

The River Avon cSAC Conservation Strategy

The River Avon cSAC Conservation Strategy

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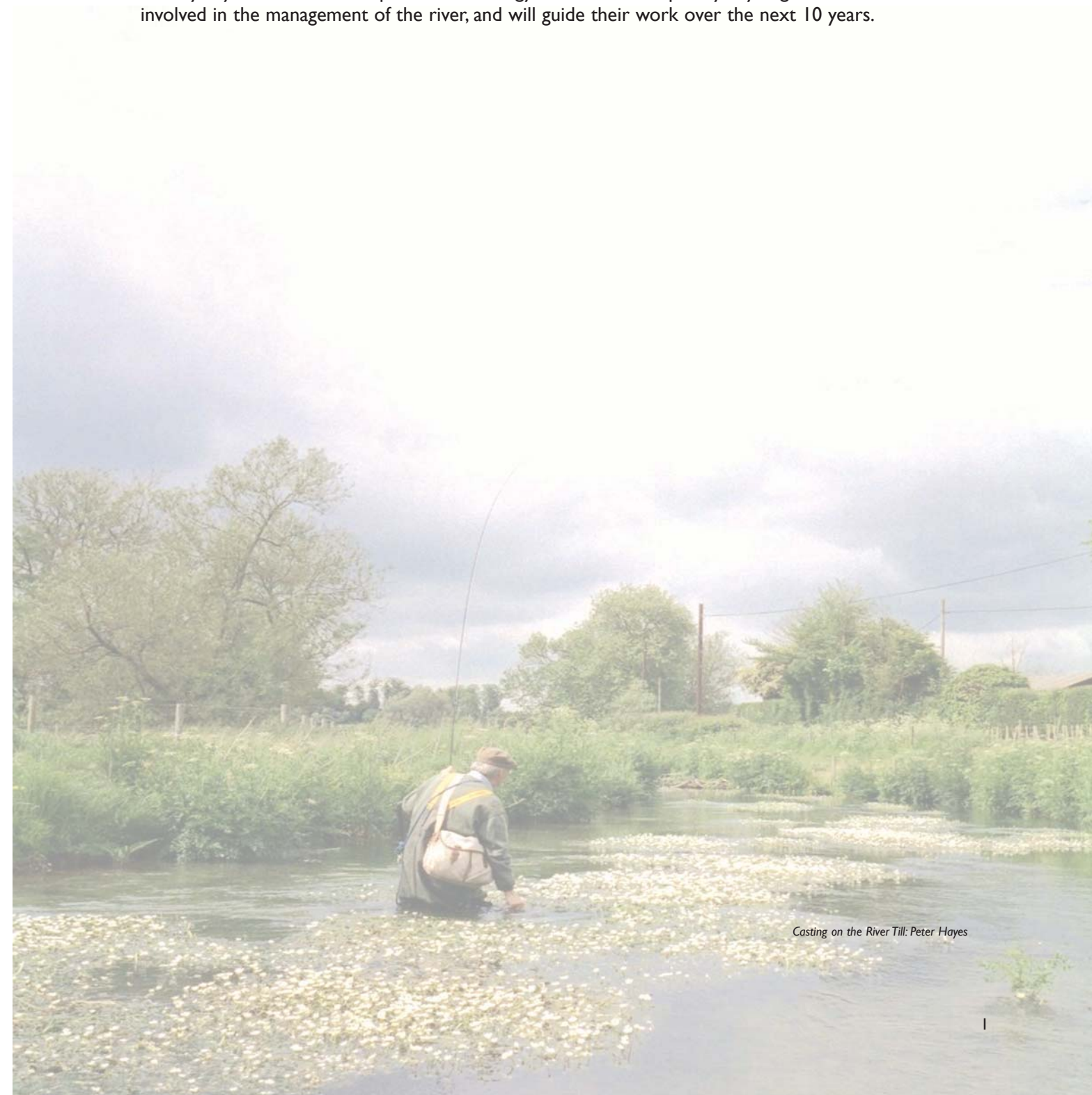
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Overview

The River Avon, rising in the Pewsey Vale and flowing through Salisbury to the sea at Christchurch, is one of the UK's most biodiverse chalk streams. The importance of the River Avon and its tributaries has been recognised by its designation as one of the first candidate Special Area of Conservation (cSAC) rivers in the UK, under the 1992 European Commission's Directive on the Conservation of Natural Habitats and of Wild Fauna and Flora (known as the Habitats Directive).

As part of **Life in UK Rivers**, conservation strategies are being developed on seven river cSACs. **Life in UK Rivers** is a partnership project between the European Union LIFE Nature fund and the main statutory conservation bodies in the UK. On the Avon this strategy aims to define issues affecting the river, to note and assess the effectiveness of mechanisms already in place to address these issues, and to identify any further action required. The strategy has been developed by key organisations and individuals involved in the management of the river, and will guide their work over the next 10 years.



