# RIVER STOUR
# CATCHMENT MANAGEMENT PLAN
# FINAL PLAN

## DECEMBER 1993


NRA

*National Rivers Authority*
*Severn-Trent Region*

# THE RIVER STOUR CATCHMENT

## CONTENTS


| | Page no. |
|---|---|
| 1. INTRODUCTION | 1 |
| 2. CONSULTATION | 1 |
| 3. THE CATCHMENT | 2 |
| 4. PLANNED ACTIONS | 3 |
| 5. FUTURE REVIEW AND MONITORING PROGRAMME | 13 |


## VISION FOR THE CATCHMENT

Restore streams and rivers to a sustainable condition closer to a natural state by:

- addressing poor water quality and the problems caused by overabstraction and flooding
- extending green river-corridors through urban areas
- increasing easily accessible water based amenities and recreation

## 1. INTRODUCTION

The National Rivers Authority, established in 1989, is the Guardian of the Water Environment. It is committed to protecting and improving the water environment, and protecting people and property from flooding.

Catchment Management Planning is a procedure designed to create a consistent framework within which the diverse responsibility of the NRA can be applied within a catchment in a co-ordinated manner. Establishing a sound planning base for the development of river catchments is essential to their future management.

Catchment Management involves the NRA using its powers and working with others to ensure that the rivers, lakes, coastal and underground waters of particular areas are protected and improved for the sake of future generations and that water is made available for all reasonable needs.

River catchments are subject to increasing use by a variety of activities. Many of these interact and some conflicts arise. The conflicting requirements and interests of users and beneficiaries must be balanced.

We use our resources to:

- Maintain existing assets and invest in new assets to provide flood protection, manage water resources and provide other NRA services.
- Control pollution by working with dischargers to achieve improvements and ensure the response to emergencies is efficient and effective.
- Determine, police, enforce and review the conditions in water abstraction licences, discharge consents and land drainage to balance differing, and sometimes conflicting, needs whilst protecting the water environment.
- Develop fisheries, and promote recreation, conservation and navigation (in some areas).
- Influence planning authorities to control development through Town and Country planning liaison.

## 2. CONSULTATION

The River Stour Catchment Management Plan Consultation Document was published on 15 January 1993. The Consultation Document concentrated on the issues in the catchment and the management options for their solution. A meeting was held to launch the Catchment Management Plan and following this the document was distributed to industry, local authorities, environmental groups, sport and recreation groups and the public. The NRA's Regional Committees met to discuss the Consultation Document and the future of the Stour Catchment. The consultation aimed to obtain agreement on the catchment uses; consensus on the environmental objectives and standards required; and detailed comment on the issues and options in the document. A two month consultation period followed. During this time a display about the Consultation Document was exhibited in eight libraries around the catchment. Three hundred Consultation Documents and a large number of summary leaflets were sent out during the consultation period.

This process resulted in over a half of the approached organisations responding, with a total of 43 responses received. These comments have all been considered and, where possible, incorporated into the Final Plan. Consideration has also been given to recently published NRA and external documents.

The Final Plan is a strategic policy framework for the management of the catchment. It includes an action plan to achieve the vision for the Stour Catchment and can be read in conjunction with the Consultation Document. The action plan will form the basis for improvements to the water environment by outlining the areas of work and investment proposed by the NRA and others. The Final Plan primarily covers the five-year period from April 1994 to March 1999. A number of the projects may take longer due to funding availability and government policy.

The region will formally adopt the proposals in the Final Plan.

Comments on the Consultation Document were received from 17 households and the following organisations:

British Waterways
Council for the Protection of Rural England
Country Landowners Association
Countryside Commission
Dudley Metropolitan Borough Council
English Heritage

English Nature: West Midlands
Halesowen Wildlife Group
Hereford & Worcester County Council
Inland Waterways Association
Kinver Parish Council
Soil Survey & Land Research Centre
Ministry of Agriculture, Fisheries and Food
National Farmers Union
Office of Water Services
Royal Society for the Protection of Birds
Severn Trent Water Limited
Sports Council, West Midlands Region
Staffordshire County Council
Staffordshire Wildlife Trust
The Ramblers' Association
UK Irrigation Association
Urban Wildlife Trust
Wolverhampton Metropolitan Borough Council (MBC)

## 3. CATCHMENT

The River Stour drains a surface area of 373 square kilometres and lies mostly within the counties of Hereford and Worcester, Staffordshire and the West Midlands. The Stour flows west from its source in the Clent Hills, towards Stourton and its confluence with the Smestow Brook, before flowing south to join the River Severn at Stourport. The River Stour and its main tributaries total 214 kilometres in length.

A section of the Staffs & Worcester Canal runs south through the catchment, parallel to the Smestow Brook and then the River Stour, linking the Shropshire Union and Birmingham Canal networks with the River Severn.

