

# Appendices to the Habitats Regulations Assessment Site Report for Hinkley Point

EN-6: Revised Draft National Policy Statement for Nuclear Power Generation



## **Habitats Regulations Assessment of the revised draft Nuclear National Policy Statement**

Habitats Regulations Assessment (HRA) screening and Appropriate Assessment (AA) of the revised draft Nuclear NPS including potentially suitable sites, has been undertaken in parallel with the Appraisal of Sustainability (AoS). These strategic assessments are part of an ongoing assessment process that will continue with project level assessments. Applications to the IPC for development consent will need to take account of the issues identified and recommendations made in the strategic, plan level HRA/AA; and include more detailed, project level HRA as necessary.

**The Habitats Regulations Assessment is provided in the following documents:**

### **HRA Non-Technical Summary**

#### **Main HRA Report of the revised draft Nuclear NPS**

- Introduction
- Methods
- Findings

#### **Annexes to the Main HRA Report: Reports on Sites**

- Site HRA Reports
- Technical Appendices

All documents are available on the website of the Department of Energy and Climate Change at [www.energynpsconsultation.decc.gov.uk](http://www.energynpsconsultation.decc.gov.uk)

This document is the Appendices to the HRA site report for Hinkley Point.

This document has been produced by the Department of Energy and Climate Change based on technical assessment undertaken by MWH UK Ltd with Enfusion Ltd and Nicholas Pearson Associates Ltd.

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## Appendix 1: European Site Characterisations

Natura 2000 Site Identification				
Natura 2000 Designation	Radius (measured from central grid reference point, MAGIC)			
	5km	10km	15km	20km
<b>SAC</b>	<ul style="list-style-type: none"> <li>Severn Estuary</li> </ul>	<ul style="list-style-type: none"> <li>Exmoor and Quantocks Oakwoods</li> </ul>		<ul style="list-style-type: none"> <li>Mendip Limestone Grasslands</li> <li>Hestercombe House</li> <li>River Usk</li> <li>River Wye</li> </ul>
<b>SPA</b>	<ul style="list-style-type: none"> <li>Severn Estuary</li> </ul>			<ul style="list-style-type: none"> <li>Somerset Levels and Moors</li> </ul>
<b>Ramsar</b>	<ul style="list-style-type: none"> <li>Severn Estuary</li> </ul>			<ul style="list-style-type: none"> <li>Somerset Levels and Moors</li> </ul>

All core site-specific information, unless otherwise stated, has been referenced from Natural England Sources ([Natura 2000 Management Plans](#)) ([Nature on the Map](#)) and the Joint Nature Conservation Committee website ([Protected Sites](#)).

## Natura 2000 Site Characterisations

### Special Areas of Conservation (SAC)<sup>1</sup>

1. Exmoor and Quantocks Oakwoods
2. Hestercombe House
3. Mendip Limestone Grassland
4. River Usk
5. River Wye
6. [Severn Estuary](#)

### Special Protection Areas (SPA)<sup>2</sup>

1. [Severn Estuary](#)
2. Somerset Levels and Moors

### Ramsar Sites<sup>3</sup>

1. [Severn Estuary](#)
2. Somerset Levels and Moors

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<sup>1</sup> **Special Areas of Conservation (SACs)** are classified under the Habitats Directive and provide rare and vulnerable animals, plants and habitats with increased protection and management.

<sup>2</sup> **Special Protection Areas (SPAs)** are classified under the Birds Directive to help protect and manage areas which are important for rare and vulnerable birds because they use them for breeding, feeding, wintering or migration. Together SACs and SPAs make up the Natura 2000 series.

<sup>3</sup> **Ramsar sites** are designated under the Convention on Wetlands of International Importance. The broad objectives are to stem the loss and progressive encroachment on wetlands now and in the future. These are often coincident with SPA sites designated under the Birds Directive. Although RAMSAR sites are not considered part of the Natura 2000 network, they are treated the same way as Natura 2000 sites.

## Special Areas of Conservation

### Site Name: Exmoor and Quantocks Oakwoods

- Location Grid Ref:
- JNCC Site Code: [UK0003148](#)
- Size: 1895.01 ha
- Designation: SAC

Exmoor and Quantocks Oakwoods SAC	
<b>Site Description</b>	<p>This site supports extensive tracts of <b>old sessile oak woods</b> in conjunction with heath. They are rich in bryophytes, ferns (including <i>Dryopteris aemula</i>) and epiphytic lichens, the latter often associated with old pollards, since parts are former wood-pasture rather than the oak coppice that is more common with this type. In the Barle Valley the woods also occur in mosaic with glades and small fields and the combination results in good populations of fritillary butterflies.</p> <p>A maternity colony of <b>barbastelles</b> <i>Barbastella barbastellus</i> utilises a range of tree roosts in this area of predominantly oak <i>Quercus</i> spp. woodland.</p>
<b>Qualifying Features</b>	<p>Annex I habitats that are a primary reason for selection of this site:            91A0 <a href="#">Old sessile oak woods with Ilex and Blechnum in the British Isles</a></p> <p>Annex I habitats present as a qualifying feature, but not a primary reason for selection of this site:            91E0 <a href="#">Alluvial forests with Alnus glutinosa and Fraxinus excelsior (Alno-Padion, Alnion incanae, Salicion albae)</a> * Priority feature</p> <p>Annex II species that are a primary reason for selection of this site:            1308 <a href="#">Barbastelle</a> <i>Barbastella barbastellus</i>            A maternity colony of <i>Barbastella barbastellus</i> utilises a range of tree roosts in this area of predominantly oak <i>Quercus</i> spp. woodland.</p> <p>Annex II species present as a qualifying feature, but not a primary reason for site selection:            1323 <a href="#">Bechstein`s bat</a> <i>Myotis bechsteinii</i></p>

Exmoor and Quantocks Oakwoods SAC	
	1355 <a href="#">Otter</a> <i>Lutra lutra</i>
<b>Conservation Objectives</b>	<p><b>Conservation Objectives for the Old Sessil Oak Woods:</b></p> <ul style="list-style-type: none"> <li>• No loss of ancient semi-natural stands. At least current area of recent semi-natural stands maintained, although their location may alter (see baseline map). At least the area of ancient woodland retained.</li>   <li>• At least the current level of structural diversity maintained (see baseline map). Understorey (2-5m) present over at least 10% of total stand area. Ground flora present over at least 50% of area. Canopy cover present over 30-90 % of stand area. All age classes present but not necessarily in an heterogeneous mix. Minimum 3 fallen lying trees &gt;20 cm diam. per ha and 4 trees per ha allowed to die standing.</li>   <li>• Signs of seedlings growing through to saplings to young trees at sufficient density to maintain canopy density over a 10 yr period (or equivalent re-growth from coppice stumps). No planting in sites where it has not occurred in the last 15 years.</li>   <li>• At least the current level of site-native species maintained (see baseline map). At least 90% of cover in any one layer of site-native or acceptable naturalised species.</li>   <li>• Oak present and providing at least 30% cover in the canopy of mature stands over feature as a whole. Death, destruction or replacement of native woodland species through effects of introduced fauna or other external unnatural factors not more than 10% by number or area in a five year period.</li>   <li>• 80% of ground flora cover referable to relevant NVC community (W10, W11, W16, W17). Distinctive elements maintained at current levels and in current locations (where appropriate). Patches and transitions maintained in extent and where appropriate location.</li>   <li>• Epiphytic lichen communities are sensitive to enrichment and acidification from atmospheric deposition;</li> </ul>



Exmoor and Quantocks Oakwoods SAC	
	<p>no proscribed air quality standards can be set at this stage but objectives will need to reflect this sensitivity. Species indicative of nutrient enrichment are restricted to appropriate locations. These species are not increasing in abundance.</p> <p><b>Alluvial Forests</b></p> <ul style="list-style-type: none"> <li>• No loss of ancient semi-natural stands. At least current area of recent semi-natural stands maintained, although their location may alter (see baseline map). At least the area of ancient woodland retained.</li> <li>• At least the current level of structural diversity maintained (see baseline map). Understorey (2-5m) present over at least 20% of total stand area. Ground flora present over at least 50% of area excluding temporary pool areas. Canopy cover present over 30-90 % of stand area. Age class structure appropriate to the site, its history and management. A minimum of 3 fallen lying trees or major branches per ha and 4 trees per ha allowed to die standing. At least the current level of natural hydrological features should be maintained (channels, pools, periodic flooding).</li> <li>• Signs of seedlings growing through to saplings to young trees at sufficient density to maintain canopy density over a 10 yr period (or equivalent re-growth from coppice stumps). No planting in stands where it has not occurred in the last 15 years.</li> <li>• At least the current level of site-native species maintained (see baseline map). At least 90% of cover in any one layer of site-native or acceptable naturalised species.</li> <li>• Death, destruction or replacement of native woodland species through effects of introduced fauna or other external unnatural factors not more than 10% by number or area in a five year period.</li> <li>• 80% of ground flora cover referable to relevant NVC wet woodland community (W 7). Distinctive elements maintained at current levels and in current locations (where appropriate). Patches and transitions maintained in extent and where appropriate location.</li> </ul>

Exmoor and Quantocks Oakwoods SAC																									
	<p><b>Otter</b></p> <ul style="list-style-type: none"> <li>• Water quality should be good, with no pollution incidents.</li> <li>• No reduction in water flow attributable to increased abstraction. No reduction of fragmentation of area.</li> <li>• Fish stocks appropriate to the nutrient status of the river. No significant decline in fish biomass or species diversity.</li> <li>• No significant change to river or bankside usage; no significant development. No permanent decrease in bankside cover.</li> <li>• Signs of otters found at least once per year.</li> </ul> <p><b>Bats</b></p> <ul style="list-style-type: none"> <li>• Conservation of Barbastelle within the SAC will not be achieved without conservation of habitats in the surrounding landscape, as summer foraging ranged up to 9km from roost locations. Over 90% of foraging appears to occur outside the SAC along linear wooded/scrub strips including along watercourses, overgrown hedgerows, uncut grassland, heather moorland edge (within Exmoor Heath SAC), gardens and areas of low level street lighting.</li> </ul>																								
<b>Component SSSIs</b>	<p><b>SSSIs including condition status:</b></p> <table border="1" style="width: 100%; border-collapse: collapse; text-align: center;"> <thead> <tr> <th style="background-color: #d3d3d3;">SSSI Component Sites</th> <th style="background-color: #d3d3d3;">Favourable</th> <th style="background-color: #d3d3d3;">Unfavourable recovering</th> <th style="background-color: #d3d3d3;">Unfavourable no change</th> <th style="background-color: #d3d3d3;">Unfavourable declining</th> <th style="background-color: #d3d3d3;">Destroyed, part destroyed</th> </tr> </thead> <tbody> <tr> <td style="text-align: left;">North Exmoor</td> <td>5</td> <td>0</td> <td>3</td> <td>1</td> <td>0</td> </tr> <tr> <td style="text-align: left;">Barle Valley</td> <td>9</td> <td>4</td> <td>6</td> <td>5</td> <td>0</td> </tr> <tr> <td style="text-align: left;">Watersmeet</td> <td>4</td> <td>2</td> <td>5</td> <td>0</td> <td>0</td> </tr> </tbody> </table>	SSSI Component Sites	Favourable	Unfavourable recovering	Unfavourable no change	Unfavourable declining	Destroyed, part destroyed	North Exmoor	5	0	3	1	0	Barle Valley	9	4	6	5	0	Watersmeet	4	2	5	0	0
SSSI Component Sites	Favourable	Unfavourable recovering	Unfavourable no change	Unfavourable declining	Destroyed, part destroyed																				
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Barle Valley	9	4	6	5	0																				
Watersmeet	4	2	5	0	0																				

Exmoor and Quantocks Oakwoods SAC						
	West Exmoor Coast and Woods	1	2	0	0	0
	The Quantocks	1	0	2	0	0
	Total No. of Units	19	8	14	6	0
	Proportion	40%	17%	30%	13%	0%
<b>Key Environmental Conditions (factors that maintain site integrity)</b>	<p><b>Woodlands</b></p> <ul style="list-style-type: none"> <li>• Appropriate woodland management is required in particular to maintain natural processes, a diverse woodland structure, tree regeneration potential, a diverse age structure, control invasive species, and support characteristic species and habitat types.</li> <li>• The woodland habitats and associated moss and lichen communities are sensitive to air pollution.</li> <li>• Alluvial woodlands in particular are sensitive to water table levels.</li> </ul> <p><b>Otter</b></p> <ul style="list-style-type: none"> <li>• Maintenance of river water quality and flow rates</li> <li>• The availability of fish stocks need to be maintained.</li> <li>• Management of bankside vegetation to ensure the proportion of cover remains stable.</li> <li>• Levels of disturbance, particularly bankside usage, need to be kept to acceptable levels.</li> </ul> <p><b>Bats</b></p> <ul style="list-style-type: none"> <li>• Roosts are sensitive to disturbance, which would therefore need to be limited to acceptable levels.</li> <li>• The management of woodland habitats particularly semi-natural ancient woodland</li> <li>• The availability of dead, dying and “veteran” trees in situ for bat roosting habitat.</li> </ul>					

Exmoor and Quantocks Oakwoods SAC	
	<ul style="list-style-type: none"> <li>Bats require connectivity of habitat features for commuting and foraging. Active management of the habitats used by bats for these activities may be required. The importance of habitat features off site for bat flight lines should be recognised.</li> </ul>
<b>SAC Condition Assessment</b>	See SSSI condition assessment.
<b>Vulnerabilities (includes existing pressures and trends)</b>	<p><b>Non-Physical disturbance:</b> Light pollution, human presence.</p> <p><b>Biological disturbance:</b> Invasion of non-native species are a problem in some sections of the woodlands, particularly <i>Rhododendron</i> and Japanese Knotweed. Beech Invasion. Overgrazing.</p> <p>Some grazing/browsing is essential to maintain conditions suitable for lower plant assemblages, which are a key feature of the woodlands. However, many woods are grazed by sheep and/or red deer and this can prevent regeneration and change the ground flora. Cases of overgrazing may require action using environmental conditions of livestock subsidy schemes. Invasive non-native species are a problem in some woods, particularly <i>Rhododendron</i> and Japanese knotweed. These species are being eliminated by conservation bodies or management agreements.</p> <p><b>Physical loss:</b> presence of oak coppice monocultures.</p> <p>Beech is also a problem, as it is replacing oak in places and does not support such a diverse or specialist wildlife on Exmoor as oak. Dense monocultures of coppiced oak occur, of little structural or species diversity. Although minimum intervention is mostly desirable, opportunities are being taken to diversify age and species composition to restore near-natural conditions where possible.</p>
<b>Landowner/ Management Responsibility</b>	N/A
<b>HRA/AA Studies undertaken that address this site</b>	<p><b>HRA of the Draft Regional Spatial Strategy for the South West, South West Regional Assembly (February, 2007, LUC):</b></p> <p>No specific impacts at this site noted arising from regional policy.</p>

	<b>Exmoor and Quantocks Oakwoods SAC</b>
	<b>Appropriate Assessment of Somerset District, Borough and County Councils Core Strategies: Initial Screening Report (February, 2008):</b> Recreational impact (cycling/ off-road vehicles) from increased population.

**Site Name: Hestercombe House**

- Location Grid Ref: 030503W/510307N
- JNCC Site Code: [UK0030168](#)
- Size: 0.08 ha
- Designation: SAC

Hestercombe House SAC													
<b>Site Description</b>	Situated 1 mile to the north of Taunton, Hestercombe House is a former country house and estate consisting of mixed woodland, pasture, lakes and landscaped gardens. The colony of lesser horseshoes utilize two roof voids within the former stable block and domestic outbuildings as maternity (breeding) roosts during the summer months, with a small number winter. Although only a small proportion of the UK population, this site has been included as representative of the species in south-west England of the bats also using the roofs as hibernation sites.												
<b>Qualifying Features</b>	Annex II species that are a primary reason for selection of this site. 1303 <a href="#">Lesser horseshoe bat</a> <i>Rhinolophus hipposideros</i>												
<b>Conservation Objectives</b>	N/A												
<b>Component SSSIs</b>	<p><b>Hestercombe House SSSI condition status:</b></p> <table border="1" style="width: 100%; text-align: center;"> <thead> <tr> <th style="background-color: #d3d3d3;">% Area meeting PSA target</th> <th style="background-color: #d3d3d3;">% Area favourable</th> <th style="background-color: #d3d3d3;">% Area unfavourable recovering</th> <th style="background-color: #d3d3d3;">% Area unfavourable no change</th> <th style="background-color: #d3d3d3;">% Area unfavourable declining</th> <th style="background-color: #d3d3d3;">% Area destroyed / part destroyed</th> </tr> </thead> <tbody> <tr> <td>0.00%</td> <td>0.00%</td> <td>0.00%</td> <td>0.00%</td> <td>100.00%</td> <td>0.00%</td> </tr> </tbody> </table>	% Area meeting PSA target	% Area favourable	% Area unfavourable recovering	% Area unfavourable no change	% Area unfavourable declining	% Area destroyed / part destroyed	0.00%	0.00%	0.00%	0.00%	100.00%	0.00%
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<b>Key Environmental Conditions (factors that maintain site integrity)</b>	<ul style="list-style-type: none"> <li>• Roosts are sensitive to disturbance (internal as well as at the entrances), need to be limited to acceptable levels.</li> <li>• Suitability of roost internal conditions (temperature, light, ventilation, stability etc) should be maintained.</li> </ul>												

<b>Hestercombe House SAC</b>	
	<ul style="list-style-type: none"> <li>• Appropriate management of roost entrances is required and there should be no artificial light shining on entrance or associated flight paths.</li> <li>• Bats require connectivity of habitat features for commuting and foraging. Active management of the habitats used by bats for these activities may be required.</li> <li>• The importance of habitat features off site for bat flight lines should be recognised.</li> </ul>
<b>SAC Condition Assessment</b>	See component SSSIs
<b>Vulnerabilities (includes existing pressures and trends)</b>	<ul style="list-style-type: none"> <li>• The bat roosts are situated in buildings which are actively used on a regular basis.</li> <li>• Current knowledge of bat movements by site managers is good so there is no immediate threat but change of use, development or change of personnel could all potentially pose a problem.</li> <li>• Cause of observed decline in bat numbers unknown, may be due to woodland work or nearby building work causing a disturbance.</li> <li>• Potential for biological disturbance from housing development in foraging area.</li> <li>• Human presence and light pollution also potential issues.</li> </ul>
<b>Landowner/ Management Responsibility</b>	Private
<b>HRA/AA Studies undertaken that address this site</b>	<p><b>HRA of the Draft Regional Spatial Strategy for the South West, South West Regional Assembly (February, 2007, LUC):</b>                      Noted the need for locationally specific safeguards for this SAC including preventing the loss of key habitats associated with housing expansion at Taunton.</p>

## Site Name: Mendip Limestone Grassland

- Location Grid Ref: 025133W/ 511748N
- JNCC Site Code [UK0030203](#)
- Size: 417.47 ha
- Designation: SAC

Mendip Limestone Grassland SAC	
<b>Site Description</b>	This site comprises coastal and inland sections of the Carboniferous Limestone outcrops of the Mendips. The coastal headland and inland hills support the largest area of CG1 <i>Festuca ovina</i> – <i>Carlina vulgaris</i> grassland in England, including two sub-types (CG1a <i>Carex humilis</i> and CG1c <i>Trinia glauca</i> sub-communities) known from no other site in the UK. Areas of short-turf CG2 <i>Festuca ovina</i> – <i>Avenula pratensis</i> grassland also occur inland. The site is exceptional in that it supports a number of rare and scarce vascular plants typical of the oceanic southern temperate and Mediterranean elements of the British flora. These include white rock-rose <i>Helianthemum apenninum</i> , Somerset hair-grass <i>Koeleria vallesiana</i> and honewort <i>Trinia glauca</i> . Transitions to limestone heath (4030 European dry heaths) situated on flatter terrain also occur.
<b>Qualifying Features</b>	<p>Annex I habitats present as a qualifying feature, but not a primary reason for selection of this site:</p> <p>4030 <a href="#">European dry heaths</a></p> <p>8310 <a href="#">Caves not open to the public</a></p> <p>9180 <a href="#">Tilio-Acerion forests of slopes, screes and ravines</a> * Priority feature</p> <p>Annex II species that are a primary reason for selection of this site:</p> <p>N/A</p> <p>Annex II species present as a qualifying feature, but not a primary reason for site selection:</p> <p>1304 <a href="#">Greater horseshoe bat</a> <i>Rhinolophus ferrumequinum</i></p>
<b>Conservation Objectives</b>	<b>Semi-natural dry grasslands and scrubland facies on calcareous substrates (<i>Festuco-Brometalia</i>).</b>



Mendip Limestone Grassland SAC	
	<p><b>Objective:</b> to maintain the site in favourable condition.</p> <p><b>Criteria Feature CG1:</b>                      No reduction in area and any consequent fragmentation without prior consent. Cover greater than <b>5%</b>. At least two species/taxa <b>frequent</b> plus at least four species <b>occasional</b> throughout the sward. No species/taxa more than <b>occasional</b> throughout the sward or singly or together more than <b>5%</b> cover. <i>Senecio jacobaea</i> no more than <b>occasional</b> throughout the sward Sward <b>5</b> cms or less.</p> <p><b>Criteria Feature CG2:</b>                      No reduction in area and any consequent fragmentation without prior consent. At least four species/taxa frequent plus at least three species occasional throughout the sward. 40-90% grass to herb ratio. Neither species at more than 10% cover. No species/taxa more than occasional throughout the sward or singly or together more than 5% cover. Sward 2-10 cms. Litter total extent no more than 25% of the sward. Bare ground no more than 10%. Localised bare ground no more than 0.05 ha i.e. approx 20x20 metres.</p> <p><b>Criteria Features CG 3</b>                      No reduction in area and any consequent fragmentation without prior consent. Bromopsis erecta (if CG3) or Brachypodium pinnatum (if CG4), or both (if CG5) frequent plus at least two species/taxa frequent and four occasional throughout the sward. Grass/herb ratio 40-90%. No species/taxa more than occasional throughout the sward or singly or together more than 5% cover. Sward 2-15 cms. Litter total extent no more than 25% of the sward. Bare ground no more than 10%. Localised bare ground no more than 0.05 ha i.e. approx 20x20 metres.</p> <p><b>European Dry Heaths</b></p> <p><b>Objective:</b> To maintain the site in favourable condition as a European dry heath type H8.</p> <p>Maintain existing area on its current sites. 'Natural' between 10-25% in intimate mosaic with vegetation. 'Disturbed' &lt;1 Cover of Calluna vulgaris/Erica cinerea to be between 25% minimum and 90% maximum. Mosaic with &gt;10% young and 30-50% mature / degenerate Calluna vulgaris/Erica cinerea within unit. 2</p>

Mendip Limestone Grassland SAC	
	<p>species from List A must be at least frequent. At least one species of list B is at least occasional. &lt; 50 % cover degenerate/dead <i>Calluna vulgaris</i> &lt; 5% tree or tree seedlings. &lt; 20% <i>Pteridium aquilinum</i>. No species more than occasional throughout the sward or singly or together more than 5% cover. No more than 50% cover. At least 20% cover of grasses sedges and broad leafed herbs. No more than 20% cover of degenerate bushes or heavily grazed forms with woody stems exceeding green material. No more than 0.05 ha around any warren.</p> <p><b><i>Tilio-Acerion</i> forests of slopes screes and ravines</b></p> <p><b>Objective:</b> to maintain the site in favourable condition</p> <ul style="list-style-type: none"> <li>• No loss of ancient semi-natural stands. At least current area of recent semi natural stands maintained, although their location may alter. At least the area of ancient woodland retained.</li> <li>• At least the current level of structural diversity maintained. Understorey (2-5m) present over at least 20% of total stand area. Ground flora present over at least 50% of area. Age class structure appropriate to the site its history and management. A minimum of 3 fallen lying trees &gt;20cm diameter per ha and 4 trees per ha allowed to die standing.</li> <li>• Signs of seedlings growing through to saplings to young trees at sufficient density to maintain canopy density over a 10 year period (or equivalent re-growth from coppice stumps). No more than 20% of areas regenerated by planting. All planting material of locally native stock. No planting in sites where it has not occurred in the last 15 years.</li> <li>• At least the current level of site -native species maintained. At least 90% of cover in any one layer of site native or acceptable naturalised species. Death, destruction or replacement of native woodland species through the effects of introduced fauna or other external unnatural factors not more than 1% by number or area in a five year period.</li> </ul>

Mendip Limestone Grassland SAC													
	<ul style="list-style-type: none"> <li>80% of ground flora cover referable to relevant NVC community (usually W8). Distinctive elements maintained at current levels and in current locations (where appropriate). Patches and transitions maintained in extent and where appropriate location.</li> </ul> <p><b><i>Rhinolophus ferrumequinum</i> and <i>Rhinolophus hipposideros</i> hibernation sites</b></p> <p><b>Objective:</b> to maintain the site in favourable condition for the hibernation of Greater and Lesser Horseshoe bats</p> <ul style="list-style-type: none"> <li>Unobstructed; no unplanned new entrances causing a change to ventilation. No change in size sufficient to affect air flow and internal temperature.</li> <li>Grille in good condition with no evidence of forced entry through or around the grille and no damage caused by attempts at entry. Security fence on sound condition.</li> <li>Vegetation present close to the entrance but not obstructing it. No artificial lights shining on the entrance.</li> <li>Human access to the site controlled and limited; no significant increase since previous visit.</li> <li>Cool (8-12 degrees c) and dark once beyond the entrance zone. No significant unplanned changes to the ventilation or temperature regime. No toxic substances present.</li> <li>Bats seen on at least one occasion each winter.</li> </ul>												
<b>Component SSSIs</b>	<p><b>Component SSSIs including condition status:</b></p> <table border="1" style="width: 100%; border-collapse: collapse; text-align: center;"> <thead> <tr> <th style="background-color: #d3d3d3;">SAC component site</th> <th style="background-color: #d3d3d3;">Favourable</th> <th style="background-color: #d3d3d3;">Unfavourable recovering</th> <th style="background-color: #d3d3d3;">Unfavourable no change</th> <th style="background-color: #d3d3d3;">Unfavourable declining</th> <th style="background-color: #d3d3d3;">Destroyed, part destroyed</th> </tr> </thead> <tbody> <tr> <td style="background-color: #d3d3d3;"></td> <td>6.08%</td> <td>83.56%</td> <td>0</td> <td>10.36%</td> <td>0</td> </tr> </tbody> </table>	SAC component site	Favourable	Unfavourable recovering	Unfavourable no change	Unfavourable declining	Destroyed, part destroyed		6.08%	83.56%	0	10.36%	0
SAC component site	Favourable	Unfavourable recovering	Unfavourable no change	Unfavourable declining	Destroyed, part destroyed								
	6.08%	83.56%	0	10.36%	0								

Mendip Limestone Grassland SAC	
<p><b>Key Environmental Conditions (factors that maintain site integrity)</b></p>	<p><b>Grassland</b></p> <ul style="list-style-type: none"> <li>• Sward structure and composition provide a valuable indication of habitat quality. Cutting or grazing may be used to maintain these habitats, including control of scrub encroachment (including Cotoneaster), though some scrub can be ecologically beneficial.</li> <li>• The presence of negative indicator species may indicate problems such as eutrophication, scrub invasion (insufficient control) or over grazing (for example by rabbits).</li> </ul> <p><b>Heaths</b></p> <ul style="list-style-type: none"> <li>• Appropriate heathland management is required to maintain the extent of the heaths, the structural diversity including undisturbed bare ground, age structure and vegetation mosaic. Grazing can play an important role in this management.</li> <li>• The control of inappropriate and invasive species is required.</li> </ul> <p><b>Woodlands</b></p> <ul style="list-style-type: none"> <li>• Appropriate woodland management is required in particular to maintain natural processes, a diverse woodland structure, tree regeneration potential, a diverse age structure, control invasive species, and support characteristic species and habitat types.</li> </ul> <p><b>Caves</b></p> <ul style="list-style-type: none"> <li>• Caves are sensitive systems, which often suffer significant pressure from human activities, both above and below ground. It is important to manage the overlying land and catchment in a manner, which takes account of potential consequences on the caves</li> </ul> <p><b>Bats</b></p> <ul style="list-style-type: none"> <li>• Roosts are sensitive to disturbance (internal as well as at the entrances), which would need to be limited to acceptable levels.</li> <li>• Suitability of roost internal conditions (temperature, light, ventilation, stability etc) should be maintained.</li> <li>• Appropriate management of vegetation at roost entrances is required and there should be no artificial light shining on entrance or associated flight paths</li> <li>• Bats require connectivity of habitat features for commuting and foraging. Active management of the habitats used by bats for these activities may be required. The importance of habitat features off site for bat flight lines should be recognised.</li> </ul>

<b>Mendip Limestone Grassland SAC</b>	
<b>SAC Condition Assessment</b>	See SSSI condition.
<b>Vulnerabilities (includes existing pressures and trends)</b>	<ul style="list-style-type: none"> <li>• These sites are all open-access and are heavily used for informal recreation.</li> <li>• The balance of habitats is heavily dependent upon adequate grazing, which is not always available.</li> <li>• The commoning system on which the management of the Crook Peak part of the site depends is breaking down and may cause serious problems in the future.</li> </ul> <p><b>Key pressures and trends:</b></p> <ul style="list-style-type: none"> <li>• Maintaining appropriate grazing levels, currently under grazing is a problem on some of the grassland and heath, and inappropriate / overgrazing is a problem in some of the woodland.</li> <li>• Inappropriate scrub control, with invasion of Cotoneaster in some locations.</li> <li>• Invasive bracken.</li> <li>• Breakdown of current management system (data form).</li> <li>• Illegal setting of fires.</li> <li>• Recreational pressure is becoming a problem with increased levels of trampling and erosion leading to localised loss of habitat (NE).</li> <li>• Light pollution (professional judgment).</li> </ul>
<b>Landowner/ Management Responsibility</b>	N/A
<b>HRA/AA Studies undertaken that address this site</b>	<p><b>HRA of the Draft Regional Spatial Strategy for the South West, South West Regional Assembly (February, 2007, LUC):</b> Notes the need for site specific protection in relation to bats at this SAC.</p> <p><b>Appropriate Assessment of Somerset District, Borough and County Councils Core Strategies: Initial Screening Report (February, 2008):</b> Recreational pressure identified as an issue, need to protect bat roosts and flightlines, ‘nibbling’ at edges of habitat from increase use of rights of way.</p>

## Site Name: River Usk

- Location Grid Ref: SO301113
- JNCC Site Code: [UK0013007](#)
- Size: 1007.71 ha
- Designation: SAC

