ED.3.18

Habitats Regulations Assessment for the Stratford-on-Avon District Consultation Core Strategy

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Prepared for Stratford-on-Avon District Council
by

SUMMARY

The consultation version of the Stratford-on-Avon District Core Strategy sets out the scale and location of development proposed for the district to 2026. It comprises 16 Core Policies and a range of more detailed site proposal policies. Key proposals contribute towards providing:

- 7500 net additional dwellings,
- 68 ha of employment land,
- between 25,000 and 45,000 square metres of comparison retail floorspace in or on the edge of Stratford-upon-Avon, and
- 20,000 square metres of office space in or on the edge of Stratford-upon Avon.

This Habitats Regulations Assessment considers the 'in combination' impacts of the consultation Core Strategy on the integrity of the Bredon Hill Special Area of Conservation (SAC), Dixton Wood SAC, Ensor's Pool SAC, Fens Pools SAC, Lyppard Grange Ponds SAC, Severn Estuary cSAC/SPA/Ramsar, and River Wye SAC. Possible impacts include air pollution, recreational disturbance, water pollution and changes in water levels due to water abstraction.

The study concludes that, on its own, the consultation Core Strategy will not have significant impacts on the integrity of any of these sites. However, in combination with other development being proposed in the West Midlands and South West, the Core Strategy could have significant impacts on the integrity of the Lyppard Grange Ponds SAC, the Severn Estuary sites and River Wye SAC due to water abstraction; and the Severn Estuary sites due to water pollution.

To deal with the water abstraction/level issue, the study recommends that Stratford-on-Avon District Council should implement one or more of the following measures:

1. wait until further studies by Severn Trent Water provide greater certainty
2. hold discussions with the Environment Agency and Severn Trent Water regarding possible headroom for abstraction
3. require new development to be 'water neutral': to produce all of its own water through e.g. rainwater collection and greywater recycling, or to reduce water use off site (e.g. in existing homes) by the same amount as the additional water used on site
4. make any development conditional on assured water supplies from sources that would not have an adverse effect on Natura 2000 sites.

To deal with the water quality issue, the study recommends that Stratford-on-Avon District Council should:

5. not permit any more housing at Kineton until Severn Trent Water has carried out its Asset Management Plan 5 (AMP5) works at the Kineton WWTW, and make any future housing allocations (e.g. KIN.1) dependent on the completion of such works;
6. ensure that no more than 112 new homes (strategic allocation plus other) are built in the Wellesbourne WWTW catchment until Severn Trent Water has carried out its AMP6 works at the Wellesbourne WWTW;

7. if more than 381 new homes (strategic allocation plus other) are built in the Itchen Bank WWTW catchment, make any additional development dependent on provision of additional capacity at the WWTW;
8. hold discussions with the Environment Agency and Severn Trent Water regarding possible headroom for abstraction and wastewater treatment;
9. consider focusing strategic development where WWTWs have significant additional capacity, e.g. Alcester, Stratford-Milcote and Wootton Wawen. Additional development could also be considered for the Redditch WWTW catchment area, subject to Redditch Borough Council not filling up the significant spare capacity at that works
10. liaise with Severn Trent Water about any other significant development proposals, including those affecting smaller WWTWs, to ensure that WWTW capacity is adequate and provided in a timely manner.

1. INTRODUCTION

1.1 European Directive (92/43/EEC) on the Conservation of Natural Habitats and Wild Flora and Fauna (the 'Habitats Directive') protects habitats and species of European nature conservation importance by establishing a network of internationally important sites designated for their ecological status. These 'Natura 2000 sites' comprise Special Areas of Conservation (SACs) and Special Protection Areas (SPAs). In the UK, Ramsar wetland sites and European marine sites are also treated like Natura 2000 sites for the purposes of Habitats Directive compliance.

1.2 Article 6(3) of the Habitats Directive requires appropriate assessment to be undertaken on proposed plans that are likely to have a significant effect on one or more Natura 2000 sites either individually, or in combination with other plans and projects. Appropriate assessment involves assessing the plan's 'in combination' impacts on the integrity of Natura 2000 sites. It is a precautionary approach, which assumes that impacts on Natura 2000 sites will occur unless /until it can be shown that they will not occur. In 2007, this requirement was transposed into UK law in Part IVA of the Conservation (Natural Habitats, & c.) (Amendment) (England and Wales) Regulations 2007. In England, appropriate assessment is called Habitats Regulations Assessment (HRA).

1.3 Table 1 shows the main steps in HRA. The Stage 1 screening stage considers whether the plan could, 'in combination', affect any Natura 2000 site. If it could, then the Stage 2 appropriate assessment stage assesses this in more detail, and considers (in case of significant impacts) whether changes to the plan could avoid or mitigate those impacts. Where there are no alternatives and adverse impacts remain, then Stage 3 involves testing whether there are imperative reasons of overriding public interest for the plan, and Stage 4 considers compensatory measures.

1.4 This report presents the screening and appropriate assessment stages of the HRA of the Stratford-on-Avon District Core Strategy. The screening stage – shown at Section 2 - involved the following tasks:

- Reviewing the draft Core Strategy to identify its main types of impacts;
- Identifying Natura 2000 sites that could possibly be affected by the plan;
- For each site, identify its qualifying features, vulnerability, and key factors affecting site integrity. This information came from the Joint Nature Conservation Committee website, and the HRAs for the South West and West Midlands Regional Spatial Strategies (SWRA, 2007; GOWM, 2009). These are shown at Appendix A; and
- Determining whether the Core Strategy could have any significant 'in combination' impacts on the integrity of Natura 2000 sites.

1.5 A draft version of this HRA identified three issues that were taken further to the appropriate assessment stage:

- Impacts on air quality at the Bredon Hill SAC and Dixton Wood SAC.
- Water levels at the Lyppard Grange Ponds SAC, Severn Estuary cSAC/SPA/Ramsar site, and River Wye SAC.
- Water quality at the Severn Estuary cSAC/SPA/ Ramsar site.