Casting on the River Till: Peter Hayes

Summary

The River Avon cSAC

The importance of the River Avon and its major tributaries is recognised by its designation as a candidate Special Area of Conservation (cSAC) for the following internationally rare or vulnerable species and habitat:

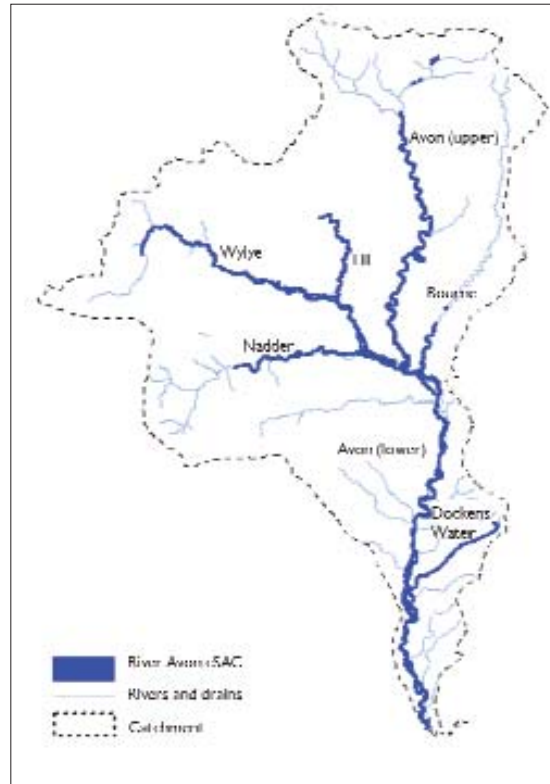
- The river habitat as characterised by flowing water vegetation including *Ranunculus* species
- Populations of Atlantic salmon
- Populations of bullhead
- Populations of brook and sea lamprey
- The river and particular adjoining areas as habitat for populations of Desmoulin's whorl snail.

The Habitats Directive requires member states to maintain or restore individual sites such as the River Avon cSAC to 'favourable condition'. Favourable condition is a range of conditions within which the various influences on a designated habitat or species do not adversely affect its distribution, abundance, structure or function throughout the cSAC in the long term.

The River Avon cSAC includes the rivers Avon, Bourne, Nadder, Wylde, Till and the Dockens Water, as shown in Figure 1. The lower River Avon flows through the Avon Valley Special Protection Area (SPA), which encompasses the River Avon and its floodplain between Bickton and Christchurch. The Avon valley is intrinsically linked to the River Avon by a complex network of drainage ditches that determine water levels in the SPA. However, it is outside the scope of the strategy to consider the management of the SPA, except where it affects the cSAC.



David Withrington/English Nature



The River Avon system has been designated as a cSAC because of its importance as habitat for several internationally rare or vulnerable species.

Figure 1. As well as the River Avon, the cSAC includes the rivers Till, Wylde, Nadder and Bourne, and the Dockens Water.

Development of the Conservation Strategy

The objectives of the conservation strategy are:

- To identify issues affecting the cSAC
- To assess existing measures to address these issues
- To identify and prioritise further measures required.

Identifying Issues

Key organisations involved in the management of the River Avon cSAC were brought together in a working group to identify objectives for the conservation strategy and the issues on which it should focus. The group was made up of county, district and borough councils, the Department for the Environment, Food and Rural Affairs (DEFRA), the Wildlife Trusts, water companies, representatives of riparian owners and fishing interests, English Nature and the Environment Agency.

Assessing Existing Measures

The working group first identified issues adversely affecting the cSAC and assessed existing measures in place to address them. Topic groups made up of participants with specialist knowledge of, or involvement in, these areas were then set up. Further groups met to discuss ways for fishery managers to help conserve the cSAC, and abstraction issues. This process further refined the issues that potentially or actually impact on the river system.

Prioritising Further Measures Required

The working group then prioritised the issues identified by considering each against a set of criteria that it had developed. The most important of these criteria was the extent to which the resolution of any particular issue would impact favourably on the condition of the cSAC. Other criteria were also identified, including: public perception, cooperation from main users of the river, impact on stakeholder commitment, and wider biodiversity (including the SPA).

The process resulted in the clear identification and prioritisation of certain key issues that impact on the condition of the cSAC. These key issues are summarised below.

Key Issues Considered by the Strategy

Point-source Discharges

The River Avon cSAC receives discharges of polluting substances from a variety of sources, including public and private domestic sewerage, agriculture, aquaculture (watercress and fish farms), and industry. Particular issues of concern include phosphorus discharges from major sewage treatment works, the impact of water quality in Christchurch Harbour on salmon, hormone-disrupting substances, and the effect of new building developments.

Discharges of phosphorus from point sources will be effectively reduced through statutory mechanisms, including the Environment Agency Review of Consents, the Avon Eutrophication Control Action Plan, and Asset Management Planning (AMP).

Diffuse Pollution

Diffuse pollution (in particular from agriculture) is considered to be contributing to nutrient enrichment, reduced water quality and elevated levels of silt and pesticides. Diffuse agricultural pollution is caused by herbicides, pesticides, organic and inorganic fertilisers, and soil washing off agricultural land and entering watercourses, or leaching into groundwater. Studies have identified the upper Avon as a target area for reducing agricultural diffuse pollution, and the implementation of sustainable 'best farming practices' is required.

Several national policy mechanisms are available to implement agricultural best management practices. At present, none of these mechanisms contributes effectively to an overall solution to diffuse agricultural pollution. However, as part of the ongoing review of agri-environment schemes, there may be an opportunity for the proposed Entry Level Scheme to address agricultural diffuse pollution.