	River Usk SAC
<p><b>Site Description</b></p>	<p>The River Usk SAC rises in the Black Mountain range in the west of the Brecon Beacons National Park and flows east and then south, to enter the Severn Estuary at Newport. The overall form of the catchment is long and narrow, with short, generally steep tributaries flowing north from the Black Mountain, Fforest Fawr and Brecon Beacons, and south from Mynydd Epynt and the Black Mountains. The underlying geology consists predominantly of Devonian Old Red Sandstone with a moderate base status, resulting in waters that are generally well buffered against acidity. This geology also produces a generally low to moderate nutrient status, and a moderate base-flow index, intermediate between base-flow dominated rivers and more flashy rivers on less permeable geology. The run-off characteristics and nutrient status are significantly modified by land use in the catchment, which is predominantly pastoral with some woodland and commercial forestry in the headwaters and arable in the lower catchment. The Usk catchment is entirely within Wales.</p> <p>The ecological structure and functions of the site are dependent on hydrological and geomorphological processes (often referred to as hydromorphological processes), as well as the quality of riparian habitats and connectivity of habitats. Animals that move around and sometimes leave the site, such as migratory fish and otters, may also be affected by factors operating outside the site.</p> <p>The River Usk is also important for its population of sea lamprey <i>Petromyzon marinus</i>. The site also supports a healthy population of brook lamprey <i>Lampetra planeri</i> and river lamprey <i>Lampetra fluviatilis</i> and is considered to provide exceptionally good quality habitat likely to ensure the continued survival of the species in this part of the UK. The site supports a range of Annex II fish species, which includes twaite shad <i>Alosa falla</i>, salmon <i>Salmo salar</i> and bullhead <i>Cottus gobi</i>. The River Usk is an important site for otters <i>Lutra lutra</i> in Wales.</p>

River Usk SAC	
<b>Qualifying Features</b>	<p>Annex I Habitats qualifying feature:</p> <ul style="list-style-type: none"> <li>• <a href="#">Water courses of plain to montane levels with the <i>Ranunculus fluitantis</i> and <i>Callitriche-Batrachion</i> vegetation</a></li> </ul> <p>Annex II Species primary reason for selection:</p> <ul style="list-style-type: none"> <li>• <a href="#">Sea lamprey</a> <i>Petromyzon marinus</i></li> <li>• <a href="#">Brook lamprey</a> <i>Lampetra planeri</i></li> <li>• <a href="#">River lamprey</a> <i>Lampetra fluviatilis</i></li> <li>• <a href="#">Twaite shad</a> <i>Alosa fallax</i></li> <li>• <a href="#">Atlantic salmon</a> <i>Salmo salar</i></li> <li>• <a href="#">Bullhead</a> <i>Cottus gobio</i></li> <li>• <a href="#">Otter</a> <i>Lutra lutra</i></li> </ul> <p>Annex II Species qualifying feature:</p> <p><a href="#">Allis shad</a> <i>Alosa alosa</i></p>
<b>Conservation Objectives</b>	<p><b>The ecological status of the water course is a major determinant of Favourable Condition Status (FCS) for all features. The required conservation objective for the water course is defined below.</b></p> <p><b>Conservation Objective for the water course</b></p> <ul style="list-style-type: none"> <li>• The capacity of the habitats in the SAC to support each feature at near-natural population levels, as determined by predominantly unmodified ecological and hydromorphological processes and characteristics, should be maintained as far as possible, or restored where necessary.</li> <li>• The ecological status of the water environment should be sufficient to maintain a stable or increasing population of each feature. This will include elements of water quantity and quality, physical habitat and community composition and structure. It is anticipated that these limits will concur with the relevant standards used by the Review of Consents process given in Annexes 1-3.</li> </ul>

	River Usk SAC
	<ul style="list-style-type: none"> <li>• Flow regime, water quality and physical habitat should be maintained in, or restored as far as possible to, a near-natural state, in order to support the coherence of ecosystem structure and function across the whole area of the SAC.</li> <li>• All known breeding, spawning and nursery sites of species features should be maintained as suitable habitat as far as possible, except where natural processes cause them to change.</li> <li>• Flows, water quality, substrate quality and quantity at fish spawning sites and nursery areas will not be depleted by abstraction, discharges, engineering or gravel extraction activities or other impacts to the extent that these sites are damaged or destroyed.</li> <li>• The river platform and profile should be predominantly unmodified. Physical modifications having an adverse effect on the integrity of the SAC, including, but not limited to, revetments on active alluvial river banks using stone, concrete or waste materials, unsustainable extraction of gravel, addition or release of excessive quantities of fine sediment, will be avoided.</li> <li>• River habitat SSSI features should be in favourable condition. In the case of the Usk Tributaries SSSI, the SAC habitat is not underpinned by a river habitat SSSI feature. In this case, the target is to maintain the characteristic physical features of the river channel, banks and riparian zone.</li> <li>• Artificial factors impacting on the capability of each species feature to occupy the full extent of its natural range should be modified where necessary to allow passage, e.g. weirs, bridge sills, acoustic barriers.</li> <li>• Natural factors such as waterfalls, which may limit the natural range of a species feature or dispersal between naturally isolated populations, should not be modified.</li> <li>• Flows during the normal migration periods of each migratory fish species feature will not be depleted by abstraction to the extent that passage upstream to spawning sites is hindered.</li> <li>• Flow objectives for assessment points in the Usk Catchment Abstraction Management Strategy will be agreed between EA and CCW as necessary. It is anticipated that these limits will concur with the standards used by the Review of Consents process given in Annex 1 of this document.</li> <li>• Levels of nutrients, in particular phosphate, will be agreed between EA and CCW for each Water Framework Directive water body in the Usk SAC, and measures taken to maintain nutrients below these levels. It is anticipated that these limits will concur with the standards used by the Review of Consents process given in Annex 2 of this document.</li> <li>• Levels of water quality parameters that are known to affect the distribution and abundance of SAC features</li> </ul>



	River Usk SAC
	<p>will be agreed between EA and CCW for each Water Framework Directive water body in the Usk SAC, and measures taken to maintain pollution below these levels. It is anticipated that these limits will concur with the standards used by the Review of Consents process given in Annex 3 of this document.</p> <ul style="list-style-type: none"> <li>• Potential sources of pollution not addressed in the Review of Consents, such as contaminated land, will be considered in assessing plans and projects.</li> <li>• Levels of suspended solids will be agreed between EA and CCW for each Water Framework Directive water body in the Usk SAC. Measures including, but not limited to, the control of suspended sediment generated by agriculture, forestry and engineering works, will be taken to maintain suspended solids below these levels.</li> </ul> <p><b>Conservation Objective for Features 1-5:</b></p> <ul style="list-style-type: none"> <li>- <b>Sea lamprey</b> <i>Petromyzon marinus</i>;</li> <li>- <b>Brook lamprey</b> <i>Lampetra planeri</i>;</li> <li>- <b>River lamprey</b> <i>Lampetra fluviatilis</i>;</li> <li>- <b>Twaite shad</b> <i>Alosa fallax</i>;</li> <li>- <b>Allis shad</b> <i>Alosa alosa</i>;</li> <li>- <b>Atlantic salmon</b> <i>Salmo salar</i>;</li> <li>- <b>Bullhead</b> <i>Cottus gobio</i>.</li> </ul> <p><b>Vision for features 1-5:</b> The vision for this feature is for it to be in a favourable conservation status, where all of the following conditions are satisfied:</p> <ul style="list-style-type: none"> <li>• The conservation objective for the water course as defined in 4.1 above must be met.</li> <li>• The population of the feature in the SAC is stable or increasing over the long term.</li> <li>• The natural range of the feature in the SAC is neither being reduced nor is likely to be reduced for the foreseeable future. The natural range is taken to mean those reaches where predominantly suitable habitat for each life stage exists over the long term. Suitable habitat is defined in terms of near-natural</li> </ul>

	River Usk SAC
	<p>hydrological and geomorphological processes and forms egg. suitable flows to allow upstream migration, depth of water and substrate type at spawning sites, and ecosystem structure and functions e.g. food supply. Suitable habitat need not be present throughout the SAC but where present must be secured for the foreseeable future. Natural factors such as waterfalls may limit the natural range of individual species. Existing artificial influences on natural range that cause an adverse effect on site integrity, such as physical barriers to migration, will be assessed in view of the following bullet point.</p> <ul style="list-style-type: none"> <li>• There is, and will probably continue to be, a sufficiently large habitat to maintain the feature’s population in the SAC on a long-term basis.</li> </ul> <p><b>Performance indicators for features 1-5:</b></p> <p>The performance indicators are part of the conservation objective, not a substitute for it. Assessment of plans and projects must be based on the entire conservation objective, not just the performance indicators. The performance indicators can be found within the <a href="#">River Usk SAC Management Plan</a>.</p> <p><b>Conservation Objective for Feature 6:</b></p> <p><b>European otter <i>Lutra lutra</i></b></p> <p><b>Vision for Feature 6:</b></p> <p>The vision for this feature is for it to be in a favourable conservation status, where all of the following conditions are satisfied:</p> <ul style="list-style-type: none"> <li>• The population of otters in the SAC is stable or increasing over the long term and reflects the natural carrying capacity of the habitat within the SAC, as determined by natural levels of prey abundance and associated territorial behaviour.</li> <li>• The natural range of otters in the SAC is neither being reduced nor is likely to be reduced for the foreseeable future. The natural range is taken to mean those reaches that are potentially suitable to form part of a breeding territory and/or provide routes between breeding territories. The whole area of the Usk</li> </ul>

	River Usk SAC
	<p>SAC is considered to form potentially suitable breeding habitat for otters. The size of breeding territories may vary depending on prey abundance. The population size should not be limited by the availability of suitable undisturbed breeding sites. Where these are insufficient they should be created through habitat enhancement and where necessary the provision of artificial holts. No otter breeding site should be subject to a level of disturbance that could have an adverse effect on breeding success. Where necessary, potentially harmful levels of disturbance must be managed.</p> <ul style="list-style-type: none"> <li>• The safe movement and dispersal of individuals around the SAC is facilitated by the provision, where necessary, of suitable riparian habitat, and underpasses, ledges, fencing etc at road bridges and other artificial barriers.</li> </ul> <p>Performance indicators for feature 6 (see performance indicators for Features 1 - 5)</p> <p><b>Conservation Objective for Feature 7:</b></p> <p><b>Water courses of plain to montane levels with the <i>Ranunculion fluitantis</i> and <i>Callitriche-Batrachion</i> vegetation</b></p> <p><b>Vision for Feature 7:</b></p> <ul style="list-style-type: none"> <li>• The performance indicators are part of the conservation objective, not a substitute for it. Assessment of plans and projects must be based on the entire conservation objective, not just the performance indicators.</li> <li>• The conservation objectives for the water course as defined above must be met.</li> <li>• The natural range of the plant communities represented within this feature should be stable or increasing in the SAC.</li> <li>• The natural range is taken to mean those reaches where predominantly suitable habitat exists over the long term.</li> <li>• Suitable habitat and associated plant communities may vary from reach to reach.</li> <li>• Suitable habitat is defined in terms of near-natural hydrological and geomorphological processes and forms e.g. Depth and stability of flow, stability of bed substrate, and ecosystem structure and functions e.g.</li> </ul>

	<b>River Usk SAC</b>
	<p>Nutrient levels, shade...</p> <ul style="list-style-type: none"> <li>• Suitable habitat for the feature need not be present throughout the SAC but where present must be secured for the foreseeable future, except where natural processes cause it to decline in extent.</li> <li>• The area covered by the feature within its natural range in the SAC should be stable or increasing.</li> <li>• The conservation status of the feature's typical species should be favourable. The typical species are defined with reference to the species composition of the appropriate JNCC river vegetation type for the particular river reach, unless differing from this type due to natural variability when other typical species may be defined as appropriate.</li> </ul> <p>Performance indicators for feature 7 (see performance indicators for features 1 - 5)</p>
<b>Component SSSIs</b>	<p>River Usk (Upper Usk) SSSI                      River Usk (Lower Usk) SSSI                      River Usk (Tributaries) SSSI                      Penllwyn-yr-hendy SSSI                      Coed Dyrysiog SSSI                      Coed Nant Menascin SSSI                      Coed Ynysfaen SSSI</p> <p>The SAC has been divided into 10 management units:                      Units 1 to 3 - River Usk (Lower Usk) SSSI.                      Units 4 to 6 - River Usk (Upper Usk) SSSI.                      Units 7 to 10 - River Usk (Tributaries) SSSI.</p> <p>A map showing the various management units can be seen within the <a href="#">River Usk SAC Management Plan</a>.</p>
<b>Key Environmental Conditions (factors that maintain site integrity)</b>	<p><b>Hydrological processes:</b></p> <p><b>River flow</b> (level and variability) and water chemistry, determine a range of habitat factors of critical</p>

	River Usk SAC
	<p>importance to the SAC features, including current velocity, water depth, wetted area, substrate quality, dissolved oxygen levels and water temperature. Maintenance of both high 'spate' flows and base-flows is essential. Reduction in flows may reduce the ability of the adults of migratory fish to reach spawning sites. Water-crowfoot vegetation thrives in relatively stable, moderate flows and clean water. The flow regime should be characteristic of the river in order to support the functioning of the river ecosystem.</p> <p><b>Geomorphological processes</b> - of erosion by water and subsequent deposition of eroded sediments downstream, create the physical structure of the river habitats. Whilst some sections of the river are naturally stable, especially where they flow over bedrock, others undergo constant and at times rapid change through the erosion and deposition of bed and bank sediments as is typical of meandering sections within floodplains (called 'alluvial' rivers). These processes help to sustain the river ecosystem by allowing a continued supply of clean gravels and other important substrates to be transported downstream. In addition, the freshly deposited and eroded surfaces, such as shingle banks and earth cliffs, enable processes of ecological succession to begin again, providing an essential habitat for specialist, early-successional species. Lampreys need clean gravel for spawning, and marginal silt or sand for the burrowing juvenile ammocoetes. Processes at the wider catchment scale generally govern processes of erosion and deposition occurring at the reach scale, although locally, factors such as the effect of grazing levels on riparian vegetation structure may contribute to enhanced erosion rates. In general, management that interferes with natural geomorphological processes, for example preventing bank erosion through the use of hard revetments or removing large amounts of gravel, are likely to be damaging to the coherence of the ecosystem structure and functions.</p> <p><b>Riparian habitats</b> - including bank sides and habitats on adjacent land, are an integral part of the river ecosystem. Diverse and high quality riparian habitats have a vital role in maintaining the SAC features in a favourable condition. The type and condition of riparian vegetation influences shade and water temperature, nutrient run-off from adjacent land, the availability of woody debris to the channel and inputs of leaf litter and invertebrates to support in-stream consumers. Light, temperature and nutrient levels influence in-stream plant production and habitat suitability for the SAC features. Woody debris is very important as it provides refuge areas from predators, traps sediment to create spawning and juvenile habitat and forms the base of an important aquatic food chain. Otters require sufficient undisturbed riparian habitats as breeding and resting sites. It is important that appropriate amounts of tree cover, in general at least 50% high canopy cover, tall</p>

River Usk SAC	
	<p>vegetation and other semi-natural habitats are maintained on the riverbanks and in adjacent areas, and that they are properly managed to support the SAC features. This may be achieved, for example, through managing grazing levels, selective coppicing of riparian trees and restoring adjacent wetlands. In the urban sections the focus may be on maintaining the river as a communication corridor but this will still require that sufficient riparian habitat is present and managed to enable the river corridor to function effectively.</p> <p><b>Habitat connectivity</b> - is an important property of a river ecosystem structure and function. Many of the fish that spawn in the river are migratory, depending on the maintenance of suitable conditions on their migration routes to allow the adults to reach available spawning habitat and juvenile fish to migrate downstream. For resident species, dispersal to new areas, or the prevention of dispersal causing isolated populations to become genetically distinct, may be important factors. Naturally isolated feature populations that are identified as having important genetic distinctiveness should be maintained. Artificial obstructions including weirs and bridge sills can reduce connectivity for some species. In addition, reaches subject to depleted flow levels, pollution, or disturbance due to noise, vibration or light, can all inhibit the movement of sensitive species. The dispersal of semi-terrestrial species such as the otter can be adversely affected by structures such as bridges under certain flow conditions; therefore, these must be designed to allow safe passage. The continuity of riparian habitats enables a wide range of terrestrial species, for example lesser horseshoe bats, to migrate and disperse through the landscape. Connectivity should be maintained or restored where necessary as a means to ensure access for the features to sufficient habitat within the SAC.</p>
<b>SAC Condition Assessment</b>	<p><b>Conservation status of Feature 1: Sea lamprey <i>Petromyzon marinus</i></b></p> <p>Status: <b>Unfavourable:</b> Unclassified. Sea lamprey monitoring showed that overall catchment mean ammocoete density considerably exceeded the JNCC target threshold and also complied with targets for spawning site and ammocoete distribution. A caveat on the latter is uncertainty over whether the natural range of sea lamprey extends above Brecon weir: this is assumed not to be the case.</p> <p>Factors leading to an unfavourable assessment are the presence of probable partial barriers further downstream (notably Crickhowell Bridge), and flow depletion resulting from abstractions including Brecon canal and Prioress Mill public water supply abstraction. The latter in particular has been shown to have effects</p>

	River Usk SAC
	<p>both on a seasonal timescale by reducing spate flows during the migration period and on a diurnal timescale by substantially depleting flows during the night time to the extent that sea lamprey nests and nursery areas are likely to be exposed above the water level. The effect of the Brecon canal abstraction has been shown to comprise a substantial depletion of flows, at least locally, during low flow periods with a resulting reduction in river depth downstream of the off-take weir.</p> <p><b>Conservation status of Feature 2: Brook lamprey <i>Lampetra planeri</i> and River lamprey <i>Lampetra fluviatilis</i></b></p> <p>Status: <b>Favourable</b>. Brook/river lamprey monitoring showed that overall catchment mean ammocoete density considerably exceeded the JNCC target threshold and also complied with targets for ammocoete distribution<sup>1</sup>.</p> <p>It has not been possible to distinguish between these two species during monitoring, due to the reliance on juvenile stages (ammocoetes). Anecdotal evidence suggests that both species are likely to be present in many reaches, though brook lamprey are expected to predominate in the headwaters and river lamprey may be the more abundant species in the main channel and the lower reaches of larger tributaries. More information on the relative abundance of these two species in different parts of the Usk SAC is desirable. Records of spawning adult river lamprey would be particularly useful.</p> <p><b>Conservation status of Feature 3: Twaite shad <i>Alosa fallax</i> and Allis shad <i>Alosa alosa</i></b></p> <p>Status: <b>Unfavourable</b>: Unclassified. Monitoring of these species in the Usk relies on two methods, Kick sampling for eggs provides qualitative information on spawning distribution, Netting for juveniles in the lower river and tidal reaches during late summer/autumn when juveniles drift downstream towards the estuary.</p> <p>These methods do not distinguish between the two species. Allis shad is thought to be rare, with no recent records in the Usk, while twaite shad is relatively common. Kick sampling for eggs is only able to give a broad scale indication of presence or absence at sampled locations. Netting for juveniles gives a quantitative</p>

	River Usk SAC
	<p>estimate of abundance, though may be subject to a high degree of uncertainty due to sampling error. This uncertainty is likely to be compounded by variation between years in the size of the adult run, spawning success and resulting numbers of juveniles. Poor adult runs are likely to result from unsuitable flows during the March to June migration period, in particular prolonged low flows, while poor survival of eggs and juveniles is related to spate flows in the mid to late summer which can flush them into the estuary prematurely.</p> <p>CSM guidance states that adult run size should comply with an agreed target for each river, with no drop in the annual run greater than would be expected from variations in natural mortality alone. This attribute is not currently assessed in the Usk due to the absence of a fish counter.</p> <p>The current unfavourable status results from a precautionary assessment of feature distribution and abundance, and from the presence of adverse factors, in particular flow depletion and physical barriers to migration.</p> <p><b>Conservation status of Feature 4: Atlantic salmon <i>Salmo salar</i></b></p> <p>Status: <b>Unfavourable:</b> Unclassified. Monitoring of Atlantic salmon in the Usk relies on two methods:</p> <ul style="list-style-type: none"> <li>• Estimation of adult run size from angling catch returns; and</li> <li>• Electro-fishing for juveniles in nursery areas.</li> </ul> <p>The estimate of adult numbers is converted into an estimate of numbers of eggs deposited which is compared against an Egg Deposition Target (EDT), calculated by considering the area of suitable spawning habitat within the catchment. The equivalent adult run to achieve the EDT is described in terms of a Conservation Limit, which must be exceeded 4 years in 5 for the Management Target to be considered attained. Electro-fishing for juveniles is either quantitative or semi-quantitative, and estimated juvenile densities are classified in one of six categories A to F. The monitoring guidance produced by the LIFE in UK Rivers project recommends that ideally juvenile densities should be compared to predicted densities for the sample reach using the HABSCORE model<sup>6</sup>. These targets are calculated and monitored by the Environment Agency as</p>



	River Usk SAC
	<p>part of the Salmon Action Plan for the Usk.</p> <p>The current unfavourable status results from a precautionary assessment of feature distribution and abundance, in particular the results of juvenile surveys, and from the presence of adverse factors, in particular flow depletion and localised water quality failures.</p> <p><b>Conservation status of Feature 5: Bullhead <i>Cottus gobio</i></b></p> <p>Status: <b>Unfavourable:</b> Unclassified. The current unfavourable status results from the presence of adverse factors, in particular flow depletion and localised water quality failures. Records obtained from juvenile salmon monitoring show that bullhead are widespread in the main river and tributaries. There is a need for quantitative information on bullhead abundance, which will be addressed by targeted monitoring in 2007.</p> <p><b>Conservation status of Feature 6: European otter <i>Lutra lutra</i></b></p> <p>Status: <b>Favourable.</b> The conservation status of otters in the Usk SAC is determined by monitoring their distribution, breeding success, and the condition of potential breeding and feeding habitat outlined in the Performance Indicators. Their current condition can be considered favourable, but with scope for further improvement, if habitat and other natural factors can be maintained and enhanced.</p> <p><b>Conservation status of Feature 7: Water courses of plain to montane levels with the <i>Ranunculon fluitantis</i> and <i>Callitricho-Batrachion</i> vegetation</b></p> <p>Status: <b>Unfavourable:</b> Unclassified. The present unfavourable status of the feature results from the over-abundance of invasive non-native species of bankside plant communities, which are included within the feature definition. These are predominantly giant hogweed and Himalayan balsam in the lower reaches of the main river.</p>

River Usk SAC	
<p><b>Vulnerabilities (includes existing pressures and trends)</b></p>	<p><b>Abstraction levels</b> - Entrainment in water abstractions directly impacts on lamprey population dynamics through reduced recruitment and survival rates. The impact of flow depletion resulting from a small number of major abstractions was highlighted in the Review of Consents process.</p> <p><b>Eutrophication</b> - factors that are important to the favourable conservation status of this feature include flow, substrate quality and water quality, which in turn influence species composition and abundance. These factors often interact, producing unfavourable conditions by promoting the growth of a range of algae and other species indicative of eutrophication. Under conditions of prolonged low flows and high nutrient status, epiphytic algae may suppress the growth of aquatic flowering plants.</p> <p><b>Diffuse Pollution</b> - The Atlantic salmon is the focus for much of the management activity carried out on the Usk. The relatively demanding water quality and spawning substrate quality requirements of this feature mean that reduction in diffuse pollution and siltation impacts is a high priority. In the Usk catchment, the most significant sources of diffuse pollution and siltation are from agriculture, including fertiliser run-off, livestock manure, silage effluent and soil erosion from ploughed land. The most intensively used areas such as heavily trampled gateways and tracks can be especially significant sources of polluting run-off. Farm operations should avoid ploughing land which is vulnerable to soil erosion or leaving such areas without crop cover during the winter. Contamination by synthetic pyrethroid sheep dips, which are extremely toxic to aquatic invertebrates, has a devastating impact on crayfish populations and can deprive fish populations of food over large stretches of river. These impacts can arise if recently dipped sheep are allowed access to a stream or hard standing area, which drains into a watercourse. Pollution from organophosphate sheep dips and silage effluent can be very damaging locally. Pollution from slurry and other agricultural and industrial chemicals, including fuels, can kill all forms of aquatic life. All sheep dips and silage, fuel and chemical storage areas should be sited away from watercourses or bunded to contain leakage. Recently dipped sheep should be kept off stream banks. Discharges from sewage treatment works, urban drainage, engineering works such as road improvement schemes, contaminated land, and other domestic and industrial sources can also be significant causes of pollution, and must be managed appropriately. Pollution of rivers with toxic chemicals, such as PCBs, was one of the major factors identified in the widespread decline of otters during the last century.</p>

	River Usk SAC
	<p><b>Barriers to migration</b> - There are few barriers to migration for the anadromous species and where barriers exist, investigation is proposed to analyse for potential impacts and remedy them through multi-species fish passes. Crickhowell Bridge is considered to be the most significant barrier to fish migration in the Usk. Management to reduce or remove the effect of this barrier is a high priority for the River Usk SAC. Artificial physical barriers are probably the single most important factor in the decline of shad in Europe. Impassable obstacles between suitable spawning areas and the sea can eliminate breeding populations of shad. Both species (but particularly allis shad) can make migrations of hundreds of kilometres from the estuary to spawning grounds in the absence of artificial barriers. Existing fish passes designed for salmon are often not effective for shad.</p> <p><b>Development pressure</b> - in the lower catchment can cause temporary physical, acoustic, chemical and sediment barrier effects that need to be addressed in the assessment of specific plans and projects. Noise/vibration for example due to impact piling, drilling, salmon fish counters present within or in close proximity to the river can create a barrier to shad migration. Land on both sides of the river in Newport is potentially highly contaminated. Contamination of the river can arise when this is disturbed for example as a result of development. Contamination can also arise from pollution events (which could be shipping or industry related). Barriers resulting from vibration, chemicals, low dissolved oxygen and artificially high sediment levels must be prevented at key times (generally March to June).</p> <p><b>Invasive non-native plants</b> - are a detrimental impact on the water courses of plain to montane levels with the <i>Ranunculon fluitantis</i> and <i>Callitricho-Batrachion</i> vegetation. Giant hogweed, Himalayan balsam and Japanese knotweed should be actively managed to control their spread and hopefully reduce their extent in the SAC.</p> <p><b>Artificially enhanced densities of other fish</b> - may introduce unacceptable competition or predation pressure and the aim should be to minimise these risks in considering any proposals for stocking.</p> <p><b>External factors</b> - operating outside the SAC, may also be influential, particularly for the migratory fish and otters. For example, salmon may be affected by barriers to migration in the Severn Estuary, inshore fishing and environmental conditions prevailing in their north Atlantic feeding grounds. Otters may be affected by</p>

River Usk SAC	
	developments that affect resting and breeding sites outside the SAC boundary.
<b>Landowner/ Management Responsibility</b>	N/A
<b>HRA/AA Studies undertaken that address this site</b>	<p>HRA Screening of the County Council of the City and County of Cardiff Local Development Plan Preferred Strategy Sept 2007.  <a href="http://www.cardiff.gov.uk/ObjView.asp?Object_ID=9788">www.cardiff.gov.uk/ObjView.asp?Object_ID=9788</a>                      The Screening states that the most likely mechanism for the Preferred Strategy to have a significant effect on this site is through airborne pollution.</p> <p>HRA Screening of the Torfaen Local Development Plan (2006-2021) January 2008.  <a href="http://www.torfaen.gov.uk/EnvironmentAndPlanning/Planning/ForwardPlanning/Publications/HabitatsRegulationAssessment.pdf">http://www.torfaen.gov.uk/EnvironmentAndPlanning/Planning/ForwardPlanning/Publications/HabitatsRegulationAssessment.pdf</a>                      The Screening concludes that there is potential for significant effects on this site through discharge of sewerage, increased surface run-off and an increase in airborne pollutants.</p> <p>HRA and AA of the Wales Spatial Plan Update June 2008.  <a href="http://wales.gov.uk/about/strategy/spatial/hra/download/?lang=en">http://wales.gov.uk/about/strategy/spatial/hra/download/?lang=en</a>                      The HRA Screening concludes that the WSPU and other plans have the potential to give rise to adverse effects at this site.                      The AA states that it is not possible to predict in specific terms whether the WSPU would or would not give rise to significant adverse effects either alone or in combination with other plans/ strategies and projects upon specific European sites. However, it does identify that this site is likely to come under increasing risk of adverse effects from urban and economic development and recreation and tourism as a result of the WSPU. The AA also identifies that transport infrastructure has the potential to have negative effects on this site as a consequence of the WSPU.</p>

## Site Name: River Wye

- Location Grid Ref: SO109369
- JNCC Site Code: [UK0012642](#)
- Size: 2234.89 ha
- Designation SAC

River Wye SAC	
<b>Site Description</b>	<p>The River Wye rises on Plynlimon in the Cambrian Mountains and flows in a generally south-easterly direction to enter the Severn Estuary at Chepstow. The upper catchment comprises several large sub-catchments, including the Irfon on the generally infertile upland landscape in the north-west, the Ithon in the north-east often on more low-lying, fertile terrain and the Lugg in the east in a predominantly low-lying fertile landscape much of which lies within England. The underlying geology consists predominantly of impermeable, acidic rocks of Silurian and Ordovician age in the north-west and more permeable Devonian Old Red Sandstone with a moderate base status in the middle and lower catchment. This geology produces a generally low to moderate nutrient status and a low to moderate base-flow index, making the river characteristically flashy. The run-off characteristics and nutrient status are significantly modified by land use in the catchment, which is predominantly pastoral with some woodland and commercial forestry in the headwaters and arable in the lower catchment and the Lugg. The Wye catchment is divided between Wales and England; the river forms the border from south of Monmouth to Chepstow and to the east of Hay-on-Wye.</p> <p>Historically, the Wye is the most famous and productive river in Wales for Atlantic salmon <i>Salmo salar</i>, with high-quality spawning grounds and juvenile habitat in both the main channel and tributaries. The Wye salmon population is particularly notable for the very high proportion (around 75%) of multi sea winter (MSW) fish, a stock component which has declined sharply in recent years throughout the UK. This pattern has also occurred in the Wye, with a consequent marked decline in the population since the 1980s. However, the Wye salmon population is still of considerable importance in UK terms. The Atlantic salmon is the focus for much of the management activity carried out on the Wye. The relatively demanding water quality and spawning substrate quality requirements of this feature mean that reduction in diffuse pollution and siltation impacts is a high priority. The Wye also holds the densest and most well-established otter <i>Lutra lutra</i> population in Wales, representative of otters occurring in lowland freshwater habitats in the borders of Wales. The river has bank-</p>

River Wye SAC	
	<p>side vegetation cover, abundant food supply, clean water and undisturbed areas of dense scrub suitable for breeding, making it particularly favourable as otter habitat. The population remained even during the lowest point of the UK decline, confirming that the site is particularly favourable for this species and the population likely to be highly stable. The site is considered one of the best in the UK for white-clawed crayfish <i>Austropotamobius pallipes</i>. The tributaries are the main haven for the species, particularly at the confluences of the main river and the Edw, Dulas Brook, Sgithwen and Clettwr Brook. Other importance species supported by the River Wye are twaite shad, bullhead and river, sea and brook lamprey.</p>
<b>Qualifying Features</b>	<p>Annex I habitats primary reason for selection:  <a href="#">Water courses of plain to montane levels with the <i>Ranunculion fluitantis</i> and <i>Callitriche-Batrachion</i> vegetation</a></p> <p>Annex I habitats qualifying feature:  <a href="#">Transition mires and quaking bogs</a></p> <p>Annex II species primary reason for selection:  <a href="#">White-clawed (or Atlantic stream) crayfish</a> <i>Austropotamobius pallipes</i>  <a href="#">Sea lamprey</a> <i>Petromyzon marinus</i>  <a href="#">Brook lamprey</a> <i>Lampetra planeri</i>  <a href="#">River lamprey</a> <i>Lampetra fluviatilis</i>  <a href="#">Twaite shad</a> <i>Alosa fallax</i>  <a href="#">Atlantic salmon</a> <i>Salmo salar</i>  <a href="#">Bullhead</a> <i>Cottus gobio</i>  <a href="#">Otter</a> <i>Lutra lutra</i></p> <p>Annex II Species qualifying feature:  <a href="#">Allis shad</a> <i>Alosa alosa</i></p>
<b>Conservation Objectives</b>	<p>The ecological status of the watercourse is a major determinant of Favourable Condition Status for all features. The required conservation objective for the watercourse is defined below.</p>