Table 1. HRA steps

Stage 1 Screening	
Tasks	• Identify Natura 2000 sites that could be affected by the plan • Examine their conservation objectives, and the factors needed to maintain site integrity • Identify the plan's potential effects on the conservation objectives / factors needed to maintain site integrity • Examine other plans and programmes that could contribute to 'in combination' effects
Decision	If no effects are likely, report this. If effects are likely or uncertainty exists, proceed to Stage 2 appropriate assessment
Stage 2 Appropriate assessment	
Tasks	• Collate information on sites and evaluate impact in light of conservation objectives • Consider how the plan 'in combination' with other plans and programmes will interact when implemented • Consider how effect on site integrity could be avoided by changes to plan, including alternatives • Develop avoidance and mitigation measures
Decision	Report outcomes of the appropriate assessment. If effects remain following the consideration of alternatives and development of avoidance/mitigation measures, proceed to Stage 3
Stage 3 Assessment of alternative solutions; Stage 4 Assessment where no alternatives exist and adverse impacts remain	
Tasks	• Identify 'imperative reasons of overriding public interest' (IROPI) • Identify/ develop potential compensatory measures
Decision	Difficult test to pass, requirements are onerous and untested to date

1.7 Natural England was consulted on the draft HRA, and recommended that

- Air quality impacts on Bredon Hill and Dixton Woods SAC could be discounted: this final HRA does not discuss them.
- The Environment Agency's review of consents on the River Severn should be referred to. This final HRA refers to a final Water Cycle Study prepared for the Warwickshire authorities, which in turn is based on the Environment Agency's review of consents.
- The HRA should use a precautionary approach to housing numbers, focusing on total housing allocations for the district rather than simply strategic housing allocations. This report has done so.
- Discussions should be held with the Environment Agency and Severn regarding possible headroom for abstraction and wastewater treatment. This has been included as a conclusion of this HRA.

1.6 This HRA concluded that, ***on its own, the consultation Core Strategy will not have significant impacts on the integrity of any European site. However, in combination with other development being proposed in the West Midlands and South West, the Core Strategy could have significant impacts on the integrity of the Lyppard Grange Ponds SAC, the Severn Estuary sites and River Wye SAC due to water abstraction; and the Severn Estuary sites due to water pollution***. Sections 3 and 4 propose measures to deal with these impacts.

2. SCREENING

The Core Strategy and its possible impacts

2.1 The consultation version of the Stratford-on-Avon District Core Strategy sets out the scale and location of development proposed for the district to 2026. It comprises 16 Core Policies and a range of more detailed site proposal policies. Key proposals contribute towards providing:

- 7500 net additional dwellings,
- 68 ha of employment land,
- between 25,000 and 45,000 square metres of comparison retail floorspace in or on the edge of Stratford-upon-Avon, and
- 20,000 square metres of office space in or on the edge of Stratford-upon Avon.

2.2 This proposed development is likely to lead to more traffic moments, which could increase air pollution near Natura 2000 sites that are sensitive to air quality. It could increase water use and production of wastewater, which could affect Natura 2000 sites whose integrity is dependent on specific water levels and good water quality. It could increase the number of visitors to Natura 2000 sites that are attractive and close enough to attract such visitors. Table 2 summarises the Core Strategy's policies and shows which are considered in this HRA, and which have been eliminated from further consideration at this stage.

Table 2. Core strategy policies and their links to this HRA

Policy	Contents of policy	Considered further in this HRA?
CS.1	Describes the general spatial distribution of proposed development in the district	No – non-spatial, no scale of development proposed, explained in more detail in subsequent policies
CS.2	Promotes Stratford-upon-Avon as the district's main town; Alcester, Shipston-on-Stour and Southam and other places. Resists development in the AONB, and in the Green Belt except for limited infilling for employment uses; promotes land adjacent to Redditch as an employment site	Yes – spatial policy could affect traffic movements, which could affect air quality at sensitive Natura 2000 sites
CS.3	Makes provision for 7500 net additional dwellings, 68 ha of employment land, between 25,000 and 45,000 square metres of comparison retail floorspace in or on the edge of Stratford-upon-Avon, and 20,000 square metres of office space in or on the edge of Stratford-upon-Avon	Yes – scale of development could affect water use, wastewater production and traffic movements, which could affect sensitive Natura 2000 sites
CS.4	Requires provision of sufficient local infrastructure for the additional requirements of new development	Yes - Could act as mitigation for some impacts on Natura 2000 sites
CS.5	Discusses type of housing needed and its delivery	No – No effect on Natura 2000 sites beyond that of CS.3
CS.6	Permits larger scale employment development at sites in or near Stratford-upon-Avon and the main rural centres; business development sites; and Long	Yes – could affect traffic movements, which could affect air pollution levels at Natura 2000 sites sensitive to air

Policy	Contents of policy	Considered further in this HRA?
	Marston, the former airfield at Gaydon, the former cement works at Harbury/Bishops Itchington and Southam, and the former brickworks at Napton-on-the-Hill	quality
CS.7	Discusses how retail and commercial development should be provided	No – No effect on Natura 2000 sites beyond that of CS.3
CS.8	Requires developments to be permitted only if they provide adequate mitigation against unacceptable transport impacts (including cumulative impacts); proposes a range of transport schemes for Stratford-upon-Avon; safeguards a range of road schemes including M42 widening north of J3a, A46(T) Alcester to Stratford improvements, and A429 improvements west of Shipston-on-Stour	Yes – Could have 'in combination' impacts on air pollution
CS.9	Aims to protect and enhance open space and green infrastructure	No – Would help to support general biodiversity but would not affect Natura 2000 sites
CS.10	Supports the efficient use of land	As for CS.9
CS.11	Restricts development in flood risk areas; requires SUDS; protects and enhances the river environment and access to it; requires CSH water efficiency level 3 or 4 for new dwellings, 25% water efficiency for other forms of development	Yes – could act as mitigation for impacts on Natura 2000 sites sensitive to water level or water quality impacts
CS.12	Aims to reduce carbon emissions and promote renewable energy	No – any impacts on Natura 2000 sites would be very localised, and there are no local Natura 2000 sites
CS.13	Aims to protect natural and landscape features, including woodland; safeguards existing habitats	Yes – safeguards nature conservation designations 'in accordance with national policy and the Habitats Directive'
CS.14	Protects heritage assets	No – no effect on Natura 2000 sites
CS.15	Aims to secure high quality design	No – no effect on Natura 2000 sites
CS.16	States that planning permission will not be granted for developments likely to cause harmful pollution, including to the natural environment	Yes - could act as mitigation for impacts on Natura 2000 sites sensitive to water level or water quality impacts
SUA.1 – 12C	Proposals in Stratford-upon-Avon: 2210 dwellings; 25,000 square metres of retail; 12,000+ square metres of office space; conference centre; hotels etc.	Yes – scale and type of development could affect traffic movements, and location of wastewater treatment
ALC.1 - 4	Business development north of Arden Road; 125 dwellings east of Kinwarton Farm Road; 250 dwellings north of Allimore Lane; foodstore off Moorfield Road	Yes – scale and type of development could affect traffic movements, and location of wastewater treatment
BID.1 - 4	Proposals in Bidford-on-Avon, including 250 dwellings and business development space	Yes – scale and type of development could affect traffic movements, and location of wastewater treatment
HEN.1 – RBS.1,	Proposals in Henley-in-Arden, Southam, Studley, Wellesbourne, Gaydon, Long Itchington, Kineton and Shipston-on-Stour	Yes – scale of development could affect location of wastewater treatment
RBS.2	Leisure-related development, employment and housing at Long Marston	Yes – scale and type of development could affect traffic movements, and location of wastewater treatment

