

Section 4

Water Resources and Flow

Maintenance of an adequate characteristic flow regime is essential to the cSAC features, as described in Section 2. It should be noted that ‘flow’ refers to both velocity and volume.

Particular attributes related to water resources and flow are relevant to the species and habitats of the River Avon cSAC, and are shown in Table 10.

Table 10. Relevant attributes related to water resources and flows.

Attribute	Measure
Flow	Flow regime should be characteristic of the river. As a guideline at least 90% of the naturalised daily mean flow should be maintained throughout the year at all points in the river system.
	Residual flows at Knapp Mill $\geq 9 \text{ m}^3\text{s}^{-1}$

A broad review of the effect of abstraction on river flow and groundwater levels in the upper Avon was undertaken in the early 1990s. This review concluded that groundwater abstraction was having a significant effect on the rivers Wylfe, Till, Chitterne Brook, Bourne and Nine Mile River (NRA 1993). It also recommended that if abstraction from Fonthill Bishop increases to its licensed quantity then the impact on the Fonthill Stream should be re-considered.

The River Wylfe and tributaries were recommended for a detailed investigation, and a subsequent study found that a reduction in the volume of groundwater abstraction would significantly improve flows in the Wylfe, Till and Chitterne Brook (Environment Agency 2000). The Bourne and Nine Mile River were recommended for detailed investigation once resources were available on completion of the River Wylfe study. Similarly, the Fonthill Stream would be the final sub-catchments to be investigated (Halcrow 1996).

In addition to reductions in flow volume, perturbations to the flow regime can impact on migratory species. A study in by Solomon (1990) found that two surface water

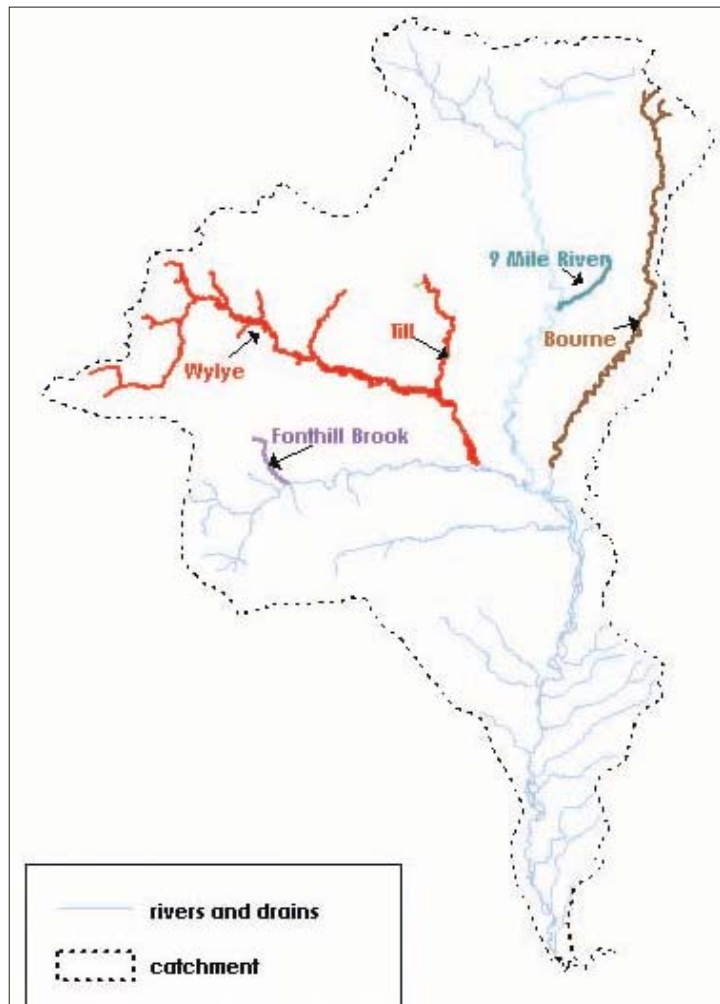


Figure 14. Rivers where risk of abstraction impacts is known or under investigation.

abstractions in the lower Avon may affect the upstream migration of salmon, and recommendations were made for optimisation of the abstraction regime.