	<b>River Wye SAC</b>
	<p><b>Conservation Objective for the watercourse:</b></p> <ul style="list-style-type: none"> <li>• The capacity of the habitats in the SAC to support each feature at near-natural population levels, as determined by predominantly unmodified ecological and hydromorphological processes and characteristics, should be maintained as far as possible, or restored where necessary.</li> <li>• The ecological status of the water environment should be sufficient to maintain a stable or increasing population of each feature. This will include elements of water quantity and quality, physical habitat and community composition and structure. It is anticipated that these limits will concur with the relevant standards used by the Review of Consents process given in Annexes 1-3.</li> <li>• Flow regime, water quality and physical habitat should be maintained in, or restored as far as possible to, a near-natural state, in order to support the coherence of ecosystem structure and function across the whole area of the SAC.</li> <li>• All known breeding, spawning and nursery sites of species features should be maintained as suitable habitat as far as possible, except where natural processes cause them to change.</li> <li>• Flows, water quality, substrate quality and quantity at fish spawning sites and nursery areas will not be depleted by abstraction, discharges, engineering or gravel extraction activities or other impacts to the extent that these sites are damaged or destroyed.</li> <li>• The river planform and profile should be predominantly unmodified. Physical modifications having an adverse effect on the integrity of the SAC, including, but not limited to, revetments on active alluvial river banks using stone, concrete or waste materials, unsustainable extraction of gravel, addition or release of excessive quantities of fine sediment, will be avoided.</li> <li>• River habitat SSSI features should be in favourable condition. Where the SAC habitat is not underpinned by a river habitat SSSI feature, the target is to maintain the characteristic physical features of the river channel, banks and riparian zone.</li> <li>• Artificial factors impacting on the capability of each species feature to occupy the full extent of its natural range should be modified where necessary to allow passage, e.g. weirs, bridge sills, acoustic barriers.</li> <li>• Natural factors such as waterfalls, which may limit, wholly or partially, the natural range of a species feature or dispersal between naturally isolated populations, should not be modified.</li> </ul>

	River Wye SAC
	<ul style="list-style-type: none"> <li>• Flows during the normal migration periods of each migratory fish species feature will not be depleted by abstraction to the extent that passage upstream to spawning sites is hindered.</li> <li>• Flow objectives for assessment points in the Wye Catchment Abstraction Management Strategy will be agreed between EA and CCW as necessary. It is anticipated that these limits will concur with the standards used by the Review of Consents process given in Annex 1 of this document.</li> <li>• Levels of nutrients, in particular phosphate, will be agreed between EA and CCW for each Water Framework Directive water body in the Wye SAC, and measures taken to maintain nutrients below these levels. It is anticipated that these limits will concur with the standards used by the Review of Consents process given in Annex 2 of this document.</li> <li>• Levels of water quality parameters that are known to affect the distribution and abundance of SAC features will be agreed between EA and CCW for each Water Framework Directive water body in the Wye SAC, and measures taken to maintain pollution below these levels. It is anticipated that these limits will concur with the standards used by the Review of Consents process given in Annex 3 of this document.</li> <li>• Potential sources of pollution not addressed in the Review of Consents, such as contaminated land, will be considered in assessing plans and projects.</li> <li>• Levels of suspended solids will be agreed between EA and CCW for each Water Framework Directive water body in the Wye SAC. Measures including, but not limited to, the control of suspended sediment generated by agriculture, forestry and engineering works, will be taken to maintain suspended solids below these levels.</li> </ul> <p><b>Conservation Objective for Features 1-5:</b></p> <ul style="list-style-type: none"> <li>- <b>Sea lamprey</b> <i>Petromyzon marinus</i>;</li> <li>- <b>Brook lamprey</b> <i>Lampetra planeri</i>;</li> <li>- <b>River lamprey</b> <i>Lampetra fluviatilis</i>;</li> <li>- <b>Twaite shad</b> <i>Alosa fallax</i>;</li> <li>- <b>Allis shad</b> <i>Alosa alosa</i>;</li> <li>- <b>Atlantic salmon</b> <i>Salmo salar</i>;</li> <li>- <b>Bullhead</b> <i>Cottus gobio</i>.</li> </ul>



River Wye SAC	
	<p><b>Vision for features 1-5</b>                      The vision for this feature is for it to be in a favourable conservation status, where all of the following conditions are satisfied:</p> <ul style="list-style-type: none"> <li>• The conservation objective for the water course as defined in 4.1 above must be met.</li> <li>• The population of the feature in the SAC is stable or increasing over the long term.</li> <li>• The natural range of the feature in the SAC is neither being reduced nor is likely to be reduced for the foreseeable future. The natural range is taken to mean those reaches where predominantly suitable habitat for each life stage exists over the long term. Suitable habitat is defined in terms of near-natural hydrological and geomorphological processes and forms e.g. suitable flows to allow upstream migration, depth of water and substrate type at spawning sites, and ecosystem structure and functions e.g. food supply. Suitable habitat need not be present throughout the SAC but where present must be secured for the foreseeable future. Natural factors such as waterfalls may limit the natural range of individual species. Existing artificial influences on natural range that cause an adverse effect on site integrity, such as physical barriers to migration, will be assessed in view of the following bullet point.</li> <li>• There is, and will probably continue to be, a sufficiently large habitat to maintain the feature's population in the SAC on a long-term basis.</li> </ul> <p><b>Performance indicators for features 1-5</b>                      The performance indicators are part of the conservation objective, not a substitute for it. Assessment of plans and projects must be based on the entire conservation objective, not just the performance indicators. The performance indicators can be found within the <a href="#">River Wye SAC Management Plan</a>.</p> <p><b>Conservation Objective for Feature 6:</b>                      - <b>European otter</b> <i>Lutra lutra</i></p> <p><b>Vision for feature 6</b>                      The vision for this feature is for it to be in a favourable conservation status, where all of the following</p>

	River Wye SAC
	<p>conditions are satisfied:</p> <ul style="list-style-type: none"> <li>• The population of otters in the SAC is stable or increasing over the long term and reflects the natural carrying capacity of the habitat within the SAC, as determined by natural levels of prey abundance and associated territorial behaviour.</li> <li>• The natural range of otters in the SAC is neither being reduced nor is likely to be reduced for the foreseeable future. The natural range is taken to mean those reaches that are potentially suitable to form part of a breeding territory and/or provide routes between breeding territories. The whole area of the Wye SAC is considered to form potentially suitable breeding habitat for otters. The size of breeding territories may vary depending on prey abundance. The population size should not be limited by the availability of suitable undisturbed breeding sites. Where these are insufficient they should be created through habitat enhancement and where necessary the provision of artificial holts. No otter breeding site should be subject to a level of disturbance that could have an adverse effect on breeding success. Where necessary, potentially harmful levels of disturbance must be managed.</li> <li>• The safe movement and dispersal of individuals around the SAC is facilitated by the provision, where necessary, of suitable riparian habitat, and underpasses, ledges, fencing etc at road bridges and other artificial barriers.</li> </ul> <p><b>Performance indicators for feature 6 (see performance indicators for features 1 - 5)</b></p> <p><b>Conservation Objective for Feature 7:</b>  <b>- Water courses of plain to montane levels with the <i>Ranunculion fluitantis</i> and <i>Callitricho-Batrachion</i> vegetation</b></p> <p><b>Vision for feature 7</b>  The vision for this feature is for it to be in a favourable conservation status, where all of the following conditions are satisfied:</p> <ul style="list-style-type: none"> <li>• The conservation objectives for the water course as defined above must be met.</li> </ul>

	River Wye SAC
	<ul style="list-style-type: none"> <li>• The natural range of the plant communities represented within this feature should be stable or increasing in the SAC. The natural range is taken to mean those reaches where predominantly suitable habitat exists over the long term. Suitable habitat and associated plant communities may vary from reach to reach. Suitable habitat is defined in terms of near-natural hydrological and geomorphological processes and forms e.g. depth and stability of flow, stability of bed substrate, and ecosystem structure and functions e.g. nutrient levels, shade. Suitable habitat for the feature need not be present throughout the SAC but where present must be secured for the foreseeable future, except where natural processes cause it to decline in extent.</li> <li>• The area covered by the feature within its natural range in the SAC should be stable or increasing.</li> <li>• The conservation status of the feature's typical species should be favourable. The typical species are defined with reference to the species composition of the appropriate JNCC river vegetation type for the particular river reach, unless differing from this type due to natural variability when other typical species may be defined as appropriate.</li> </ul> <p><b>Performance indicators for feature 7 (see performance indicators for features 1 - 5)</b></p> <p><b>Conservation Objective for Feature 8:</b>  <b>- White-clawed crayfish <i>Austropotamobius pallipes</i></b></p> <p><b>Vision for feature 8</b></p> <p>The vision for this feature is for it to be in a favourable conservation status, where all of the following conditions are satisfied:</p> <ul style="list-style-type: none"> <li>• The conservation objective for the water course as defined in 4.1 above must be met.</li> <li>• The population of the feature in the SAC is stable or increasing over the long term.</li> <li>• The natural range of the feature in the SAC is neither being reduced nor is likely to be reduced for the foreseeable future. The natural range is taken to mean those reaches where predominantly suitable habitat for each life stage exists over the long term. Suitable habitat is defined in terms of near-natural</li> </ul>

	<b>River Wye SAC</b>
	<p>hydrological and geomorphological processes and forms for example substrate type, water hardness and temperature, and ecosystem structure and functions for example food supply, absence of invasive non-native competitors. Suitable habitat need not be present throughout the SAC but where present must be secured for the foreseeable future. Natural factors such as waterfalls may limit the natural range of individual species. Existing artificial influences on natural range that cause an adverse effect on site integrity will be assessed in view of the objective below.</p> <ul style="list-style-type: none"> <li>• There is, and will probably continue to be, a sufficiently large habitat to maintain the feature’s population in the SAC on a long-term basis.</li> </ul> <p><b>Performance indicators for feature 8 (see performance indicators for features 1 - 5)</b></p> <p><b>Conservation Objective for Feature 9: - Quaking bogs and transition mires</b></p> <p><b>Vision for feature 9</b></p> <p>The vision for this feature is for it to be in a favourable conservation status, where all of the following conditions are satisfied:</p> <ul style="list-style-type: none"> <li>• The conservation objective for the water course as defined in 4.1 above must be met.</li> <li>• The natural range of the plant communities represented within this feature should be stable or increasing in the SAC. The natural range is taken to mean those reaches where near-natural hydrological and geomorphological processes and landforms favour the development of this habitat. The feature need not be present in all suitable locations in the SAC but where present must be secured for the foreseeable future.</li> <li>• The area covered by the feature within its natural range in the SAC should be stable or increasing.</li> <li>• The conservation status of the feature’s typical species should be favourable. The typical species are defined with reference to the species composition of the appropriate NVC type(s), unless differing from this type due to natural variability/local distinctiveness when other typical/indicator species may be defined</li> </ul>

	<b>River Wye SAC</b>
	<p>as appropriate.</p> <p><b>Performance indicators for feature 9 (see performance indicators for features 1 - 5)</b></p>
<b>Component SSSIs</b>	<p>The site has been divided into management units to enable practical communication about features, objectives, and management. This will also allow CCW to differentiate between the different designations where necessary. In the management plan units have been based on the following:</p> <ul style="list-style-type: none"> <li>• SSSI boundaries.</li> <li>• Natural hydromorphology, where there are significant differences in management issues/key features between reaches.</li> <li>• Units partly within England coincide with Natural England’s equivalent units, as far as is practicable.</li> <li>• The units include one or more of EA’s River Basin Management Plan water bodies; as far as is practicable, unit boundaries coincide with these water body boundaries.</li> </ul> <p><b>The component SSSIs and management units that comprise to form the River Wye SAC are:</b>  River Wye (Lower Wye) SSSI - Management units 1A to 1D;  River Wye (Upper Wye) SSSI - Management units 2A and 2B;  River Wye (Tributaries) SSSI - Management unit 3;  Afon Llynfi SSSI - Management unit 4;  Duhonw SSSI - Management unit 5;  Afon Irfon SSSI - Management unit 6;  River Ithon SSSI - Management unit 7;  Upper Wye Tributaries SSSI - Management unit 8; and  Colwyn Brook Marshes (North and South) SSSI - Management units 9A to 9G and 10A and 10E.</p> <p>Note: a number of smaller SSSI have part of their area included within the River Wye SAC. These are not all included separately here, but management actions for adjacent SAC units also apply to these sites.</p>

River Wye SAC													
	<p>Maps containing the component SSSIs and management units can be viewed on the <a href="#">CCW website</a>.</p> <p>Component SSSIs Condition Assessment for those SSSIs occurring in England: River Wye</p> <table border="1" style="width: 100%; text-align: center;"> <thead> <tr> <th style="background-color: #d3d3d3;">% Area meeting PSA target</th> <th style="background-color: #d3d3d3;">% Area favourable</th> <th style="background-color: #d3d3d3;">% Area unfavourable recovering</th> <th style="background-color: #d3d3d3;">% Area unfavourable no change</th> <th style="background-color: #d3d3d3;">% Area unfavourable declining</th> <th style="background-color: #d3d3d3;">% Area destroyed / part destroyed</th> </tr> </thead> <tbody> <tr> <td>16.74%</td> <td>16.74%</td> <td>0.00%</td> <td>83.26%</td> <td>0.00%</td> <td>0.00%</td> </tr> </tbody> </table>	% Area meeting PSA target	% Area favourable	% Area unfavourable recovering	% Area unfavourable no change	% Area unfavourable declining	% Area destroyed / part destroyed	16.74%	16.74%	0.00%	83.26%	0.00%	0.00%
% Area meeting PSA target	% Area favourable	% Area unfavourable recovering	% Area unfavourable no change	% Area unfavourable declining	% Area destroyed / part destroyed								
16.74%	16.74%	0.00%	83.26%	0.00%	0.00%								
<p><b>Key Environmental Conditions (factors that maintain site integrity)</b></p>	<p>The <b>ecological structure and functions of the site are dependent on hydrological and geomorphological processes</b> (often referred to as hydromorphological processes), as well as the quality of riparian habitats and connectivity of habitats. Animals that move around and sometimes leave the site, such as migratory fish and otters, may also be affected by factors operating outside the site.</p> <p><b>Hydrological processes</b> in particular river flow (level and variability) and water chemistry, determine a range of habitat factors of importance to the SAC features, including current velocity, water depth, wetted area, substrate quality, dissolved oxygen levels and water temperature. Maintenance of both high 'spate' flows and base-flows is essential. Reductions in flow may reduce the ability of the adult migratory fish to reach spawning sites. Water-crowfoot vegetation thrives in relatively stable, moderate flows and clean water. The flow regime should be characteristic of the river in order to support the functioning of the river ecosystem.</p> <p><b>Geomorphological processes</b> of erosion by water and subsequent deposition of eroded sediments downstream create the physical structure of the river habitats. While some sections of the river are naturally stable, especially where they flow over bedrock, others undergo continual and at times rapid change through the erosion and deposition of bed and bank sediments as is typical of meandering sections within floodplains (called 'alluvial' rivers). These processes help to sustain the river ecosystem by allowing a continued supply</p>												

	River Wye SAC
	<p>of clean gravels and other important substrates to be transported downstream. In addition, the freshly deposited and eroded surfaces, such as shingle banks and earth cliffs, enable processes of ecological succession to begin again, providing an essential habitat for specialist, early-successional species. Processes at the wider catchment scale generally govern processes of erosion and deposition occurring at the reach scale, although locally factors such as the effect of grazing levels on riparian vegetation structure may contribute to enhanced erosion rates. In general, management that interferes with natural geomorphological processes, for example preventing bank erosion through the use of hard revetments or removing large amounts of gravel, are likely to be damaging to the coherence of the ecosystem structure and functions.</p> <p><b>Riparian habitats</b> including bank sides and habitats on adjacent land, are an integral part of the river ecosystem. Diverse and high quality riparian habitats have a vital role in maintaining the SAC features in a favourable condition. The type and condition of riparian vegetation influences shade and water temperature, nutrient run-off from adjacent land, the availability of woody debris to the channel and inputs of leaf litter and invertebrates to support in-stream consumers. Light, temperature and nutrient levels influence in-stream plant production and habitat suitability for the SAC features. Woody debris is very important as it provides refuge areas from predators, traps sediment to create spawning and juvenile habitat and forms the base of an important aquatic food chain. Otters require sufficient undisturbed riparian habitat for breeding and resting sites. It is important that appropriate amounts of tree cover, in general at least 50% high canopy cover, tall vegetation and other semi-natural habitats are maintained on the riverbanks and in adjacent areas, and that they are properly managed to support the SAC features. This may be achieved for example, through managing grazing levels, selective coppicing of riparian trees and restoring adjacent wetlands. In the urban sections the focus may be on maintaining the river as a communication corridor but this will still require that sufficient riparian habitat is present and managed to enable the river corridor to function effectively. Overhanging trees provide valuable shade and food sources for Atlantic salmon whilst tree root systems provide important cover and flow refuges for juveniles. Bullheads are particularly associated with woody debris in lowland reaches, where it is likely that it provides an alternative source of cover from predators and floods. It may also be used as an alternative spawning substrate. Debris dams and woody debris should be retained where characteristic of the river/reach. Woody debris removal should be minimised, and restricted to essential activities such as flood defence.</p>

	<b>River Wye SAC</b>
	<p><b>Habitat connectivity</b> is an important property of river ecosystem structure and function. Many of the fish that spawn in the river are migratory, depending on the maintenance of suitable conditions on their migration routes to allow the adults to reach available spawning habitat and juvenile fish to migrate downstream. For resident species, dispersal to new areas, or the prevention of dispersal causing isolated populations to become genetically distinct, may be important factors. Naturally isolated feature populations that are identified as having important genetic distinctiveness should be maintained.</p> <p>In all river types, artificial barriers should be made passable. Physical modification of barriers is required where depth/velocity/duration of flows is unsuitable to allow passage. Complete or partial natural barriers to potentially suitable spawning areas should not be modified or circumvented. Certain areas of the SAC are critical to the movement of otters both within the system and to adjacent sites. The Wye SAC provides a key movement corridor for otters passing between the relatively high densities in mid Wales and the south-east Wales coastal strip (Seven Estuary and Gwent Levels). The function of this aspect of the site should be protected through the maintenance of suitable resting sites (in terms of size, quality and levels of disturbance) through urban centres such as Monmouth. Connectivity should be maintained, or restored where necessary, as a means to ensure access for the features to sufficient habitat within the SAC.</p> <p><b>External factors</b> operating outside the SAC, may also be influential, particularly for the migratory fish and otters. For example, salmon may be affected by barriers to migration in the Severn Estuary, inshore fishing and environmental conditions prevailing in their north Atlantic feeding grounds. Otters may be affected by developments that affect resting and breeding sites outside the SAC boundary.</p>
<b>SAC Condition Assessment</b>	<p><b>Conservation status of Feature 1: Sea lamprey <i>Petromyzon marinus</i></b></p> <p>Conservation status (2006)</p> <p>Status within the site: <b>Favourable: Unclassified</b>. Sea lamprey monitoring showed that overall catchment mean ammocoete density considerably exceeded the JNCC target threshold and also complied with targets</p>



	<b>River Wye SAC</b>
	<p>for spawning site and ammocoete distribution. Sea lamprey ammocoetes were recorded in good numbers immediately upstream of the falls at Rhayader, their most upstream recorded site on the main Wye. They were also recorded in the Irfon and Ithon tributaries.</p> <p><b>Conservation status of Feature 2: Brook lamprey <i>Lampetra planeri</i> and River lamprey <i>Lampetra fluviatilis</i></b></p> <p>Conservation status (2006)</p> <p>Status within the site: <b>Favourable: Unclassified.</b> Brook/river lamprey monitoring showed that overall catchment mean ammocoete density considerably exceeded the JNCC target threshold. However, <i>Lampetra</i> ammocoetes were recorded at only 30 of the 54 sample sites (56%) thus failed to meet the criterion of presence at least two thirds of sites within their natural range. Consequently, the feature may be in unfavourable condition. Further clarification is needed concerning a number of sample sites in the upper reaches (Upper Wye and Elan), which may reflect unsuitable habitat and be outside the natural ranges of the species.</p> <p>It has not been possible to distinguish between these two species during monitoring, due to the reliance on juvenile stages (ammocoetes). Anecdotal evidence suggests that both species are likely to be present in many reaches, though brook lamprey are expected to predominate in the headwaters and river lamprey may be the more abundant species in the main channel and the lower reaches of larger tributaries. More information on the relative abundance of these two species in different parts of the Wye SAC is desirable. Records of spawning adult river lamprey would be particularly useful.</p> <p><b>Conservation status of Feature 3: Twait shad <i>Alosa fallax</i> and Allis shad <i>Alosa alosa</i></b></p> <p>Conservation status (2006)</p> <p>Status within the site: <b>Unfavourable: Unclassified.</b></p>

	River Wye SAC
	<p>Physical barriers to migration are a major cause of unfavourable status of these species in Europe as a whole; however, there are not thought to be any significant barriers to shad migration in the Wye.</p> <p>The current unfavourable status results from a precautionary assessment of feature abundance, and from the presence of adverse factors, in particular the potential for damaging flow depletion and entrainment/impingement in water intakes.</p> <p><b>Conservation status of Feature 4: Atlantic salmon <i>Salmo salar</i></b></p> <p>Conservation status (2006)</p> <p>Status within the site: <b>Unfavourable: Unclassified.</b></p> <p>The current unfavourable status results from failure of the Management Target for adult run size as well as a precautionary assessment of juvenile distribution and abundance and the presence of adverse factors, in particular the potential for flow depletion and localised water quality failures. Acidification due to forestry is a factor in the upper reaches of the Wye and Irfon.</p> <p><b>Conservation status of Feature 5: Bullhead <i>Cottus gobio</i></b></p> <p>Conservation status (2006)</p> <p>Status within the site: <b>Unfavourable: Unclassified.</b> The current unfavourable status results from the presence of adverse factors, in particular localised water quality failures. Records obtained from juvenile salmon monitoring show that bullhead are widespread in the main river and tributaries. Quantitative information on bullhead abundance is being provided through targeted monitoring.</p> <p><b>Conservation status of Feature 6: European otter <i>Lutra lutra</i></b></p>

	River Wye SAC
	<p>Conservation status (2006)</p> <p>Status within the site: <b>Unfavourable</b>. The conservation status of otters in the Wye SAC is determined by monitoring their distribution, breeding success, and the condition of potential breeding and feeding habitat as outlined in the Performance Indicators. Their current condition is considered unfavourable due a lack of suitable breeding sites around the middle reaches of the river.</p> <p><b>Conservation status of Feature 7: Water courses of plain to montane levels with the <i>Ranunculion fluitantis</i> and <i>Callitricho-Batrachion</i> vegetation</b></p> <p>Conservation status (2006)</p> <p>Status within the site: <b>Unfavourable: Declining</b>. The present unfavourable status of the feature results from declining water quality in some tributaries of the Wye for example parts of the Ithon and Llynfi sub-catchments, due mainly to diffuse pollution from agriculture.</p> <p>A further adverse factor is the over-abundance of invasive non-native species of bankside plant communities, which are included within the feature definition. Japanese knotweed and Himalayan balsam are widespread in the catchment, including the Irfon sub-catchment.</p> <p><b>Conservation status of Feature 8: White-clawed crayfish <i>Austropotamobius pallipes</i></b></p> <p>Conservation status (2006)</p> <p>Status within the site: <b>Unfavourable: Declining</b>. There is considerable anecdotal evidence of a major decline in the distribution and abundance of the native white-clawed crayfish in the Wye catchment over the last few decades. Native crayfish may have been lost from the main river channel, from tributaries such as</p>

	<b>River Wye SAC</b>
	<p>the Duhonw and Ithon and have almost disappeared from the Afon Irfon. Significant populations within the Wye SAC are now confined to the Sgithwen, Cletwr, Edw, Llynfi Dulas and Builth Road Dulas. The most recent assessment of the condition of crayfish in the Wye SAC, using modified Common Standards Monitoring techniques, found that populations are unfavourable.</p>
<p><b>Vulnerabilities (includes existing pressures and trends)</b></p>	<p><b>Abstraction levels</b> - entrainment in water abstractions directly impacts on species population dynamics through reduced recruitment and survival rates. The impact of flow depletion resulting from a small number of major abstractions was highlighted in the Review of Consents process. As a result of this process, flow targets have been set which are considered likely to significantly reduce or remove the potential impacts on SAC features.</p> <p><b>Eutrophication</b> - factors that are important to the favourable conservation status of this feature include flow, substrate quality and water quality, which in turn influence species composition and abundance. These factors often interact, producing unfavourable conditions by promoting the growth of a range of algae and other species indicative of eutrophication. Under conditions of prolonged low flows and high nutrient status, epiphytic algae may suppress the growth of aquatic flowering plants.</p> <p><b>Diffuse Pollution</b> - in the Wye catchment the most significant sources of diffuse pollution and siltation are from agriculture, including fertiliser run-off, livestock manure, silage effluent and soil erosion from ploughed land. The most intensively used areas such as heavily trampled gateways and tracks can be especially significant sources of polluting run-off. Preventative measures can include surfacing of tracks and gateways, moving feeding areas, and separating clean and dirty water in farmyards. Farm operations should avoid ploughing land which is vulnerable to soil erosion or leaving such areas without crop cover during the winter.</p> <p>Among toxic pollutants, sheep dip and silage effluent present a particular threat to aquatic animals in this predominantly rural area. Contamination by synthetic pyrethroid sheep dips, which are extremely toxic to aquatic invertebrates, has a devastating impact on crayfish populations and can deprive fish populations of food over large stretches of river. These impacts can arise if recently dipped sheep are allowed access to a stream or hard standing area, which drains into a watercourse. Pollution from organophosphate sheep dips and silage effluent can be very damaging locally. Pollution from slurry and other agricultural and industrial</p>

	<b>River Wye SAC</b>
	<p>chemicals, including fuels, can kill all forms of aquatic life. All sheep dips and silage, fuel and chemical storage areas should be sited away from watercourses or bunded to contain leakage. Recently dipped sheep should be kept off stream banks.</p> <p>Discharges from sewage treatment works, urban drainage, engineering works such as road improvement schemes, contaminated land, and other domestic and industrial sources can also be significant causes of pollution, and must be managed appropriately. Used dip should be disposed of strictly in accordance with Environment Agency Regulations and guidelines. Statutory and voluntary agencies should work closely with landowners and occupiers to minimise the risk of any pollution incidents and enforce existing regulations. Measures to control diffuse pollution in the water environment, including 'Catchment Sensitive Farming', may be implemented as a result of the Water Framework Directive and, along with existing agri-environment schemes, will help to achieve the conservation objectives for the SAC. Pollution of rivers with toxic chemicals, such as PCBs, was one of the major factors identified in the widespread decline of otters during the last century. There should be no increase in pollutants potentially toxic to otters.</p> <p><b>Barriers to migration</b> - Artificial obstructions including weirs and bridge sills can reduce connectivity for some species. In addition, reaches subject to depleted flow levels, pollution, or disturbance due to noise, vibration or light, can all inhibit the movement of sensitive species. The dispersal of semi-terrestrial species, such as the otter, can be adversely affected by structures such as bridges under certain flow conditions, therefore these must be designed to allow safe passage.</p> <p><b>Development pressure</b> - can cause temporary physical, acoustic, chemical and sediment barrier effects that need to be addressed in the assessment of specific plans and projects. Noise/vibration e.g. due to impact piling, drilling, salmon fish counters present within or in close proximity to the river can create a barrier to shad migration. Barriers resulting from vibration, chemicals, low dissolved oxygen and artificially high sediment levels must be prevented at key times. Engineering works such as bridge repairs in reaches where white-clawed crayfish are known to occur should include appropriate pollution prevention measures and a crayfish rescue by a suitably licensed person where there is a risk of physical damage to crayfish.</p> <p><b>Invasive and non-native species</b> - are a detrimental impact on the water courses of plain to montane levels</p>

	River Wye SAC
	<p>with the <i>Ranunculon fluitantis</i> and <i>Callitricho-Batrachion</i> vegetation. Giant hogweed, Himalayan balsam and Japanese knotweed should be actively managed to control their spread and hopefully reduce their extent in the SAC. The American signal crayfish is present in the Wye catchment and poses a very serious threat to the continued existence of the native white-clawed crayfish in the site and in Wales. Native crayfish are unable to co-exist where signal crayfish are present, due to the latter's superior competitive ability and a disease, crayfish plague, which it carries but to which native crayfish have no immunity. American signal crayfish and crayfish plague are widespread and abundant in nearby catchments such as the Lugg, Arrow and Severn. Crayfish plague can be transferred to streams on wet fishing gear, boots, canoes, machinery, stocked fish etc., so measures such as raising awareness, disinfection facilities and where appropriate restrictions on access, should be implemented where a significant risk is identified. Signal crayfish are also extremely harmful to fish communities and the overall ecology of the river. It is illegal to release non-native crayfish into the wild, to keep live crayfish in most of Wales or to trap crayfish without a licence from the Environment Agency. Bullhead densities have been found to be negatively correlated with densities of non-native crayfish, suggesting competitive and/or predator-prey interactions. Non-native crayfish should be absent from the SAC.</p> <p><b>Artificially enhanced densities of other fish</b> - may introduce unacceptable competition or predation pressure and the aim should be to minimise these risks in considering any proposals for stocking. A small-scale salmon rearing and stocking programme is currently in operation in the Wye, run by the Wye and Usk Foundation. The management objectives for SAC salmon populations are to attain naturally self-sustaining populations. Salmon stocking should not be routinely used as a management measure. Salmon stocking represents a loss of naturalness and, if successful, obscures the underlying causes of poor performance (potentially allowing these risks to perpetuate). It carries various ecological risks, including the loss of natural spawning from broodstock, competition between stocked and naturally produced individuals, disease introduction and genetic alterations to the population. Therefore, there is a presumption that salmon stocking in the Wye SAC will be phased out over time. The presence of artificially high densities of salmonids and other fish will create unacceptably high levels of predatory and competitive pressure on juvenile and adult bullhead. Stocking of fish should be avoided in the SAC.</p> <p><b>External factors</b> - operating outside the SAC, may also be influential, particularly for the migratory fish and</p>