Policy	Contents of policy	Considered further in this HRA?
RBS.3 – REDD.1	Proposals near Bishops Itchington, Napton and Redditch	Yes – scale of development could affect location of wastewater treatment

Natura 2000 sites that could be affected by the Core Strategy

2.3 There are no Natura 2000 sites within the boundary of Stratford-on-Avon District. The Natura 2000 sites initially considered for this HRA were:

- Bredon Hill SAC – about 12km south-west of the district boundary
- Dixton Wood SAC – about 25km south-west of the district boundary
- Fens Pools SAC – about 25km north-west of the district boundary, in a built-up area of Dudley
- Lyppard Grange Ponds SAC – about 18km west of the district boundary, in a built-up area of Worcester
- Severn Estuary SAC/SPA/Ramsar – a large estuarine site that starts about 50km south-west of the district boundary
- River Wye SAC – located more than 50km from the district boundary and in a different river basin, but used to provide water to the district

2.4 Oxford Meadows SAC – designated for the creeping marshwort which is dependent on water levels - was originally considered because it could have been downriver of some developments proposed in the Core Strategy. However, although a small part of the river basin catchment of the River Thames, which determines the water levels at Oxford Meadows, is in the south-east part of the district near Ratley, the Core Strategy proposes no specific development sites in this area and development in the area is likely to be limited.

2.5 Impacts Ensor's Pool SAC – designated for white-clawed crayfish – were not analysed because it is more than 25km upstream from the edge of Stratford-on-Avon District. The River Clun SAC, River Dee and Bala Lake SAC, River Mease SAC and River Usk SAC were considered because they contribute to the West Midlands' water supply, but a water study for the West Midlands Regional Assembly (Treweek Environmental Consultants, 2009) has confirmed that they are not affected by water abstraction for the district.

2.6 Fens Pool SAC and Lyppard Grange Ponds SAC are designated for the great crested newt, *Triturus cristatus.* Their site integrity could be affected by land take or change of use on nearby land, recreational disturbance, water pollution, changes in water levels, and the introduction of fish.

2.7 The Severn Estuary cSAC/SPA/Ramsar site is designated for its over-wintering estuarine birds, sea and river lampreys, Twaite shad, sandbanks, estuary and Atlantic salt meadows; and because of the ecosystem functions provided by its wide range of intertidal wetland habitats. It is sensitive to changes in water level, poor water quality, and recreational pressures and disturbance.

2.8 The River Wye SAC is designated for its riverine habitat, transition mires and quaking bogs, white-clawed crayfish, sea lamprey, brook lamprey, river lamprey, Twaite shad, Atlantic salmon, bullhead and otter. It is sensitive to nearby land use changes, recreational disturbance, water pollution and changes in water levels.

2.9 No further analysis was carried out for Bredon Hill SAC and Dixton Wood SAC. Both are designated for the violet click beetle, *Limoniscus violaceus.* Their site integrity could be affected by land take and invasive species (which could out-compete the trees that host the beetle). Neither of these will be affected by the Stratford-on-Avon District Core Strategy. Although a draft version of this HRA suggested that their site integrity might be affected by air pollution linked to the Stratford-on-Avon District Core Strategy, Natural England has suggested that this is unlikely, and it is not discussed further in this HRA.

2.10 Table 3 summarises the key factors affecting the relevant sites' integrity.

Table 3. Factors affecting the integrity of the Natura 2000 sites

	diffuse air pollution	invasive species	land take, land use change	recrea-tional dis-turbance	water levels	water quality
Fens Pool SAC		✓	✓	✓	✓	✓
Lyppard Grange Ponds SAC		✓	✓	✓	✓	✓
Severn Estuary cSAC/ SPA/ Ramsar				✓	✓	✓
River Wye SAC			✓	✓	✓	✓

Possible 'in combination' impacts on the integrity of the Natura 2000 sites

2.11 Both Fens Pools SAC and Lyppard Grange Ponds SAC lie more than 15km from the district boundary, and still further from the main areas where development is proposed. They lie in built-up areas, and maintenance of their site integrity will primarily rely on how the impacts of the surrounding urban development are managed. They are not large or interesting enough from a visitor's perspective to attract additional residents from Stratford-on-Avon District that would increase *recreational disturbance* or lead to the *introduction of fish*. Fens Pools SAC is upriver of Stratford-on-Avon District, and so unaffected by potential changes in *water levels* due to the Core Strategy. As such, the Stratford-on-Avon District Core Strategy is unlikely to have a significant impact on Fens Pools SAC; and ***its only possible impact on the integrity of Lyppard Grange Ponds SAC could be through changes in water levels in the Severn River,*** which runs through Worcester. The latter is discussed further at Section 3.

2.12 The Severn Estuary cSAC/SPA/Ramsar site is located 50km or more from the district boundary as the crow flies, and further in terms of river distance. The River Avon, which (with its tributaries) runs through much of Stratford-on-Avon District, discharges into the River Severn at Tewkesbury, and in turn this discharges into the Severn Estuary at Frampton on Severn. The nearest recreational site to Stratford is the WWT's Slimbridge Wetland Centre, which informs visitors about the estuary, and manages visitor pressure.

Recreational disturbance from the additional residents of Stratford-upon-Avon District Council is likely to be minimal, due to the distance involved.

2.13 The JNCC's Natura 2000 forms for the Severn Estuary sites make it clear that water levels in the estuary are dominated by tidal patterns. However, ***water abstraction from rivers leading to the Severn Estuary, and wastewater discharge into those rivers due to the Core Strategy could possibly have an 'in combination' impact on water quality and water levels in the estuary***. These issues are discussed in Sections 3 and 4.

2.15 For the purposes of this HRA***, the only impact considered on the River Wye SAC will be on water levels***. The SAC is too far away to be affected by land use change or recreational pressures from the Core Strategy, and is not downriver of any Stratford-on-Avon District related wastewater treatment works. However its integrity could potentially be affected by water abstraction for the district in combination with abstraction for other authorities in the Severn Trent Water area.