### Land Use

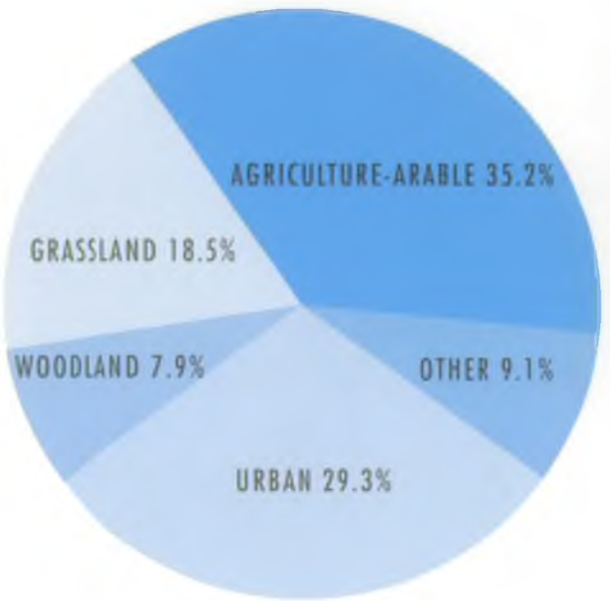
To the north and east, the catchment overlaps the West Midlands conurbation, and includes a large proportion of the Black Country. Historically, the area has been a significant industrial and residential centre, and still has important light engineering and manufacturing industries. In recent years, high technology business parks have been established.

Kidderminster, in the lower reaches of the River Stour, has a number of large carpet factories, a sugarbeet processing plant and other light industrial works.

Intensive arable agriculture dominates the rest of the catchment, with localised areas of pasture, particularly on the urban fringes.

Figure 1 shows the proportion of Land Use classifications in this catchment using statistics from Landsat.

Figure 1 Land Use Classification




### Catchment Uses

Thirteen catchment uses were identified in the Consultation Document:

Urban Development
Groundwater and Surface Water Abstraction
Effluent Disposal
Solid Waste Disposal
Mineral Extraction
Surface Water Drainage and Flood Protection
Nature Conservation
Cultural Heritage
Landscape Conservation
Fisheries
Angling
Recreation and Leisure
Navigation

These catchment uses have been taken into account in the Action Plan which is on an issue-by-issue basis.

## Catchment Facts

| | | |
|---|---|---|
| Total Population in Catchment | 540,000 | |
| Area | 373 km2 | |
| County Councils (% of Area) | West Midland Metropolitan Boroughs | (35%) |
| | Hereford and Worcester | (33%) |
| | Staffordshire | (31%) |
| | Shropshire | (1%) |
| District/Borough Councils | Bridgnorth, Bromsgrove, Dudley, Sandwell, South Staffordshire, Wolverhampton, Wyre Forest | |
| NRA | Severn-Trent Region Upper Severn Area | |
| Water Companies | Severn Trent Water Limited | |
| | South Staffordshire Water Company | |
| Main Centres of Population within the Catchment (1991) | Dudley (part) | 150,995 |
| | Wolverhampton (part) | 114,735 |
| | Halesowen | 57,532 |
| | Stourbridge | 55,499 |
| | Kidderminster | 50,746 |
| | Stourport | 17,933 |
| | Wombourne | 12,930 |
| Water Quality | Length of River in National Water Council Class - 1992 | |
| | Class 1A (Very Good) | 0 km |
| | Class 1B (Good) | 19 km |
| | Class 2 (Fair) | 36 km |
| | Class 3 (Poor) | 56 km |
| | Class 4 (Bad) | 1 km |
| Water Resources | Mean Annual Rainfall (1961-90) | 673mm |
| | Abstraction licences(number) | 155 |
| | Total Abstracted groundwater & surface water (volume) | 87,000 megalitres/yr |
| | Dry weather flow (Stour at Stourport) | 150 megalitres/yr |
| | Mean flow (Stour at Stourport) | 300 megalitres/yr |
| Flood Defence | Length of designated statutory Main River | 80.9km |
| Fisheries | Length of river supporting Salmonid fisheries | 10km |
| | Length of river supporting Cyprinid fisheries | 39km |
| | Length of EC designated canal fishery | 26km |
| Conservation | Water dependant Sites of Special Scientific Interest (SSSIs) | 6 |

## 4. PLANNED ACTIONS

The proposed action plan is based around 11 key issues - labelled A to K - which are detailed in the following tables. Each issue relates to problem areas which were identified in the Consultation Document (Chapter 5).

The issues are presented along with the overall objectives, actions needed to achieve the objectives and identification of responsible parties. General information about each particular issue can be found directly under the heading.

Wherever possible, estimated costs are identified for the period covered by this plan.

A number of actions may require feasibility studies and appraisal of options prior to work commencing. In some cases this may mean the solving of issues may not be viable.