	<b>River Wye SAC</b>
	<p>otters. For example, salmon may be affected by barriers to migration in the Severn Estuary, inshore fishing and environmental conditions prevailing in their north Atlantic feeding grounds. Otters may be affected by developments that affect resting and breeding sites outside the SAC boundary.</p>
<b>Landowner/ Management Responsibility</b>	N/A
<b>HRA/AA Studies undertaken that address this site</b>	<p>HRA Screening of the Torfaen Local Development Plan (2006-2021) January 2008.  <a href="http://www.torfaen.gov.uk/EnvironmentAndPlanning/Planning/ForwardPlanning/Publications/HabitatsRegulationAssessment.pdf">http://www.torfaen.gov.uk/EnvironmentAndPlanning/Planning/ForwardPlanning/Publications/HabitatsRegulationAssessment.pdf</a></p> <p>The screening concludes that due to the distance between the SAC and Torfaen (approximately 30-35km) it is considered that the LDP is unlikely to have any significant effects on this SAC. Increases in airborne pollution could potentially have effects on particular habitats but this impact is considered negligible.</p> <p>HRA and AA of the Wales Spatial Plan Update June 2008.  <a href="http://wales.gov.uk/about/strategy/spatial/hra/download/?lang=en">http://wales.gov.uk/about/strategy/spatial/hra/download/?lang=en</a></p> <p>The HRA Screening concludes that the WSPU and other plans have the potential to give rise to adverse effects at this site.</p> <p>The AA states that it is not possible to predict in specific terms whether the WSPU would or would not give rise to significant adverse effects either alone or in combination with other plans/ strategies and projects upon specific European sites. However, it does identify that this site is likely to come under increasing risk of adverse in combination effects from urban and economic development and recreation and tourism as a result of the WSPU and English RSSs. The AA also identifies that in combination with the English RSSs the WSPU has the potential to have negative effects on water levels, flood protection and water quality issues, which could affect this site.</p>





## Site Name: Severn Estuary SAC

- Location Grid Ref: ST321748
- JNCC Site Code: [UK0013030](#)
- Size: 73715.4 ha
- Designation: SAC

Severn Estuary SAC	
<b>Site Description</b>	<p>The Severn Estuary is the largest coastal plain estuary in the UK with extensive mudflats and sandflats, rocky shore platforms, shingle and islands. Saltmarsh fringes the coast, backed by grazing marsh with freshwater and occasional brackish ditches. The estuary's classic funnel shape, unique in the UK, is a factor causing the Severn to have the second highest tidal range in the world (after the Bay of Fundy in Canada) at more than 12 meters. This tidal regime results in plant and animal communities typical of the extreme physical conditions of strong flows, mobile sediments, changing salinity, high turbidity and heavy scouring. The resultant low diversity invertebrate communities, that frequently include populations of ragworms, lugworms and other invertebrates in high densities, form an important food source for passage and wintering birds. The site is important in the spring and autumn migration periods for waders moving along the west coast of Europe, as well as in winter for large numbers of waterbirds including swans, geese, ducks and waders. These bird populations are regarded as internationally important.</p> <p>Glassworts and annual sea-blite colonise the open mud, with beds of all three species of eelgrass <i>Zostera</i> occurring on more sheltered mud and sandbanks. Large expanses of common cord-grass also occur on the outer marshes. Heavily grazed saltmarsh fringes the estuary with a range of saltmarsh types present. The middle marsh sward is dominated by common saltmarsh-grass with typical associated species. In the upper marsh, red fescue and saltmarsh rush become more prominent.</p> <p>Areas of saltmarsh fringe the estuary, mostly grazed with a range of vegetation communities. There are gradual and stepped transitions between bare mudflat to upper marsh and grassland. Main vegetation types are: upper saltmarsh with <i>Festuca rubra</i> and <i>Juncus gerardii</i>; middle marsh dominated by <i>Puccinellia maritima</i> with <i>Glaux maritima</i> and <i>Triglochin maritima</i>; dense monocultures of <i>Spartina anglica</i> at the edge of the mudflats-brackish pools and depressions with <i>Phragmites australis</i> and <i>Bolboschoenus maritimus</i>.</p>

Severn Estuary SAC	
<b>Qualifying Features</b>	<p>Annex I Habitats primary reason for selection:  <a href="#">Estuaries</a>  <a href="#">Mudflats and sandflats not covered by seawater at low tide</a>  <a href="#">Atlantic salt meadows (<i>Glauco-Puccinellietalia maritimae</i>)</a></p> <p>Annex I Habitats qualifying feature:  <a href="#">Sandbanks which are slightly covered by sea water all the time</a>  <a href="#">Reefs</a></p> <p>Annex II Species primary reason for selection:  <a href="#">Sea lamprey</a> <i>Petromyzon marinus</i>  <a href="#">River lamprey</a> <i>Lampetra fluviatilis</i>  <a href="#">Twaite shad</a> <i>Alosa fallax</i></p>
<b>Conservation Objectives</b>	<p><b>The conservation objective for the “estuaries” feature of the Severn Estuary SAC is to maintain the feature in favourable condition, as defined below:</b></p> <p><b><u>Interest feature 1: Estuaries</u></b></p> <ul style="list-style-type: none"> <li>• the total extent of the estuary is maintained;</li> <li>• the characteristic physical form (tidal prism/cross sectional area) and flow (tidal regime)of the estuary is maintained;</li> <li>• the characteristic range and relative proportions of sediment sizes and sediment budget within the site is maintained;</li> <li>• the extent, variety and spatial distribution of estuarine habitat communities (i.e. subtidal sandbanks, intertidal mudflats and sandflats, atlantic salt meadows, and reefs of <i>Sabellaria alveolata</i>) within the site is</li> </ul>

Severn Estuary SAC	
	<p>maintained;</p> <ul style="list-style-type: none"> <li>• the extent, variety, spatial distribution and community composition of the following notable communities is maintained: <i>Sabellaria alveolata</i> reefs on sand-abraded eulittoral rock; <i>Hydroids</i>, <i>ephemeral seaweeds</i> and <i>Littorina littorea</i> in shallow eulittoral mixed substrata pools; <i>Balanus crenatus</i> and <i>Tubularia indivisa</i> on extremely tide-swept circalittoral rock; <i>Fucus serratus</i> and piddocks on lower eulittoral soft rock; <i>Mytilus edulis</i> and piddocks on eulittoral firm clay; <i>Balanus crenatus</i>, <i>Halichondrea panicea</i> and <i>Alcyonidium diaphanum</i> on extremely tide-swept sheltered circalittoral rock; <i>Sertularia cupressina</i> and <i>Hydrallmania falcate</i> on tide-swept sublittoral cobbles or pebbles in coarse sand; Peat and clay exposures; <i>Corralina officinalis</i> and coralline crusts in shallow eulittoral rockpools; Eel grass (<i>Zostera</i>) beds; and any other notable hard substrata;</li> <li>• the abundance of the following notable estuarine species assemblages is maintained or increased: Migratory fish species (River and Sea Lamprey, Twaite shad, Allis shad, Sea trout, salmon, eel); Estuarine species (species typically occurring and breeding in estuaries); Marine species, predominantly those occurring infrequently in the Severn; Freshwater species occurring and breeding within the Severn SAC; Assemblage of waterfowl species (Bewicks' swan, dunlin, redshank, shelduck, European whitefronted goose); Nationally important bird populations (wigeon, teal, pintail, pochard, tufted duck, ringed plover, grey plover, curlew, whimbrel and spotted redshank); Assemblage of vascular plant species (salt marsh species; Eel grass (<i>Zostera</i>) species);</li> <li>• the physico-chemical characteristics of the water column (nutrients, oxygen, turbidity, temperature and salinity) support the ecological objectives described above;</li> <li>• Toxic contaminants in water column (including contributory water flows into the estuary such as surface flows over mudflats and saltmarsh) and sediment are below levels which would pose a risk to the ecological objectives described above.</li> </ul> <p><b><u>Interest feature 2: Subtidal Sandbanks</u></b></p>

	<b>Severn Estuary SAC</b>
	<p>the total extent of the subtidal sandbanks within the site is maintained;</p> <ul style="list-style-type: none"> <li>• the extent and distribution of the individual subtidal sandbank communities (Sublittoral Sands and Muddy Sands; Sublittoral cohesive mud and sandy mud communities) within the site is maintained;</li> <li>• the community composition of the sub tidal sandbank feature within the site is maintained;</li> <li>• the variety and distribution of sediment types across the subtidal sandbank feature is maintained;</li> <li>• the gross morphology (depth, distribution and profile) of the subtidal sandbank feature within the site is maintained.</li> </ul> <p><b><u>Interest feature 3: Mudflats and sandflats not covered by seawater at low tide (mudflats and sandflats)</u></b></p> <ul style="list-style-type: none"> <li>• the total extent of the mudflats and sandflats feature is maintained;</li> <li>• the variety and extent of individual mudflats and sandflats communities (Intertidal gravel and clean sand communities; Intertidal muddy sand communities; Intertidal mud communities) within the site is maintained;</li> <li>• the distribution of individual mudflats and sandflats communities ( within the site is maintained;</li> <li>• the community composition of the mudflats and sandflats feature within the site is maintained;</li> <li>• the topography of the intertidal flats and the morphology (dynamic processes of sediment movement and channel migration across the flats) are maintained.</li> </ul> <p><b><u>Interest feature 4: Atlantic salt meadow</u></b></p>

	<b>Severn Estuary SAC</b>
	<ul style="list-style-type: none"> <li>• the total extent of Atlantic salt meadow and associated transitional vegetation communities within the site is maintained;</li> <li>• the extent and distribution of the individual Atlantic salt meadow and associated transitional vegetation communities within the site is maintained;</li> <li>• the zonation of Atlantic salt meadow vegetation communities and their associated transitions to other estuary habitats is maintained;</li> <li>• the relative abundance of the typical species of the Atlantic salt meadow and associated transitional vegetation communities is maintained;</li> <li>• the abundance of the notable species of the Atlantic salt meadow and associated transitional vegetation communities is maintained;</li> <li>• the structural variation of the salt marsh sward (resulting from grazing) is maintained within limits sufficient to satisfy the requirements of conditions above and the requirements of the Ramsar and SPA features;</li> <li>• the characteristic stepped morphology of the salt marshes and associated creeks, pills, drainage ditches and pans, and the estuarine processes that enable their development, is maintained.</li> <li>• Any areas of <i>Spartina anglica</i> salt marsh are capable of developing naturally into other saltmarsh communities.</li> </ul> <p><b><u>Interest feature 5: Reefs</u></b></p> <ul style="list-style-type: none"> <li>• the total extent and distribution of <i>Sabellaria</i> reef is maintained;</li> </ul>

	<b>Severn Estuary SAC</b>
	<ul style="list-style-type: none"> <li>• the community composition of the <i>Sabellaria</i> reef is maintained;</li> <li>• the full range of different age structures of <i>Sabellaria</i> reef are present;</li> <li>• the physical (abundance of suitable coarse sediments to support reef growth (tube building) and the availability of suitable substrates where <i>Sabellaria</i> has been known to occur in the past) and ecological processes (supply of <i>Sabellaria</i> larvae (within the water column) and abundance of food (suspended detritus material) within the water column to support feeding) necessary to support <i>Sabellaria</i> reef are maintained.</li> </ul> <p><b><u>Interest feature 6 : River lamprey <i>Lampetra fluviatilis</i></u></b></p> <ul style="list-style-type: none"> <li>• the migratory passage of both adult and juvenile river lamprey through the Severn Estuary between the Bristol Channel and any of their spawning rivers is not obstructed or impeded by physical barriers, changes in flows, or poor water quality;</li> <li>• the size of the river lamprey population in the Severn Estuary and the rivers which drain into it, is at least maintained and is at a level that is sustainable in the long term;</li> <li>• the abundance of prey species forming the river lamprey's food resource within the estuary, is maintained;</li> <li>• toxic contaminants in the water column and sediment are below levels which would pose a risk to the ecological objectives described above.</li> </ul> <p><b>Note:</b> The river lamprey population of the Severn depends on habitat in the adjacent River Usk SAC, River Wye SAC and River Severn. The habitats in these rivers, including spawning and nursery areas, are essential for the fulfillment of the species' lifecycle and therefore the Severn Estuary river lamprey feature can only be in favourable condition if the conservation objectives pertaining to the River Usk SAC and River Wye SAC river lamprey feature are also met in full and there is a continued recorded presence of this species in the</p>

	<b>Severn Estuary SAC</b>
	<p>River Severn.</p> <p><b><u>Interest feature 7: The conservation objective for sea lamprey <i>Petromyzon marinus</i></u></b></p> <ul style="list-style-type: none"> <li>• the migratory passage of both adult and juvenile sea lamprey through the Severn Estuary between the Bristol Channel and any of their spawning rivers is not obstructed or impeded by physical barriers, changes in flows, or poor water quality;</li> <li>• the size of the sea lamprey population in the Severn Estuary and the rivers which drain into it, is at least maintained as is at a level that is sustainable in the long term;</li> <li>• the abundance of prey species forming the sea lamprey’s food resource within the estuary, is maintained;</li> <li>• Toxic contaminants in the water column and sediment are below levels which would pose a risk to the ecological objectives described above.</li> </ul> <p><b><u>Interest feature 8: The conservation objective for twaite shad <i>Alosa fallax</i></u></b></p> <ul style="list-style-type: none"> <li>• the migratory passage of both adult and juvenile twaite shad through the Severn Estuary between the Bristol Channel and their spawning rivers is not obstructed or impeded by physical barriers, changes in flows or poor water quality;</li> <li>• the size of the twaite shad population within the Severn Estuary and the rivers draining into it is at least maintained and is at a level that is sustainable in the long term;</li> <li>• the abundance of prey species forming the twaite shad’s food resource within the estuary, in particular at the salt wedge, is maintained;</li> <li>• Toxic contaminants in the water column and sediment are below levels which would pose a risk to the ecological objectives described above.</li> </ul>

Severn Estuary SAC	
<b>Component SSSIs</b>	N/A
<b>Key Environmental Conditions (factors that maintain site integrity)</b>	<p><b>Hydrodynamic and sedimentary regime</b> - 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 the presence of high sediment loads.</p> <p><b>Maintain suitable distance between the site and development</b> - to allow for managed retreat of intertidal habitats and avoid coastal squeeze.</p> <p><b>Manage public access and activities.</b></p>
<b>SAC Condition Assessment</b>	N/A
<b>Vulnerabilities (includes existing pressures and trends)</b>	<p><b>Physical loss of supporting habitats through removal</b> - The physical loss of areas of intertidal habitats may be caused directly through change of land use or indirectly as a consequence of changes to sedimentation processes (for example coastal defences) as well as via the effects of smothering by artificial structures (for example jetties) or the disposal of spoils. The intertidal mudflats and sandflats and the saltmarsh are highly sensitive to removal by land reclamation and barrage construction. Information provided by NE and CCW states that large areas of the European marine site are not currently under threat, however when combined with a high level of sensitivity this leads to a moderate vulnerability.</p> <p><b>Contamination by synthetic and/or non-synthetic toxic compounds</b> - At the moment there is no evidence to show that this is the case on the Severn Estuary, but the estuary is vulnerable to oil spills and there is a continuous discharge of toxins into the estuary, some of which bind to the sediments. NE and CCW identify this is an area which requires further assessment. The intertidal mudflats and sandflats and the saltmarsh are currently highly vulnerable to the introduction of synthetic and non-synthetic compounds.</p> <p><b>Damage by abrasion or selective extraction</b> - Saltmarsh may be physically damaged from overgrazing or</p>



Severn Estuary SAC	
	<p>eroded when boats are moored on it and when paths are worn through it to reach moored boats on foot or via vehicles. Currently all supporting habitats are considered to be moderately vulnerable to abrasion. Intertidal habitats are highly sensitive to damage by direct and indirect effects of aggregate dredging. The intertidal mudflats and sandflats and the shingle and rocky shore are therefore considered by NE and CCW to be highly vulnerable to selective extraction.</p> <p><b>Changes in nutrient and/or organic loading</b> - Changes in organic or nutrient loading can change the species composition of the plants on the saltmarsh and thus the structure of the sward. Increases in nutrients can also cause excessive algal growth on the mudflats, denying the birds access to their invertebrate prey and changing the invertebrate species composition in the sediment. Though the water quality has been improved in recent years there are still local areas of concern and any increase in nutrient loading should be avoided. At present the intertidal mudflats and sandflats are moderately vulnerable to this category of operation.</p> <p><b>Inappropriate grazing</b> - Much of the saltmarsh is managed by grazing and changes in management can alter the availability of prey and suitability of roosting sites. The saltmarsh is currently highly vulnerable to the selective extraction of species.</p>
<b>Landowner/ Management Responsibility</b>	N/A
<b>HRA/AA Studies undertaken that address this site</b>	<p>HRA Screening of the County Council of the City and County of Cardiff Local Development Plan Preferred Strategy Sept 2007.  <a href="http://www.cardiff.gov.uk/ObjView.asp?Object_ID=9788">www.cardiff.gov.uk/ObjView.asp?Object_ID=9788</a></p> <p>The Screening states that the significance of the potential impacts of the Eastern Bay Link (Page 50, Paragraph 6.23) in the Preferred Strategy (either alone or in-combination with other plans and projects) will be considered when a more detailed scheme is available. An appropriate assessment may be required for the scheme.</p> <p>HRA Screening of the Torfaen Local Development Plan (2006-2021) January 2008.  <a href="http://www.torfaen.gov.uk/EnvironmentAndPlanning/Planning/ForwardPlanning/Publications/HabitatsRegulation">http://www.torfaen.gov.uk/EnvironmentAndPlanning/Planning/ForwardPlanning/Publications/HabitatsRegulation</a></p>

	Severn Estuary SAC
	<p><a href="#">onAssessment.pdf</a></p> <p>It is likely that an increase of 7000 dwellings in Torfaen and associated development will in some way impact upon the site. It is likely however that the potential impact will be as a result of in-combination effects with other implemented plans and programmes in close proximity to the Severn Estuary.</p> <p>AA Screening of the Vale of Glamorgan Local Development Plan Preferred Strategy December 07.  <a href="http://www.valeofglamorgan.gov.uk/files/Living/Planning/Policy/LDP/Appropriate_Assessment_Screening_Report.pdf">http://www.valeofglamorgan.gov.uk/files/Living/Planning/Policy/LDP/Appropriate_Assessment_Screening_Report.pdf</a></p> <p>Given the extent of the Severn Estuary and the diverse range of activities and operations that could result in adverse impact to the European Site, it is considered inevitable that the Draft Preferred Strategy will in some way, impact upon the designated site. While much of the development arising from the Draft Preferred Strategy is likely to be located well away from the Severn Estuary, the south-eastern zone has been identified as a growth area and abuts the boundary of the designated site. Therefore, it is recommended that a more detailed assessment of the LDP be undertaken following consultation on the Draft Preferred Strategy to ascertain and mitigate against any likely significant effects to the SPA, SAC, RAMSAR.</p> <p>HRA and AA of the Wales Spatial Plan Update June 2008.  <a href="http://wales.gov.uk/about/strategy/spatial/hra/download/?lang=en">http://wales.gov.uk/about/strategy/spatial/hra/download/?lang=en</a></p> <p>The HRA Screening concludes that the WSPU and other plans have the potential to give rise to adverse effects at this site.</p> <p>The AA states that it is not possible to predict in specific terms whether the WSPU would or would not give rise to significant adverse effects either alone or in combination with other plans/ strategies and projects upon specific European sites. However, it does identify that this site is likely to come under increasing risk of adverse in combination effects from transport infrastructure, urban and economic development and recreation and tourism as a result of the WSPU and English RSSs. The AA also identifies that in combination with the English RSSs the WSPU has the potential to have negative effects on water levels, flood protection and water quality issues, which could affect this site.</p>

## Special Protection Areas

**Site Name: Severn Estuary**

- **Location:** 51 13 29 N/03 02 57 W
- **JNCC Site Code:** [UK9015022](#)
- **Size:** 24662.98 ha
- **Designation:** SPA

Severn Estuary SPA	
<b>Site Description</b>	<p>The Severn Estuary is the largest coastal plain estuary in the UK with extensive mudflats and sandflats, rocky shore platforms, shingle and islands. Saltmarsh fringes the coast, backed by grazing marsh with freshwater and occasional brackish ditches. The estuary’s classic funnel shape, unique in the UK, is a factor causing the Severn to have the second highest tidal range in the world (after the Bay of Fundy in Canada) at more than 12 meters. This tidal regime results in plant and animal communities typical of the extreme physical conditions of strong flows, mobile sediments, changing salinity, high turbidity and heavy scouring. The resultant low diversity invertebrate communities, that frequently include populations of ragworms, lugworms and other invertebrates in high densities, form an important food source for passage and wintering birds. The site is important in the spring and autumn migration periods for waders moving along the west coast of Europe, as well as in winter for large numbers of waterbirds including swans, geese, ducks and waders. These bird populations are regarded as internationally important.</p> <p>Glassworts and annual sea-blite colonise the open mud, with beds of all three species of eelgrass <i>Zostera</i> occurring on more sheltered mud and sandbanks. Large expanses of common cord-grass also occur on the outer marshes. Heavily grazed saltmarsh fringes the estuary with a range of saltmarsh types present. The middle marsh sward is dominated by common saltmarsh-grass with typical associated species. In the upper marsh, red fescue and saltmarsh rush become more prominent.</p> <p>Areas of saltmarsh fringe the estuary, mostly grazed with a range of vegetation communities. There are gradual and stepped transitions between bare mudflat to upper marsh and grassland. Main vegetation types are: upper saltmarsh with <i>Festuca rubra</i> and <i>Juncus gerardii</i>; middle marsh dominated by <i>Puccinellia maritima</i> with <i>Glaux maritima</i> and <i>Triglochin maritima</i>; dense monocultures of <i>Spartina anglica</i> at the edge of the mudflats-brackish pools and depressions with <i>Phragmites australis</i> and <i>Bolboschoenus maritimus</i>.</p>

Severn Estuary SPA	
<b>Qualifying Features</b>	<p>Article 4.1 Qualification</p> <p>Over winter the area regularly supports:  <a href="#">Bewick's Swan</a> <i>Cygnus columbianus bewickii</i> 3.9% of the GB population</p> <p>Article 4.2 Qualification</p> <p>Over winter the area regularly supports:  <a href="#">Gadwall</a> <i>Anas strepera</i> 0.9% of the population  <a href="#">White-fronted Goose</a> <i>Anser albifrons albifrons</i> 0.4% of the population  <a href="#">Dunlin</a> <i>Calidris alpina alpina</i> 3.3% of the population  <a href="#">Shelduck</a> <i>Tadorna tadorna</i> 1.1% of the population  <a href="#">Redshank</a> <i>Tringa totanus</i> 1.3% of the population</p> <p>Article 4.2 Qualification: Internationally Important Assemblage of Birds</p> <p>Over winter the area regularly supports:              84317 waterfowl</p>
<b>Conservation Objectives</b>	<p><b>Interest feature 1: Internationally important population of regularly occurring Annex 1 species: Bewick's swan</b></p> <p>The conservation objective is to maintain the Bewick's swan population and its supporting habitats in <b>favourable condition</b>, as defined below.</p> <p>The interest feature Bewick's swan will be considered to be in favourable condition when, subject to natural processes, each of the following conditions are met:</p>

	<b>Severn Estuary SPA</b>
	<ul style="list-style-type: none"> <li>• the 5 year peak mean population size for the Bewick’s swan population is no less than 289 individuals (i.e. the 5 year peak mean between 1988/9 - 1992/3);</li> <li>• the extent of saltmarsh at the Dumbles is maintained;</li> <li>• the extent of intertidal mudflats and sandflats at Frampton Sands, Waveridge Sands and the Noose is maintained;</li> <li>• the extent of vegetation with an effective field size of &gt;6 ha and with unrestricted bird sightlines &gt; 500m at feeding, roosting and refuge sites are maintained;</li> <li>• greater than 25% cover of suitable soft leaved herbs and grasses in winter season throughout the transitional saltmarsh at the Dumbles is maintained;</li> <li>• aggregations of Bewick’s swan at feeding, roosting and refuge sites are not subject to significant disturbance.</li> </ul> <p><b>Interest feature 2: Internationally important population of regularly occurring migratory species: wintering dunlin</b></p> <p>The conservation objective is to maintain the dunlin population and it’s supporting habitats in <b>favourable condition</b>, as defined below.</p> <p>The interest feature dunlin will be considered to be in favourable condition when, subject to natural processes, each of the following conditions are met:</p> <ul style="list-style-type: none"> <li>• the 5 year peak mean population size for the wintering dunlin population is no less than 41,683 individuals (i.e. the 5 year peak mean between 1988/9 - 1992/3);</li> <li>• the extent of saltmarsh is maintained;</li> <li>• the extent of intertidal mudflats and sandflats is maintained;</li> <li>• the extent of shingle and rocky shore is maintained;</li> <li>• the extent of vegetation with a sward height of &lt;10cm is maintained throughout the saltmarsh;</li> <li>• the distribution and abundance of suitable invertebrates in intertidal mudflats and sandflats is maintained;</li> </ul>

	<b>Severn Estuary SPA</b>
	<ul style="list-style-type: none"> <li>• the distribution and abundance of suitable invertebrates in shingle and rocky shore is maintained;</li> <li>• the extent of strandlines is maintained;</li> <li>• unrestricted bird sightlines of &gt;200m at feeding and roosting sites are maintained; aggregations of dunlin at feeding or roosting sites are not subject to significant disturbance.</li> </ul> <p><b>Interest feature 3: Internationally important population of regularly occurring migratory species: wintering European white-fronted goose</b></p> <p>The conservation objective is to maintain the European white-fronted goose population and its supporting habitats in <b>favourable condition</b>, as defined below.</p> <p>The interest feature European white-fronted goose will be considered to be in favourable condition when, subject to natural processes (Box 1), each of the following conditions are met:</p> <ul style="list-style-type: none"> <li>• the 5 year peak mean population size for the wintering European white fronted goose population is no less than 3,002 individuals (i.e. the 5 year peak mean between 1988/9-1992/3);</li> <li>• the extent of saltmarsh at the Dumbles is maintained;</li> <li>• the extent of intertidal mudflats and sandflats at Frampton Sands, Waveridge Sands and the Noose is maintained;</li> <li>• greater than 25% cover of suitable soft-leaved herbs and grasses is maintained during the winter on saltmarsh areas;</li> <li>• unrestricted bird sightlines of &gt;200m at feeding and roosting sites are maintained;</li> <li>• aggregations of European white-fronted goose at feeding or roosting sites are not subject to significant disturbance.</li> </ul> <p><b>Interest feature 4: Internationally important population of regularly occurring migratory species: wintering redshank</b></p> <p>The conservation objective is to maintain the redshank population and its supporting habitats in <b>favourable</b></p>

	<b>Severn Estuary SPA</b>
	<p><b>condition</b>, as defined below.</p> <p>The interest feature redshank will be considered to be in favourable condition when, subject to natural processes, each of the following conditions are met:</p> <ul style="list-style-type: none"> <li>• the 5 year peak mean population size for the wintering redshank population is no less than 2,013 individuals (i.e. the 5 year peak mean between 1988/9 - 1992/3);</li> <li>• the extent of saltmarsh is maintained;</li> <li>• the extent of intertidal mudflats and sandflats is maintained;</li> <li>• the extent of shingle and rocky shore is maintained;</li> <li>• the extent of vegetation with a sward height of &lt;10cm throughout the saltmarsh is maintained;</li> <li>• the distribution and abundance of suitable invertebrates in intertidal mudflats and sandflats is maintained;</li> <li>• the distribution and abundance of suitable invertebrates in shingle and rocky shore is maintained;</li> <li>• strandlines are not subject to significant disturbance;</li> <li>• unrestricted bird sightlines of &gt;200m at feeding and roosting sites are maintained;</li> <li>• aggregations of redshank at feeding or roosting sites are not subject to significant disturbance.</li> </ul> <p><b>Interest feature 5: Internationally important population of regularly occurring migratory species: wintering shelduck</b></p> <p>The conservation objective is to maintain the shelduck population and its supporting habitats in <b>favourable condition</b>, as defined below.</p> <p>The interest feature shelduck will be considered to be in favourable condition when, subject to natural processes, each of the following conditions are met:</p> <ul style="list-style-type: none"> <li>• the 5 year peak mean population size for the wintering shelduck population is no less than 2,892 individuals (i.e. the 5 year peak mean between 1988/9 - 1992/3);</li> </ul>

	<b>Severn Estuary SPA</b>
	<ul style="list-style-type: none"> <li>• the extent of saltmarsh is maintained;</li> <li>• the extent of intertidal mudflats and sandflats is maintained;</li> <li>• the extent of shingle and rocky shore is maintained;</li> <li>• the distribution and abundance of suitable invertebrates in intertidal mudflats and sandflats is maintained;</li> <li>• unrestricted bird sightlines of &gt;200m at feeding and roosting sites are maintained;</li> <li>• aggregations of shelduck at feeding or roosting sites are not subject to significant disturbance.</li> </ul> <p><b>Interest feature 6: Internationally important assemblage of waterfowl</b></p> <p>The conservation objective is to maintain the waterfowl assemblage and its supporting habitats in <b>favourable condition</b>, as defined below.</p> <p>The interest feature waterfowl assemblage will be considered to be in favourable condition when, subject to natural processes (Box1), each of the following conditions are met:</p> <ul style="list-style-type: none"> <li>• the 5 year peak mean population size for the waterfowl assemblage is no less than 68,026 individuals (i.e. the 5 year peak mean between 1988/9 - 1992/3);</li> <li>• the extent of saltmarsh is maintained;</li> <li>• the extent of intertidal mudflats and sandflats is maintained;</li> <li>• the extent of shingle and rocky shore is maintained;</li> <li>• extent of vegetation of &lt;10cm throughout the saltmarsh is maintained;</li> <li>• the distribution and abundance of suitable invertebrates in intertidal mudflats and sandflats is maintained;</li> <li>• the distribution and abundance of suitable invertebrates in shingle and rocky shore is maintained;</li> <li>• greater than 25% cover of suitable soft leaved herbs and grasses during the winter on saltmarsh areas is maintained;</li> <li>• strandlines are not subject to significant disturbance;</li> <li>• unrestricted bird sightlines of &gt;500m at feeding and roosting sites are maintained;</li> </ul>



Severn Estuary SPA	
	<ul style="list-style-type: none"> <li>• waterfowl aggregations at feeding or roosting sites are not subject to significant disturbance.</li> </ul>
<b>Component SSSIs</b>	<p>Severn Estuary SSSI                      Flat Holm SSSI                      Bridgwater Bay SSSI                      Penarth Coast SSSI                      Steep Holm SSSI                      Sully Island SSSI                      Upper Severn Estuary SSSI</p> <p>Maps of the site can be viewed on the <a href="#">CCW website</a>.</p>
<b>Key Environmental Conditions (factors that maintain site integrity)</b>	<p><b>Key supporting habitats for the Annex I species:</b></p> <p><b>Intertidal mudflats and sandflats:</b></p> <ul style="list-style-type: none"> <li>• Habitat extent - The focal area for the Bewick's swans is the upper Severn Estuary in the vicinity of the New Grounds, Slimbridge area. The mudflats and sandflats exposed as the tide falls where the estuary widens in the upper reaches of the site at Waveridge Sands, Frampton Sands and The Noose are used as safe refuge areas when the birds are disturbed.</li> <li>• Unimpeded sightlines at feeding and roosting sites - Bewick's swan require unrestricted views &gt;500m to allow early detection of predators when feeding and roosting.</li> </ul> <p><b>Saltmarsh communities:</b></p> <ul style="list-style-type: none"> <li>• Habitat extent - The birds feed on the saltmarsh and the transition from saltmarsh to coastal grazing marsh in front of the sea defences in the upper estuary at The Dumbles, where areas of the high marsh are mainly affected only by brackish water during tidal inundation.</li> <li>• Vegetation characteristics - Bewick's swan graze on a range of 'soft' meadow grasses such as <i>Agrostis stolonifera</i> and <i>Alopecurus geniculatus</i> found in wet meadows which are outwith the European marine site boundary.</li> </ul>