3. APPROPRIATE ASSESSMENT: WATER RESOURCES AT LYPPARD GRANGE SAC, SEVERN ESTUARY cSAC/SPA/RAMSAR AND RIVER WYE SAC

Source

3.1 The Stratford-on-Avon District Core Strategy would increase water use through policy CS.3, which promotes 7500 new dwellings, 68 ha of employment land, plus retail and office space.

3.2 Policy CS.4 states "*The release of land for development will be dependent on there being sufficient capacity within the existing local infrastructure, or necessary improvements being provided in parallel with development, to meet the additional requirements. Suitable arrangements will be put in place to improve infrastructure, services and community facilities to successfully mitigate the impact of development and integrate it with the existing community*." The supporting text to the policy lists water resources as an example of infrastructure.

3.3 Policy CS.11 states that "*All new development should demonstrate good water efficiency standards. Meeting or exceeding the minimum water conservation standard of Level 3 and 4 of the Code for Sustainable Homes will demonstrate this for new dwellings. Other forms of development should demonstrate water efficiency savings of at least 25%*", although it does not specify what the 25% should be better than. CS.13 states that "*Proposals should [safeguard] existing habitats... in accordance with... the Habitats Directive*".

Pathway

3.4 A Water Cycle Study recently carried out for the district (Halcrow, 2010) notes that most of Stratford-on-Avon District's water is supplied by Severn Trent Water's Severn Resource Zone, with a small amount supplied by Severn Trent Water's Birmingham Resource Zone and South Staffordshire Water Plc. The study does not consider the latter because it

accounts for only 0.6% of Warwickshire's water supply. Severn Trent Water moves water between its resource zones and also imports much of its water.

3.5 The River Severn is a major source of water for the West Midlands region. There are currently five major abstraction points. Water levels in the Severn Estuary cSAC/SPA/ Ramsar site and Lyppard Grange SAC could be affected if water from the River Severn is over-abstracted, and the River Wye SAC could be affected if water from the River Wye is over-abstracted.

Receiver, including in-combination impacts

3.6 There are already significant in-combination impacts on the Severn Estuary sites and the other SACs due to water abstraction, and further impacts are expected in the future. Increased abstraction from the River Severn at Ombersley was proposed in Severn Water's draft Water Resources Management Plan but was withdrawn because of its potential to affect the Severn Estuary sites (Treweek Environmental Consultants, 2009).

3.7 The HRA for the South West Regional Spatial Strategy stated that it was not possible to conclude that no effects on the integrity of the Severn Estuary sites will occur on the basis of the draft RSS, but considered that sufficient safeguards are available at lower tiers of plan-making and through other regulatory mechanisms to ensure that no adverse effects will occur. However that HRA was for 461,200 homes rather than the 592,460 currently being mooted in the Proposed Changes to the RSS (28.5% more).

3.8 The HRA for the West Midlands Regional Spatial Strategy (GOWM, 2009) stated that water supply is a problem for the region, and that this would be assessed in a separate study. That study (Treweek Environmental Consultants, 2009) concluded that, without the results from the Environment Agency review of consents, the Restoring Sustainable Abstraction sensitivity analysis and the HRA for the Severn Trent's Water Resource Management Plan, it was not possible to say with certainty that the RSS would not have an adverse effect on Natura 2000 sites, in particular the Severn Estuary sites. It recommended that

- Local authorities should engage in early consultation with water companies and the Environment Agency on site allocations to ensure that development is located in water resource zones where there is surplus water available after the required sustainability reductions. Mandatory water cycle studies would demonstrate this;
- A commitment should be enshrined in LDFs that development must be conditional on assured water supplies from sources that would not have an adverse effect on Natura 2000 sites.

3.9 A subsequent Water Cycle Study for Warwickshire of March 2010 (Halcrow, 2010) concluded that "*there is a continued supply-demand risk in Severn WRZ which worsens over the forecast period. Supply-demand balance became negative in 2006/0 and remains negative thereafter. By [2020] shortfall is 70Ml/d. By 2034/35 shortfall is 100Ml/d.*" The Water Cycle Study was unable to assess the implications of growth at Stratford-on-Avon for

water supply infrastructure, since Severn Trent Water had not yet sent the requisite information.

Conclusion

3.10 Neither the Water Cycle Study for Warwickshire nor the water study prepared for the West Midlands RSS have been able to specify circumstances under which development in the West Midlands can proceed without possible significant 'in combination' impacts on several Natura 2000 sites. As such, unless Severn Trent Water can confirm that this can happen, it must be assumed that 7,500 new homes and additional commercial/retail development in Stratford-on-Avon District could cause significant 'in combination' impacts on the integrity of Natura 2000 sites.

3.11 Ways of dealing with this issue are to

1. wait until further studies by Severn Trent Water provide greater certainty; and/or
2. hold discussions with the Environment Agency and Severn Trent Water regarding possible headroom for abstraction; and/or
3. require new development to be 'water neutral': to produce all of its own water through e.g. rainwater collection and greywater recycling, or to reduce water use off site (e.g. in existing homes) by the same amount as the additional water used on site; and/or
4. make any development conditional on assured water supplies from sources that would not have an adverse effect on Natura 2000 sites.

The third approach would be in clear conformity with the spirit of the Habitats Directive, would provide certainty to developers and would ensure that the Core Strategy is internally coherent, but would clearly be very onerous for developers and may not be acceptable to GOWM.

4. APPROPRIATE ASSESSMENT: WATER QUALITY AT SEVERN ESTUARY cSAC/SPA/RAMSAR

Source

4.1 The Stratford-on-Avon District Core Strategy could increase the wastewater and surface water run-off produced by the district through policies CS.2, CS.3 and CS.6, which promote 7500 new dwellings, 68 ha of employment land, plus retail and office space, primarily at Stratford-upon-Avon but also at Alcester, Shipston-on-Stour, Southam and other villages in the district; and through the detailed proposals policies which recommend where much of this development should be located.

4.2 All of the proposals for Alcester (ALC.1 – ALC.4) require foul and surface water drainage to be kept independent from the existing deficient network; it is not clear how this could be done or whether this is feasible at all. All of the proposals for Bidford-on-Avon (BID.1 –

BID.4) require developments to incorporate necessary improvements to the drainage/sewerage system. Proposal SHIP.1 (north and south of Campden Road) requires inclusion of appropriate drainage measures to ensure that pollution of the River Stour is not increased. Proposal SUA.11 (South of Kipling Road) requires measures to ensure that water quality and quantity in Rushbrook does not deteriorate. Proposal SUA.14A (north of Bishopton Lane) requires the development to have a positive impact on the water environment.

