current understanding, will be reviewed during the lifetime of the CFMP & FSS as new research is made available.

All issues and comments from consultees are fed into the appraisal process.



Stourport

² The Countryside Stewardship Grant Scheme is managed by Defra and supports landscape and wildlife conservation on farms.

ENVIRONMENT AGENCY

Midlands Information Centre

Environment Agency
Olton Court,
10 Warwick Road,
Olton, Solihull,
West Midlands B92 7HX
Tel 0121 708 4651 / 4772

For further information on either of these strategic studies, please contact us:

The Environment Agency
Regional Office
Sapphire East
550 Streetsbrook Road
Solihull
West Midlands
B91 1QT

Tel: 0121 711 2324

Fax: 0121 711 5824

Email: shirley.greenwood@environment-agency.gov.uk

www.environment-agency.gov.uk

ENVIRONMENT AGENCY
EMERGENCY HOTLINE

0800 80 70 60



ENVIRONMENT
AGENCY