The rivers in the Avon catchment known to be or potentially affected by abstraction are shown in Figure 14.

4.1 Water Resources in the Avon cSAC Catchment

The groundwater from the chalk aquifers in the upper part of the Avon catchment provides the majority of the water resource for in-river flow and a variety of uses, including public and private water supply, agriculture, aquaculture (watercress and fish farms), and industry. With a few exceptions, the Environment Agency licences abstraction of water to supply these needs (Environment Agency 2000) and monitors all authorised abstractions to determine any potential or actual local environmental effects.

There are approximately 600 licences for abstraction in the catchment. The licences include a mixture of surface and groundwater abstractions for consumptive and non-consumptive uses. Consumptive uses result in an effective loss of water to the catchment, while non-consumptive uses return abstracted water to the watercourse close to the point of abstraction. On a catchment scale, consumptive use is likely to be of more concern, but non-consumptive use can have a significant localised effect.

The largest licensed consumptive abstractions are for public water supply, assuming maximum uptake of licensed quantities (NRA 1994). Public water supply is not truly consumptive, as some water will be discharged back into the catchment from which it was sourced.

The majority of abstraction for public water supply is licensed to Wessex Water Services Ltd and Bournemouth and West Hampshire Water Company. The public water supply is taken from a number of sources dominated by groundwater north of Salisbury and direct river or surface water south of Salisbury. Both Wessex Water and Bournemouth and West Hampshire Water Company pump some of the abstracted water outside of the Avon catchment. For example, water from the River Wylye supplies Bath and West Wiltshire and is discharged into the Bristol Avon, resulting in a net loss of water from the catchment.

The largest licensed non-consumptive abstractions are for fish farms, assuming maximum uptake of licensed quantities (NRA 1994).

For detailed information on abstraction in the Avon catchment, refer to the Local Environment Agency Plan (Environment Agency 2000).

4.2 Issues Related to Existing Licensed Abstractions

As described in Section 4.1, studies have shown that the rivers Wylye, Bourne, Nine Mile River, Nadder and Fonthill Stream are at risk due to groundwater abstraction. There are two primary mechanisms in place to investigate and modify abstractions, Asset Management Planning (AMP), and the Review of Consents process (see Section 1.6.5)

4.2.1 Public Water Supply Abstractions

In *A Price Worth Paying* (1998a), the Environment Agency identified several improvements to abstractions in the Avon catchment. These changes are to be delivered by AMP, which enables investigation and modification of water company functions if they are potentially impacting on the environment.

The current programme (known as AMP 3) runs from 2000 to 2005. The status of improvements in the Avon catchment to be delivered by through AMP 3 is summarised in Table 11.

In the resulting price determination for 2000–2005, OFWAT rejected the proposed scheme for the Wylye and advised that options for a more cost-effective solution should be examined. The Minister for

Table 11. Summary of environmental improvements required under AMP 3 and current status.

Catchment	Source	Improvement expected	Timescale	Current Status
Wylde and tributaries	Groundwater	Reduce abstraction at Chitterne borehole and trial stream support for Chitterne Brook.	by 2003	Options for cost-effective solution under discussion. Phase 1 solution now agreed.
Bourne and Nine Mile River	Groundwater	Investigate impacts of abstractions by three water companies and formulate necessary mitigation measures.	by 2005	Data collation and conceptual modelling complete. Detailed modelling to be undertaken and results analysed, led by the EA.
Avon	Surface water	Review abstraction impact and investigate possible optimisation of abstraction patterns to facilitate salmon migration.	by 2005	Investigation began June 2002 by BWHW Co.
Fonthill Brook	Groundwater	Investigate impacts of abstractions.	2005	Investigations underway, led by the EA.

the Environment accepted this advice, but announced that a scheme to address the effects of abstraction on the Wylde must still be put in place within the AMP 3 period.

DEFRA (formerly the Department of the Environment, Transport and the Regions) set out to review the options in consultation with the Environment Agency, OFWAT, English Nature and Wessex Water. These organisations have been developing alternative proposals and have agreed an interim solution with a view to progressing towards a sustainable solution. The interim solution will be carefully monitored and further measures may be required in the long term.