4.3 Policy C.4 states "*The release of land for development will be dependent on there being sufficient capacity within the existing local infrastructure, or necessary improvements being provided in parallel with development, to meet the additional requirements. Suitable arrangements will be put in place to improve infrastructure, services and community facilities to successfully mitigate the impact of development and integrate it with the existing community*." The supporting text to the policy lists wastewater treatment as an example of infrastructure. Policy CS.11 requires sites of over 1 hectare to be designed to limit their surface water discharge rate to the original Greenfield run-off rates, and all developments to incorporate Sustainable Drainage Systems. CS.13 states that "*Proposals should [safeguard] existing habitats... in accordance with... the Habitats Directive*".

Pathway

4.4 Wastewater from the new developments would be piped to wastewater treatment works (WWTWs) where it would be treated and discharged into a nearby river, along with other diffuse pollution. The Water Cycle Study for the district (Halcrow, 2010) listed the wastewater treatment works (WWTW) that are currently receiving water from the district. They all ultimately discharge into the River Avon, which in turn discharges into the River Severn at Tewkesbury, and the Severn cSAC/SPA/Ramsar site at Frampton on Severn:

Alcester WWTW → River Arrow → River Avon about 10km downstream

Bidford-on-Avon WWTW → River Arrow → River Avon <1km

Itchen Bank WWTW → River Itchen → River Leam about 11km → River Avon about 20km

Kineton WWTW → River Dene → River Avon about 15km

Redditch (Spernal) WWTW → River Arrow → River Avon about 10km

Shipston Fell Mill WWTW → River Stour → River Avon about 20km

Stratford-Milcote WWTW → River Avon

Wellesbourne WWTW → River Dene → River Avon about 1.5km

Wootton Wawen WWTW → River Alne → River Arrow about 9km → River Avon about 11km

4.5 This list does not include small rural WWTWs. Although these could cumulatively have a negative impact on the integrity of the River Severn, and should be considered as part of the overall management of wastewater for the district, no significant development is

planned that would affect these works, and as such they are individually unlikely to have a significant impact.

Receiver

4.6 The River Basin Management Plan for the Severn (Environment Agency, 2009) identifies point source pollution from sewage works, reduced flow due to unsustainable water abstraction, and diffuse pollution from urban sources as being some of the key issues facing the river basin. Only 11% of the water bodies in the Warwickshire Avon catchment - in which the district lies and which feeds into the River Severn - are currently at good ecological status or potential, and this is not expected to improve by 2015, due in large part to discharges at some wastewater treatment works. For the whole Severn catchment, 29% of water bodies are at good or better ecological status or potential now, and between 32% and 37% are expected to be in 2015.

4.7 The JNCC Natura 2000 form for the Severn Estuary SAC lists industrial pollution as a possible vulnerability, but that for the Ramsar does not.

In-combination impacts

4.8 The proposed development of 500 new dwellings and a 'leisure hub' at Long Marston will generate wastewater, which will presumably go to the Stratford-Milcote WWTW. This has spare capacity.

4.9 The Panel Report for the West Midlands Regional Spatial Strategy of September 2009 recommends that 397,900 additional dwellings should be built in the West Midlands between 2006 and 2026, including 57,500 in Birmingham, 7,000 in Redditch, and 11,000 in Worcester City. The HRA for the RSS concludes that:

> "*The Severn system is under considerable pressure for water supply and is under investigation by the EA as part of the Habitats Directive Review of Consents. Increased abstraction, including that arising from the RSS, has the potential to affect the qualifying features of the Severn Estuary SAC due the current and future tension between providing water supply for new housing and maintaining minimum flows. Water quality impacts are also possible due to increasing surface water run-off, the adequacy of water treatment infrastructure and the possibility of reduced flow concentrating pollutants in the watercourse*" (WMRA, 2009).

4.10 The Proposed Changes to the Regional Spatial Strategy for the South West propose that 592,460 additional buildings should be built in the South West to 2026, including 36,500 in Bristol City, 11,500 in Gloucester, and 14,600 in Tewkesbury. All of these drain into the Severn Estuary. The HRA for a previous version of that RSS with lower housing numbers (South West Regional Assembly, 2007) concluded that the draft RSS could have significant 'in combination' impacts on the Severn Estuary sites due to the Environment Agency Review of Consents process not being complete. It also noted that 'the EA has

advised it is likely that there will be some existing consented discharges which are adversely affecting the site'.

Conclusions

4.11 The points above suggest that the Stratford-on-Avon District Core Strategy, in combination with other plans and projects, could have a significant impact on the integrity of the Severn sites due to worsening water quality.

4.12 The Water Cycle Study for the district (Halcrow, 2010) has identified whether the WWTWs in the district could accept further growth. Focusing on strategic allocations, which would comprise 4355 of the 7500 homes proposed for the district, the study considered whether the strategic allocations would cause the environmental capacity at each WWTW to be breached. It identifies WWTWs that can accept wastewater from further development ('green'), works that are already at capacity ('red'), and works that are marginal in terms of their ability to accept all of the proposed growth ('amber'). Table 5 summarises the study's findings, updated to include those allocations proposed in the February 2010 version of the strategy (which comprise 3770 homes, not 4355).

Table 5. Estimated spare hydraulic capacity of WWTWs v. proposed strategic allocations (based on Halcrow (2010), updated to reflect Feb. 2010 Core Strategy)

WWTW name	Estimated spare hydraulic capacity	Proposed allocations*		Proposed mitigation measures in Core Strategy
Alcester	2310	ALC.1 – North of Arden Road	employment only	Foul and surface water drainage to be kept independent from the existing deficient network
		ALC.2 - East of Kinwarton Farm Road	125	
		ALC.3 - North of Allimore Lane	250	
		ALC.4 – Land off Moorfield Road	food store	
Bidford-on-Avon	575	BID.1 – Friday Furlong, Waterloo Road	125	Incorporate necessary improvements to the drainage/ sewerage system
		BID.2 - North of Bramley Way	50	
		BID.3 - North of Salford Road	75	
		BID.4 – Land to east of Waterloo Park Industrial Estate	business devel. only	
Itchen Bank	Additional treatment capacity is expected to be needed to accommodate proposed levels of development, but STW do not envisage problems in providing this additional capacity	SOU.1 - West and East of Banbury Road	200	
		SOU.2 - West of Coventry Road, Southam	100	
		SOU.3 – High Street	15 + retail	
		RBS.3 – Former Southam Cement Works, Long Itchington	employment etc. incl. leisure	
		RBS.4 – Former Harbury Cement Works, Bishops Itchington	no clear number	
Kineton	This WWTW has no spare capacity but a revised consent which must be met	KIN.1 – North of Banbury Road	75	