	<b>Severn Estuary SPA</b>
	<ul style="list-style-type: none"> <li>• Unimpeded sightlines at feeding and roosting sites - Bewick's swan require unrestricted views &gt;500m to allow early detection of predators when feeding and roosting.</li> </ul> <p><b>Key supporting habitats for populations of regularly occurring migratory species and assemblage of waterfowl:</b></p> <p><b>Intertidal mudflats and sandflats:</b></p> <ul style="list-style-type: none"> <li>• Habitat extent - Intertidal mudflats and sandflats and their communities are important habitats as they provide both roosting and feeding areas. The European white-fronted geese roost at night on estuarine sandbanks and usually fly less than 10km to the daytime feeding grounds. Therefore conservation of traditional roosting sites is necessary to enable the population to exploit potential feeding habitats.</li> <li>• Food availability - Most of the waders and waterfowl within the assemblage including the internationally important regularly occurring migratory birds feed on invertebrates within and on the sediments.</li> <li>• Unimpeded sightlines at feeding and roosting sites - Waterfowl require unrestricted views &gt;500m to allow early detection of predators when feeding and roosting.</li> </ul> <p><b>Saltmarsh:</b></p> <ul style="list-style-type: none"> <li>• Habitat extent - Saltmarsh and their communities are important habitats as they provide both roosting and feeding areas. Upper and lower saltmarsh provide important feeding and roosting areas for the internationally important migratory birds throughout the estuary.</li> <li>• Food availability - The saltmarshes provide a rich feeding habitat for redshank and shelduck, which feed on invertebrate species in the sediments, such as the mudsnail <i>Hydrobia</i>. The European white-fronted geese graze on a range of saltmarsh grasses and herbs such as common saltmarsh grass <i>Puccinellia maritime</i> and sea barley <i>Hordeum marinum</i>. The birds feed on the saltmarsh and the transition to coastal grazing marsh in front of the sea defences in the upper estuary and particularly at The Dumbles.</li> <li>• Vegetation characteristics - Vegetation of &lt;10 cm is required throughout areas used by roosting waders. This is managed by grazing.</li> <li>• Unimpeded sightlines at feeding and roosting sites - Waterfowl require unrestricted views &gt;500m to allow early detection of predators when feeding and roosting. The saltmarshes also have an important function</li> </ul>

	<b>Severn Estuary SPA</b>
	<p>providing a safe haven from the tides that flood the mudflats twice a day. The low-growing dense vegetation provides a suitable roosting habitat for redshank and dunlin, which prefer to roost on areas of short vegetation ensuring good visibility.</p> <p><b>Shingle and rocky shore:</b></p> <ul style="list-style-type: none"> <li>• Habitat extent - the shingle and rocks in the estuary provide feeding areas for dunlin and redshank and some limited foraging at high tide. It also provides important roost sites at high tide particularly for the dunlin and redshank. Many of the rocks are off shore and are therefore generally free from human disturbance. These include Guscar Rocks in the upper reaches, Blackstone Rocks at Clevedon and Stert Island in Bridgwater Bay.</li> <li>• Food availability - see above.</li> <li>• Unimpeded sightlines at feeding and roosting sites - Waterfowl require unrestricted views &gt;500m to allow early detection of predators when feeding and roosting.</li> </ul> <p><b>Wet coastal grazing marsh, improved grassland and open standing waters</b></p> <ul style="list-style-type: none"> <li>• these supporting habitats lie outside the European marine site boundary but within the SPA. They provide key areas for feeding and roosting for all the migratory species particularly at high tide.</li> </ul> <p><b>Key environmental conditions for the supporting habitats:</b></p> <p><b>Hydrodynamic and sedimentary regime</b></p> <ul style="list-style-type: none"> <li>• 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 the presence of high sediment loads.</li> </ul> <p><b>Maintain suitable distance between the site and development</b></p> <ul style="list-style-type: none"> <li>• to allow for managed retreat of intertidal habitats and avoid coastal squeeze.</li> </ul> <p><b>Other key conditions:</b></p>

Severn Estuary SPA													
	<p><b>Manage/restrict public access</b></p> <ul style="list-style-type: none"> <li>at certain times of the year. Significant disturbance attributable to human activities can result in reduced food intake and/or increased energy expenditure.</li> </ul> <p><b>Maintain levels of prey.</b></p> <p>Maps showing supporting habitats of the Severn Estuary SPA can be found on the <a href="#">CCW Website</a>.</p>												
<b>SPA Condition Assessment</b>	<p><b>Severn Estuary SSSI condition summary<sup>4</sup></b> (compiled 09 April 2008).</p> <table border="1" style="width: 100%; border-collapse: collapse; text-align: center;"> <thead> <tr> <th style="width: 16.6%;">% Area meeting PSA* target</th> <th style="width: 16.6%;">% Area favourable</th> <th style="width: 16.6%;">% Area unfavourable recovering</th> <th style="width: 16.6%;">% Area unfavourable no change</th> <th style="width: 16.6%;">% Area unfavourable declining</th> <th style="width: 16.6%;">% Area destroyed / part destroyed</th> </tr> </thead> <tbody> <tr> <td>95.71%</td> <td>95.71%</td> <td>0.00%</td> <td>2.44%</td> <td>1.85%</td> <td>0.00%</td> </tr> </tbody> </table> <p>*PSA target - The Government's Public Service Agreement (PSA) target to have 95% of the SSSI area in favourable or recovering condition by 2010.</p>	% Area meeting PSA* target	% Area favourable	% Area unfavourable recovering	% Area unfavourable no change	% Area unfavourable declining	% Area destroyed / part destroyed	95.71%	95.71%	0.00%	2.44%	1.85%	0.00%
% Area meeting PSA* target	% Area favourable	% Area unfavourable recovering	% Area unfavourable no change	% Area unfavourable declining	% Area destroyed / part destroyed								
95.71%	95.71%	0.00%	2.44%	1.85%	0.00%								
<b>Vulnerabilities (includes existing pressures and trends)</b>	<p><b>Internationally important populations of regularly occurring Annex 1 species:</b></p> <p><b>Physical loss of supporting habitats through removal</b> - The physical loss of areas of intertidal habitats may be caused directly through change of land use or indirectly as a consequence of changes to sedimentation processes (for example coastal defences) as well as via the effects of smothering by artificial structures (for example jetties) or the disposal of spoils. Activities or developments resulting in physical loss of the intertidal supporting habitats are likely to reduce the availability of feeding and roosting habitat and thus be detrimental to the favourable condition of the SPA interest features including the Annex 1 species,</p>												

<sup>4</sup> Natural England SSSI condition summary. Available online: <http://www.english-nature.org.uk/special/ssi/reportAction.cfm?report=sdr18&category=S&reference=1002284>

	<b>Severn Estuary SPA</b>
	<p>Bewick's swan. The intertidal mudflats and sandflats and the saltmarsh are highly sensitive to removal by land reclamation and barrage construction. Information provided by NE and CCW states that large areas of the European marine site are not currently under threat, however when combined with a high level of sensitivity this leads to a moderate vulnerability.</p> <p><b>Noise or visual disturbance</b> - Overwintering birds are disturbed by sudden movements and sudden noises. This can displace the birds from their feeding grounds. Disturbance can prevent the birds from feeding and in response they either a) decrease their energy intake at their present (disturbed) feeding site through displacement activity, or b) move to an alternative less favoured feeding site. Such a response affects energy budgets and thus survival. There is intermittent disturbance from both the landward and seaward side of the site. Bewick's swans are mainly affected by disturbance from the landward side and any increase in disturbance should be avoided. At present NE and CCW assess that the Annex 1 species are moderately vulnerable to noise and visual disturbance on the intertidal mudflats and sandflats and highly vulnerable to this category of operation on the saltmarsh.</p> <p><b>Contamination by synthetic and/or non-synthetic toxic compounds</b> - Waterfowl are subject to the accumulation of toxins through the food chain or through direct contact with toxic substances when roosting or feeding. Their ability to feed can also be affected by the abundance or change in palatability of their prey caused by toxic contamination. At the moment there is no evidence to show that this is the case, but the estuary is vulnerable to oil spills and there is a continuous discharge of toxins into the estuary, some of which bind to the sediments. NE and CCW identify this is an area which requires further assessment. They also identify Bewick's swans as currently moderately vulnerable to toxic contamination.</p> <p><b>Internationally important waterfowl assemblage including populations of regularly occurring migratory species:</b></p> <p><b>Physical loss through removal</b> - The physical loss of areas of intertidal habitats may be caused directly through change of land use or indirectly as a consequence of changes to sedimentation processes (for example coastal defences) as well as via the effects of smothering by artificial structures (for example jetties)</p>

	<b>Severn Estuary SPA</b>
	<p>or the disposal of spoils. Eelgrass beds are being affected by siltation due to changes in sediment movement after construction of the Second Severn Crossing which has resulted in smothering. Activities or developments resulting in physical loss of the intertidal supporting habitats are likely to reduce the availability of food and roosting habitat and thus be detrimental to the favourable condition of the SPA interest features including all the migratory species and waterfowl assemblage. All three supporting habitats are highly sensitive to removal by land reclamation and barrage construction. Information provided by NE and CCW states that large areas of the European marine site are not currently under threat, however when combined with a high level of sensitivity this leads to a moderate vulnerability.</p> <p><b>Damage by abrasion or selective extraction</b> - Saltmarsh may be physically damaged from overgrazing or eroded when boats are moored on it and when paths are worn through it to reach moored boats on foot or via vehicles. Currently all supporting habitats are considered to be moderately vulnerable to abrasion. Intertidal habitats are highly sensitive to damage by direct and indirect effects of aggregate dredging. The intertidal mudflats and sandflats and the shingle and rocky shore are therefore considered by NE and CCW to be highly vulnerable to selective extraction.</p> <p><b>Noise or visual disturbance</b> - Overwintering birds are disturbed by sudden movements and sudden noises. This can have the effect of displacing the birds from their feeding grounds. Disturbance can prevent the birds from feeding and in response they either a) decrease their energy intake at their present (disturbed) feeding site through displacement activity, or b) move to an alternative less favoured feeding site. Such a response affects energy budgets and thus survival. There is intermittent disturbance to the internationally important migratory species and the waterfowl assemblage from both the landward and seaward side of the site which has increased in recent years, due to the estuary becoming more populated and the development of all weather recreational pursuits. All supporting habitats are currently highly vulnerable to noise and visual disturbance.</p> <p><b>Contamination by synthetic and/or non-synthetic toxic compounds</b> - Waterfowl are subject to the accumulation of toxins through the food chain or through direct contact with toxic substances when roosting or feeding. Their ability to feed can also be affected by the abundance or change in palatability of their prey</p>

Severn Estuary SPA	
	<p>caused by toxic contamination. At the moment there is no evidence to show that this is the case on the Severn Estuary, but the estuary is vulnerable to oil spills and there is a continuous discharge of toxins into the estuary, some of which bind to the sediments. NE and CCW identify this is an area which requires further assessment. The intertidal mudflats and sandflats and the saltmarsh are currently highly vulnerable to the introduction of synthetic and non-synthetic compounds.</p> <p><b>Changes in nutrient and/or organic loading</b> - Changes in organic or nutrient loading can change the species composition of the plants on the saltmarsh and thus the structure of the sward. Increases in nutrients can also cause excessive algal growth on the mudflats, denying the birds access to their invertebrate prey and changing the invertebrate species composition in the sediment. Though the water quality has been improved in recent years there are still local areas of concern and any increase in nutrient loading should be avoided. At present the intertidal mudflats and sandflats are moderately vulnerable to this category of operation.</p> <p><b>Biological disturbance through the selective extraction of species</b> - Wildfowling is carried out all around the estuary. NE and CCW have not established that it has a detrimental effect on the overall bird populations but state that wildfowling needs to be exercised in a managed and sustainable manner preferably by a British Association of Shooting and Conservation (BASC) affiliated association, applying the BASC wildfowlers code of conduct. Bait digging is also carried out around the estuary. If too large an area is regularly dug over, it can change the availability of prey in the sediment as the area needs a period of recovery and recolonisation. The removal of strandline vegetation by beach cleaning removes an important habitat for invertebrates, as well as many of the invertebrates themselves, reducing the quantity and variety of prey available to the birds. Much of the saltmarsh is managed by grazing and changes in management can alter the availability of prey and suitability of roosting sites. The saltmarsh is currently highly vulnerable to the selective extraction of species.</p>
<b>Landowner/ Management Responsibility</b>	N/A
<b>HRA/AA Studies undertaken that address this site</b>	HRA Screening of the County Council of the City and County of Cardiff Local Development Plan Preferred Strategy Sept 2007. <a href="http://www.cardiff.gov.uk/ObjView.asp?Object_ID=9788">www.cardiff.gov.uk/ObjView.asp?Object_ID=9788</a>

	<b>Severn Estuary SPA</b>
	<p>The Screening states that the significance of the potential impacts of the indicative route in the Preferred Strategy (either alone or in-combination with other plans and projects) will be considered when a more detailed scheme is available. An appropriate assessment may be required for the scheme.</p> <p>HRA Screening of the Torfaen Local Development Plan (2006-2021) January 2008.  <a href="http://www.torfaen.gov.uk/EnvironmentAndPlanning/Planning/ForwardPlanning/Publications/HabitatsRegulationAssessment.pdf">http://www.torfaen.gov.uk/EnvironmentAndPlanning/Planning/ForwardPlanning/Publications/HabitatsRegulationAssessment.pdf</a></p> <p>It is likely that an increase of 7000 dwellings in Torfaen and associated development will in some way impact upon the site. It is likely however that the potential impact will be as a result of in-combination effects with other implemented plans and programmes in close proximity to the Severn Estuary.</p> <p>AA Screening of the Vale of Glamorgan Local Development Plan Preferred Strategy Dec 07.  <a href="http://www.valeofglamorgan.gov.uk/files/Living/Planning/Policy/LDP/Appropriate_Assessment_Screening_Report.pdf">http://www.valeofglamorgan.gov.uk/files/Living/Planning/Policy/LDP/Appropriate_Assessment_Screening_Report.pdf</a></p> <p>Given the extent of the Severn Estuary and the diverse range of activities and operations that could result in adverse impact to the European Site, it is considered inevitable that the Draft Preferred Strategy will in some way, impact upon the designated site. While much of the development arising from the draft preferred strategy is likely to be located well away from the Severn Estuary, the south-eastern zone has been identified as a growth area and abuts the boundary of the designated site. Therefore, it is recommended that a more detailed assessment of the LDP be undertaken following consultation on the Draft Preferred Strategy to ascertain and mitigate against any likely significant effects to the SPA, SAC, RAMSAR.</p> <p>HRA and AA of the Wales Spatial Plan Update June 2008.  <a href="http://wales.gov.uk/about/strategy/spatial/hra/download/?lang=en">http://wales.gov.uk/about/strategy/spatial/hra/download/?lang=en</a></p> <p>The HRA Screening concludes that the WSPU and other plans have the potential to give rise to adverse effects at this site.</p> <p>The AA states that it is not possible to predict in specific terms whether the WSPU would or would not give rise to significant adverse effects either alone or in combination with other plans/ strategies and projects upon specific European sites. However, it does identify that this site is likely to come under increasing risk of adverse in combination effects from transport infrastructure, urban and economic development and recreation</p>



	<b>Severn Estuary SPA</b>
	and tourism as a result of the WSPU and English RSSs. The AA also identifies that in combination with the English RSSs the WSPU has the potential to have negative effects on water levels, flood protection and water quality issues, which could affect this site.

## Site Name: Somerset Levels and Moors

Location Grid Ref: 025200W/511014N

JNCC Site Code [UK9010031](#)

Size: 6388.49 ha

Designation: SPA

Somerset Levels and Moors SPA	
<b>Site Description</b>	<p>The Somerset Levels and Moors SPA status was classified on 26 June 1997. The Levels and Moors is one of the largest and richest areas of traditionally managed wet grassland and fen habitats in lowland UK. The SPA is within this area and totals 6388.49 hectares. The majority of the site is only a few metres above mean sea level and drains through a network of ditches, rhynes, drains and rivers.</p> <p>Flooding may affect large areas in winter depending on rainfall and tidal conditions. Parts of the site in the Brue valley include areas of former raised peat bog that have now been substantially modified by agricultural intensification and peat extraction. This has created areas of open water, fen and reed bed. The site attracts important numbers of water birds in winter. The network of rhynes and ditches support an outstanding assemblage of aquatic invertebrates, particularly beetles.</p>
<b>Qualifying Features</b>	<p>Annex 1 Primary Reason for selection</p> <p>Over winter:</p> <p style="padding-left: 40px;">Bewick's Swan <i>Cygnus columbianus bewickii</i>, 191 individuals representing at least 2.7% of the wintering population of Great Britain (5 year peak mean 1991/2 – 1995/96)</p> <p style="padding-left: 40px;">Golden Plover <i>Pluvialis apricaria</i>, 3029 individuals representing at least 1.2% of the wintering population of Great Britain (5 year peak mean 1991/2 – 1995/96)</p> <p>Article 4.2 qualification:</p>

Somerset Levels and Moors SPA	
	<p>Shoveler <i>Anas clypetea</i>, 501 individuals representing at least 1.3% of the wintering Northwestern/Central European population (5 year peak mean 1991/2 – 1995/96)</p> <p>Teal <i>Anas crecca</i>, 13,307 individuals representing at least 3.3% of the wintering Northwestern European population (5 year peak mean 1991/2 – 1995/96)</p> <p>Wigeon <i>Anas penelope</i>, 13,661 individuals representing at least 1.1% of the wintering Western Siberian/Northwestern/Northeastern European population (5 year peak mean 1991/2 – 1995/96)</p> <p>Article 4.2 qualification: (supporting at least 20,000 waterfowl. Over winter the area regularly supports 72,000 individual waterfowl). The waterfowl includes:</p> <p style="padding-left: 40px;"> <i>Snipe Gallinago gallinago</i>  <i>Lapwing Vanellus vanellus</i>  <i>Pintail Anas acuta</i>  <i>Gadwall Anas strepera</i>  <i>Shoveler Anas clypetea</i>  <i>Teal Anas crecca</i>  <i>Golden Plover Pluvialis apricaria</i>  <i>Bewick's Swan Cygnus columbianus bewickii</i>  <i>Whimbrel Numenius phaeopus</i> </p> <p><b>Non-qualifying species of interest:</b>                      Hen harrier (<i>Circus cyaneus</i>), merlin (<i>Falco columbarius</i>), short-eared owl (<i>Asio flammeus</i>) and kingfisher (<i>Alcedo atthis</i>) (all Annex I species) occur in non-breeding numbers of less than 1% of the GB population.</p>
<b>Conservation Objectives</b>	<b>Conservation Objectives</b>

Somerset Levels and Moors SPA													
	<p>To maintain at, or restore to, favourable conservation status, the natural habitats and/or the populations of birds for which the site has been selected. The conservation status of a species is defined as favourable when the population, range and natural habitats of the species are stable or increasing.</p> <p><b>Targets</b> In relation to the bird species the following targets must be reached to achieve a favourable condition:</p> <ul style="list-style-type: none"> <li>• Maintain wet grassland with rhynes and ditches;</li> <li>• No significant displacement of birds attributable to human disturbance</li> <li>• Daytime feeding areas and roosting areas within c50 metres of each other;</li> <li>• No significant reduction in view lines in feeding and roosting areas;</li> <li>• No significant reduction in presence and abundance of food species;</li> <li>• No significant reduction in extent of short vegetation areas for feeding and longer vegetation for roosting;</li> <li>• No significant reduction in reedbed, fen, swamp and open water communities;</li> <li>• Maintain water levels at summer pen which supports reedbed, fen, swamp and open water communities;</li> <li>• Maintain differential margin lengths for corresponding area of open water and area of swamp.</li> </ul> <p>Targets may vary slightly depending on component site except the first six bullet points remain constant throughout.</p>												
<b>Component SSSIs</b>	<p>Component SSSIs including condition status</p> <table border="1" style="width: 100%; border-collapse: collapse; text-align: center;"> <thead> <tr> <th style="background-color: #d3d3d3;">Component SSSIs</th> <th style="background-color: #d3d3d3;">Favourable</th> <th style="background-color: #d3d3d3;">Unfavourable recovering</th> <th style="background-color: #d3d3d3;">Unfavourable no change</th> <th style="background-color: #d3d3d3;">Unfavourable declining</th> <th style="background-color: #d3d3d3;">Destroyed, part destroyed</th> </tr> </thead> <tbody> <tr> <td style="text-align: left;">Curry and Hay Moor</td> <td>1.74%</td> <td>0</td> <td>95.3%</td> <td>2.96%</td> <td>0</td> </tr> </tbody> </table>	Component SSSIs	Favourable	Unfavourable recovering	Unfavourable no change	Unfavourable declining	Destroyed, part destroyed	Curry and Hay Moor	1.74%	0	95.3%	2.96%	0
Component SSSIs	Favourable	Unfavourable recovering	Unfavourable no change	Unfavourable declining	Destroyed, part destroyed								
Curry and Hay Moor	1.74%	0	95.3%	2.96%	0								

Somerset Levels and Moors SPA						
	Wet Moor	53.27%	27.5%	19.23%	0	0
	West Sedgemoor	44.87%	12.02%	33.29%	0	9.82%
	Southlake Moor	0	19.94%	80.06%	0	0
	Moorlinch	2.44%	67.76%	29.8%	0	0
	King's Sedgemoor	26.51%	0	73.9%	0	0
	Shapwick Heath	70.45%	23.91%	5.64%	0	0
	Westhay Heath	100%	0	0	0	0
	Westhay Moor	24.15%	0	73.26%	2.59%	0
	Catcott, Edington and Chilton Moors	5.37%	0	94.63%	0	0
<b>Key Environmental Conditions (factors that maintain site integrity)</b>	<p>The Somerset Levels and Moors are one of the largest and richest areas of traditionally managed wet grassland and fen habitats in lowland UK. It is this habitat mosaic that supports the diverse range of birds that are the qualifying feature of this site. The majority of the site is only a few metres above mean sea level and drains through a large network of ditches, rhynes, drains and rivers. Active management is required to maintain the ground and surface water levels of the site. Key factors that support site integrity are:</p> <ul style="list-style-type: none"> <li>• Management of the habitats present on the site is required to maintain the diverse structure and composition of vegetation. This would include hay cutting, light grazing and ditch drainage.</li> <li>• Control of inappropriate or invasive species, an open landscape free of scrub is required for breeding waders.</li> <li>• Birdlife found on the site is vulnerable to disturbance.</li> </ul>					
<b>SPA Condition Assessment</b>	See condition assessment for SSSI component unit.					

Somerset Levels and Moors SPA	
<b>Vulnerabilities (includes existing pressures and trends)</b>	<p>The site lies within the flood plains of a number of large rivers and drains with many areas below high tide levels. Peat extraction occurs over part of the site. This is not currently thought to pose a risk (May 2006), and future controls would be subject to the Habitats Regulations.</p> <p>The majority of land is farmed and under private ownership. Most farms have beef and dairy herds. Trends in agriculture and support schemes have a critical influence as improvement with conversion of grassland to arable, land drainage, increased applications of inorganic fertilisers and cutting of silage are major threats to vulnerable peat soils and the nature conservation value of the site.</p> <p>Less intensive practices are encouraged through the ESA scheme, WES and Section 15 agreements. Water Level Management is critical and is being addressed through the Water level Management Plans process and the development of Raised Water Level Areas and Environmentally Sensitive Areas (ESA).</p> <p>Current pressures and trends include:</p> <ul style="list-style-type: none"> <li>• Conversion of grassland to arable;</li> <li>• Peat extraction and increasing levels of unmanaged scrub;</li> <li>• Drainage and ditch management (winter ditch water levels not secured);</li> <li>• Nutrient enrichment due to sewage treatment facilities in to watercourses. Also water pollution from agricultural run off;</li> <li>• Inappropriate water level management issues due to development on flood plain;</li> <li>• Disturbance from access, shooting and other recreational activities;</li> <li>• Invasive freshwater species;</li> <li>• Undergrazing.</li> </ul>
<b>Landowner/ Management Responsibility</b>	<ul style="list-style-type: none"> <li>• Various/ private.</li> </ul>

Somerset Levels and Moors SPA	
<p><b>HRA/AA Studies undertaken that address this site</b></p>	<p><b>HRA of the Draft Regional Spatial Strategy for the South West</b>, South West Regional Assembly (February, 2007, LUC) With regard to Somerset Levels and Moors, the HRA noted:                      The EA Review of Consents process only considers the adverse impacts on the overwintering birds for which this site is designated an SPA, and not the Ramsar features. It found no licensed abstractions or discharges likely to have a significant effect on these qualifying features. However, the EA acknowledged that some licensed discharges are increasing nutrient levels in the ditch network of the site, which could have an adverse effect on the invertebrates for which the site has its Ramsar designation.</p> <p><b>Appropriate Assessment of Somerset County Borough and District Councils' Core Strategies:</b> Initial Screening of Somerset Levels and Moors and Severn Estuary (Bridgwater Bay European sites) Report (Nov, 2007).</p> <p>Screening indentifies potential impacts as a result of house building and related infrastructure on: water table, pollution (toxic and non-toxic), non-physical disturbance (human presence, lighting) and physical damage form recreation and water sports.</p>

## Ramsar Sites

### Site Name: Severn Estuary

- Location: 51 13 29 N/ 03 02 57 W
- JNCC Site Code: [UK11081](#)
- Size: 24662.98 ha
- Designation: Ramsar

Severn Estuary Ramsar	
<b>Site Description</b>	<p>The Severn Estuary is the largest coastal plain estuary in the UK with extensive mudflats and sandflats, rocky shore platforms, shingle and islands. Saltmarsh fringes the coast, backed by grazing marsh with freshwater and occasional brackish ditches. The estuary’s classic funnel shape, unique in the UK, is a factor causing the Severn to have the second highest tidal range in the world (after the Bay of Fundy in Canada) at more than 12 meters. This tidal regime results in plant and animal communities typical of the extreme physical conditions of strong flows, mobile sediments, changing salinity, high turbidity and heavy scouring. The resultant low diversity invertebrate communities, that frequently include populations of ragworms, lugworms and other invertebrates in high densities, form an important food source for passage and wintering birds. The site is important in the spring and autumn migration periods for waders moving along the west coast of Europe, as well as in winter for large numbers of waterbirds including swans, geese, ducks and waders. These bird populations are regarded as internationally important.</p> <p>Glassworts and annual sea-blite colonise the open mud, with beds of all three species of eelgrass <i>Zostera</i> occurring on more sheltered mud and sandbanks. Large expanses of common cord-grass also occur on the outer marshes. Heavily grazed saltmarsh fringes the estuary with a range of saltmarsh types present. The middle marsh sward is dominated by common saltmarsh-grass with typical associated species. In the upper marsh, red fescue and saltmarsh rush become more prominent.</p> <p>Areas of saltmarsh fringe the estuary, mostly grazed with a range of vegetation communities. There are gradual and stepped transitions between bare mudflat to upper marsh and grassland. Main vegetation types are: upper saltmarsh with <i>Festuca rubra</i> and <i>Juncus gerardii</i>; middle marsh dominated by <i>Puccinellia maritima</i> with <i>Glaux maritima</i> and <i>Triglochin maritima</i>; dense monocultures of <i>Spartina anglica</i> at the edge of</p>



Severn Estuary Ramsar	
	the mudflats-brackish pools and depressions with <i>Phragmites australis</i> and <i>Bolboschoenus maritimus</i> .
<b>Qualifying Features</b>	<p><b>Ramsar criterion 1</b> Immense tidal range (second-largest in world) creating diversity of physical environment and biological communities.</p> <p><b>Ramsar criterion 3</b> Due to unusual estuarine communities, reduced diversity and high productivity.</p> <p><b>Ramsar criterion 4</b> This site is important for the run of migratory fish between sea and river via estuary. Species include Salmon <i>Salmo salar</i>, sea trout <i>S. trutta</i>, sea lamprey <i>Petromyzon marinus</i>, river lamprey <i>Lampetra fluviatilis</i>, allis shad <i>Alosa alosa</i>, twaite shad <i>A. fallax</i>, and eel <i>Anguilla anguilla</i>. It is also of particular importance for migratory birds during spring and autumn.</p> <p><b>Ramsar criterion 5</b> Species with peak counts in winter: 70919 waterfowl</p> <p><b>Ramsar criterion 6</b> Species with peak counts in winter:</p> <ul style="list-style-type: none"> <li>• Bewick's swan</li> <li>• Greater white-fronted goose</li> <li>• Common shelduck</li> <li>• Gadwall</li> <li>• Dunlin</li> <li>• Common redshank</li> </ul>

Severn Estuary Ramsar	
	<p><b>Ramsar criterion 8</b></p> <p>The fish of the whole estuarine and river system is one of the most diverse in Britain, with over 110 species recorded. Salmon <i>Salmo salar</i>, sea trout <i>S. trutta</i>, sea lamprey <i>Petromyzon marinus</i>, river lamprey <i>Lampetra fluviatilis</i>, allis shad <i>Alosa alosa</i>, twaite shad <i>A. fallax</i>, and eel <i>Anguilla Anguilla</i> use the Severn Estuary as a key migration route to their spawning grounds in the many tributaries that flow into the estuary. The site is important as a feeding and nursery ground for many fish species particularly allis shad <i>Alosa alosa</i> and twaite shad <i>A. fallax</i> which feed on mysid shrimps in the salt wedge.</p>
<b>Conservation Objectives</b>	No conservation objectives currently available for this site.
<b>Component SSSIs</b>	<p>Sully Island SSSI                      Steep Holm SSSI                      Bridgwater Bay SSSI                      Flat Holm SSSI                      Severn Estuary SSSI                      Severn Estuary SSSI                      Flat Holm SSSI                      Upper Severn Estuary SSSI                      Bridgwater Bay SSSI                      Penarth Coast SSSI                      Steep Holm SSSI                      Sully Island SSSI                      Upper Severn Estuary SSSI</p>
<b>Key Environmental Conditions (factors that maintain site integrity)</b>	<p><b>Key supporting habitats for the Bewick's swan:</b></p> <p><b>Intertidal mudflats and sandflats:</b></p> <ul style="list-style-type: none"> <li>Habitat extent - The focal area for the Bewick's swans is the upper Severn Estuary in the vicinity of the New Grounds, Slimbridge area. The mudflats and sandflats exposed as the tide falls where the estuary</li> </ul>