In the upper Avon, the Landcare project will promote measures to control diffuse pollution, and to influence land managers, farm consultants and advisors to adopt these. The Landcare Partnership and the River Avon cSAC Conservation Strategy Agriculture Group have identified a critical need for increased funding for the project over a sustained period.

Other aspects of diffuse pollution that require action are: research into the role of bed sediments in recycling nutrients in the



Paul Bryson/Environment Agency

Diffuse agricultural pollution is caused by soil, pesticides and fertilisers washing off agricultural land, such as maize fields (above) or wheat fields (below) into watercourses, or leaching into groundwater. Point-source pollution includes overflows from private septic tanks (left).



David Withrington/English Nature



Paul Bryson/Environment Agency

river system, and the development of guidance to ensure that ditching works do not adversely impact on the cSAC due to silt and nutrients being released.

Abstraction

Abstraction from the River Avon catchment is carried out for a variety of uses, including public and private water supply, agriculture, aquaculture (watercress and fish farms), and industry. The rivers Wylde, Bourne and Nine Mile River, and Fonthill Stream are considered to be at risk from groundwater abstraction for public water supply.

The following statutory mechanisms are being used to evaluate and address impacts of abstraction on the river system: the Review of Consents, Catchment Abstraction Management Strategy, and Asset Management Planning. The proposed draft Water Bill should also benefit the cSAC, water companies and consumers by establishing a more flexible abstraction licensing system.

Recreational Fisheries Management

Fisheries management is an important influence throughout the river system and includes several activities that may significantly affect the cSAC. The upper Avon is primarily managed as a game fishery, and the lower Avon as a coarse fishery. A topic group agreed that it would be useful to develop guidance on fishery management for conservation, initially for the upper Avon, which is more highly managed.

Managing Exploitation of Salmon Stocks

Exploitation of salmon stocks must be managed to ensure the restoration and maintenance of healthy salmon populations. Particular issues include the need for continued catch and release of salmon from both rods and nets, return of salmon caught as a by-catch of mullet and bass fisheries, and illegal fishing.

Riparian owners and the Mudeford Netsmen have recently agreed voluntary catch and release of all salmon caught by both rods and nets until sustainable salmon stocks are achieved and maintained in the Avon. Legal mullet and bass fisheries operate in Christchurch Harbour, and any salmon caught as a by-

catch of these fisheries must be returned (dead or alive). This requirement is enforced.

Some illegal salmon fishing is believed to occur in Christchurch Harbour, in the estuary and immediately offshore, and on the spawning grounds. A consistent police response would benefit enforcement activities related to the bass and mullet fisheries and any illegal fishing. An initiative to tag legally caught sea trout seems to be successfully reducing illegal sea trout fishing and associated salmon catches.



Guy Mawle/Environment Agency

A voluntary catch-and-release scheme has been instigated for all salmon caught by both rods and nets in the River Avon cSAC until sustainable stocks are achieved.

Flood Defence and Land Drainage Activities

The Environment Agency is the principal body undertaking flood-defence operations and maintenance activities in the cSAC.

Activities of concern include mechanical weed cutting, the maintenance of ex-Internal Drainage Board drains, and removal of woody debris from the channel.

Routine maintenance activities related to flood defence, including blockage and debris removal, de-silting and weed cutting, have been agreed by English Nature and the Environment Agency, and are set out in 1993 River Avon (Salisbury–Christchurch) Operational and Maintenance (O&M) plan. The plan is currently under review to ensure the Environment Agency fulfils its responsibilities under the Habitats Regulations 1994 and Wildlife and Countryside Act 1981.

Water-level Management

Water-level management is an issue in the upper Avon, where sluices and hatches control water levels, and in the lower Avon, where land drainage impacts on the Avon Valley SPA. Water Level Management Plans (WLMPs) are being developed for the River Avon cSAC/SSSI (Site of Special Scientific Interest) and Avon Valley SPA/SSSI. Their successful implementation is vital in ensuring wildlife gain. For the River Avon cSAC, the priority is to ensure appropriate water-level management for the river, taking into account seasonal variations in flow. In the lower Avon, the plans aim to establish appropriate water-level management in the SPA, which could impact on the river.

Catchment Flood Risk Management

In the next five years, the Environment Agency will develop Catchment Flood Management Plans (CFMPs). These plans will provide the context for flood management, and have the potential to benefit biodiversity as well as to deliver flood protection. New flood defence schemes are proposed to protect Downton, Ringwood, Fordingbridge and parts of Salisbury from flooding. It is essential that the CFMP and any new flood defence schemes take into consideration the water level and flow requirements of the River Avon cSAC.

Problem Species

Non-native Invasive Plant Species

The impact of bankside and aquatic non-native invasive plant species has become a major concern in many habitats of conservation importance, due to their ability to achieve dominance over native species and difficulty in their control or eradication. Himalayan balsam and Japanese knotweed are present in localised patches in the Avon catchment and are a risk to the cSAC, in particular Desmoulin's whorl snail habitat.

There is a need to collate existing data on invasive plants and to instigate a control and eradication programme. In the Avon catchment, awareness raising of non-native



Ian Killeen



Jenny Wheeldon/English Nature

Non-native plants such as Himalayan balsam (right) may come to dominate riverine areas. They present a particular risk to Desmoulin's whorl snail (left).