### IN THE TABLES, THE FOLLOWING ABBREVIATIONS ARE USED:

| | |
|---|---|
| P | Project costs yet to be identified |
| R | Recurring costs yet to be identified |
| U | Unknown or unavailable costs |
| < | Less than |
| pa | per annum |
| ▲ | Activity added as a result of the Consultation |
| ★ | Expenditure expected in year indicated |

## ISSUE A: Impact of Urban Development

Urban development is concentrated in the upper reaches and at Kidderminster. It has created the predominant pressure on the whole water environment. Inner city regeneration and the pressure for development of suburban business and industrial sites will continue this process. Major road investment, both the N-S orbital motorway and E-W bypasses, is likely to change wet weather run-off patterns.

Historically, development has tended to turn its back on the polluted urban reaches of the Stour and its tributaries. The NRA supports urban environment initiatives to reverse this trend and encourages redevelopment which incorporates water as a feature. Such initiatives should enhance the scenic, wildlife and recreational value of waterside locations, whilst also providing for floodplain management and access.

The impact of urban development can affect all aspects of the water environment. These impacts include:

- increased loading of sewage treatment works;
- increased demand for potable and non-potable water supply;
- encroachment of development on floodplain;
- increased flood flows/decreased low flows.

Redevelopment of contaminated land in urban areas is also a particular problem as this will require remedial action to prevent pollution of both ground and surface water.

| OBJECTIVE | ACTION | RESPONSIBLE PARTIES | 94/5 | 95/6 | 96/7 | 97/8 | 98/9 | FUTURE | COST(£K) |
|---|---|---|---|---|---|---|---|---|---|
| A1 Seek to minimise the adverse effects of urban development on the water environment. | a) Persuade Local Planning Authorities to include policies designed to protect the water environment and NRA interests in development plans | NRA<br>Local Planning Authorities | ★ | ★ | ★ | ★ | ★ | ★ | R<br>U |
| | b) Encourage environmental enhancement as part of development/redevelopment and as part of the NRA's duty to enhance the environment under the Water Resources Act 1991 | Local Planning Authorities<br>Developers<br>NRA | ★ | ★ | ★ | ★ | ★ | ★ | U<br>U<br>R |

Timing of actions depends on funding availability

## ISSUE B: Poor Surface Water Quality

The catchment receives discharges from over 70 sewage treatment plants and 40 industrial sites, together with overflows from the sewerage system in times of storm. Due to the headwaters lying within a highly urbanised area, there is often insufficient dilution available to receive these wastes without some impact on quality. As a result, nearly 35 per cent of the catchment's rivers fail to comply with their quality objective.

Objectives which define the long term expected quality have been set for the 112 kilometres of river length that are monitored for water quality purposes. It is anticipated that they will eventually become statutory objectives entailing a binding commitment to achieve them. Discussions on this aspect are currently taking place with the Government. Breaches of the EC Dangerous Substances Directive have to be addressed.

The NRA's role is to ensure consent standards are set to maintain, and where necessary, improve the water environment for the benefit of all.

Pollution incidents and water quality problems associated with agriculture are also of concern. The NRA is responsible for enforcing the Control of Pollution (Silage, Slurry and Agriculture Fuel Oil) Regulations 1991, which set legal minimum standards. The aim of the regulations is to reduce the risk of pollution by improving storage facilities.

The poor surface water quality throughout the catchment is mainly attributed to:

- unsatisfactory discharges from sewage treatment works and sewer overflows;
- surface water run-off in highly urbanised areas;
- drainage from contaminated land and redundant waste disposal sites;
- illegal discharges of domestic, agricultural and industrial effluents.

| OBJECTIVE | ACTION | RESPONSIBLE PARTIES | 94/5 | 95/6 | 96/7 | 97/8 | 98/9 | FUTURE | COST(£K) |
|---|---|---|---|---|---|---|---|---|---|
| B1 Improve 4km of River Stour from Cradley to Freehold STW (upgrade from NWC Class 3 to Class 2) | a) Investigate and identify causes of pollution | NRA | ★ | | | | | | P |
| | b) Secure improvements where appropriate | Dischargers | | | | | | | U |
| B2 Improve 7.5km of River Stour from Freehold STW to confluence with Smestow Brook (upgrade from Class 3 to Class 2) | a) Improve Freehold Sewage Treatment Works (STW) and Caledonia STW | Severn Trent Water Limited (STW Ltd) | | | | | | ● | U |
| | b) Investigate performance of sewage overflows and negotiate improvements to sewerage system | NRA<br>STW Ltd | ★ | | | | | <br>● | P<br>U |
| B3 Improve 21.8km of River Stour from Smestow Brook confluence to Kidderminster (upgrade from Class 3 to Class 2) | Improve Roundhill STW | STW Ltd | | | | | | ● | U |
| B4 Improve 5km of River Stour from Kidderminster to River Severn (upgrade from Class 3 to Class 2) | a) Secure upstream improvements in STWs | STW Ltd | | | | | | ● | U |
| | b) Ensure compliance with agreed action plan for progressively reducing discharge of pesticides from carpet industry | NRA<br>STW Ltd<br>Carpet Industry | ★ | | | | | | P<br>U<br>U |
| B5 Improve 3km of Mousesweet Brook to ensure compliance with EC Dangerous Substances Directive (for Chromium) | a) Investigate and identify source of contamination | NRA | ★ | | | | | | P |
| | b) Negotiate improvement scheme with landowner/ discharger subject to adequate legal provision | Landowner<br>Discharger | | | | | | | U |
| B6 Improve 10km of Smestow Brook from Trescott to Hinksford (upgrade from Class 3 to Class 2) | Improve Trescott STW and Barnhurst STW | STW Ltd | | | | | | ● | U |
| B7 Improve 2km of Wom/Penn Brook from Gospel End to The Wodehouse (Upgrade from Class 3 to Class 2) | a) Improve Gospel End STW and/or | STW Ltd | | | | | | ● | U |
| | b) Redirect effluent to Smestow Brook | STW Ltd | | | | | | ● | U |
| B8 Improve 0.5km of Wom/Penn Brook from Wombourne to confluence with River Stour (upgrade from Class 3 to 2) | a) Improve Wombourne STW and/or | STW Ltd | | | | | | ● | U |
| | b) Redirect discharge to Smestow Brook | STW Ltd<br>NRA | | | | | | ● | U |