WWTW name	Estimated spare hydraulic capacity	Proposed allocations*		Proposed mitigation measures in Core Strategy
	by 2015 will allow up to 150 dwellings			
Redditch (Spernal)	Significant extra capacity	STUD.1 – West of Birmingham Road	75 + business	
		REDD.1 – Winyates Green Triangle	employment only	
Shipston Fell Mill	697	SHIP.1 - North and South of Campden Road	250 + business	Inclusion of appropriate drainage measures to ensure that pollution of the River Stour is not increased
Stratford-Milcote	There is significant hydraulic capacity at this WWTW although parts of the treatment process are close to capacity. However there are mothballed assets at this site which can be brought back on-line to provide additional capacity, and STW do not anticipate any issues which would prevent this additional capacity from being provided	SUA1 - Western Road/ Wharf Road	50 + business	
		SUA.2 - Rother Street/ Grove Road	50 + retail etc.	
		SUA.3 - Bridgeway/Bridgefoot	retail etc. only	
		SUA.4 – Town square	25 + retail	
		SUA.5 – Former Cattle Market, Alcester Road	150 + office etc.	
		SUA.6 - North of Banbury Road	75	
		SUA.7 - West of Shottery	800 + local centre etc.	Enhance the ecological value of the Shottery Brook corridor
		SUA.8 – South of Alcester Road	employment only	Protect ponds and watercourse within the site
		SUA.9 – Egg Packing Station, Bishopton Lane	80	
		SUA.10 – Land off Bishopton Lane	railway statn	
		SUA.11 – South of Kipling Road	100	Include measures to ensure that water quality and quantity in Rushbrook does not deteriorate
		SUA.12 – Milestone Road	nursing home	
		SUA.13 – East of Shipston Road	food store etc.	
		SUA.14A – North of Bishopton Lane	500	All built development to have a positive impact on the water environ.
		SUA.14B – West of Birmingham Road	80 + leisure centre	

WWTW name	Estimated spare hydraulic capacity	Proposed allocations*		Proposed mitigation measures in Core Strategy
		SUA.14C – East of Birmingham Road	200	
Wellesbourne	This WWTW has minimal spare capacity and minimal capacity to improve quality. Capacity improvements would be needed to accommodate c380** dwellings	WELL.1 - East of Ettington Road	175	
		WELL.2 – Horticultural Research International	employment etc. only	
Wootton Wawen	STW expect the WWTW to be able to accommodate the proposed number of new dwellings, although parts of the process are close to capacity. If additional capacity is needed, STW do not envisage any problems in providing this.	HEN.1 – Former cattle market, Warwick Road	20 + other	
		HEN.2 – West of Bear Lane	25 + business	
Other smaller WwTW	?	Likely to be limited spare capacity at all these works, as they are generally small		

* does not include RBS.1 Gaydon site, RBS.2 Former engineer resources depot, Long Marston; or RBS.5 Former Napton Brickworks, as we were unclear about what WWTW these would discharge to
** The Water Cycle Study was based on an earlier version of the Core Strategy which planned for 380 new homes

4.13 Table 5 suggests that most of the housing allocations proposed in the Stratford-on-Avon District Core Strategy – notably those in and near Stratford-upon-Avon – can be adequately accommodated through spare capacity at existing WWTWs, through the provision of additional capacity, or by bringing mothballed assets back on line. The study concludes that

> "*WwTW capacity is likely to be exceeded at Kineton, Itchen Bank and Wellesbourne WwTW due to growth. However, the proposed AMP5 [Severn Trent Water Asset Management Plan for period 2010-2015] schemes at these works should provide sufficient capacity to accommodate the proposed growth. Stratford DC should confirm the level and phasing of development with [Severn Trent Water] to ensure that adequate infrastructure provision is provided prior to development*.":

4.14 The Water Cycle Study (Halcrow, 2010) also considered whether the scale of development proposed in the Core Strategy would lead to exceedances of the WWTW consented dry weather flows, which are needed to achieve good ecological status as required by the Water Framework Directive. The Environment Agency sets discharge consents based on the ecological sensitivity of the receiving watercourse, and specifies a maximum flow and a minimum effluent quality that the WWTW has to achieve to meet water quality targets without causing environmental damage. The Water Cycle Study argues that "*if growth will not cause a breach of the current consented [dry water flow] then it is fair to assume that there will not be deterioration of planned water quality (that is the water quality the Environment Agency expect if a WwTW was discharging at its [dry water flow] and discharge consent)*" (Halcrow, 2010).

4.15 Table 6 shows the consented available capacity of each WWTW, and whether the allocations proposed by the Core Strategy of February 2010 would exceed this capacity. Capacity at Kineton is already exceeded, capacity at Wellesbourne would be exceeded in the period 2015-2020, and capacity at Itchen Bank could be exceeded if a significant number of non-strategic developments are approved as well as the strategic allocations.

Table 6. Consented available capacity of WWTW v. proposed strategic allocations (based on Halcrow (2010), updated to reflect Feb. 2010 Core Strategy)

WWTW	**consented available capacity**	**strategic allocations**	**will capacity be exceeded with strategic allocations only?**
Alcester	2603	375	no
Bidford-on-Avon	884	250	no
Itchen Bank	381	315	not with strategic allocations, although additional (non-strategic allocation) dwellings could lead to exceedances
Kineton	-239	75	yes, already exceeded
Redditch (Spernal)	9188	75	no
Shipston Fell Mill	486	250	no
Stratford-Milcote	9332	2210	no
Wellesbourne	112	175	yes in AMP6 (2015-2020) for strategic allocations (175), sooner if additional (non-strategic allocation) dwellings are built
Wootton Wawen	2004	45	no

4.16 Table 5 shows the water quality related mitigation measures put forward in the Core Strategy for each proposed allocation. Although Policy C.4 requires the provision of adequate local infrastructure, the current proposals for site allocations do not identify the wastewater treatment infrastructure needed.

4.17 Given all of these points, it is not possible to state that the February 2010 draft of the Core Strategy will not have a significant 'in combination' impact on the integrity of the

Severn Estuary sites on grounds of water pollution. Constraints at Kineton WWTW are particularly acute.