Severn Estuary Ramsar	
	<p>widens in the upper reaches of the site at Waveridge Sands, Frampton Sands and The Noose are used as safe refuge areas when the birds are disturbed.</p> <ul style="list-style-type: none"> <li>• Unimpeded sightlines at feeding and roosting sites - Bewick's swan require unrestricted views &gt;500m to allow early detection of predators when feeding and roosting.</li> </ul> <p><b>Saltmarsh communities:</b></p> <ul style="list-style-type: none"> <li>• Habitat extent - The birds feed on the saltmarsh and the transition from saltmarsh to coastal grazing marsh in front of the sea defences in the upper estuary at The Dumbles, where areas of the high marsh are mainly affected only by brackish water during tidal inundation.</li> <li>• Vegetation characteristics - Bewick's swan graze on a range of 'soft' meadow grasses such as <i>Agrostis stolonifera</i> and <i>Alopecurus geniculatus</i> found in wet meadows which are outwith the European marine site boundary.</li> <li>• Unimpeded sightlines at feeding and roosting sites - Bewick's swan require unrestricted views &gt;500m to allow early detection of predators when feeding and roosting.</li> </ul> <p><b>Key supporting habitats for populations of regularly occurring migratory species and assemblage of waterfowl</b></p> <p><b>Intertidal mudflats and sandflats:</b></p> <ul style="list-style-type: none"> <li>• Habitat extent - Intertidal mudflats and sandflats and their communities are important habitats as they provide both roosting and feeding areas. The European white-fronted geese roost at night on estuarine sandbanks and usually fly less than 10km to the daytime feeding grounds. Therefore conservation of traditional roosting sites is necessary to enable the population to exploit potential feeding habitats.</li> <li>• Food availability - Most of the waders and waterfowl within the assemblage including the internationally important regularly occurring migratory birds feed on invertebrates within and on the sediments.</li> <li>• Unimpeded sightlines at feeding and roosting sites - Waterfowl require unrestricted views &gt;500m to allow early detection of predators when feeding and roosting.</li> </ul>

Severn Estuary Ramsar	
	<p><b>Saltmarsh:</b></p> <ul style="list-style-type: none"> <li>• Habitat extent - Saltmarsh and their communities are important habitats as they provide both roosting and feeding areas. Upper and lower saltmarsh provide important feeding and roosting areas for the internationally important migratory birds throughout the estuary.</li> <li>• Food availability - The saltmarshes provide a rich feeding habitat for redshank and shelduck, which feed on invertebrate species in the sediments, such as the mudsnail <i>Hydrobia</i>. The European white-fronted geese graze on a range of saltmarsh grasses and herbs such as common saltmarsh grass <i>Puccinellia maritime</i> and sea barley <i>Hordeum marinum</i>. The birds feed on the saltmarsh and the transition to coastal grazing marsh in front of the sea defences in the upper estuary and particularly at the The Dumbles.</li> <li>• Vegetation characteristics - Vegetation of &lt;10 cm is required throughout areas used by roosting waders. This is managed by grazing.</li> <li>• Unimpeded sightlines at feeding and roosting sites - Waterfowl require unrestricted views &gt;500m to allow early detection of predators when feeding and roosting. The saltmarshes also have an important function providing a safe haven from the tides that flood the mudflats twice a day. The low-growing dense vegetation provides a suitable roosting habitat for redshank and dunlin, which prefer to roost on areas of short vegetation ensuring good visibility.</li> </ul> <p><b>Shingle and rocky shore:</b></p> <ul style="list-style-type: none"> <li>• Habitat extent - the shingle and rocks in the estuary provide feeding areas for dunlin and redshank and some limited foraging at high tide. It also provides important roost sites at high tide particularly for the dunlin and redshank. Many of the rocks are off shore and are therefore generally free from human disturbance. These include Guscar Rocks in the upper reaches, Blackstone Rocks at Clevedon and Stert Island in Bridgwater Bay.</li> <li>• Food availability - see above.</li> <li>• Unimpeded sightlines at feeding and roosting sites - Waterfowl require unrestricted views &gt;500m to allow early detection of predators when feeding and roosting.</li> </ul> <p><b>Wet coastal grazing marsh, improved grassland and open standing waters</b> - these supporting habitats lie outside the European marine site boundary but within the SPA. They provide key areas for feeding and</p>

Severn Estuary Ramsar	
	<p>roosting for all the migratory species particularly at high tide.</p> <p><b>Key environmental conditions for the supporting habitats:</b></p> <p><b>Hydrodynamic and sedimentary regime</b> - 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 the presence of high sediment loads.</p> <p><b>Maintain suitable distance between the site and development</b> - to allow for managed retreat of intertidal habitats and avoid coastal squeeze.</p> <p><b>Other key conditions:</b></p> <p><b>Manage/restrict public access</b> - at certain times of the year. Significant disturbance attributable to human activities can result in reduced food intake and/or increased energy expenditure.</p> <p><b>Maintain levels of prey.</b></p>
<b>Ramsar Condition Assessment</b>	N/A
<b>Vulnerabilities (includes existing pressures and trends)</b>	<p><b>Physical loss of supporting habitats through removal</b> - The physical loss of areas of intertidal habitats may be caused directly through change of land use or indirectly as a consequence of changes to sedimentation processes (for example coastal defences) as well as via the effects of smothering by artificial structures (for example jetties) or the disposal of spoils. Activities or developments resulting in physical loss of the intertidal supporting habitats are likely to reduce the availability of feeding and roosting habitats. The intertidal mudflats and sandflats and the saltmarsh are highly sensitive to removal by land reclamation and barrage construction. Information provided by NE and CCW states that large areas of the European marine site are not currently under threat, however when combined with a high level of sensitivity this leads to a moderate vulnerability.</p>

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	<p><b>Noise or visual disturbance</b> - Overwintering birds are disturbed by sudden movements and sudden noises. This can displace the birds from their feeding grounds. Disturbance can prevent the birds from feeding and in response they either a) decrease their energy intake at their present (disturbed) feeding site through displacement activity, or b) move to an alternative less favoured feeding site. Such a response affects energy budgets and thus survival. There is intermittent disturbance to the internationally important migratory species and the waterfowl assemblage from both the landward and seaward side of the site which has increased in recent years, due to the estuary becoming more populated and the development of all weather recreational pursuits. Bewick's swans are mainly affected by disturbance from the landward side and any increase in disturbance should be avoided. All supporting habitats are currently highly vulnerable to noise and visual disturbance.</p> <p><b>Contamination by synthetic and/or non-synthetic toxic compounds</b> - Waterfowl are subject to the accumulation of toxins through the food chain or through direct contact with toxic substances when roosting or feeding. Their ability to feed can also be affected by the abundance or change in palatability of their prey caused by toxic contamination. At the moment there is no evidence to show that this is the case, but the estuary is vulnerable to oil spills and there is a continuous discharge of toxins into the estuary, some of which bind to the sediments. NE and CCW identify this is an area which requires further assessment. The intertidal mudflats and sandflats and the saltmarsh are currently highly vulnerable to the introduction of synthetic and non-synthetic compounds.</p> <p><b>Damage by abrasion or selective extraction</b> - Saltmarsh may be physically damaged from overgrazing or eroded when boats are moored on it and when paths are worn through it to reach moored boats on foot or via vehicles. Currently all supporting habitats are considered to be moderately vulnerable to abrasion. Intertidal habitats are highly sensitive to damage by direct and indirect effects of aggregate dredging. The intertidal mudflats and sandflats and the shingle and rocky shore are therefore considered by NE and CCW to be highly vulnerable to selective extraction.</p> <p><b>Changes in nutrient and/or organic loading</b> - Changes in organic or nutrient loading can change the species composition of the plants on the saltmarsh and thus the structure of the sward. Increases in nutrients</p>

	<b>Severn Estuary Ramsar</b>
	<p>can also cause excessive algal growth on the mudflats, denying the birds access to their invertebrate prey and changing the invertebrate species composition in the sediment. Though the water quality has been improved in recent years there are still local areas of concern and any increase in nutrient loading should be avoided. At present the intertidal mudflats and sandflats are moderately vulnerable to this category of operation.</p> <p><b>Biological disturbance through the selective extraction of species</b> - Wildfowling is carried out all around the estuary. NE and CCW have not established that it has a detrimental effect on the overall bird populations but state that wildfowling needs to be exercised in a managed and sustainable manner preferably by a British Association of Shooting and Conservation (BASC) affiliated association, applying the BASC wildfowling code of conduct. Bait digging is also carried out around the estuary. If too large an area is regularly dug over, it can change the availability of prey in the sediment as the area needs a period of recovery and recolonisation. The removal of strandline vegetation by beach cleaning removes an important habitat for invertebrates, as well as many of the invertebrates themselves, reducing the quantity and variety of prey available to the birds. Much of the saltmarsh is managed by grazing and changes in management can alter the availability of prey and suitability of roosting sites. The saltmarsh is currently highly vulnerable to the selective extraction of species.</p>
<b>Landowner/ Management Responsibility</b>	N/A
<b>HRA/AA Studies undertaken that address this site</b>	<p>HRA Screening of the County Council of the City and County of Cardiff Local Development Plan Preferred Strategy Sept 2007.  <a href="http://www.cardiff.gov.uk/ObjView.asp?Object_ID=9788">www.cardiff.gov.uk/ObjView.asp?Object_ID=9788</a>                      The Screening states that the significance of the potential impacts of the indicative route in the Preferred Strategy (either alone or in-combination with other plans and projects) will be considered when a more detailed scheme is available. An appropriate assessment may be required for the scheme.</p> <p>HRA Screening of the Torfaen Local Development Plan (2006-2021) January 2008.  <a href="http://www.torfaen.gov.uk/EnvironmentAndPlanning/Planning/ForwardPlanning/Publications/HabitatsRegulationAssessment.pdf">http://www.torfaen.gov.uk/EnvironmentAndPlanning/Planning/ForwardPlanning/Publications/HabitatsRegulationAssessment.pdf</a>                      It is likely that an increase of 7000 dwellings in Torfaen and associated development will in some way impact</p>

	Severn Estuary Ramsar
	<p>upon the site. It is likely however that the potential impact will be as a result of in-combination effects with other implemented plans and programmes in close proximity to the Severn Estuary.</p> <p>AA Screening of the Vale of Glamorgan Local Development Plan Preferred Strategy Dec 07.  <a href="http://www.valeofglamorgan.gov.uk/files/Living/Planning/Policy/LDP/Appropriate_Assessment_Screening_Report.pdf">http://www.valeofglamorgan.gov.uk/files/Living/Planning/Policy/LDP/Appropriate_Assessment_Screening_Report.pdf</a></p> <p>Given the extent of the Severn Estuary and the diverse range of activities and operations that could result in adverse impact to the European Site, it is considered inevitable that the Draft Preferred Strategy will in some way, impact upon the designated site. While much of the development arising from the draft preferred strategy is likely to be located well away from the Severn Estuary, the south-eastern zone has been identified as a growth area and abuts the boundary of the designated site. Therefore, it is recommended that a more detailed assessment of the LDP be undertaken following consultation on the Draft Preferred Strategy to ascertain and mitigate against any likely significant effects to the SPA, SAC, RAMSAR.</p> <p>HRA and AA of the Wales Spatial Plan Update June 2008.  <a href="http://wales.gov.uk/about/strategy/spatial/hra/download/?lang=en">http://wales.gov.uk/about/strategy/spatial/hra/download/?lang=en</a></p> <p>The HRA Screening concludes that the WSPU and other plans have the potential to give rise to adverse effects at this site.</p> <p>The AA states that it is not possible to predict in specific terms whether the WSPU would or would not give rise to significant adverse effects either alone or in combination with other plans/ strategies and projects upon specific European sites. However, it does identify that this site is likely to come under increasing risk of adverse in combination effects from transport infrastructure, urban and economic development and recreation and tourism as a result of the WSPU and English RSSs. The AA also identifies that in combination with the English RSSs the WSPU has the potential to have negative effects on water levels, flood protection and water quality issues, which could affect this site.</p>



## Site Name: Somerset Levels and Moors

- Location Grid Ref:
- JNCC Site Code [UK11064](#)
- Size: 6394.53 ha
- Designation: Ramsar

Somerset Levels and Moors Ramsar	
<b>Site Description</b>	<p>The Somerset Levels and Moors Ramsar status was classified on 26 June 1997. The Levels and Moors is one of the largest and richest areas of traditionally managed wet grassland and fen habitats in lowland UK. The SPA is within this area and totals 6388.49 hectares. The majority of the site is only a few metres above mean sea level and drains through a network of ditches, rhynes, drains and rivers.</p> <p>Flooding may affect large areas in winter depending on rainfall and tidal conditions. Parts of the site in the Brue valley include areas of former raised peat bog that have now been substantially modified by agricultural intensification and peat extraction. This has created areas of open water, fen and reed bed. The site attracts important numbers of water birds in winter. The network of rhynes and ditches support an outstanding assemblage of aquatic invertebrates, particularly beetles.</p>
<b>Qualifying Features</b>	<p><b>Criteria</b></p> <p>2a – Supports an assemblage of rare, vulnerable or endangered species of sub species (specifically rare invertebrates, particularly beetles)</p> <p>3a – Regularly supports at least 20,000 waterfowl (specifically 73014 waterfowl)</p> <p>3c – Regularly supports at least 1% of all individuals in a waterfowl population (specifically Teal and Bewick's Swan [see SPA criteria])</p> <p>Ramsar Listed Species</p>

Somerset Levels and Moors Ramsar			
	Common Name	Scientific Name	Numbers
	Eurasian wigeon	Anas penelope (Western Siberia/North-western/North-eastern Europe)	25759
	Common snipe	Gallinago gallinago (Europe - breeding)	1633
	Tundra swan	Cygnus columbianus bewickii (Western Siberia/North-eastern and North-western Europe)	112
	Gadwall	Anas strepera (North-western Europe)	522
	Northern pintail	Anas acuta (North-western Europe)	927
	Northern shoveler	Anas clypeata (North-western/Central Europe)	1094
	Water rail	Rallus aquaticus (Europe)	36
	European golden plover	Pluvialis apricaria (North-western Europe - breeding)	3857
	Eurasian teal	Anas crecca (North-western Europe)	21231
	Ruff	Philomachus pugnax (Western Africa - wintering)	16
	Mute swan	Cygnus olor (Britain)	842
	Waterfowl assemblage	Waterfowl assemblage	97155
	Northern lapwing	Vanellus vanellus (Europe - breeding)	36580
<b>Conservation Objectives</b>	<ul style="list-style-type: none"> <li>• See SPA characterisation</li> </ul>		
<b>Component SSSIs</b>	<ul style="list-style-type: none"> <li>• See SPA characterisation</li> </ul>		
<b>Key Environmental Conditions (factors that maintain site integrity)</b>	<p>The Somerset Levels and Moors are one of the largest and richest areas of traditionally managed wet grassland and fen habitats in lowland UK. It is this habitat mosaic that supports the diverse range of birds that are the qualifying feature of this site.</p> <p>The majority of the site is only a few metres above mean sea level and drains through a large network of ditches, rhynes, drains and rivers. Active management is required to maintain the ground and surface water levels of the site.</p> <p>Management of the habitats present on the site is required to maintain the diverse structure and composition</p>		

<b>Somerset Levels and Moors Ramsar</b>	
	<p>of vegetation. This would include hay cutting, light grazing and ditch drainage.</p> <p>Control of inappropriate or invasive species, an open landscape free of scrub is required for breeding waders. Birdlife found on the site is vulnerable to disturbance.</p>
<b>Ramsar Condition Assessment</b>	See SPA condition
<b>Vulnerabilities (includes existing pressures and trends)</b>	<p>Key issues impacting the site are:</p> <p>Conversion of grassland to arable</p> <ul style="list-style-type: none"> <li>• Peat extraction and increasing levels of unmanaged scrub;</li> <li>• Drainage and ditch management (winter ditch water levels not secured);</li> <li>• Nutrient enrichment due to sewage treatment facilities in to watercourses. Also water pollution from agricultural run off;</li> <li>• Inappropriate water level management issues due to development on flood plain;</li> <li>• Disturbance from access, shooting and other recreational activities;</li> <li>• Invasive freshwater species;</li> <li>• Undergrazing.</li> </ul>
<b>Landowner/ Management Responsibility</b>	Various/ private
<b>HRA/AA Studies undertaken that address this site</b>	<p><b>HRA of the Draft Regional Spatial Strategy for the South West</b>, South West Regional Assembly (February, 2007, LUC) With regard to Somerset Levels and Moors the HRA noted</p> <p>The EA Review of Consents process only considers the adverse impacts on the overwintering birds for which this site is designated an SPA, and not the Ramsar features. It found no licensed abstractions or discharges likely to have a significant effect on these qualifying features. However, the EA acknowledged that some licensed discharges are increasing nutrient levels in the ditch network of the site, which could have an adverse effect on the invertebrates for which the site has its Ramsar designation.</p>

	Somerset Levels and Moors Ramsar
	<p><b>Appropriate Assessment of Somerset County Borough and District Councils' Core Strategies:</b> Initial Screening of Somerset Levels and Moors and Severn Estuary (Bridgwater Bay European sites) Report (Nov, 2007).</p> <p>Screening identifies potential impacts as a result of house building and related infrastructure on: water table, pollution (toxic and non-toxic), non-physical disturbance (human presence, lighting) and physical damage from recreation and water sports.</p>

## Appendix 2: Plans and Projects Review

### National

Plan	Potential impacts that could cause 'in-combination' effects
<p><b>People, Places, Futures: The Wales Spatial Plan (update) 2008</b></p>	<ul style="list-style-type: none"> <li>• Housing and employment growth may lead to increased transport movements - the potential for in-combination effect is greater where housing sites are in close proximity to European sites.</li> <li>• New communities require increased infrastructure – potential for land take, pollution increase, disturbance/ severance of habitats and species.</li> <li>• Growth in the requirement for waste management/ transport disposal from new communities and businesses has the potential to increase pollution, and introduce land take issues.</li> <li>• Recreation pressures may result from housing developments near/ adjacent to European sites.</li> <li>• Atmospheric pollution generated as a result of housing, employment and transport growth.</li> </ul>
<p><b>Welsh Coastal Tourism Strategy Draft Final Strategy Document 2007</b></p>	<ul style="list-style-type: none"> <li>• Direct loss of habitat through development - Severn Estuary SPA, Ramsar and SAC is present all along the Cardiff coastline.</li> <li>• Increased levels of tourism and employment may lead to increased transport movements.</li> <li>• Atmospheric pollution generated as a result of employment and transport growth.</li> <li>• Increased recreational pressure through water sports.</li> <li>• An increased level of waterborne transport and development along the coast has the potential to increase diffuse levels of water pollution.</li> </ul>
<p><b>'Catching the Wave' - A watersports tourism strategy for Wales 2004</b></p>	<ul style="list-style-type: none"> <li>• Increased recreational pressure on the Severn Estuary, Ramsar and SAC.</li> <li>• An increased level of watersports has the potential to increase diffuse levels of water pollution.</li> <li>• There is also the potential of increased levels of disturbance on nesting birds.</li> </ul>

## Regional

Plan	Potential impacts that could cause ‘in-combination’ effects
<b>Somerset County Council Waste Strategy Issues and Options (October 2007); Somerset County Council Minerals Local Plan - adopted (April 2004)</b>	<ul style="list-style-type: none"> <li>• The minerals plan also currently provides strong policy protection for European Sites.</li> <li>• In-combination impacts from minerals workings in Somerset are unlikely due to the distance of the main resource area (West Mendips) from the Wiltshire county boundary/ mineral sites – and SACs being assessed.</li> </ul>
<b>Somerset County Council Local Transport Plan 2: 2006-2011</b>	<ul style="list-style-type: none"> <li>• Potential positive impacts (air quality) through implementation of sustainable transport solutions.</li> </ul>
<b>Welsh Water - Water Resource Management Plan (WRMP) 2008</b>	<ul style="list-style-type: none"> <li>• The WRMP sets out how water companies ensure they are able to provide sufficient water supplies to meet customers’ demands and how the environment will be protected. It aims to maintain the existing supply - demand balances in certain Water Resource Zones through promoting water conservation and efficiency measures and improving leakages.</li> <li>• The HRA of Welsh Water’s Draft Water Resource Management Plan (Nov 2008) states that “accurate assessment of exposure (and therefore vulnerability)”, of a European site “can only be achieved through detailed studies in the RoC process, informed by the site knowledge of the CCW local teams and officers”<sup>5</sup>.</li> <li>• Therefore it cannot be concluded that there will be no likely significant effect on the River Usk SAC if the dWRMP is implemented. The HRA suggests that appropriate caveats be included within the existing dWRMP to help ensure that no significant effects are likely as a result of its implementation.</li> </ul>
<b>Severn Trent Water - Water Resource Management Plan (WRMP)</b>	<ul style="list-style-type: none"> <li>• The WRMP sets out how water companies ensure they are able to provide sufficient water supplies to meet customers’ demands and how the environment will be protected. It aims to maintain the existing supply - demand balances in certain Water Resource Zones through promoting water conservation and efficiency measures and improving leakages.</li> </ul>

<sup>5</sup> Welsh Water (2008) HRA of the Draft Water Resource Management Plan. Available online: <http://www.dwrcymru.com/English/Company/Operations/resources/wrmp/index.asp>

Plan	Potential impacts that could cause 'in-combination' effects
	<ul style="list-style-type: none"> <li>The implementation of the Severn Trent WRMP would mean reliance upon additional flow augmentation to the River Severn during dry periods to minimise/avoid adverse environmental effects (in particular the Severn Estuary SPA, SAC and Ramsar Site). This would require agreement with the Environment Agency, and possible development of the next phase of the Shropshire Groundwater Scheme (GWS). Further investigations would be required prior to implementation, particularly in regard to specific UK legislation.</li> </ul>
<p><b>Wessex Water - Water Resource Management Plan (WRMP) 2008</b></p>	<ul style="list-style-type: none"> <li>The WRMP sets out how water companies ensure they are able to provide sufficient water supplies to meet customers' demands and how the environment will be protected. It aims to maintain the existing supply - demand balances in certain Water Resource Zones through promoting water conservation and efficiency measures and improving leakages.</li> <li>Wessex Water have determined that in the south and west resource zones there is enough available water to meet demands over the coming years. In the north and east zones, however, some deficits are likely to occur resulting from expected reductions in permitted groundwater abstraction volumes arising from the low flows project and population growth.</li> <li>HRA of the WRMP does not identify European sites within the Severn Estuary area as requiring HRA with regard to abstraction/ discharge requirements contained in the WRMP.</li> </ul>
<p><b>The Parret Catchment Abstraction Management Strategy March 2006</b></p>	<ul style="list-style-type: none"> <li>Under the Habitats Regulations the Environment Agency Wales has a duty to assess the effects of existing abstraction licences and any new applications to make sure they are not impacting on internationally important nature conservation sites. Water efficiency is also tested by the EA before a new license is granted. If the assessment of a new application shows that it could have an impact on a SAC/SPA the EA will have to follow strict rules in setting a time limit for that license.</li> <li>The Environment Agency has a statutory duty, to ensure that the integrity of the riverine SAC ecosystem is maintained or restored through sustainable water resources management. As part of this duty, they have to ensure that permissions (abstraction licences, discharge consents, radioactive substance authorisations, waste management licences and integrated pollution control (IPC) authorisations) do not have an adverse effect on the integrity of the designated SAC species.</li> <li>The catchment has been split into 10 Water Resource Management Units (WRMU). WRMUs 1, 4, 5 and 7 are assessed as having 'water available'. WRMU's 2 and 10 are assessed as having 'no water</li> </ul>

Plan	Potential impacts that could cause 'in-combination' effects
	<p>available'. WRMU 3 is 'over licensed' and 6, 8 and 9 are 'over abstracted'.</p> <ul style="list-style-type: none"> <li>• The impact of any water shortage in the assessment areas could have impacts on the Severn Estuary SAC/ SPA/ Ramsar and Somerset Levels and Moors SPA/ Ramsar downstream.</li> </ul>
<p><b>The Wye Catchment Abstraction Management Strategy March 2008</b></p>	<ul style="list-style-type: none"> <li>• The catchment has been split into 4 Water Resource Management Units (WRMU). The document states that all 4 WRMUs are assessed to have 'no water available'.</li> <li>• The River Wye ultimately flows into the Severn Estuary. Therefore any impact to the Severn Estuary caused by changes to the water resource management of the catchment needs is considered as part of the CAMS process.</li> </ul>
<p><b>The Usk Catchment Abstraction Management Strategy 2006</b></p>	<ul style="list-style-type: none"> <li>• Under the Habitats Regulations the Environment Agency Wales has a duty to assess the effects of existing abstraction licences and any new applications to make sure they are not impacting on internationally important nature conservation sites.</li> <li>• The catchment has been split into 3 Water Resource Management Units (WRMU). The CAMS states that WRMU 1 (Sor Brook) has water available, WRMU 2 (River Usk) is over licensed and WRMU 18 (Bettws/Malpas Brook) is over licensed.</li> <li>• The River Usk SAC, Usk Bat Sites SAC and Coed y Cerrig SAC are situated within WRMU 2, which according to the CAMS is over licensed.</li> <li>• The River Usk SAC is sensitive to any changes in the hydrological regime, more specifically any changes to water flow and quality.</li> </ul>
<p><b>The Severn Estuary Coastal Habitat Management Plan: Technical Summary (EA, 2006)</b></p>	<ul style="list-style-type: none"> <li>• 6 habitat behaviour units, includes Hinkley Point to Brean Down (Unit 1).</li> <li>• Unit 1 includes designated habitats (intertidal mud and sandflats, saltmarsh, shingle and rocky shore, atlantic saltmeadows, estuaries, reefs, subtidal sandbanks).</li> <li>• CHaMPs include morphological and historical trends analysis.</li> <li>• Intertidal change over 20 years considered to be minimal, 50 years (5-10%), 100 years (10-20%).</li> </ul>
<p><b>Environment Agency Review of Consents</b></p>	<ul style="list-style-type: none"> <li>• No documentation regarding the Severn Estuary and/or those rivers discharging into the Severn Estuary has been made available from the Environment Agency at the time of this assessment. The Review of</li> </ul>



Plan	Potential impacts that could cause 'in-combination' effects
	<p>Consents process is a review of all permits and consents (such as discharge consents and abstraction licenses) granted prior to the enforcement of the Habitats Regulations to ensure that no adverse effects on the nature conservation interests on designated sites are likely to occur. The RoC process aims to be fully completed by 2010.</p>

## Local

Plan	Potential impacts that could cause 'in-combination' effects
<b>Cardiff Local Development Plan Preferred Strategy 2006-2021</b>	<ul style="list-style-type: none"> <li>• Housing and employment growth may lead to increased transport movements - the potential for in-combination effect is greater where housing sites are in proximity to European sites.</li> <li>• Atmospheric pollution is likely to be the main impact of the Preferred Strategy on sites outside of Cardiff.</li> </ul>
<b>Monmouthshire County Council Local Development Plan Options Report December 2008</b>	<p>Generic effects related to development/ growth scenarios include:</p> <ul style="list-style-type: none"> <li>• Potential for land take/ habitat fragmentation.</li> <li>• Increased demand for water resources/ abstraction/ hydrological impacts.</li> <li>• Increased traffic movements, contributions to atmospheric pollution loading.</li> <li>• Growth in requirements for waste management facilities, increased demand for minerals.</li> <li>• Increased recreational pressure from existing/ new populations.</li> </ul>
<b>Newport City Council Unitary Development Plan (Adopted May 2006)</b>	<ul style="list-style-type: none"> <li>• Development of Brownfield sites in close proximity to the River Usk SAC could have the potential to significantly affect water quality as a result of construction activities. This also has implications for the River Severn SPA/ Ramsar/ SAC as the River Usk flows into the Severn Estuary. Any development that would involve the building of a bridge across the River Usk SAC has the potential to have significant effects on migratory fish.</li> </ul>
<b>The Vale of Glamorgan Council Local Development Draft Preferred Strategy Dec 2007</b>	<ul style="list-style-type: none"> <li>• Given the extent of the Severn Estuary and the diverse range of activities and operations that could result in adverse impact to the European Site, it is considered inevitable that the Draft Preferred Strategy will in some way, impact upon the designated site. While much of the development arising from the draft preferred strategy is likely to be located well away from the Severn Estuary, the south-eastern zone has been identified as a growth area and abuts the boundary of the designated site. Therefore, it is recommended that a more detailed assessment of the LDP be undertaken following consultation on the Draft Preferred Strategy to ascertain and mitigate against any likely significant effects to the SPA, SAC, RAMSAR.</li> </ul>

Plan	Potential impacts that could cause 'in-combination' effects
<p><b>Forest of Dean District Council Core Strategy Second Preferred Options (March 2008)</b></p>	<ul style="list-style-type: none"> <li>• The River Wye SAC, Wye Valley Woodlands SAC, Wye Valley and Forest of Dean Bat Sites SAC and the Severn Estuary SPA, Ramsar and SAC are all within the district boundary.</li> <li>• Lydney lies in close proximity to the Severn Estuary SPA, Ramsar and SAC. There is the potential for increased levels of disturbance as a result of new development and increased recreational activity.</li> </ul>

## Other plans and programmes

Plan	Potential impacts that could cause 'in-combination' effects
<b>Decommissioning of Hinkley A and B (Nuclear Decommissioning Authority)</b>	<ul style="list-style-type: none"> <li>• Construction/ demolition related impacts (transport, dust, noise, light, vibration, air quality).</li> <li>• Water pollution/ contamination – accidental runoff, changes to surface water.</li> <li>• Waste, contamination from temporary storage (radioactive and non-radioactive).</li> <li>• Land take, habitat loss, fragmentation and disturbance.</li> </ul>
<b>Cardiff International Airport Master Plan 2006</b>	<ul style="list-style-type: none"> <li>• A greater number of planes and improved highways access has the potential to increase the levels of recreational pressure at Cardiff Beech Woods SAC and the Severn Estuary SPA/ Ramsar/ SAC.</li> <li>• Severn Estuary SPA/ Ramsar/ SAC - overwintering birds can be disturbed by sudden movements and noises that can result in reduced food intake and/or increased energy expenditure.</li> </ul>
<b>Severn Tidal Power Feasibility Study 2009</b>	<p>The Severn Tidal Power HRA preliminary screening<sup>6</sup> identified a number of potentially significant impacts in relation to tidal range power generation:</p> <ul style="list-style-type: none"> <li>• Permanent habitat loss from the placement of power generation infrastructure;</li> <li>• Temporary habitat loss/disturbance during construction activities;</li> <li>• Noise, vibration and light pollution during construction;</li> <li>• Sediment generation during construction;</li> <li>• Pollution incident during construction;</li> <li>• Habitat loss/change as a result of alterations in tidal range upstream of a barrage or lagoon;</li> <li>• Habitat loss/change as a result of alterations in tidal range downstream of a barrage or lagoon;</li> <li>• Habitat loss or change as a result of alterations in land drainage capacity;</li> <li>• Habitat loss/change as a result of alterations to tidal flows (for example, flow speeds and flow patterns);</li> <li>• Habitat loss/change as a result of alterations to sediment transport (including erosion and deposition);</li> </ul>

<sup>6</sup> DECC (2008) Severn Tidal Power HRA Preliminary Screening

	<ul style="list-style-type: none"> <li>• Habitat loss/change as a result of alterations to chemical parameters such as salinity, dissolved oxygen and the dispersion of regulated discharges;</li> <li>• Direct mortality of aquatic species (sluices and turbines);</li> <li>• Barrier to movement for aquatic species (barrage and turbines);</li> <li>• Noise, vibration and light pollution during operation (gates, sluices, turbines and permanent lighting installations);</li> <li>• Electromagnetic field from power transmission cables; and,</li> <li>• Reduction in prey availability, for example., reduced invertebrate populations, reduced fish populations, and displacement effects.</li> </ul>
<p><b>Bristol Deep Sea Container Terminal (BDSCT)</b></p>	<ul style="list-style-type: none"> <li>• The EIA<sup>7</sup> identifies the main impacts of the BDSCT on the Severn Estuary SPA/ SAC/ Ramsar.</li> <li>• The direct impacts that relate to the designated status of the Severn Estuary are:             <ul style="list-style-type: none"> <li>○ The reclamation of intertidal habitat and the loss of a small area of designated SPA and SAC habitat (approximately 2ha);</li> <li>○ Capital dredging within the main channel of the estuary and the turning area for the proposed container terminal and the effects of this on subtidal animal communities; and</li> <li>○ The disposal of arisings from the capital dredging within a deep water area of the estuary and the effects of this on subtidal animal communities.</li> </ul> </li> </ul> <p>The indirect impacts of the proposed works that have the potential to affect the designated status of the site comprise:</p> <ul style="list-style-type: none"> <li>• Modification of the local hydrodynamics and sediment transport around the container terminal, leading to an increase in accretion over SPA and SAC upstream intertidal mudflats totaling approximately 80ha;</li> <li>• Subtidal and potentially intertidal deposition of fine sediment within the estuary as a result of dredging and disposal of sediment; and</li> <li>• Disturbance to birds in and around the port as a result of activities during the construction process.</li> </ul>
<p><b>Severn Estuary Coastal Habitat Management Plan</b></p>	<ul style="list-style-type: none"> <li>• The area designated for construction of a new nuclear power station and associated development at</li> </ul>

<sup>7</sup> Bristol Port Company (2008) Bristol Deep Sea Container Terminal Environmental Statement - Non Technical Summary.