● Timing of actions depends on funding availability and government policy

| OBJECTIVE | ACTION | RESPONSIBLE PARTIES | 94/5 | 95/6 | 96/7 | 97/8 | 98/9 | FUTURE | COST(£K) |
|---|---|---|---|---|---|---|---|---|---|
| B9 Improve 0.5km of Bobs Brook from Lower Gornal to Holbeache Brook confluence (upgrade from Class 4 to 3) | Improve Lower Gornal STW | STW Ltd | | | | | | ● | U |
| B10 Improve 3.2km of Gallows Brook from Hagley STW to confluence with Blakedown Brook (upgrade from Class 3 to 2) | Improve Hagley STW | STW Ltd | | | | | | ● | U |
| B11 Improve 5km of Blakedown Brook from Gallows Brook confluence to River Stour confluence (upgrade from Class 2 to 1B) | a) Secure improvement to Hagley STW (see above) | STW Ltd | | | | | | ● | U |
| | b) Improve Blakedown STW and/or | STW Ltd | | | | | | ● | U |
| | c) Secure an improvement in stream baseflow | NRA<br>Abstractors | | | | | | | U<br>U |
| B12 Establish reason for apparent deterioration in quality of Hoo Brook | a) Investigate and identify cause | NRA | ★ | | | | | | P |
| | b) Secure improvements where appropriate | Dischargers | | | | | | | U |
| B13 Improve 17km of Staffs & Worcs Canal between Compton & Stourbridge Canal confluence (upgrade from Class 3 to 2) | a) Improve Barnhurst STW | STW Ltd | | | | | | ● | U |
| | b) Consider redirecting effluents to Smestow Brook/River Penk | NRA<br>STW Ltd | | | | | | <br>● | P<br>U |
| | c) Undertake removal of contaminated sediments from canal bed | British Waterways (BW) | ★ | | | | | | U |
| B14 Investigate use of settling lakes to treat urban run-off | Commission desk study | NRA | ★ | | | | | | P |
| B15 Progressively improve water quality throughout catchment and protect against risk of pollution incidents | a) Trace and stop illegal discharges | NRA | ★ | ★ | ★ | ★ | ★ | ★ | R |
| | b) Continue to inspect high risk sites eg, pesticide stores and give advice to developers | NRA<br>Developers | ★ | ★ | ★ | ★ | ★ | ★ | R |
| | c) Monitoring and enforcement | NRA | ★ | ★ | ★ | ★ | ★ | ★ | R |

● Timing of actions depends on funding availabilty and government policy

## ISSUE C: Contamination of Groundwater

The protection of aquifers from pollution is of great importance, as the clean up of contaminated groundwater is a very difficult and expensive operation. Groundwater is particularly at risk from sources which are diffuse or built up over many years.

The underground water quality within the Stour catchment is generally good. However, certain areas yield poor quality water due to the effects of urban and industrial development, and previous intensive sewage sludge spreading. Accumulation of waste from widespread industry in the upper reaches of the catchment has created large tracts of contaminated land. Sewage irrigation and sludge spreading is now being phased out to reduce nitrate and chloride build up in groundwater.

Almost half of the designated Wildmoor Nitrate Sensitive Area (NSA) falls within the Stour catchment. In NSA's farmers are encouraged to join a scheme designed to change farming practice and limit the amount of nitrate leached.

Specific controls on solid waste disposal have only been in place since 1976. Current policy requires containment to reduce aquifer pollution risks. The design of landfill sites must incorporate methods of minimising leachate production.

Mineral extraction impacts on the quality and recharge of groundwater. Within the catchment sand and gravel are extracted in the middle reaches, whilst old coal mines and brick clay pits are widespread in the east.

The NRA published its "Policy and Practice for the Protection of Groundwater' in December 1992. This is a comprehensive national policy to safeguard this essential natural resource.