4.18 We recommend that Stratford-on-Avon District Council should:

- Not permit any more housing at Kineton until Severn Trent Water has carried out its AMP5 works at the Kineton WWTW, and make any future housing allocations (e.g. KIN.1) dependent on the completion of such works
- Ensure that no more than 112 new homes (strategic allocation plus other) are built in the Wellesbourne WWTW catchment until Severn Trent Water has carried out its AMP6 works at the Wellesbourne WWTW.
- If more than 381 new homes (strategic allocation plus other) are built in the Itchen Bank WWTW catchment, make additional development dependent on provision of additional capacity at the WWTW.
- Hold discussions with the Environment Agency and Severn Trent Water regarding possible headroom for wastewater treatment
- Consider allocating strategic development where WWTWs have significant additional capacity, e.g. Alcester, Stratford-Milcote and Wootton Wawen. Additional development could also be considered for the Redditch WWTW catchment area, subject to Redditch Borough Council not filling up the significant spare capacity at that works
- Liaise with Severn Trent Water about any other significant development proposals, including those affecting smaller WWTWs, to ensure that WWTW capacity is adequate and provided in a timely manner.

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APPENDIX A. NATURA 2000 SITE INFORMATION

Fens Pools SAC

Reason for designation:

Annex II: *Triturus cristatus* (great crested newt), for which this is considered to be one of the best areas in the UK

Site conservation objectives:

Subject to natural change, to maintain, in favourable condition, *Triturus cristatus*

Vulnerability

The newt population at this site is dependent on the control of fish, maintenance of adequate water quality given an urban catchment, and the protection of surrounding terrestrial habitat from major ground disturbance. The vulnerability of the breeding ponds is being reduced through factors such as desiccation, human disturbance, fish introductions and pollution by expanding the number of ponds in the current cluster. This action will also help mitigate the populations' relative isolation resulting from its urban setting. The post-industrial origins of much of the site's surface material means that land contamination could be a possible future issue.

Key factors affecting site integrity:

- Land-take or change of use on surrounding habitats need to maintain sufficient terrestrial habitat suitable for newts. Development that reduces or fragments the available terrestrial habitats for newts would be a significant negative factor.
- Recreational disturbance is cited as a vulnerability of the site in the original SAC citation.
- Water quantity: sufficient ponds suitable for breeding newts are essential for maintaining the site's status.
- Water quality is a threat, given the urban surroundings.
- Appropriate management: trees shading ponds need to be controlled to retain suitable habitat for newts.
- Invasive/non-native species: the introduction of fish has potential to damage the populations of newts in individual ponds; fish predating newts.

Lyppard Grange Ponds SAC

Reason for designation:

Annex II: *Triturus cristatus* (great crested newt), for which this is considered to be one of the best areas in the UK

Site conservation objectives:

To maintain, in favourable condition, the habitats for the population of Great crested newt (*Triturus cristatus*)

Vulnerability

This site is composed of two ponds in an area of public open space surrounded by residential development. The site is vulnerable to the effects of recreational pressure from the public and in particular the introduction of fish, which affect the suitability of ponds as breeding habitats for great

crested newts. One of the ponds is currently overrun with sticklebacks which is affecting the long-term survival of the newt population at the current level. A series of measures, including the notification of the site as an SSSI, development of a management plan, the implementation of an action plan to remove stickleback and construction of hibernacula and refugia and water management systems, are being undertaken to secure the conservation of the newt population.

Key factors affecting site integrity:

- Land-take or change of use on surrounding habitats need to maintain sufficient terrestrial habitat suitable for newts. Development that reduces or fragments the available terrestrial habitats for newts would be a significant negative factor.
- Recreational disturbance is cited as a vulnerability of the site in the original SAC citation.
- Water quantity: sufficient ponds suitable for breeding newts are essential for maintaining the site's status.
- Water quality is a threat, given the urban surroundings.
- Appropriate management: trees shading ponds need to be controlled to retain suitable habitat for newts.
- Invasive/non-native species: the introduction of fish has potential to damage the populations of newts in individual ponds; fish predating newts.

Seven Estuary / Môf Hafren cSAC

Reason for designation:

Petromyzon marinus (sea lamprey), *Lampetra fluviatilis* (river lamprey) and *Alosa fallax* (Twaite shad), for which the area is considered to be one of the best areas in the UK

Sandbanks which are slightly covered by sea water all the time and reefs, for which the area is considered to support a significant presence

Estuaries and Atlantic salt meadows, for which the area is considered to be one of the best areas in the UK

Conservation objective:

To maintain the designated interest features in favourable condition.

Vulnerability

The conservation of the site features is dependent on the tidal regime. The tidal range in the Severn Estuary is the second-highest in the world and the scouring of the seabed and strong tidal streams resul in natural erosion of the habitats and presence of high sediment loads. The estuary is therefore vulnerable to large-scale interference, mainly as a result of human actions. These include land-claim, aggregate extraction, physical developments such as barrage construction and other commercial construction activities, flood defences, industrial pollution, oil spillage and tourism-based activities and disturbance.

Key factors affecting site integrity:

All habitats

- The Severn Estuary has an extreme type of hydrodynamic and sedimentary regime and these determine the type of habitat and species present. The management of the Severn Estuary must ensure that these factors are not unduly influenced by anthropomorphic activities.

- These are dynamic habitats and this need to be taken account of when managing the site. Management needs to create space to enable landward roll-back to take place in response to sea-level rise. This should also allow the system to be dynamic and retain the flexibility to respond to associated changes, such as the movement of physical features within the system, e.g. migrating subtidal sandbanks.
- The habitats within this site are highly sensitive to inorganic fertilisers and pesticides, applications of which should be avoided both within the site itself and in adjacent areas. Herbicides may be useful in targeting certain invasive species, but should be used with extreme care.

Atlantic saltmeadows

- Grazing by domestic livestock is particularly significant in determining the structure and species composition of the habitat type and in determining its relative value for plants, for invertebrates and for wintering or breeding waterfowl. Where there is no history of grazing, the saltmarsh should be able to maintain itself and no grazing should be introduced.
- Creeks absorb tidal energy and assist with the delivery of sediment into saltmarshes. The efficiency of this process depends on creek pattern. Creek density is controlled by vegetation cover, suspended sediment load and tidal influence. Management may be required to ensure there is no change in creek density.
- Manage the levels of human activities to ensure disturbance stays within acceptable levels.

Estuaries

- Sediment flows and fluxes affecting the estuary are of particular importance for estuarine processes and ecology. The morphology of the estuary is constantly changing due to the complex hydrodynamics. The management of the site has to take this into account and ensure that these changes stay within acceptable limits.

Mudflats and sandflats

- Avoidance of disturbance from human activities, for example, bait digging, dog walking and wildfowling.