<p><b>(2006)</b></p>	<p>Hinkley Point is included within Habitat Behavioural Unit 1: Hinkley Point to Brean Down of the Severn Estuary CHaMP. Habitats within this unit include intertidal mudflats, sandflats, saltmarsh, shingle and rocky shore, Atlantic salt meadows, estuaries, reefs and subtidal sandbanks. The CHaMP states that intertidal change for this unit is anticipated to be minimal over the next 20 years, with changes to habitat extent over the next 50 and 100 years likely to rise to 5-10% and 10-20% respectively. In addition, the habitats within this unit have been identified within the Severn Estuary CHaMP as being part of the total extent of habitat within Habitat Behavioural Unit 1 considered suitable for habitat creation and reclamation as part of future managed coastal retreat. The proposed development of a new nuclear power station within this area including the requirements for further coastal defence (thereby restricting landward migration of habitat)<sup>8</sup>, together with the additional loss and fragmentation of designated habitats arising from the development, may therefore act cumulatively or accelerate changes identified by the CHaMP in relation to designated features of the Severn Estuary SAC, SPA and Ramsar sites, with potential adverse effects on site integrity likely.</p>
<p><b>Severn Estuary Shoreline Management Plan (SMP) and developing SMP2; and Flood Risk Strategy (2000)</b></p>	<ul style="list-style-type: none"> <li>• The short – to medium- term management options for the coastal defences along the coastal edge of this site as determined within the Shoreline Management Plan (North Devon and Somerset) is to ‘hold the line’ (maintain, improve or construct sea defences to maintain the existing line of defences), such that local defences should be maintained, improved, or constructed to maintain the existing defences of the coastal sub unit. However the coastline immediately to the west of the existing stations consists of unprotected cliffs, which could be the subject of erosion. In-combination impacts may arise given that existing defences need to be extended westwards to provide further protection to the nominated site. The construction of additional sea defence infrastructure at Hinkley may therefore result in moving the line of defences seaward, equating to an ‘advance the line’ approach, a management option considered inappropriate within the SMP with regard to coastal processes or natural environment interests. Any alterations to the management of the coastline here will likely lead to coastal erosion issues upon sensitive shoreline habitats and species further along the coast, with impacts upon the integrity of the Severn Estuary European Sites.</li> </ul>

<sup>8</sup> <http://www.severnestuary.net/frms/docs/severn%20scoping%20report%20jan%2009%20v2.pdf>

## Appendix 3: Likely Significant Effect (LSE) Screening Table

### SIGNIFICANT EFFECTS SCREENING (INCORPORATING IN-COMBINATION ASSESSMENT):

#### European Sites<sup>9</sup>:

	Designation	Distance from the nominated site <sup>10</sup>
Exmoor and Quantocks Oakwoods	<b>SAC</b>	within 10 km
Hestercombe House	<b>SAC</b>	within 20 km
Mendip Limestone Grasslands	<b>SAC</b>	within 20 km
River Usk	<b>SAC</b>	within 40 km
River Wye	<b>SAC</b>	within 56 km
Severn Estuary	<b>SAC</b> <sup>11</sup>	adjacent
Severn Estuary	<b>SPA</b>	adjacent
Severn Estuary	<b>Ramsar</b>	adjacent
Somerset Levels and Moors	<b>SPA</b>	within 5 km
Somerset Levels and Moors	<b>Ramsar</b>	within 20 km

The likely significant effects of the development of the nominated site on the above listed European sites have been assessed. Some of these European sites have been screened out for the reasons given below. For the remaining European sites, the assessment of the likely significant effects of the construction, operation and decommissioning phases of a new nuclear power station development are presented in tabular form.

<sup>9</sup> All European sites within a 20km radius were scoped into the screening process. In addition, two sites (River Usk SAC and River Wye SAC) which fall outside the search area but have hydrological connections to the Severn Estuary designations, were included in the Screening Assessment in line with consultation comments provided by Statutory Consultees.

<sup>10</sup> Measured to nearest site boundary.

<sup>11</sup> At the time of issue of this report, the Severn Estuary has been accepted by the European Commission as a Site of Community Importance (SCI) but formal notices have not yet been issued (expected to take place later in 2009). Given the imminent notification of the SAC the Severn Estuary SCI is referred to as SAC throughout this report.

**European Sites for which likely significant impacts are not considered not to arise:**

- **Exmoor and Quantocks Oakwoods SAC:** This SAC is designated for its old sessile oak woods, alluvial forests, bat species and Otters and is located within 10km to the south-west of the nominated site. Conditions necessary to maintain site integrity are appropriate woodland management, water quality and flow rates and low disturbance levels for bats and Otters. Consequently local management factors (grazing, recreational pressure) are considered to be the most significant elements in supporting condition status. The woodland habitats are sensitive to air pollution. There is therefore the potential for some negative impacts on air quality during the construction phase, dust, particulates and nitrogen oxides from transportation. However pollution levels from roads/ sites typically fall to background levels beyond 200m (DoT, 2003), therefore increases resulting from the development of Hinkley Point are unlikely to be significant. Furthermore the EA note that non-radioactive emissions from nuclear power stations are typically less than 0.2% of the total from IPC regulated industry. As such, radioactive emissions to the atmosphere are anticipated to be within authorised limits and are therefore considered to not have significant effects upon the identified vulnerabilities of this site.
- **Hestercombe House SAC:** This SAC is located to the south-west of the nominated site in a managed country estate, and supports a colony of Lesser Horseshoe Bats. Very local site specific factors are known to influence site integrity. Key pressures to this SAC in particular relate to disturbance of the roost site such as from human presence and potential loss of habitat features used for commuting and foraging arising from housing and associated recreation which may affect foraging areas and flight paths. The Lesser Horseshoe Bat typically forages within an 8km radius using well connected habitats. The nominated site however lies on open pasture land well beyond this foraging radius. There is therefore no identified 'cause-effect' pathways between impacts identified arising from the development of the nominated site and the known environmental conditions (and vulnerabilities) at this site, therefore no significant effects are likely.
- **Mendip Limestone Grasslands SAC:** This SAC is located to the north-east of the nominated site and includes inland and coastal sections of grassland [contiguous with the Severn Estuary SAC/ SPA /Ramsar] which support rare vascular plants. Local, site-specific factors such as recreational access, urbanisation pressures (e.g. fire setting) and scrub control are the most crucial determinants in maintaining site integrity. Key pressures at this site therefore relate to grazing, recreational impacts and invasive species such as Bracken and Cotoneaster. There are no identified 'cause-effect' pathways between the identified impacts arising from the development of the nominated site and the known environmental conditions (and vulnerabilities) at this site. No likely significant effects are therefore anticipated.
- **Somerset Levels and Moors SPA/ Ramsar:** The Somerset Levels and Moors SPA/ Ramsar site is spread over a series of individual locations inland to the east of Hinkley Point. Potential impacts are only expected to arise in relation to water quality given that this



European Site's interest features are shared with the Severn Estuary. Significant impacts arising from the development upon habitat and species loss and fragmentation, coastal squeeze, disturbance (noise/light/visual) and air quality however are not considered likely given its location away from the coast and distance from the nominated site.

- **River Wye SAC and River Usk SAC:** Given the distance and location of these SACs from the nominated site, impacts in relation to coastal squeeze and air quality are not considered likely to arise as a result of the development of the nominated site.

## Severn Estuary, SAC<sup>12</sup>

**Unitary Authority** Vale of Glamorgan; Cardiff; Newport; City of Bristol; Monmouthshire; Gloucestershire; North Somerset; Somerset; South Gloucestershire

### Source: Construction (duration approx 5 years)

Severn Estuary, SAC: Construction (duration approx 5 years)	
Water Quality	
<b>Potential Impacts: Pathway</b>	Potential effects on water quality and drainage from earthworks/ excavations, infrastructure provision (sedimentation, pollution incidents).
<b>Potential effects on the SAC: Receptor</b>	Potential effects on water quality and drainage from earthworks/ excavations, infrastructure provision (sedimentation, pollution incidents). SAC is vulnerable to changes in nutrient loading and toxic compounds. Addition of (warmer) water to aquatic system. Potential for thermal inclines/ barriers to migration as a result of thermal discharges.
<b>Risk of Likely Significant Effect (LSE)?</b>	Yes.
<b>Potential Impacts - other Plans and Programmes</b>	<p><b>Severn Barrage – Feasibility Study</b> – Water quality, habitat loss, fragmentation, barriers to migration.</p> <p><b>Local Development Frameworks</b> (Gloucester, Bristol, Somerset, south-east Wales)                      Water quality (abstraction, pollution)                      Habitat disturbance (recreation, infrastructure development)</p> <p>Of relevance to understanding environmental condition:</p> <ul style="list-style-type: none"> <li>• Catchment Abstraction Management Strategies</li> </ul>

<sup>12</sup> Currently no conservation objective available for this SAC.

Severn Estuary, SAC: Construction (duration approx 5 years)	
Water Quality	
	<ul style="list-style-type: none"> <li>• Coastal Habitat Management Plans Frameworks</li> </ul>
<b>Risk from 'In Combination' Effects?</b>	Potential indirect effects.  Diffuse pollution/ development pressures/ growth in recreational pressure/ disturbance.
<b>AA Required?</b>	Yes

Severn Estuary, SAC: Construction (duration approx 5 years)	
Air Quality	
<b>Potential Impacts: Pathway</b>	Potential local impacts from increased development/ traffic growth, and emissions arising from construction activity. Likely to be restricted to a local level e.g. dust/ particulates.
<b>Potential effects on the SAC: Receptor</b>	Potential local impacts from increased development/ traffic growth. Air quality not an identified vulnerability for the SAC.
<b>Risk of Likely Significant Effect (LSE)?</b>	Yes.
<b>Potential Impacts - other Plans and Programmes</b>	<p><b>Severn Barrage – Feasibility Study</b> – Water quality, habitat loss, fragmentation, barriers to migration.</p> <p><b>Local Development Frameworks</b> (Gloucester, Bristol, Somerset, south-east Wales)                      Water quality (abstraction, pollution)                      Habitat disturbance (recreation, infrastructure development)</p> <p>Of relevance to understanding environmental condition:</p> <ul style="list-style-type: none"> <li>• Catchment Abstraction Management Strategies</li> <li>• Coastal Habitat Management Plans Frameworks</li> </ul>
<b>Risk from ‘In Combination’ Effects?</b>	<p>Potential indirect effects.</p> <p>Diffuse pollution/ development pressures/ growth in recreational pressure/ disturbance.</p>
<b>AA Required?</b>	Yes

Severn Estuary, SAC: Construction (duration approx 5 years)	
Habitats and Species (Loss and Fragmentation)	
<b>Potential Impacts: Pathway</b>	Construction of infrastructure, extension of site into 'buffer' habitats, possible development at the coastal fringes
<b>Potential effects on the SAC: Receptor</b>	<p>SAC is vulnerable to the physical loss of supporting habitats, especially in the intertidal area (mudflats &amp; sandflats). Tidal regime is crucial to maintenance of site features.</p> <p>Construction phase includes new coastal frontage, direct impacts on designated site. Construction and new site boundaries directly adjacent to SAC, therefore, strong potential for coastal squeeze – which prevents the managed retreat of intertidal habitats necessary for the maintenance of favourable condition status.</p>
<b>Risk of Likely Significant Effect (LSE)?</b>	<p>Yes.</p> <p>Significant risk from project alone – direct impacts (habitat loss) and range of indirect effects that likely to be significant.</p>
<b>Potential Impacts - other Plans and Programmes</b>	<p><b>Severn Barrage – Feasibility Study</b> – Water quality, habitat loss, fragmentation, barriers to migration.</p> <p><b>Local Development Frameworks</b> (Gloucester, Bristol, Somerset, south-east Wales)                      Water quality (abstraction, pollution)                      Habitat disturbance (recreation, infrastructure development)</p> <p>Of relevance to understanding environmental condition:</p> <ul style="list-style-type: none"> <li>• Catchment Abstraction Management Strategies</li> <li>• Coastal Habitat Management Plans Frameworks</li> </ul>

Severn Estuary, SAC: Construction (duration approx 5 years)	
Habitats and Species (Loss and Fragmentation)	
<b>Risk from 'In Combination' Effects?</b>	<p>Potential indirect effects.</p> <p>Diffuse pollution/ development pressures/ growth in recreational pressure/ disturbance.</p>
<b>AA Required?</b>	Yes

Severn Estuary, SAC: Construction (duration approx 5 years)	
Coastal Squeeze	
<b>Potential Impacts: Pathway</b>	Construction of infrastructure and facilities relating to the operation of the nuclear power station may result in an encroachment upon land at the coastal fringes. All supporting habitats are sensitive to removal by land reclamation and construction activity.
<b>Potential effects on the SPA/Ramsar: Receptor</b>	Construction and the proposed new site boundaries are directly adjacent to SAC, therefore, strong potential for coastal squeeze which prevents the managed retreat of intertidal habitats necessary to support favourable condition. All supporting habitats for SAC designation are sensitive to removal by land reclamation and construction activity.
<b>Risk of Likely Significant Effect (LSE)?</b>	Yes.
<b>Potential Impacts - other Plans and Programmes</b>	<p><b>Severn Barrage – Feasibility Study</b> – Water quality, habitat loss, fragmentation</p> <p><b>Local Development Frameworks</b> (Gloucester, Bristol, Somerset, south-east Wales) Water quality (abstraction, pollution). Habitat disturbance (recreation, infrastructure development).</p> <p>Of relevance to understanding environmental condition:</p> <ul style="list-style-type: none"> <li>• Catchment Abstraction Management Strategies</li> <li>• Coastal Habitat Management Plans Frameworks</li> </ul>
<b>Risk from ‘In Combination’ Effects?</b>	Potential indirect effects in particular from population growth/ disturbance/ human interference both landward and on water.
<b>AA Required?</b>	Yes

Severn Estuary SAC: Construction (duration approx 5 years)	
Noise/Light/Visual Disturbance	
<b>Potential Impacts: Pathway</b>	The construction phase extends over 5-6 years with potential for significant increases in noise/ light and visual changes during the construction period.
<b>Potential effects on the SPA/Ramsar: Receptor</b>	Disturbance to mudflats and sandflats at the intertidal zone from construction activity.  Low frequency noise and regular, frequent vibration can impact upon the movement and reproductive success of migratory fish species within the Severn Estuary Ramsar site (Sea Lamprey, River lamprey, Twaite Shad, Allis Shad, Eel, Atlantic Salmon, Sea Trout), given their proximity to the nominated site.
<b>Risk of Likely Significant Effect (LSE)?</b>	Yes.
<b>Potential Impacts - other Plans and Programmes</b>	<b>Severn Barrage – Feasibility Study</b> – Water quality, habitat loss, fragmentation  <b>Local Development Frameworks</b> (Gloucester, Bristol, Somerset, south-east Wales) Water quality (abstraction, pollution) Habitat disturbance (recreation, infrastructure development)  Of relevance to understanding environmental condition: <ul style="list-style-type: none"> <li>• Catchment Abstraction Management Strategies</li> <li>• Coastal Habitat Management Plans Frameworks</li> </ul>
<b>Risk from ‘In Combination’ Effects?</b>	Potential indirect effects in particular from population growth/ disturbance/ human interference both landward and on water.
<b>AA Required?</b>	Yes



## Source: Operation (duration approx 60 years)

Severn Estuary, SAC: Operation (duration approx 60 years)	
Water Resources/ Quality	
<b>Potential Impacts: Pathway</b>	Potential impacts on quality from discharges (radioactive and non-radioactive).
<b>Potential effects on the SAC: Receptor</b>	Potential impacts on quality from discharges (radioactive and non-radioactive). Changes to water quality and of water temperature can impact species composition/ encourage excessive algal growth – results in wider impacts on dependant bird species.
<b>Risk of Likely Significant Effect (LSE)?</b>	Yes.
<b>Potential Impacts - other Plans and Programmes</b>	<p><b>Severn Barrage – Feasibility Study</b> – Water quality, habitat loss, fragmentation, barriers to migration.</p> <p><b>Local Development Frameworks</b> (Gloucester, Bristol, Somerset, south -east Wales)                      Water quality (abstraction, pollution)                      Habitat disturbance (recreation, infrastructure development)</p> <p>Of relevance to understanding environmental condition:</p> <ul style="list-style-type: none"> <li>• Catchment Abstraction Management Strategies</li> <li>• Coastal Habitat Management Plans Frameworks</li> </ul>
<b>Risk from 'In Combination' Effects?</b>	Potential indirect effects. Diffuse pollution/ development pressures/ growth in recreational pressure/ disturbance.
<b>AA Required?</b>	Yes

Severn Estuary, SAC: Operation (duration approx 60 years)

<b>Air Quality</b>	
<b>Potential Impacts: Pathway</b>	Potential local impacts from increased development/ traffic growth.
<b>Potential effects on the SAC: Receptor</b>	Potential local impacts from increased development/ traffic growth. Air quality not an identified vulnerability for the Estuary.
<b>Risk of Likely Significant Effect (LSE)?</b>	Yes.
<b>Potential Impacts - other Plans and Programmes</b>	<p><b>Severn Barrage – Feasibility Study</b> – Water quality, habitat loss, fragmentation, barriers to migration.</p> <p><b>Local Development Frameworks</b> (Gloucester, Bristol, Somerset, south-east Wales)                      Water quality (abstraction, pollution)                      Habitat disturbance (recreation, infrastructure development)</p> <p>Of relevance to understanding environmental condition:</p> <ul style="list-style-type: none"> <li>• Catchment Abstraction Management Strategies</li> <li>• Coastal Habitat Management Plans Frameworks</li> </ul>
<b>Risk from ‘In Combination’ Effects?</b>	<p>Potential indirect effects.</p> <p>Diffuse pollution/ development pressures/ growth in recreational pressure/ disturbance.</p>
<b>AA Required?</b>	Yes

Severn Estuary, SAC: Operation (duration approx 60 years)	
Habitat Fragmentation (Loss and Fragmentation)	
<b>Potential Impacts: Pathway</b>	Changes to footprint of site through operation, e.g. to accommodate waste storage, develop infrastructure may lead to the loss of supporting or buffer habitats. The construction and maintenance of permanent infrastructure such as roads, compound sites and waste storage facilities may result in fragmentation of habitats and reduce/alter available corridors for the movement of species across habitats and resources.
<b>Potential effects on the SAC: Receptor</b>	Potential for fragmentation of habitat through loss of buffer habitats (land between designated areas) that will be accommodated by the proposed site.
<b>Risk of Likely Significant Effect (LSE)?</b>	Yes.  Significant risk from project alone – direct impacts (habitat loss) and range of indirect effects that likely to be significant.
<b>Potential Impacts - other Plans and Programmes</b>	<b>Severn Barrage – Feasibility Study</b> – Water quality, habitat loss, fragmentation, barriers to migration.  <b>Local Development Frameworks</b> (Gloucester, Bristol, Somerset, south-east Wales) Water quality (abstraction, pollution) Habitat disturbance (recreation, infrastructure development)  Of relevance to understanding environmental condition: <ul style="list-style-type: none"> <li>• Catchment Abstraction Management Strategies</li> <li>• Coastal Habitat Management Plans Frameworks</li> </ul>
<b>Risk from ‘In Combination’ Effects?</b>	Potential indirect effects. Diffuse pollution/ development pressures/ growth in recreational pressure/ disturbance.
<b>AA Required?</b>	Yes

Severn Estuary, SAC: Operation (duration approx 60 years)	
Noise/Light/Visual Disturbance	
<b>Potential Impacts: Pathway</b>	Operational activity may result in significant local increases in noise and vibration events, light pollution and visual disturbance in and around the immediate vicinity of the site.
<b>Potential effects on the SPA/Ramsar: Receptor</b>	Operation of offshore infrastructure e.g. marine landing facility and cooling water intake infrastructure can result in disturbance to migratory fish species, affecting their migration and reproductive behaviour.
<b>Risk of Likely Significant Effect (LSE)?</b>	Yes.  Disturbance to fish can result in displacement, reduced feeding capacity, and impact upon breeding/ survival rates.
<b>Potential Impacts - other Plans and Programmes</b>	<b>Severn Barrage – Feasibility Study</b> – Water quality, habitat loss, fragmentation  <b>Local Development Frameworks</b> (Gloucester, Bristol, Somerset, south-east Wales) Water quality (abstraction, pollution) Habitat disturbance (recreation, infrastructure development)  Of relevance to understanding environmental condition: <ul style="list-style-type: none"> <li>• Catchment Abstraction Management Strategies</li> <li>• Coastal Habitat Management Plans Frameworks</li> </ul>
<b>Risk from ‘In Combination’ Effects?</b>	Potential indirect effects in particular from population growth/ disturbance/ human interference both landward and on water.
<b>AA Required?</b>	Yes

**Source: Decommissioning (duration approx 30 years)**

Severn Estuary, SAC: Decommissioning (duration approx 30 years)	
Water Resources/ Quality	
<b>Potential Impacts: Pathway</b>	Potential for effects on quality/ drainage from interim storage general and radioactive (accidental leakage/ pollution incidents). Potential impacts of toxins/ pollution noted above.
<b>Potential effects on the SAC: Receptor</b>	Potential for effects on quality/ drainage from interim storage general and radioactive (accidental leakage/ pollution incidents).
<b>Risk of Likely Significant Effect (LSE)?</b>	Yes.
<b>Potential Impacts - other Plans and Programmes</b>	<p><b>Severn Barrage – Feasibility Study</b> – Water quality, habitat loss, fragmentation, barriers to migration.</p> <p>Of relevance to understanding environmental condition:</p> <ul style="list-style-type: none"> <li>• Catchment Abstraction Management Strategies</li> <li>• Coastal Habitat Management Plans Frameworks</li> </ul>
<b>Risk from ‘In Combination’ Effects?</b>	Potential indirect effects. Diffuse pollution/ development pressures/ growth in recreational pressure/ disturbance.
<b>AA Required?</b>	Yes

Severn Estuary, SAC: Decommissioning (duration approx 30 years)	
Air Quality	
<b>Potential Impacts: Pathway</b>	Potential for local level effects in line with increased traffic/ transportation/ development.

Severn Estuary, SAC: Decommissioning (duration approx 30 years)	
Air Quality	
<b>Potential effects on the SAC: Receptor</b>	Potential for local level effects in line with increased traffic/ transportation/ development. Air quality not an identified vulnerability for the SAC.
<b>Risk of Likely Significant Effect (LSE)?</b>	Yes.
<b>Potential Impacts - other Plans and Programmes</b>	<p><b>Severn Barrage – Feasibility Study</b> – Water quality, habitat loss, fragmentation, barriers to migration.</p> <p><b>Local Development Frameworks</b> (Gloucester, Bristol, Somerset, south-east Wales)                      Water quality (abstraction, pollution)                      Habitat disturbance (recreation, infrastructure development)</p> <p>Of relevance to understanding environmental condition:</p> <ul style="list-style-type: none"> <li>• Catchment Abstraction Management Strategies</li> <li>• Coastal Habitat Management Plans Frameworks</li> </ul>
<b>Risk from ‘In Combination’ Effects?</b>	<p>Potential indirect effects.</p> <p>Diffuse pollution/ development pressures/ growth in recreational pressure/ disturbance.</p>
<b>AA Required?</b>	Yes

Severn Estuary, SAC: Decommissioning (duration approx 30 years)	
Habitat Fragmentation (Loss and Fragmentation)	
<b>Potential Impacts: Pathway</b>	Changes to footprint of site through decommissioning activities e.g. to accommodate waste storage, develop infrastructure.
<b>Potential effects on the SAC: Receptor</b>	Additional construction activities required during decommissioning can result in a direct loss of terrestrial, marine and sub-tidal habitats given the location of the proposed nominated site on the coast.
<b>Risk of Likely Significant Effect (LSE)?</b>	The impacts of habitat and species loss and fragmentation from decommissioning of the nominated site at Hinkley Point are likely.
<b>Potential Impacts - other Plans and Programmes</b>	<p><b>Severn Barrage – Feasibility Study</b> – Water quality, habitat loss, fragmentation, barriers to migration.</p> <p><b>Local Development Frameworks</b> (Gloucester, Bristol, Somerset, south-east Wales)                      Water quality (abstraction, pollution)                      Habitat disturbance (recreation, infrastructure development)</p> <p>Of relevance to understanding environmental condition:</p> <ul style="list-style-type: none"> <li>• Catchment Abstraction Management Strategies</li> <li>• Coastal Habitat Management Plans Frameworks</li> </ul>
<b>Risk from ‘In Combination’ Effects?</b>	<p>Potential indirect effects.</p> <p>Diffuse pollution/ development pressures/ growth in recreational pressure/ disturbance.</p>
<b>AA Required?</b>	Yes

Severn Estuary SAC: Decommissioning (duration approx 30 years)	
Noise/Light/Visual Disturbance	
<b>Potential Impacts: Pathway</b>	Decommissioning activity and associated de-construction likely to result in significant local increases in noise events, light pollution and visual disturbance in and around the immediate vicinity of the site.
<b>Potential effects on the SPA/Ramsar: Receptor</b>	Disturbance to mudflats and sandflats at the intertidal zone from deconstruction activity.  Deconstruction of offshore infrastructure e.g. marine landing facility and cooling water intake infrastructure can result in disturbance to migratory fish species.
<b>Risk of Likely Significant Effect (LSE)?</b>	Yes.
<b>Potential Impacts - other Plans and Programmes</b>	<b>Severn Barrage – Feasibility Study</b> – Water quality, habitat loss, fragmentation  <b>Local Development Frameworks</b> (Gloucester, Bristol, Somerset, south-east Wales) Water quality (abstraction, pollution) Habitat disturbance (recreation, infrastructure development)  Of relevance to understanding environmental condition: <ul style="list-style-type: none"> <li>• Catchment Abstraction Management Strategies</li> <li>• Coastal Habitat Management Plans Frameworks</li> </ul>
<b>Risk from ‘In Combination’ Effects?</b>	Potential indirect effects in particular from population growth/ disturbance/ human interference both landward and on water.
<b>AA Required?</b>	Yes



## Severn Estuary, SPA/ Ramsar

**Unitary Authority** Vale of Glamorgan; Cardiff; Newport; City of Bristol; Monmouthshire; Gloucestershire; North Somerset; Somerset; South Gloucestershire

### Source: Construction (duration approx 5 years)

Severn Estuary, SPA/Ramsar: Construction (duration approx 5 years)	
Water Quality	
<b>Potential Impacts: Pathway</b>	Potential effects on water quality and drainage from earthworks/ excavations, infrastructure provision (sedimentation, pollution incidents).
<b>Potential effects on the SPA/Ramsar: Receptor</b>	<p>Potential effects on water quality and drainage from earthworks/ excavations, infrastructure provision (sedimentation, pollution incidents). Waterfowl are subject to accumulation of toxins through the food chain, and vulnerable to changes in palatability of prey caused by [toxic] contamination. NE and CCW have identified this is an issue that requires further assessment.</p> <p>Ramsar criterion 4 &amp; 8 note the importance of the estuary for migratory fish species and as a feeding and nursery ground. Fish species are vulnerable to changes in water quality.</p>
<b>Risk of Likely Significant Effect (LSE)?</b>	Yes.
<b>Potential Impacts - other Plans and Programmes</b>	<p><b>Severn Barrage – Feasibility Study</b> – Water quality, habitat loss, fragmentation</p> <p><b>Local Development Frameworks</b> (Gloucester, Bristol, Somerset, south-east Wales) – Water quality (abstraction, pollution). Habitat disturbance (recreation, infrastructure development).</p> <p>Of relevance to understanding environmental condition:</p>

Severn Estuary, SPA/Ramsar: Construction (duration approx 5 years)	
Water Quality	
	<ul style="list-style-type: none"> <li>• Catchment Abstraction Management Strategies</li> <li>• Coastal Habitat Management Plans Frameworks</li> </ul>
<b>Risk from 'In Combination' Effects?</b>	Potential indirect effects in particular from population growth/ disturbance/ human interference both landward and on water.
<b>AA Required?</b>	Yes

Severn Estuary, SPA/Ramsar: Construction (duration approx 5 years)	
Air Quality	
<b>Potential Impacts: Pathway</b>	Potential local impacts from increased development/ traffic growth, and emissions arising from construction activity. Likely to be restricted to a local level e.g. dust/ particulates
<b>Potential effects on the SPA/Ramsar: Receptor</b>	Potential local impacts from increased development/ traffic growth. Air quality not an identified vulnerability for the SPA.
<b>Risk of Likely Significant Effect (LSE)?</b>	Yes.
<b>Potential Impacts - other Plans and Programmes</b>	<p><b>Severn Barrage – Feasibility Study</b> – Water quality, habitat loss, fragmentation</p> <p><b>Local Development Frameworks</b> (Gloucester, Bristol, Somerset, south-east Wales)                      Water quality (abstraction, pollution)                      Habitat disturbance (recreation, infrastructure development)</p> <p>Of relevance to understanding environmental condition:</p> <ul style="list-style-type: none"> <li>• Catchment Abstraction Management Strategies</li> <li>• Coastal Habitat Management Plans Frameworks</li> </ul>
<b>Risk from ‘In Combination’ Effects?</b>	Potential indirect effects in particular from population growth/ disturbance/ human interference both landward and on water.
<b>AA Required?</b>	Yes