The main risks to groundwater quality that have been identified within the catchment are:

- land contaminated by industrial development and waste disposal activities;
- previous intensive irrigation of treated sewage effluent and sludge spreading;
- diffuse nitrate pollution.

| OBJECTIVE | ACTION | RESPONSIBLE PARTIES | 94/5 | 95/6 | 96/7 | 97/8 | 98/9 | FUTURE | COST(£K) |
|---|---|---|---|---|---|---|---|---|---|
| C1 Ensure that development of waste disposal sites or redevelopment of contaminated land sites does not compromise groundwater quality | a) Provide guidance to Developers/Landowners as part of NRA statutory duties | NRA<br>Developers<br>Landowners | ★ | ★ | ★ | ★ | ★ | ★ | R<br>U<br>U |
| | b) Provide guidance to Local Waste Disposal and Local Planning Authorities as a statutory consultee | NRA<br>Local Waste Disposal Authorities<br>Local Planning Authorities | ★ | ★ | ★ | ★ | ★ | ★ | R<br>U<br>U |
| C2 Ensure that any activity does not compromise groundwater quality | a) Seek adoption of the NRA Policy and Practice for the protection of Groundwater | NRA<br>Local Waste Disposal Authorities<br>Local Planning Authorities<br>Developers<br>Landowners | ★ | ★ | ★ | ★ | ★ | ★ | R<br>U<br>U<br>U<br>U |
| | b) Continue phasing out of sewage sludge spreading (sewage sludge incinerator being developed) | STW Ltd<br>NRA | ★ | | | | | | 14,000 |
| | c) Encourage farmers to adopt alternative farming practices to reduce nitrate pollution | NRA<br>Farmers<br>Ministry of Agriculture Fisheries and Food | ★ | ★ | ★ | ★ | ★ | ★ | R<br>U<br>U |

Timing of actions depends on funding availability

## ISSUE D: Use of Groundwater exceeds long-term availability

Groundwater is the major source for water abstraction in the catchment. Abstractions are made for public water supply, industrial and agricultural use. They account for 89 per cent, 9 per cent and 2 per cent of the total licensed abstractions respectively.

Use of groundwater exceeds the long term sustainable yield available.

In parts of the catchment the amount of groundwater currently licensed is significantly greater than the amount provided by the long-term rate of recharge.

| OBJECTIVE | ACTION | RESPONSIBLE PARTIES | 94/5 | 95/6 | 96/7 | 97/8 | 98/9 | FUTURE | COST(£K) |
|---|---|---|---|---|---|---|---|---|---|
| D1 Encourage more efficient use of existing sources | a) Develop winter storage for agricultural use | NRA<br>Landowners | ★ | ★ | ★ | ★ | ★ | ★ | R<br>U |
| | b) Improve leakage control for public water supply | NRA<br>STW Ltd<br>South Staffordshire Waterworks Co (SSWC) | ★ | ★ | ★ | ★ | ★ | ★ | R<br>U<br>U |
| | c) Investigate further joint use of groundwater and surface water sources | NRA | ★ | ★ | ★ | ★ | ★ | ★ | R |
| D2 Reduce licensed abstractions, initially to arrest further decline in the water table and later to promote a return of baseflow to currently affected streams | a) Promote use of alternative sources | NRA<br>STW Ltd<br>Abstractors | ★ | ★ | ★ | ★ | ★ | ★ | R<br>U<br>U |
| | b) Refuse further licensing of resource in over licensed groundwater units | NRA | ★ | ★ | ★ | ★ | ★ | ★ | R |
| | c) Assess revocation of existing licence rights | NRA | ★ | | | | | | P |
| | d) Develop Groundwater Model to assess resources | NRA<br>Water Companies | ★ | ★ | ★ | | | | P<br>P |
| | e) Seek legislative change to gain greater control over licences | NRA<br>Department of the Environment (DOE) | ★ | ★ | ★ | ★ | ★ | ★ | R<br>U |

Timing of actions depends on funding availability

## ISSUE E: Low Flow Problems

The overall rate of abstraction from groundwater for all uses is high and has led to some watercourses in the catchment suffering from low flows and several pools have dried up.

In particular, current abstraction for public water supply is greater than the sustainable resource. This problem is evident in the area surrounding Blakedown, to the north and east of Kidderminster.

| OBJECTIVE | ACTION | RESPONSIBLE PARTIES | 94/5 | 95/6 | 96/7 | 97/8 | 98/9 | FUTURE | COST(£K) |
|---|---|---|---|---|---|---|---|---|---|
| E1 Ameliorate low flow problems | a) As Issue D2 | NRA<br>Abstractors | ★ | ★ | ★ | ★ | ★ | ★ | R<br>U |
| | b) Undertake localised short-term compensation measures to augment flows by means of 2 boreholes in Blakedown Valley | NRA | ★ | | | | | | 50 |