The implementation of all the AMP 3 requirements is a crucial element in ensuring that the condition of the cSAC is not significantly impacted by existing abstractions.

Action underway	Delivery		
	By whom	Mechanism	Date
Investigations and improvements to abstractions under AMP 3.	EA, WCO	AMP3	2005
Further improvements depending on the outcome of AMP 3 investigations.	EA, WCO	AMP	2005+
Implement interim solution to alleviate the effect of abstraction on the Wylde and tributaries. Solution to be monitored to inform sustainable solution.	EA, WCO	AMP 3	2003

4.2.2 The Review of Consents

Under the Habitats Directive, the Environment Agency must review relevant all existing abstractions to establish the likelihood of their significant effect (alone and in combination with other permissions, plans or projects) on the cSAC. This process is called the Review of Consents and is detailed in Section 1.6.5.

In the case of public water supply, there is likely to be a degree of overlap between the AMP 4 programme and licences identified as in need of variation through the Review of Consents. The review of consents is expected to finish in 2004, but negotiations to obtain water company investment for AMP 4 (2005–2010) are already underway. For this reason, AMP 4 is unlikely to include all the modifications required to satisfy the requirements of the Habitats Directive. This leaves two alternatives for funding changes required under the Habitats Directive through the periodic review: inclusion in AMP5 (2010–2015) or the interim determination process.

Action underway	Delivery		
	By whom	Mechanism	Date
Changes to public water supply abstraction licences identified in the Review of Consents process will be included in AMP4 or the interim determination process as soon as possible.	EA, EN, WCO	AMP, RoC	2003+

4.3 Issues Related to Future Abstraction Licences

4.3.1 National Legislation

In March 1999, the government published a document detailing changes to the abstraction licensing system that should make the system more flexible. Some of the changes required are achievable within the existing powers of the Environment Agency. However, alterations in primary legislation are required to make the remainder of the changes. The resulting proposed legislation is the draft Water Bill.

Important elements of the draft Water Bill are the introduction of time-limited licences and an end to the payment of compensation for the revocation of licences. It is crucial that the Water Bill progresses through Parliament and that these provisions are made to ensure the sustainable use of water resources in the future. The passing of the Water Bill is likely to take some time and, in the case of the Avon, action is needed now, which means there must be continued efforts to deliver improvements through the AMP process.

Action underway	Delivery		
	By whom	Mechanism	Date
National policy work to influence the Water Bill and ensure it continues to progress.	EA, EN, WTs	Policy work	2003+

4.3.2 Regional Water Resources Strategy

In 2001 the Environment Agency produced *Water Resources For The Future: A strategy for the South West Region* (2001). The strategy examines likely future patterns of water use and highlights the importance of increased efficiency in the use of water. Improved efficiency, leakage control and reduced wastage of water are important elements in managing demand, and should make a significant contribution to management of water resources in the next 25 years.

Action required	Delivery		
	By whom	Mechanism	Date
Support the implementation of the South West Region Water Resources Strategy, promoting ways to manage demand for water.	EA, EN, WCO, WTs	Routine work	2003+

4.3.3 Catchment Context

The context for assessing the likely significant effect of future abstraction licences will be provided by the Avon Catchment Abstraction Management Strategy (CAMS). CAMS considers the ecological requirements and needs of water resource users in an open way, setting out a strategy for sustainable management of water resources at a catchment scale. For more detailed information on CAMS see Appendix B.

In determining significant effect, the Environment Agency must ensure that river flows, groundwater levels and water levels in wetlands will not fall below the minimum ecologically acceptable level required to achieve favourable condition. However, the needs of existing protected rights and lawful uses of water must be met where possible. CAMS will provide a consistent framework within which to achieve this, and will inform the appropriate assessment of new or varied licences. The Avon CAMS will be developed in 2003–4 in order to take into account the findings of the review of consents.

Action required	Delivery		
	By whom	Mechanism	Date
The CAMS ecological assessment must have regard to the favourable condition flow targets for the Avon cSAC.	EA	CAMS	2003+

4.3.4 Development

Applications for new developments may create increased demand for public water supply. Refer to Section 8 for details of issues related to development.