Catherine Duigan/CCW

Japanese knotweed is present in local patches in the River Avon cSAC, and poses a risk to native plant species.

commissioned a review of available literature related to swan grazing on the Avon cSAC to draw together existing knowledge, attempt to determine the impact of grazing on the cSAC, and to guide future efforts to minimise it.

Avian Predation

Cormorant predation on fish is of increasing concern to fishery managers in the cSAC, but it is not currently thought that management of cormorant on the Avon is required on conservation grounds.

However, juvenile salmon and smolts may be vulnerable at particular times and locations, and this should be investigated.

Signal Crayfish

It is not known whether signal crayfish are currently having an adverse ecological effect on the cSAC, although there are established populations at several locations. However, signal crayfish have been shown to be negatively correlated with bullhead, suggesting competitive and/or predator-prey interactions. The spread of signal crayfish in the catchment could therefore lead to localised extinction of bullhead.

Development and Road Schemes

There are several building developments and road schemes proposed within the Avon cSAC catchment. The main potential impacts of developments and road schemes on the cSAC are: pollution of the river system during construction, runoff during operation/usage, indirect pressures on the river if floodplain dynamics are altered, increased demand on water resources in the area, increased need for sewage disposal, and fragmentation of habitat.

Under the Habitats Regulations any development that may have an impact on the cSAC requires scrutiny and is also subject to statutory planning legislation, land drainage and pollution controls. The River Avon cSAC/SSSI designations place considerable demands on public bodies specifically to address this aspect. Despite the statutory measures already in place, there are several issues to consider. In particular, few of the local authorities in the Avon catchment have experience of implementing the Habitats Regulations.

It is recommended that a planning forum and seminars are established to help identify development

invasive plant species is required to reduce the risk of further introductions of invasive plants.

Grazing of Water Crowfoot by Flocks of Mute Swans

Grazing by flocks of unmated mute swans has been observed to have a marked local effect on beds of water crowfoot (*Ranunculus*) in the River Avon system. In some instances this is due to, or related to, other impacts known to be affecting the condition of the vegetation communities. Grazing of *Ranunculus* species is thought to impact the SAC by depleting the vegetation community and reducing refuges for salmon and bullhead.

English Nature has recently

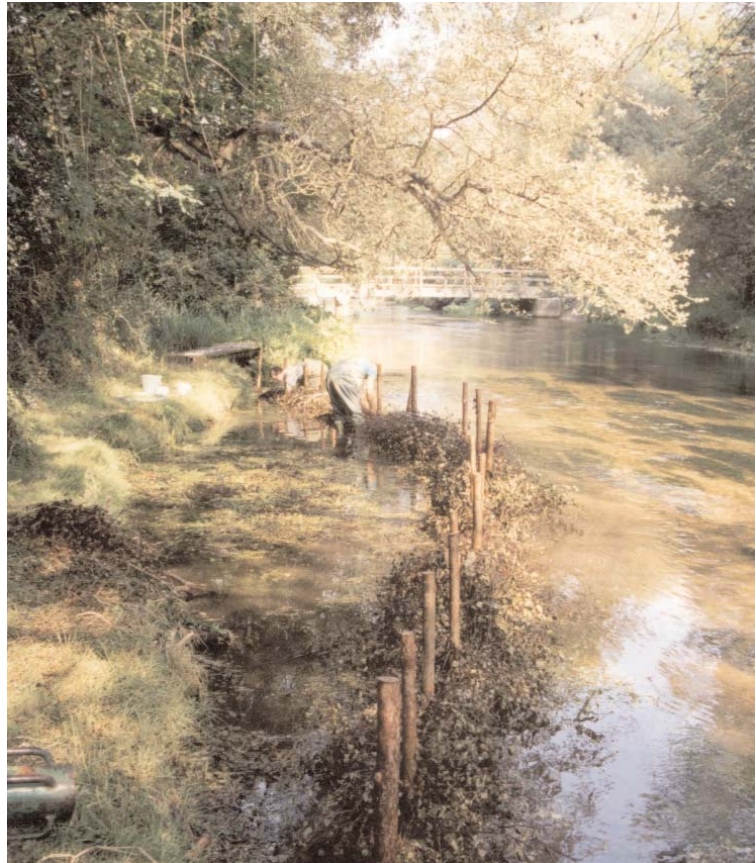
proposals likely to affect the cSAC, potential issues related to these, responsibilities and a timetable for action. Local planning authorities and highways authorities also need to strengthen their procedures for consultation with the Environment Agency and English Nature early in the planning process.

Strategic Approach to River Rehabilitation

The river habitat is damaged or in poor condition in places, often as a result of historical land drainage and engineering activities. To try and improve the physical habitat of the river system, various organisations and individuals undertake habitat enhancement works. These enhancement schemes have varied aims.

A strategic approach to rehabilitation must be developed to maximise ecological gain for the cSAC, comprising clear objectives and a framework within which to identify sites that would benefit most from this work. The approach must also consider any constraints at those sites.

Several rehabilitation schemes are being undertaken on the River Avon, including here at Figheldean. When rehabilitation work is finished, the water is clear and submerged plants such as water crowfoot can flourish, providing habitat for numerous species.