Timing of actions depends on funding availability

| OBJECTIVE | ACTION | RESPONSIBLE PARTIES | 94/5 | 95/6 | 96/7 | 97/8 | 98/9 | FUTURE | COST(£K) |
|---|---|---|---|---|---|---|---|---|---|
| | c) Undertake an investigation to establish flow controls at Hurcott pools (SSSI) | NRA | ★ | | | | | | 10 |
| | d) Undertake remedial works to restore more natural flow regime in Blakedown Valley Pools | NRA<br>Local Wildlife trust<br>Local Authorities (LAs) | | ★ | | | | | P<br>U<br>U |

Timing of actions depends on funding availability

## ISSUE F: Low Conservation Value of Water Environment

Nature Conservation aims to protect and enhance water related habitats and their associated flora and fauna. The Stour and Smestow Brook are ecologically poor with heavily engineered banks in the upper and lower reaches, limited bankside vegetation and poor water quality. There are 16 Sites of Special Scientific Interest (SSSIs) in the catchment requiring protection, including six water dependent sites, together with over 200 other listed sites of wildlife interest. The NRA seeks to increase species diversity and enhance the ecological value of the aquatic environment.

Also included in the issue are references to cultural/industrial heritage and landscape. Cultural Heritage sites include 16 Scheduled Ancient Monuments, numerous archaeological sites and listed buildings, and 29 designated Conservation Areas. The NRA seeks to protect sites associated with watercourses from direct damage and from drying out. Landscapes of national importance have not been identified in the catchment but a wide variety of landscape type is found, both urban and rural in character. The NRA seeks to conserve interesting features in appropriate water related situations.

The main reasons for the low conservation value of the water enviroment in the catchment can be summarised as follows:

- poor surface water quality;
- low/inconsistent flows in some watercourses;
- river channels being heavily engineered/urbanised;
- damaged landscape areas related to the water environment.

| OBJECTIVE | ACTION | RESPONSIBLE PARTIES | 94/5 | 95/6 | 96/7 | 97/8 | 98/9 | FUTURE | COST(£K) |
|---|---|---|---|---|---|---|---|---|---|
| F1 Increase biological diversity of water environment | a) Improve underlying water quality (see also Issues B & C) | NRA<br>STW Ltd<br>LA | ★ | ★ | ★ | ★ | ★ | ★ | R<br>U<br>U |
| | b) Improve water resources/low flows (see also Issues D & E) | NRA<br>STW Ltd | ★ | ★ | ★ | ★ | ★ | ★ | R<br>U |
| | c) Improve physical habitat in association with flood defence works | NRA | ★ | ★ | ★ | ★ | ★ | ★ | 10 |
| | d) Determine policy and methodology for control of exotic invasive weeds | NRA | ★ | | | | | | <5 |
| ▲ F2 Improve damaged landscape areas related to water environment | a) Identify damaged sites | NRA | ★ | ★ | ★ | ★ | ★ | ★ | 5 |
| | b) Implement improvements | NRA | ★ | ★ | ★ | ★ | ★ | ★ | 10 |
| ▲ F3 Improve educational conservation facilities | Develop local nature reserve by River Stour in Kidderminster | NRA<br>Wildlife Trusts<br>English Nature (EN) | | | | ★ | | | 10<br>U<br>U |
| ▲ F4 Improve site management on wetland SSSI's and Prime Sites | a) Develop site management plans | EN<br>LA<br>Wildlife Trusts | ★ | ★ | ★ | | | | U<br>U<br>U |

Timing of actions depends on funding availability

| OBJECTIVE | ACTION | RESPONSIBLE PARTIES | 94/5 | 95/6 | 96/7 | 97/8 | 98/9 | FUTURE | COST(£K) |
|---|---|---|---|---|---|---|---|---|---|
| | b) Implement site management plans | NRA<br>EN<br>LA<br>Wildlife Trusts | ★ | ★ | ★ | ★ | ★ | ★ | 10<br>U<br>U<br>U |
| | c) Safeguard existing wetland wildlife sites | NRA | ★ | ★ | ★ | ★ | ★ | ★ | 10 |
| ▲ F5 Improve knowledge on typical landscape styles to enable protection and enhancement to be done | a) Upgrade NRA information | NRA | ★ | ★ | | | | | <5 |
| | b) Develop landscape strategy and guidelines for all NRA activities | NRA | ★ | ★ | | | | | <5 |
| ▲ F6 Improve records on relevant archaeological sites in catchment | Update NRA records | NRA | ★ | ★ | | | | ★ | 5 |
| ▲ F7 Improve protection, interpretation of and access to sites of industrial heritage significance | a) Incorporate protective measures in all NRA operations | NRA | ★ | ★ | ★ | ★ | ★ | ★ | 5 |
| | b) Encourage external bodies and developers to adopt protective measures | NRA | ★ | ★ | ★ | ★ | ★ | ★ | 5 |
| | c) Undertake projects to protect and interpret important sites | NRA<br>English Heritage<br>LA | | ★ | ★ | ★ | ★ | ★ | 5<br>U<br>U |

Timing of actions depends on funding availability

## ISSUE G: Poor Fish Stocks

Fisheries provide a good indication of the overall health of the river. Cyprinid fish are widespread in the catchment but generally their numbers and diversity are low, mostly because of poor water quality. Small pollution tolerant species such as sticklebacks are predominant upstream of the Stour/Smestow confluence. Trout are limited to a few cleaner water tributaries such as the Philley Brook. The Staffs & Worcester Canal is an EC Designated Fishery south of Swindon. The NRA seeks to develop fish stocks in the river system as water quality and flows improve, and to protect the EC designated canal fishery.