Fish

- Rivers within the Severn estuary should be managed in such a way to ensure their natural structure and form is maintained to support a natural flow regime that will provide resting pools for fish, conserve the quality of the riverbed as fish spawning habitat, and avoid the creation of artificial barriers to the passage of migratory fish.
- Any exploitation of fish populations or other native animals or plants should be at a sustainable level, without manipulation of the river's natural capacity to support them or augmentation by excessive stocking.
- Water quality is an important factor in maintaining healthy fish populations and the management of the site should take this into account.

Severn Estuary SPA

Reason for designation:

Article 4.1: Over winter the area regularly supports *Cygnus columbianus bewickii* (Bewick's Swan)

Article 4.2: Over winter the area regularly supports Anas strepara (Gadwall), Anser albifrons albifrons (White-fronted goose), *Calidris alpina alpine* (Dunlin), *Tadorna tadorna (*Shelduck) and *Tringa*

tetanus(Redshank)

Over winter the area regularly supports 84317 waterfowl

Vulnerability

The conservation of the site features is dependent on the tidal regime. The tidal range in the Severn Estuary is the second-highest in the world and the scouring of the seabed and strong tidal streams result in natural erosion of the habitats and presence of high sediment loads. The estuary is therefore vulnerable to large scale interference, mainly as a result of human actions. These include land-claim, aggregate extraction, physical developments such as barrage construction and other commercial construction activities, flood defences, industrial pollution, oil spillage and tourism-based activities and disturbance.

Key factors affecting site integrity:

Birds

- Bird usage of the site varies seasonally, with different areas being favoured over others at certain times of year. Bird communities are highly mobile and exhibit patterns of activity related to tidal water movements and many other factors. The most important factors are:
- Current extent and distribution of suitable feeding and roosting habitat.
- Sufficient prey availability
- Levels of disturbance are maintained within necessary levels.
- Water quality and levels

Severn Estuary Ramsar

Reason for designation:

1 (contains a representative, rare or unique example of a natural or near-natural wetland type found within the appropriate biogeographic region): a wide range of intertidal habitats occurs, with the estuary also having the second-largest tidal range in the world.

2 (supports vulnerable, endangered or critically-endangered species or threatened ecological communities): unusual estuarine communities are present, the estuary having low diversity and high productivity

4 (supports plant and/or animal species at a critical stage in their life cycles, or provides refuge during adverse conditions): important for the run of fish between the river and sea (species include Salmon *Salmo salar*, sea trout *S. trutta*, sea lamprey *Petromyzon marinus*, river lamprey *Lampetra fluviatilis*, allis shad *Alosa alosa*, twaite shad *A. fallax*, and eel *Anguilla anguilla*); also important for migratory birds in spring and autumn.

8 (an important source of food for fishes, spawning ground, nursery and/or migration path on which fish stocks, either within the wetland or elsewhere, depend): one of the most diverse fish communities in Britain, with more than 110 species recorded. A key migratory route for species listed above, the river is also an important feeding and nursery ground for allis shad and twaite shad in particular.

Key factors affecting site integrity:

- Recreational pressure and disturbance
- Water quality
- Water levels
- Invasive or non-native species

River Wye SAC

Reason for designation:

- Water courses of plain to montane levels with the *Ranunculion fluitantis* and *Callitricho-Batrachion* vegetation (Annex I habitat). A large river representative of sub-type 2 of this habitat. An exceptional range of aquatic flora occurs in the catchment.
- Transition mires and quaking bogs (supporting Annex I habitat).
- White-clawed crayfish *Austropotamobius pallipes* (Annex II species). Welsh tributaries are the best Welsh site for this species.
- Sea lamprey *Petromyzon marinus* (Annex II species).
- Brook lamprey *Lampetra planeri* (Annex II species).
- River lamprey *Lampetra fluviatilis* (Annex II species). The Wye is exceptionally good habitat for the three lamprey species.
- Twaite shad *Alosa fallax* (Annex II species). The largest spawning areas for this species occur in the Wye.
- Atlantic salmon *Salmo salar* (Annex II species). An important UK population of salmon, particularly as it has a high proportion of multi sea winter individuals, a declining stock component in the UK.
- Bullhead *Cottus gobio* (Annex II species). The Wye probably represents most habitat conditions in which bullhead occurring the UK.
- Otter *Lutra lutra* (Annex II species). The densest and best-established otter population in Wales.
- Allis shad *Alosa alosa* (supporting Annex II species).

Site conservation objectives:

Maintain the river as a habitat for floating formations of water crowfoot (*Ranunculus*) of plain and sub-mountainous rivers, populations of Atlantic salmon, allis shad, twaite shad, bullhead, lampreys, and white-clawed crayfish, and the river and adjoining land as habitat for populations of otter.

Vulnerability

Water quality impacts arising from changing agricultural land-use within the catchment are having direct and indirect effects on the SAC interests through effects of diffuse pollution such as nutrient run-off and increased siltation. English Nature and the Countryside Council for Wales are seeking to address such issues through improved targeting of existing and new agri-environment schemes and through improvements in compliance with agricultural Codes of Practice.

Water quality is also affected by synthetic pyrethroid sheep-dips and by point-source discharges within the catchment. The impact of sewage treatment works on the cSAC is being addressed through the Asset Management Plan process and review under the Habitats Regulations. Loss of riparian habitat is occurring as a result of changes in agricultural land-use practices and other factors, including riverside development and the loss of alder tree-cover through disease. These impacts and concerns over water quality will be identified and actions recommended within the joint English Nature/Environment Agency/Countryside Council for Wales conservation strategy for the river.

Fishing activities are implicated in the decline of the salmon; initiatives such as the Wye Salmon Action Plan will help to address this issue.

There is increasing demand for abstraction from the river for agriculture and potable water. The impact of this is still being investigated by the Environment Agency, but maintenance of water levels and flow will be addressed under the review of consents under the Habitats Regulations.

Demand for increased recreational activities is a source of potential concern for the future. Regularisation of the functions of the competent authorities, currently being sought, should reduce the risk of damage

to the cSAC as a result of developments for such activities.

Key factors affecting site integrity:

- Water quality: agricultural runoff raising nutrient levels and increasing siltation due to intensive agriculture in the catchment. Sheep-dip chemicals also affecting water quality, along with sewage and point-source discharges
- Water quantity: abstraction levels are apparently high, and demand increasing. Maintained characteristic flows are essential for *Ranunculus* and aquatic fauna
- Land use changes: intensive agriculture in the catchment is affecting water quality (see above) and damage to riparian vegetation (loss of bankside trees in particular), as well as placing pressure on water resources (see above)
- Recreational pressure and disturbance: salmon fishery is implicated in salmonid decline, casual damage to bankside habitat is possible through increased access for recreational use