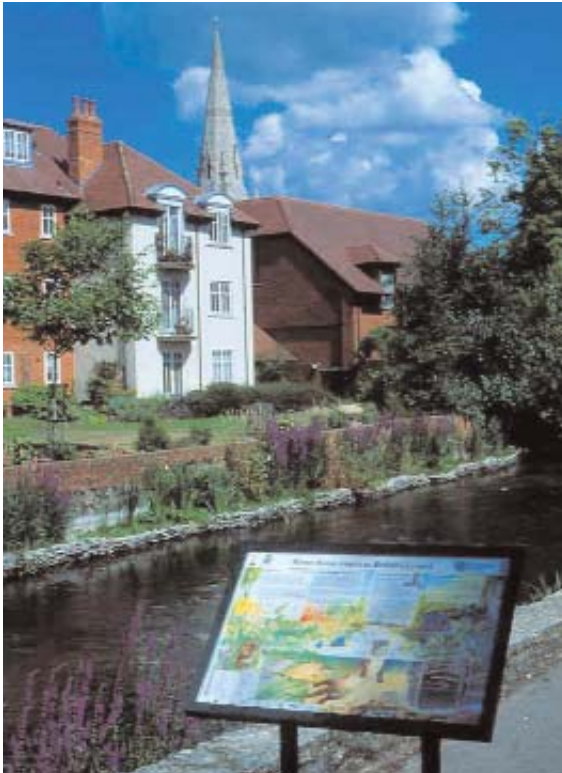


Both photos by Tony Wells



Communication and Access

Ineffective communication has been identified as an issue that undermines co-operation between river managers. In addition, the wider community has limited opportunities to access information about the river. Improved communication and access to information would help create an identity and sense of ownership for the river in the wider community, and improve levels of co-operation from key groups.



Steve Davies/English Nature

Information available to the public, such as here at Salisbury, is vital to help create a sense of ownership of the river and habitats.

Particular action is required to investigate how best to improve communication between stakeholders and statutory bodies, and how best to improve public understanding and managed access to the river system. Depending on the outcome of the WLMP initiative, a similar structure could be used for future consultation between parties (statutory, regulatory and riparian owners) involved in management of the River Avon cSAC.

Data Collation and Information Management

Large amounts of data exist for the River Avon cSAC, but are currently dispersed between organisations. To improve understanding of the processes and needs of the river system, further action is required to ensure information is collated and stored in a useful format (GIS-based) and long-term management assured.

Boundary of the River Avon cSAC

The boundary of the River Avon cSAC/SSSI was based on the available scientific knowledge at the time of notification. New information indicates that the boundary could be revised.

Survey and Monitoring of the cSAC's Habitats and Species

Adequate data exist on water quality, flows and salmon stocks, but there is inadequate information regarding the distribution, range and size of bullhead and lamprey populations. Surveys to gain more information on populations of these species in the river system are underway. To improve our knowledge of the river and to allow reporting on favourable condition there is a need to determine a monitoring strategy for the cSAC.

Climate Change

The consensus for the impact of climate change on the weather in southeast England is drier summers, wetter winters and increased likelihood of extreme events such as storms and droughts. It is vital that the actions recommended throughout the strategy are implemented through sustainable solutions, which take into consideration climate change.

Priorities for Action

Careful consideration of the key issues above via the prioritisation process described has resulted in the detailed action tables following. Within these tables, four levels of priority for further action have been identified: Key Major, Major, Intermediate and Minor. In considering the actions listed in the tables it is important to bear in mind that these priorities have been assigned in the specific context of the strategy. Consequently, where a key issue is judged already fully or partially in hand, any adjustment or addition to the existing action may well be considered a lower priority when compared to an issue that has been neglected hitherto. Equally, because of the criteria used, issues that have a localised impact (perhaps applicable to the upper or lower Avon only), or which are not directly relevant to the cSAC (such as management of the SPA), have also been accorded a lower priority.

The summary action tables therefore show the prioritised issues and associated further actions required. Where an action is mainly relevant to a localised area, this has been indicated. All the actions shown in the tables need to be tackled. However, those in priority groups Key Major and Major will be most urgently acted upon. For further information on each action, refer to the corresponding section of the strategy, as indicated in the tables. A copy of the full strategy document can be obtained from English Nature.

Twenty-four general issues affecting the cSAC were identified, many of which are being addressed in part or entirely by existing measures. Agricultural diffuse pollution and strategic habitat rehabilitation were identified as major key issues where the action required cannot be delivered through the existing work of organisations.

An example table follows, while a key to the symbols and abbreviations used is given on the following page.

Action tables

Example

Issue	Existing measures	Priority	Area	Action required	By whom/Lead and potential partners)	Mechanism	Date
Name of issue	Measures already in place	Priority for further action	Area where action is most applicable	Further actions required over and above those already in place	Potential partners. Where a clear lead has been identified this is indicated in bold . The symbol * indicates that a lead needs to be identified.	Suggested delivery mechanism	Suggested date by which action should be carried out.