Three main reasons have been identified as causing poor fish diversity and numbers throughout much of the catchment:

- poor surface water quality;
- low flows and inconsistency of flows in some watercourses;
- river channels being heavily engineered/urbanised.

| OBJECTIVE | ACTION | RESPONSIBLE PARTIES | 94/5 | 95/6 | 96/7 | 97/8 | 98/9 | FUTURE | COST(£K) |
|---|---|---|---|---|---|---|---|---|---|
| G1 Increase fish stocks throughout catchment | a) Improve underlying water quality (see also Issues B & C) | NRA<br>STW Ltd<br>LA | ★ | ★ | ★ | ★ | ★ | ★ | R<br>U<br>U |
| | b) Improve water resources/low flows (see also Issues D & E) | NRA<br>STW Ltd | ★ | ★ | ★ | ★ | ★ | ★ | R<br>U |
| | c) Improve physical habitat in association with flood defence works | NRA | ★ | ★ | ★ | ★ | ★ | ★ | 10 |
| | d) Restock suitable species in improved reaches | NRA | ★ | ★ | ★ | ★ | ★ | ★ | 10 |

Timing of actions depends on funding availability

| OBJECTIVE | ACTION | RESPONSIBLE PARTIES | 94/5 | 95/6 | 96/7 | 97/8 | 98/9 | FUTURE | COST(£K) |
|---|---|---|---|---|---|---|---|---|---|
| G2 Provide adequate information on canal fish stocks (to monitor compliance with EC Directives and Statutory Water Quality objectives) | Carry out surveys on Staffs & Worcs Canal | NRA | ★ | | | ★ | | ★ | 8 |

Timing of actions depends on funding availability

## ISSUE H: Limited Recreational Facilities

Recreation and leisure are impeded by poor water quality and limited access particularly in urban areas. Angling activity in the Stour is also restricted by poor water quality and access in most urban areas, with only the lower reaches of the river attracting any significant fishing interest. Most fishing in the catchment is confined to stillwaters and canals. The NRA seeks to promote suitable and safe conditions for recreation associated with the water environment and angling. Canal towpaths are extensively used by walkers and four long distance footpaths are located in the catchment together with five country parks. In addition, local authorities are planning green corridors which are centred on the river.

Navigation is carried out mainly for recreational purposes on the Staffs & Worcester and Stourbridge Canals which have six marinas and various moorings in the area. The small size of river watercourses largely limits navigational use, although a historical navigation existed on the lower Stour, the current legal status of which is uncertain. The NRA seeks to promote cooperative use of established navigations whilst minimising potential conflicts between different interests.

Several reasons have been identified as being the cause of the unsuitability of environmental conditions for recreational activities. These include:

- poor surface water quality;
- low/inconsistent flow in some watercourses;
- limited access to reaches in urban areas;
- litter problems;
- the unknown navigation status of the Lower Stour.

| OBJECTIVE | ACTION | RESPONSIBLE PARTIES | 94/5 | 95/6 | 96/7 | 97/8 | 98/9 | FUTURE | COST(£K) |
|---|---|---|---|---|---|---|---|---|---|
| H1 Increase scope for recreational uses within catchment | a) Improve underlying water quality (see also Issues B & C) | NRA<br>STW Ltd<br>LA | ★ | ★ | ★ | ★ | ★ | ★ | R<br>U<br>U |
| | b) Improve water resources/low flows (see also Issues D & E) | NRA<br>STW Ltd | ★ | ★ | ★ | ★ | ★ | ★ | R<br>U |
| | c) Improve physical habitat in association with flood defence works | NRA | ★ | ★ | ★ | ★ | ★ | ★ | 5 |
| | d) Improve access for able and disabled anglers | NRA<br>Sports Council<br>Landowners<br>LAs | | | | | | ★ | 10<br>U<br>U<br>U |
| | e) Improve access for other recreational use by collaborative projects eg Stour Valley Walkway | NRA<br>Sports Council<br>Landowners<br>LAs | | | | ★ | ★ | ★ | 10<br>U<br>U<br>U |
| | f) Promote angling opportunities | NRA<br>Sports Council<br>Landowners | | | | | | ★ | 5<br>U<br>U |