Key to symbols and abbreviations

The abbreviations used to describe organisations and mechanisms referred to in the strategy document and a key for priorities for action are as follows:

Organisation		Mechanism	
A&SRA	The Avon and Stour Rivers Association	AMP	Asset Management Planning
CERC	Relevant County Environmental Record Centres	BAP	Biodiversity Action Plan
DEFRA	Department of the Environment, Fisheries and Rural Affairs	CAMS	Catchment Abstraction Management Strategy
EA	Environment Agency	CFMP	Catchment Flood Management Plan
EN	English Nature	CSS	Countryside Stewardship
GCT	Game Conservancy Trust	ECAP	Eutrophication Control Action Plan
HA	Highways Authority	ESA	Environmentally Sensitive Area
LA	Local Authorities (both district, county and borough councils)	FAP	Fisheries Action Plan
		LEAP	Local Environment Agency Plan
LA 21	Local Agenda 21	NT&GS	National Trout and Grayling Strategy
RRC	River Restoration Centre	O & M	Operational and Maintenance Plan
RSPB	Royal Society for the Protection of Birds	PSYCHIC	Project developing a risk assessment and decision-making tool for agricultural diffuse pollution
WCO	Water companies		
WFA	Wiltshire Fishery Association	RoC	Review of Consents
WSRT	Wessex Salmon and Rivers Trust	SAP	Salmon Action Plan
WTs	Wildlife Trusts	WLMP	Water Level Management Plan
WTT	Wild Trout Trust		

Note: In the action tables on the following pages, reference is made to the following:
Fisheries interests – fishing clubs, representative organisations e.g. WFA, A&SRA and sources of expertise e.g. WTT, GCT
Landowner interests – landowners, tenant farmers and representative organisations e.g. NFU, CLBA

Area action primarily applies to		Priorities for action	
UA	Upper Avon (above Salisbury)	1	Key Major
LA	Lower Avon (below Salisbury)	2	Major
A	All Avon	3	Intermediate
H	Christchurch Harbour	4	Minor

Issue	Existing measures	Priority	Area	Action required	Lead (in bold) and potential partners	Mechanism	Date	Section
1	Existing point-source discharges	2	A	1.1	Ensure that appropriate discharges from the Stour are included in the Review of Consents.	EA, WCO	2003	3.2.3
			H	1.2	Investigate water quality in Christchurch Harbour to determine if this is a significant influence on salmon and lamprey	EA	RoC/ research	?
		2	A	1.3	If national-level Environment Agency work finds that the Avon is at risk from hormone-disrupting substances, investigate options for reducing this risk.	EA	Research	2003+
2	New discharges	2	A	2.1	The Avon ECAP must have regard to the cSAC favourable condition targets, and in particular soluble reactive phosphorus levels.	EA	2002/3	3.2.1.2
			A	2.2	Promote the use of Sustainable Urban Drainage Systems in all new developments or road schemes to ensure no significant effect on the cSAC.	LA, EA, EN	Planning process	Ongoing
3	Agricultural diffuse pollution	1	UA	3.1	Seek funding to develop the Landcare project within the River Avon catchment, including the provision of financial support for farmers and riparian owners prepared to adjust their farming practices in order to benefit the conservation interests of the cSAC.	EA, EN, DEFRA	2003+	3.3.1.1
				3.2	Provide agri-environment scheme advisors and project officers with information on where to target advice on best farming practice.	Landcare, DEFRA, WTs	2003+	3.3.1.2
		1	A	3.3	Support agri-environment scheme advisors and project officers to increase their knowledge of best farming practices, including soil and nutrient management.	Landcare, DEFRA	2003+	3.3.1.2
				3.4	Ensure that advisors in the Lower Avon are kept informed of experiences from the Landcare project and have access to further information if required.			
		1	LA	3.5	Investigate the contribution of diffuse pollution to water quality on the Lower Avon if phosphorus levels indicate this may be an issue.	EA, EN, DEFRA	?	3.3.1.6

Issue	Existing measures	Priority	Area	Action required	Lead (in bold) and potential partners	Mechanism	Date	Section
3	Road runoff	1	A	3.6	Seek funds to support best farming practices where agricultural land use contributes to road runoff.	EA, EN, HA, LA	2003+	3.3.2
	Current and future abstractions	2	A	5.1	Support the implementation of the South West Region Water Resources Strategy, promoting ways to manage demand for water.	EA, EN, WCO, WTs	2003+	4.3.2
6	Recreational fishery management	2	A	5.2	The CAMS ecological assessment must have regard to the favourable condition flow targets for the Avon cSAC.	EA	2003+	4.3.3
		2	A	6.1	Avon FAP to take into account potential interactions between stocked brown trout and the River Avon cSAC/SSSI features	EA, EN, WTs, - fisheries interests	?	5.3.3.2
		2	A	6.2	Avon FAP to address the issue of the stocking of rainbow trout in the Avon cSAC		?	
		2	A	6.3	Avon FAP to take into account potential interactions between the coarse fishery and the cSAC/SSSI features		?	
		2	LA	6.4	In the Avon Valley SPA/SSSI, remove fences at the earliest opportunity once appropriate grazing regimes are established	EA, EN, DEFRA, Fisheries and landowner interests	2003+	5.3.4.3,
2	A	6.5	Revise the gravel-cleaning protocol to take into account the cSAC features and the findings of the <i>Decline of Chalk Stream Salmon</i> research project.	EA	Research	2003	5.3.5	
	Advisory services	2	A	6.5	Develop guiding principles for sensitive management of fisheries within the cSAC, in partnership with fishing interests.	EN, EA, WTs, WFA, A&SRA, fishing interests	2004	5.3.6
		2	A	6.7	Promote adoption of principles of sensitive management as a voluntary code of practice.		2004	

Issue	Existing measures	Priority	Area	Action required	Lead (in bold) and potential partners	Mechanism	Date	Section	
7	Exploitation of salmon stocks	3	A	7.1	Keep catch and release guidance for the Avon fisheries under review and develop suitable guidance taking account of temperature effects.	EA, fisheries interests	Research	2003+	5.4.1
				7.2	Keep local sea fishery netting bylaws under review and if necessary and appropriate put forward proposals for further bylaws to protect salmon.	EA	Review	2003+	5.4.2.1
	7.3	Work with the police to ensure an adequate response to illegal activity, particularly resolving county/borough boundary issues.	EA , police	Enforcement	2003+	5.4.2.2/3			
8	Monitoring	4	A	8.1	Continue with actions underway	EA	Monitoring	Ongoing	5.5
9	Enforcement New legislation	4	A	9.1	Continue with actions underway	EA	Enforcement	Ongoing	5.6
10	Flood defence operations and maintenance	2	LA	10.1	Incorporate the revised Weed Cutting Code of Practice into the Operational and Maintenance Plan once English Nature, the Environment Agency and ESA officer are satisfied with the new procedure.	EA , EN, DEFRA	O & M plan	2003	6.1.2.1
				10.2	Review the Weed Cutting Code of Practice regularly and amend the Operations and Maintenance Plan accordingly.				
		2	LA	10.3	Consider appropriate monitoring to determine changes in <i>Ranunculus</i> communities on the river in response to Environment Agency weed cuts and to determine if the cuts achieve their water-level management objectives.	EA	?	?	6.1.2.1
				10.4	Have regard to the suitability of weed-cutting equipment and collection, removal and disposal of weed.	EA	O & M plan	2003+	6.1.2.1
				10.5	Leave coarse woody debris in place where this will not increase the risk of flooding or damage to infrastructure.	EA	O & M plan	2003+	6.1.3

Issue	Existing measures	Priority	Area	Action required	Lead (in bold) and potential partners	Mechanism	Date	Section
11 Water-level management	WLMs, Weed Cutting Protocol, LIFE research	3	A	11.1	Ensure that any new or reinstated water level management structures (as part of WLMs or other initiatives) do not compromise the safe passage of salmon, lamprey and bullhead.	EA, EN, DEFRA, fisheries and landowner interests	2003+	6.2
				11.2	Ensure the implementation of the Water Level Management Plan for the Avon Valley SPA/SSSI takes into account potential conflicts with the cSAC interests.			
				11.3	Take the revised Weed Cutting Code of Practice into account in the Water Level Management Planning Initiative.			
				11.4	Take into account the results of a Life in UK Rivers investigation into the hydrological requirements of Desmoulin's whorl snail and identify areas for potential habitat enhancement.			
				11.5	In the upper Avon, enhancement of Desmoulin's whorl snail habitat must take into account seasonal variations in flow and ensure that flow levels for the in-river interests are maintained at all times.			
12 Catchment flood-risk management		3	A	12.1	Flood-defence schemes should provide integrated solutions to reducing flood risk, delivering net wildlife gain.	EA, LA	2003+	6.3
				12.2	The Catchment Flood Management Plan must take into account the ecological requirements of the River Avon cSAC and the Avon Valley SPA and opportunities for wildlife enhancement.			

Issue	Existing measures	Priority	Area	Action required	Lead (in bold) and potential partners	Mechanism	Date	Section	
13	Non-native invasive plant species	3	A	13.1	Undertake a co-ordinated Avon-wide publicity campaign to inform and educate the public regarding the need to take a responsible attitude to the introduction and control of invasive plant species.	*EA, EN, WTs, LA 2.1, fisheries and landowner interests	2004?	7.1.3.2	
				13.2	Inform and educate target groups on identification, sources of advice and management of invasive non-native plants.				
		3	A	13.3	Collate information on invasive plant species locations for storage in a central database that is compatible with both Mapinfo and Arcview geographic information systems.	* EN, EA, CERC, LA, HA, WTs, all bodies undertaking survey	Data collation	2004	7.1.3.3
				13.4	Ensure that relevant data on invasive plants collected as part of other surveys are input to the invasive species database.				
		3	A	13.5	Improve and develop existing recording networks and reporting mechanisms to collect and store information on invasive plants.	fisheries and landowner interests	Data management	2004?	7.1.3.4
				13.6	Create an invasive plant species forum in the Avon catchment, to identify target areas for action and to instigate a programme of appropriate management.				
3	UA	14.1	Collate information on mute swans for storage in a central database that is compatible with both Mapinfo and Arcview geographic information systems.	* DEFRA, EN, EA, fisheries interests	Data collation	2004	7.2.1.1		
		14.2	Determine the ecological impact of mute swan grazing on the cSAC. If necessary, identify practical options for reducing the impact of mute swan grazing on the cSAC.	EN , DEFRA, fisheries interests	?	2003/4	7.2.1.2		