Timing of actions depends on funding availability

| OBJECTIVE | ACTION | RESPONSIBLE PARTIES | 94/5 | 95/6 | 96/7 | 97/8 | 98/9 | FUTURE | COST(£K |
|---|---|---|---|---|---|---|---|---|---|
| | g) Promote other recreational opportunities | NRA<br>Sports Council<br>Landowner | ★ | ★ | ★ | ★ | ★ | ★ | 5<br>U<br>U |
| ▲ | h) Remove waterborne debris which has flooding implications | NRA | ★ | ★ | ★ | ★ | ★ | ★ | R |
| ▲ | i) Encourage outside bodies/groups to undertake bank clean up campaigns where appropriate | NRA<br>LAs<br>Volunteer Groups | ★ | ★ | ★ | ★ | ★ | ★ | 5<br>U<br>U |
| ▲ | j) Determine legal status of navigation of Lower Stour | NRA | | | ★ | | | | <5 |

Timing of actions depends on funding availability

## ISSUES I J K: Flooding Problems

The growth of the West Midlands conurbation is causing constant pressure for development of the flood plains of both the River Stour and the Smestow Brook.

The NRA is concerned with ensuring that the flow of surface water passes down the watercourse system without exceeding levels appropriate to the use of land through which it is passing, whether it is urban or agricultural. There are a number of flooding problems in the catchment, both within the steeply sloping eastern developed area and further downstream. This is due to the rapid run-off produced by the urban areas.

Particular problems have been identified in Kidderminster, Wolverhampton/Aldersley and at 16 other specific locations in the catchment. These are at Aldersley, Belbroughton, Black Brook Bratch, Brierley Hill, Enville, Gospel End, Himley, Kingswinford Netherton, Old Swinford, Sedgeley, Smestow, Stourbridge, Trescot and Wombourne.

Flooding problems are caused by:

- increased runoff arising from development pressure in Kidderminster (Issue I);
- increased peak-rate flow due to surface water drainage systems in Wolverhampton (Issue J);
- urbanisation;
- inadequate maintenance (partly due to poor access);
- inadequate structures;
- high levels of waterborne debris (Issue K).

| OBJECTIVE | ACTION | RESPONSIBLE PARTIES | 94/5 | 95/6 | 96/7 | 97/8 | 98/9 | FUTURE | COST(£K |
|---|---|---|---|---|---|---|---|---|---|
| Protect people, property and land from flooding to standards which are practical, economic and appropriate | | | | | | | | | |
| Issue I: Potential flooding in Kidderminster | a) Implement improvement scheme, pending redevelopment of riparian land | NRA<br>Landowner<br>Developer | | | | | | | )<br>) 1700<br>) |
| | b) Provide flood forecasting and warning | NRA<br>LA<br>Police<br>Flood Wardens | ★ | ★ | ★ | ★ | ★ | ★ | R<br>U<br>U<br>U |

Timing of actions depends on funding availability

| OBJECTIVE | ACTION | RESPONSIBLE PARTIES | 94/5 | 95/6 | 96/7 | 97/8 | 98/9 | FUTURE | COST(£K) |
|---|---|---|---|---|---|---|---|---|---|
| Issue J: Periodic flooding of Wolverhampton Racecourse and properties in Aldersley area | Increase channel capacity of the Smestow Brook by either-construction of a by-pass culvert or instream channel improvement | NRA<br>Wolverhampton MBC<br>STW Ltd | | ★ | | | | ) | P<br>2500 |
| Issue K: Periodic flooding at 16 specific locations | a) Restore flow to natural regime through source control and surface water balancing where appropriate | NRA<br>LAs<br>Landowners<br>Developer | ★ | ★ | ★ | ★ | ★ | ★ | R<br>U<br>U<br>U |
| | b) Improve watercourses to increase capacity | NRA<br>LAs<br>Landowners<br>Developer | ★ | ★ | ★ | ★ | ★ | ★ | R<br>U<br>U<br>U |
| | c) Improve access through liaison with landowners and LAs | NRA<br>LAs<br>Landowners<br>Developer | ★ | ★ | ★ | ★ | ★ | ★ | R<br>U<br>U<br>U |
| | d) Encourage environmental awareness to reduce waterborne debris | NRA<br>LAs<br>Landowners<br>Developer | ★ | ★ | ★ | ★ | ★ | ★ | R<br>U<br>U<br>U |
| | e) Undertake surveys of flooding problems as required under the Water Resources Act 1991 | NRA | ★ | ★ | ★ | ★ | ★ | ★ | P |
| | f) Prevent encroachment of development into floodplain by seeking inclusion of appropriate policies in development plans. | NRA | ★ | ★ | ★ | ★ | ★ | ★ | R |

Timing of actions depends on funding availability

## 5. FUTURE REVIEW AND MONITORING PROGRAMME

In collaboration with identified organisations and individuals, the NRA will pursue the actions in this Final Plan. An annual review will be undertaken to monitor and report on progress.

The monitoring review will consider the need to update the Consultation Document. Update requirements will obviously vary from catchment to catchment depending on particular needs, but on the whole the update will normally be at five year intervals.

NRA

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