Issue	Existing measures	Priority	Area	Action required	Lead (in bold) and potential partners	Mechanism	Date	Section	
15	Avian predation	3	A	15.1	Keep a watching brief on the number of cormorants and other avian predators and any trends affecting the cSAC.	* DEFRA, EA, EN, fisheries interests, RSPB	2003+	7.3	
		3	A	15.2	Carry out an investigation to assess whether there is a likely significant effect of avian predation on salmon juvenile numbers (particularly smolts) at certain times and places), and formulate appropriate action.				
16	Native Crayfish BAP	4	UA	16.1	Investigate current population densities of signal crayfish in the Nadder and Eastern Avon and determine if there has been an impact on bullhead and <i>Ranunculus</i> habitat.	EA, EN, WTs	BAP	7.4	
17	Appropriate assessment, planning process	2	A	17.1	Ensure that Regional Development Plans contain policies that safeguard the River Avon cSAC.	Regional planning authority, EA, EN, WTs	Regional development plans	2003+	8.2.1
		2	A	17.2	Establish a planning forum to broadly identify development proposals likely to affect the cSAC, potential issues, responsibilities and a timetable for action.	EN, LA, HA	New planning forum	2004	8.2.2
		2	A	17.3	Hold seminars to determine what support public bodies responsible for planning and development need and discuss local case studies of good practice.	EN, LA, HA	Seminar	2003/4	8.2.2
		2	A	17.4	Local planning authorities and Highways Authorities must strengthen consultation with the Environment Agency and English Nature early in the planning process, to ensure proposals have no significant effect on the cSAC.	LA, HA	Appropriate assessment	2003+	8.2.2.1

Issue	Existing measures	Priority	Area	Action required	Lead (in bold) and potential partners	Mechanism	Date	Section	
18 Habitat rehabilitation	Condition assessment	I	A	18.1 Use condition assessment criteria to determine whether and where rehabilitation is required to achieve favourable condition.	EA, EN	Condition assessment	2003	9.1.2	
	Strategy partnership	I	A	18.2 Consider whether major investment in a programme of larger-scale rehabilitation is required. If so establish the necessary partnership and seek funding.	Strategy Working Group partnership, RRC	n/a	2003	9.1.2	
	Life in UK Rivers	I	A	18.2 Refine the proposed strategic approach to rehabilitation, using the River Wylye as a pilot catchment.	EA, EN	Investigation	2003	9.1.2	
		I	A	18.3 Undertake a detailed geomorphological assessment of the remainder of the cSAC, using the refined Wylye approach.				2003/4	9.1.2
		I	A	18.4 Evaluate the physical and ecological impact of existing rehabilitation schemes in the cSAC to help identify the most appropriate techniques.	EA, EN	Research	2004	9.1.2	
		I	A	18.5 Adopt the strategic approach as a framework for targeting rehabilitation projects that bring maximum ecological gain to the cSAC and preserve/enhance important archaeological features.	EA, EN, WTs, fisheries interests	Policy	2004/5	9.1.2/9.2	

Issue	Existing measures	Priority	Area	Action required	Lead (in bold) and potential partners	Mechanism	Date	Section
19	Habitat rehabilitation guidance	3	A	19.1	Undertake research to evaluate the physical and ecological impact of rehabilitation techniques, including type of materials used.	EA, EN	2003+	9.2
	WCSP/EA advice on projects	3	A	19.2	Develop, evaluate and disseminate best-practice guidance to ensure that in-channel rehabilitation projects have maximum ecological gain for the cSAC and preserve/enhance important archaeological features.	EA, EN, DEFRA fisheries and landowner interests, WTs, RRC, LA	2003/4	9.2
		3	A	19.3	Develop, evaluate and disseminate best-practice guidance to ensure that floodplain rehabilitation has maximum ecological gain for the cSAC and archaeological features.		2003/4	9.2
20	Accessibility	2	A	20.1	Investigate how best to improve communication between stakeholders and statutory bodies.	EA, EN, WTs, fisheries and landowner interests, LA	2004	10.1
		2	A	20.2	Depending on the outcome of the WLMP initiative, consider using a similar structure for future consultation between parties (statutory, regulatory and riparian owners/tenants) involved in management of the River Avon cSAC.		2003+	10.1
		3	A	20.3	Investigate how best to improve public understanding and managed access to the river system.		2003+	10.1

Issue	Existing measures	Priority	Area	Action required	Lead (in bold) and potential partners	Mechanism	Date	Section
21	Data management	2	A	21.1 Collate data related to the River Avon cSAC, put in place a database management system and investigate options for making elements of the database publicly available	EA, EN, CERCs, NBN	?	2004	10.2
22	Boundary of the cSAC	3	A	22.1 Review the boundary of the cSAC/SSSI if new information indicates that additional parts of the river system fulfil the criteria for inclusion in the cSAC/SSSI.	EN	Routine	?	10.3
23	Survey and monitoring	2	A	23.1 Develop a monitoring strategy for the River Avon cSAC in order to report on favourable condition.	EN, EA	Reporting	2003/4	10.4
24	Climate change	n/a	A	24.1 All actions recommended in the River Avon cSAC strategy to be implemented using sustainable solutions, which take into consideration climate change.	All	All	Ongoing	n/a