Severn Estuary, SPA/Ramsar: Construction (duration approx 5 years)	
Habitats and Species (Loss & Fragmentation)	
<b>Potential Impacts: Pathway</b>	<p>Changes to footprint of site through operation, e.g. to accommodate waste storage, develop infrastructure may lead to the loss of supporting or buffer habitats.</p> <p>The construction and maintenance of permanent infrastructure such as roads, compound sites and waste storage facilities may result in fragmentation of habitats and reduce/alter available corridors for the movement of species across habitats and resources.</p>
<b>Potential effects on the SPA/Ramsar: Receptor</b>	<p>SPA designated species are particularly vulnerable to the physical loss of supporting habitats, especially in the intertidal area which may occur through a change of land use or indirectly through changes to sedimentation.</p> <p>Direct loss of habitat is likely to reduce the availability of feeding and roosting habitat and thus be detrimental to the favourable condition of the SPA interest features, including Annex 1 Bewick's Swan. The construction phase for Site H includes new coastal frontage, direct impacts on designated site.</p>
<b>Risk of Likely Significant Effect (LSE)?</b>	Yes.
<b>Potential Impacts - other Plans and Programmes</b>	<p><b>Severn Barrage – Feasibility Study</b> – Water quality, habitat loss, fragmentation</p> <p><b>Local Development Frameworks</b> (Gloucester, Bristol, Somerset, south-east Wales)                      Water quality (abstraction, pollution)                      Habitat disturbance (recreation, infrastructure development)</p> <p>Of relevance to understanding environmental condition:</p> <ul style="list-style-type: none"> <li>• Catchment Abstraction Management Strategies</li> <li>• Coastal Habitat Management Plans Frameworks</li> </ul>
<b>Risk from 'In</b>	Potential indirect effects in particular from population growth/ disturbance/ human interference both landward and

<b>Severn Estuary, SPA/Ramsar: Construction (duration approx 5 years)</b>	
<b>Habitats and Species (Loss &amp; Fragmentation)</b>	
<b>Combination' Effects?</b>	on water.
<b>AA Required?</b>	Yes

Severn Estuary, SPA/Ramsar: Construction (duration approx 5 years)	
Coastal Squeeze	
<b>Potential Impacts: Pathway</b>	Construction of infrastructure and facilities relating to the operation of the nuclear power station may result in an encroachment upon land at the coastal fringes. All supporting habitats are sensitive to removal by land reclamation and construction activity.
<b>Potential effects on the SPA/Ramsar: Receptor</b>	Construction and the proposed new site boundaries are directly adjacent to SPA, therefore, strong potential for coastal squeeze which prevents the managed retreat of intertidal habitats necessary to support favourable condition. All habitats supporting species within the SPA are sensitive to removal by land reclamation and construction activity.
<b>Risk of Likely Significant Effect (LSE)?</b>	Yes.
<b>Potential Impacts - other Plans and Programmes</b>	<p><b>Severn Barrage – Feasibility Study</b> – Water quality, habitat loss, fragmentation</p> <p><b>Local Development Frameworks</b> (Gloucester, Bristol, Somerset, south-east Wales)                      Water quality (abstraction, pollution)                      Habitat disturbance (recreation, infrastructure development)</p> <p>Of relevance to understanding environmental condition:</p> <ul style="list-style-type: none"> <li>• Catchment Abstraction Management Strategies</li> <li>• Coastal Habitat Management Plans Frameworks</li> </ul>
<b>Risk from ‘In Combination’ Effects?</b>	Potential indirect effects in particular from population growth/ disturbance/ human interference both landward and on water.
<b>AA Required?</b>	Yes

Severn Estuary, SPA/Ramsar: Construction (duration approx 5 years)	
Noise/Light/Visual Disturbance	
<b>Potential Impacts: Pathway</b>	The construction phase extends over 5-6 years with potential for significant increases in noise/ light and visual changes during the construction period.
<b>Potential effects on the SPA/Ramsar: Receptor</b>	The construction phase extends over 5-6 years with potential for significant increases in noise/ light and visual changes during the construction period. Overwintering birds are disturbed by sudden movements and noise which can displace them from their feeding grounds. The Bewick Swan in particular is affected by disturbance from the landward side. NE & CCW note that supporting habitats are highly vulnerable to noise and visual disturbance.
<b>Risk of Likely Significant Effect (LSE)?</b>	Yes.
<b>Potential Impacts - other Plans and Programmes</b>	<p><b>Severn Barrage – Feasibility Study</b> – Water quality, habitat loss, fragmentation</p> <p><b>Local Development Frameworks</b> (Gloucester, Bristol, Somerset, south-east Wales) Water quality (abstraction, pollution) Habitat disturbance (recreation, infrastructure development)</p> <p>Of relevance to understanding environmental condition:</p> <ul style="list-style-type: none"> <li>• Catchment Abstraction Management Strategies</li> <li>• Coastal Habitat Management Plans Frameworks</li> </ul>
<b>Risk from ‘In Combination’ Effects?</b>	Potential indirect effects in particular from population growth/ disturbance/ human interference both landward and on water.
<b>AA Required?</b>	Yes

**Source: Operation (duration approx 60 years)**

Severn Estuary, SPA/Ramsar: Operation (duration approx 60 years)	
Water Resources/ Quality	
<b>Potential Impacts: Pathway</b>	Potential impacts on quality from discharges (radioactive and non-radioactive). Intake of water for cooling and discharge of (heated) cooling water to main estuary.
<b>Potential effects on the SPA/Ramsar: Receptor</b>	<p>Potential impacts on quality from discharges (radioactive and non-radioactive). Changes to composition can impact species composition/ encourage excessive algal growth – results in wider impacts on dependant bird species. Waterfowl are particularly subject to the accumulation of toxins through the food chain. The estuary is vulnerable to oil spills and discharges of toxins which bind to sediments. CCW &amp; NE have indicated that impacts require further assessment.</p> <p>Ramsar criterion 4 &amp; 8 note the importance of the estuary for migratory fish species and as a feeding and nursery ground. Fish species are vulnerable to changes in water quality and temperature.</p>
<b>Risk of Likely Significant Effect (LSE)?</b>	Yes.
<b>Potential Impacts - other Plans and Programmes</b>	<p><b>Severn Barrage – Feasibility Study</b> – Water quality, habitat loss, fragmentation</p> <p><b>Local Development Frameworks</b> (Gloucester, Bristol, Somerset, south-east Wales)                      Water quality (abstraction, pollution)                      Habitat disturbance (recreation, infrastructure development)</p> <p>Of relevance to understanding environmental condition:</p> <ul style="list-style-type: none"> <li>• Catchment Abstraction Management Strategies</li> <li>• Coastal Habitat Management Plans Frameworks</li> </ul>
<b>Risk from 'In Combination' Effects?</b>	Potential indirect effects in particular from population growth/ disturbance/ human interference both landward and on water.
<b>AA Required?</b>	Yes



Severn Estuary, SPA/Ramsar: Operation (duration approx 60 years)	
Air Quality	
<b>Potential Impacts: Pathway</b>	Potential local impacts from increased development/ traffic growth.
<b>Potential effects on the SPA/Ramsar: Receptor</b>	Potential local impacts from increased development/ traffic growth. Air quality not an identified vulnerability for the Estuary.
<b>Risk of Likely Significant Effect (LSE)?</b>	Yes.
<b>Potential Impacts - other Plans and Programmes</b>	<p><b>Severn Barrage – Feasibility Study</b> – Water quality, habitat loss, fragmentation</p> <p><b>Local Development Frameworks</b> (Gloucester, Bristol, Somerset, south-east Wales)                      Water quality (abstraction, pollution)                      Habitat disturbance (recreation, infrastructure development)</p> <p>Of relevance to understanding environmental condition:</p> <ul style="list-style-type: none"> <li>• Catchment Abstraction Management Strategies</li> <li>• Coastal Habitat Management Plans Frameworks</li> </ul>
<b>Risk from ‘In Combination’ Effects?</b>	Potential indirect effects in particular from population growth/ disturbance/ human interference both landward and on water.
<b>AA Required?</b>	Yes

Severn Estuary, SPA/Ramsar: Operation (duration approx 60 years)

<b>Habitats and Species (Loss &amp; Fragmentation)</b>	
<b>Potential Impacts: Pathway</b>	Potential for fragmentation of habitat through loss of buffer habitats (land between designated areas) for nominated site. The construction and maintenance of permanent infrastructure such as roads, compound sites and waste storage facilities may result in fragmentation of habitats and reduce/alter available corridors for the movement of species across habitats and resources.
<b>Potential effects on the SPA/Ramsar: Receptor</b>	Potential for fragmentation of habitat through loss of buffer habitats (land between designated areas) for proposed site. Particular issues for sightlines between feeding and roosting sites for bird species as noted in conservation objectives for all SPA interest features.
<b>Risk of Likely Significant Effect (LSE)?</b>	Yes.
<b>Potential Impacts - other Plans and Programmes</b>	<p><b>Severn Barrage – Feasibility Study</b> – Water quality, habitat loss, fragmentation</p> <p><b>Local Development Frameworks</b> (Gloucester, Bristol, Somerset, south-east Wales) Water quality (abstraction, pollution) Habitat disturbance (recreation, infrastructure development)</p> <p>Of relevance to understanding environmental condition:</p> <ul style="list-style-type: none"> <li>• Catchment Abstraction Management Strategies</li> <li>• Coastal Habitat Management Plans Frameworks</li> </ul>
<b>Risk from ‘In Combination’ Effects?</b>	Potential indirect effects in particular from population growth/ disturbance/ human interference both landward and on water.
<b>AA Required?</b>	Yes

Severn Estuary, SPA/Ramsar: Operation (duration approx 60 years)	
Noise/Light/Visual Disturbance	
<b>Potential Impacts: Pathway</b>	Operational activity may result in significant local increases in noise and vibration events, light pollution and visual disturbance in and around the immediate vicinity of the site.
<b>Potential effects on the SPA/Ramsar: Receptor</b>	Operation of offshore infrastructure e.g. cooling water intake infrastructure can result in disturbance to migratory fish species designated within the Ramsar site, affecting their migration and reproductive behaviour.  Disturbance to fish can result in displacement, reduced feeding capacity, and impact upon breeding/ survival rates.
<b>Risk of Likely Significant Effect (LSE)?</b>	Yes.  Significant risk from project alone – direct impacts (habitat loss) and range of indirect effects that likely to be significant, including noise/light/ disturbance of species and supporting habitats.
<b>Potential Impacts - other Plans and Programmes</b>	<b>Severn Barrage – Feasibility Study</b> – Water quality, habitat loss, fragmentation  <b>Local Development Frameworks</b> (Gloucester, Bristol, Somerset, south-east Wales) Water quality (abstraction, pollution) Habitat disturbance (recreation, infrastructure development)  Of relevance to understanding environmental condition: <ul style="list-style-type: none"> <li>• Catchment Abstraction Management Strategies</li> <li>• Coastal Habitat Management Plans Frameworks</li> </ul>
<b>Risk from 'In Combination' Effects?</b>	Potential indirect effects in particular from population growth/ disturbance/ human interference both landward and on water.
<b>AA Required?</b>	Yes

## Source: Decommissioning (duration approx 30 years)

Severn Estuary, SPA/Ramsar: Decommissioning (duration approx 30 years)	
Water Resources / Quality	
<b>Potential Impacts: Pathway</b>	Potential for effects on quality/ drainage from interim storage general and radioactive (accidental leakage/ pollution incidents). Potential impacts of toxins/ pollution noted above.
<b>Potential effects on the SPA/Ramsar: Receptor</b>	Potential for effects on quality/ drainage from interim storage general and radioactive (accidental leakage/ pollution incidents). Potential impacts of toxins/ pollution noted above. Ramsar criterion 4&8 note the importance of the estuary for migratory fish species and as a feeding and nursery ground. Fish species are vulnerable to changes in water quality
<b>Risk of Likely Significant Effect (LSE)?</b>	Yes.
<b>Potential Impacts - other Plans and Programmes</b>	<p><b>Severn Barrage – Feasibility Study</b> – Water quality, habitat loss, fragmentation</p> <p><b>Local Development Frameworks</b> (Gloucester, Bristol, Somerset, south-east Wales) Water quality (abstraction, pollution) Habitat disturbance (recreation, infrastructure development)</p> <p>Of relevance to understanding environmental condition:</p> <ul style="list-style-type: none"> <li>• Catchment Abstraction Management Strategies</li> <li>• Coastal Habitat Management Plans Frameworks</li> </ul>
<b>Risk from ‘In Combination’ Effects?</b>	Potential indirect effects in particular from population growth/ disturbance/ human interference both landward and on water.
<b>AA Required?</b>	Yes

Severn Estuary, SPA/Ramsar: Decommissioning (duration approx 30 years)	
Air Quality	
<b>Potential Impacts: Pathway</b>	Potential for local level effects in line with increased traffic/ transportation/ development.
<b>Potential effects on the SPA/Ramsar: Receptor</b>	Potential for local level effects in line with increased traffic/ transportation/ development. Air quality not an identified vulnerability for the SPA.
<b>Risk of Likely Significant Effect (LSE)?</b>	Yes.
<b>Potential Impacts - other Plans and Programmes</b>	<p><b>Severn Barrage – Feasibility Study</b> – Water quality, habitat loss, fragmentation</p> <p><b>Local Development Frameworks</b> (Gloucester, Bristol, Somerset, south-east Wales)                      Water quality (abstraction, pollution)                      Habitat disturbance (recreation, infrastructure development)</p> <p>Of relevance to understanding environmental condition:</p> <ul style="list-style-type: none"> <li>• Catchment Abstraction Management Strategies</li> <li>• Coastal Habitat Management Plans Frameworks</li> </ul>
<b>Risk from ‘In Combination’ Effects?</b>	Potential indirect effects in particular from population growth/ disturbance/ human interference both landward and on water.
<b>AA Required?</b>	Yes

Severn Estuary, SPA/Ramsar: Decommissioning (duration approx 30 years)	
Habitat Fragmentation (Loss and Fragmentation)	
<b>Potential Impacts: Pathway</b>	Changes to footprint of site through decommissioning activities e.g. to accommodate waste storage, develop infrastructure.
<b>Potential effects on the SAC: Receptor</b>	Additional construction activities required during decommissioning can result in a direct loss of terrestrial, marine and sub-tidal habitats given the location of the proposed nominated site on the coast.
<b>Risk of Likely Significant Effect (LSE)?</b>	The impacts of habitat and species loss and fragmentation from decommissioning of the nominated site at Hinkley Point are likely.
<b>Potential Impacts - other Plans and Programmes</b>	<p><b>Severn Barrage – Feasibility Study</b> – Water quality, habitat loss, fragmentation, barriers to migration.</p> <p><b>Local Development Frameworks</b> (Gloucester, Bristol, Somerset, south-east Wales)                      Water quality (abstraction, pollution)                      Habitat disturbance (recreation, infrastructure development)</p> <p>Of relevance to understanding environmental condition:</p> <ul style="list-style-type: none"> <li>• Catchment Abstraction Management Strategies</li> <li>• Coastal Habitat Management Plans Frameworks</li> </ul>
<b>Risk from 'In Combination' Effects?</b>	<p>Potential indirect effects.</p> <p>Diffuse pollution/ development pressures/ growth in recreational pressure/ disturbance.</p>
<b>AA Required?</b>	Yes

<b>Severn Estuary SPA/Ramsar: Decommissioning (duration approx 30 years)</b>	
<b>Noise/Light/Visual Disturbance</b>	
<b>Potential Impacts: Pathway</b>	Decommissioning activity and associated de-construction likely to result in significant local increases in noise events, light pollution and visual disturbance in and around the immediate vicinity of the site.
<b>Potential effects on the SPA/Ramsar: Receptor</b>	Disturbance to mudflats and sandflats at the intertidal zone from deconstruction activity.  Deconstruction of offshore infrastructure e.g. marine landing facility and cooling water intake infrastructure can result in disturbance to migratory fish species.
<b>Risk of Likely Significant Effect (LSE)?</b>	Yes.
<b>Potential Impacts - other Plans and Programmes</b>	<b>Severn Barrage – Feasibility Study</b> – Water quality, habitat loss, fragmentation  <b>Local Development Frameworks</b> (Gloucester, Bristol, Somerset, south-east Wales) Water quality (abstraction, pollution) Habitat disturbance (recreation, infrastructure development)  Of relevance to understanding environmental condition: <ul style="list-style-type: none"> <li>• Catchment Abstraction Management Strategies</li> <li>• Coastal Habitat Management Plans Frameworks</li> </ul>
<b>Risk from ‘In Combination’ Effects?</b>	Potential indirect effects in particular from population growth/ disturbance/ human interference both landward and on water.
<b>AA Required?</b>	Yes

## River Usk SAC

**Unitary Authority** Vale of Glamorgan; Cardiff; Newport; City of Bristol; Monmouthshire; Gloucestershire; North Somerset; Somerset; South Gloucestershire

### Source: Construction (duration approx 5 years)

River Usk SAC: Construction (duration approx 5 years)	
Water Resources/Quality	
<b>Potential Impacts: Pathway</b>	Potential effects on water quality and drainage from earthworks/ excavations, infrastructure provision, sedimentation, pollution incidents.
<b>Potential effects on the SAC: Receptor</b>	Potential effects on water quality and drainage from earthworks/ excavations, infrastructure provision (sedimentation, pollution incidents). SAC is vulnerable to changes in nutrient loading and toxic compounds.
<b>Risk of Likely Significant Effect (LSE)?</b>	The impacts of the construction of the nominated site at Hinkley Point on water quality at River Usk SAC are unknown.
<b>Potential Impacts - other Plans and Programmes</b>	<p><b>Severn Barrage – Feasibility Study</b> – Water quality, habitat loss, fragmentation, barriers to migration.</p> <p><b>Local Development Frameworks</b> - Water quality, habitat disturbance (recreation, infrastructure, development).</p> <p><b>Catchment Abstraction Management Plans</b></p> <p><b>Coastal Habitat Management Plans Frameworks</b></p> <p><b>Severn Barrage – Feasibility Study</b> – Water quality, habitat loss, fragmentation, barriers to migration.</p> <p><b>Local Development Frameworks</b> - Water quality, habitat disturbance (recreation, infrastructure, development).</p>



River Usk SAC: Construction (duration approx 5 years)	
Water Resources/Quality	
<b>Risk from 'In Combination' Effects?</b>	Potential indirect effects. Diffuse pollution/ development pressures/ growth in recreational pressure/ disturbance.
<b>AA Required?</b>	Yes

River Usk SAC: Construction (duration approx 5 years)	
Habitats (& Species) Loss and Fragmentation	
<b>Potential Impacts: Pathway</b>	Construction of infrastructure, extension of site into 'buffer' habitats, possible development at the coastal fringes
<b>Potential effects on the SAC: Receptor</b>	Adverse impacts upon migratory fish species further along the coast at the nominated site may be transferred to populations at the River Usk.  Any significant effects upon fish populations at the River Usk may also negatively impact upon otter populations.
<b>Risk of Likely Significant Effect (LSE)?</b>	The impacts of habitat and species loss and fragmentation from construction of the nominated site at Hinkley Point are likely.
<b>Potential Impacts - other Plans and Programmes</b>	<b>Severn Barrage – Feasibility Study</b> – Water quality, habitat loss, fragmentation  <b>Catchment Abstraction Management Strategies</b>  <b>Coastal Habitat Management Plans Frameworks</b>  <b>Severn Barrage – Feasibility Study</b> – Water quality, habitat loss, fragmentation  <b>Local Development Frameworks</b> - (Gloucester, Bristol, Somerset, south-east Wales) Water quality (abstraction, pollution) Habitat disturbance (recreation, infrastructure development)
<b>Risk from 'In Combination' Effects?</b>	Potential indirect effects.  Diffuse pollution/ development pressures/ growth in recreational pressure/ disturbance.
<b>AA Required?</b>	Yes

River Usk SAC: Construction (duration approx 5 years)	
Noise/ Light/ Visual Disturbance	
<b>Potential Impacts: Pathway</b>	The construction phase extends over 5-6 years with potential for significant increases in noise/ light and visual changes during the construction period.
<b>Potential effects on the SAC: Receptor</b>	Impacts to migratory fish species that travel between this SAC and the Severn Estuary SAC/SPA/Ramsar site.  Potential disturbance impacts such as fluctuating water levels and/or the change in flow may impact upon on the feeding and breeding cycles of the migratory fish, in particular Allis and Twaite Shad.
<b>Risk of Likely Significant Effect (LSE)?</b>	Direct and Indirect impacts of disturbance on migratory fish species unknown.
<b>Potential Impacts - other Plans and Programmes</b>	<b>Severn Barrage – Feasibility Study</b> – Water quality, habitat loss, fragmentation, barriers to migration.  <b>Local Development Frameworks.</b> Water quality, habitat disturbance (recreation, infrastructure, development).  <b>Catchment Abstraction Management Plans</b>  <b>Coastal Habitat Management Plans Frameworks</b>  <b>Severn Barrage – Feasibility Study</b> – Water quality, habitat loss, fragmentation, barriers to migration.  <b>Local Development Frameworks.</b> Water quality, habitat disturbance (recreation, infrastructure, development)
<b>Risk from ‘In Combination’ Effects?</b>	Unknown Potential indirect effects. Diffuse pollution/ development pressures/ growth in recreational pressure/ disturbance.
<b>AA Required?</b>	Yes

## Source: Operation (duration approx 60 years)

River Usk SAC: Operation (duration approx 60 years)	
Water Quality	
<b>Potential Impacts: Pathway</b>	Potential impacts on water quality and drainage from planned and accidental discharges (radioactive and non-radioactive), and from the abstraction and discharge of water for cooling (heated water up to 10° warmer than the receiving environment).
<b>Potential effects on the SAC: Receptor</b>	Potential impacts on quality from discharges (radioactive and non-radioactive). Changes to water quality and of water temperature can impact species composition/ encourage excessive algal growth – results in wider impacts on dependant bird species and otter populations.
<b>Risk of Likely Significant Effect (LSE)?</b>	The impacts on water quality from the nominated site at Hinkley Point are unknown
<b>Potential Impacts - other Plans and Programmes</b>	<p><b>Severn Barrage – Feasibility Study</b> – Water quality, habitat loss, fragmentation, barriers to migration.</p> <p><b>Local Development Frameworks.</b> Water quality, habitat disturbance (recreation, infrastructure, development).</p> <p><b>Catchment Abstraction Management Plans</b></p> <p><b>Coastal Habitat Management Plans Frameworks</b></p> <p><b>Severn Barrage – Feasibility Study</b> – Water quality, habitat loss, fragmentation, barriers to migration.</p> <p><b>Local Development Frameworks.</b> Water quality, habitat disturbance (recreation, infrastructure, development).</p>
<b>Risk from ‘In Combination’ Effects?</b>	<p>Unknown</p> <p>Potential indirect effects.</p> <p>Diffuse pollution/ development pressures/ growth in recreational pressure/ disturbance.</p>
<b>AA Required?</b>	Yes

River Usk SAC: Operation (duration approx 60 years)	
Habitats (& Species) Loss and Fragmentation	
<b>Potential Impacts: Pathway</b>	<p>Impingement and entrainment of fish (larvae and eggs) and other aquatic species at water intakes/condenser units.</p> <p>The presence of physical barriers such as marine off-shore landing facility and water cooling infrastructure can impact upon breeding and movement of migratory fish species.</p>
<b>Potential effects on the SAC: Receptor</b>	<p>Impingement and entrainment of fish (larvae and eggs) and other aquatic species at water intakes/condenser units. Species of migratory fish move through the Severn Estuary between the sea and the Rivers Usk.</p> <p>The presence of physical barriers such as marine off-shore landing facility and water cooling infrastructure can impact upon breeding and movement of migratory fish species.</p>
<b>Risk of Likely Significant Effect (LSE)?</b>	The impacts on habitats and species of the operation of the nominated site at Hinkley Point are unknown.
<b>Potential Impacts - other Plans and Programmes</b>	<p><b>Severn Barrage – Feasibility Study</b> – Water quality, habitat loss, fragmentation, barriers to migration.</p> <p><b>Local Development Frameworks.</b> Water quality, habitat disturbance (recreation, infrastructure, development).</p> <p><b>Catchment Abstraction Management Plans</b></p> <p><b>Coastal Habitat Management Plans Frameworks</b></p> <p><b>Severn Barrage – Feasibility Study</b> – Water quality, habitat loss, fragmentation, barriers to migration.</p> <p><b>Local Development Frameworks.</b> Water quality, habitat disturbance (recreation, infrastructure, development).</p>
<b>Risk from ‘In Combination’ Effects?</b>	<p>Unknown</p> <p>Potential indirect effects.</p> <p>Diffuse pollution/ development pressures/ growth in recreational pressure/ disturbance.</p>
<b>AA Required?</b>	Yes

River Usk SAC: Operation (duration approx 60 years)	
Noise/Light/Visual Disturbance	
<b>Potential Impacts: Pathway</b>	Operational activity may result in significant local increases in noise and vibration events, light pollution and visual disturbance in and around the immediate vicinity of the site.
<b>Potential effects on the SAC: Receptor</b>	Impacts to migratory fish species that travel between this SAC and the Severn Estuary SAC/SPA/Ramsar site. Potential disturbance impacts such as fluctuating water levels and or the change in flow may impact upon on the feeding and breeding cycles of the migratory fish, in particular Allis and Twaite Shad.
<b>Risk of Likely Significant Effect (LSE)?</b>	The impacts of disturbance arising from the nominated site at Hinkley Point are unknown.
<b>Potential Impacts - other Plans and Programmes</b>	<p><b>Severn Barrage – Feasibility Study</b> – Water quality, habitat loss, fragmentation, barriers to migration.</p> <p><b>Local Development Frameworks.</b> Water quality, habitat disturbance (recreation, infrastructure, development).</p> <p><b>Catchment Abstraction Management Plans</b></p> <p><b>Coastal Habitat Management Plans Frameworks</b></p> <p><b>Severn Barrage – Feasibility Study</b> – Water quality, habitat loss, fragmentation, barriers to migration.</p> <p><b>Local Development Frameworks.</b> Water quality, habitat disturbance (recreation, infrastructure, development).</p>
<b>Risk from ‘In Combination’ Effects?</b>	Unknown Potential indirect effects. Diffuse pollution/ development pressures/ growth in recreational pressure/ disturbance.
<b>AA Required?</b>	Yes

## Source: Decommissioning (duration approx 30 years)

River Usk SAC: Decommissioning (duration approx 30 years)	
Water Quality	
<b>Potential Impacts: Pathway</b>	Potential effects on water quality and drainage from [de]construction activities, earthworks, infrastructure, waste storage.
<b>Potential effects on the SAC: Receptor</b>	SAC is vulnerable to changes in nutrient loading and toxic compounds. Addition of (warmer) water to aquatic system. Potential for thermal inclines/ barriers to migration as a result of thermal discharges.
<b>Risk of Likely Significant Effect (LSE)?</b>	The impacts on water quality from the nominated site at Hinkley Point are unknown.
<b>Potential Impacts - other Plans and Programmes</b>	<p><b>Severn Barrage – Feasibility Study</b> – Water quality, habitat loss, fragmentation, barriers to migration.</p> <p><b>Local Development Frameworks.</b> Water quality, habitat disturbance (recreation, infrastructure, development).</p> <p><b>Catchment Abstraction Management Plans</b></p> <p><b>Coastal Habitat Management Plans Frameworks</b></p> <p><b>Severn Barrage – Feasibility Study</b> – Water quality, habitat loss, fragmentation, barriers to migration.</p> <p><b>Local Development Frameworks.</b> Water quality, habitat disturbance (recreation, infrastructure, development).</p>
<b>Risk from ‘In Combination’ Effects?</b>	The indirect impacts of decommissioning on water and air quality on the River Usk SAC are unknown.
<b>AA Required?</b>	Yes

River Usk SAC: Decommissioning (duration approx 30 years)	
Habitats (& Species) Loss and Fragmentation	
<b>Potential Impacts: Pathway</b>	Changes to footprint of site through decommissioning activities e.g. to accommodate waste storage, develop infrastructure.
<b>Potential effects on the SAC: Receptor</b>	Additional construction activities required during decommissioning may impact upon migratory fish species at European sites adjacent to the development. This may affect the population dispersal of those species to the River Usk SAC, as species of migratory fish move through the estuary between the sea and the River Usk.
<b>Risk of Likely Significant Effect (LSE)?</b>	The impacts of habitat and species loss and fragmentation from decommissioning of the nominated site at Hinkley Point are likely.
<b>Potential Impacts - other Plans and Programmes</b>	<p><b>Severn Barrage – Feasibility Study</b> – Water quality, habitat loss, fragmentation, barriers to migration.</p> <p><b>Local Development Frameworks.</b> Water quality, habitat disturbance (recreation, infrastructure, development).</p> <p><b>Catchment Abstraction Management Plans</b></p> <p><b>Coastal Habitat Management Plans Frameworks</b></p> <p><b>Severn Barrage – Feasibility Study</b> – Water quality, habitat loss, fragmentation, barriers to migration.</p> <p><b>Local Development Frameworks.</b> Water quality, habitat disturbance (recreation, infrastructure, development).</p>
<b>Risk from ‘In Combination’ Effects?</b>	Unknown Potential indirect effects. Diffuse pollution/ development pressures/ growth in recreational pressure/ disturbance.
<b>AA Required?</b>	Yes



River Usk SAC: Decommissioning (duration approx 30 years)	
Noise/ Light/ Visual Disturbance	
<b>Potential Impacts: Pathway</b>	Decommissioning activity and associated de-construction likely to result in significant local increases in noise events, light pollution and visual disturbance in and around the immediate vicinity of the site.
<b>Potential effects on the SAC: Receptor</b>	Impacts to migratory fish species that travel between this SAC and the Severn Estuary SAC/SPA/Ramsar site.  Potential disturbance impacts such as fluctuating water levels and or the change in flow may impact upon on the feeding and breeding cycles of the migratory fish, in particular Allis and Twaite Shad.
<b>Risk of Likely Significant Effect (LSE)?</b>	The impacts of disturbance on the River Usk SAC from the decommissioning at Hinkley Point are unknown.
<b>Potential Impacts - other Plans and Programmes</b>	<p><b>Severn Barrage – Feasibility Study</b> – Water quality, habitat loss, fragmentation, barriers to migration.</p> <p><b>Local Development Frameworks.</b> Water quality, habitat disturbance (recreation, infrastructure, development).</p> <p><b>Catchment Abstraction Management Plans</b></p> <p><b>Coastal Habitat Management Plans Frameworks</b></p> <p><b>Severn Barrage – Feasibility Study</b> – Water quality, habitat loss, fragmentation, barriers to migration.</p> <p><b>Local Development Frameworks.</b> Water quality, habitat disturbance (recreation, infrastructure, development).</p>
<b>Risk from ‘In Combination’ Effects?</b>	The indirect impacts of decommissioning on water and air quality on the River Usk SAC are unknown.
<b>AA Required?</b>	Yes

## River Wye SAC

Unitary Authority

### Source: Construction (duration approx 5 years)

River Wye SAC: Construction (duration approx 5 years)	
Water Quality	
<b>Potential Impacts: Pathway</b>	Potential effects on water quality and drainage from earthworks/ excavations, infrastructure provision, sedimentation, pollution incidents
<b>Potential effects on the SAC: Receptor</b>	Potential effects on water quality and drainage from earthworks/ excavations, infrastructure provision (sedimentation, pollution incidents). SAC is vulnerable to changes in nutrient loading and toxic compounds.
<b>Risk of Likely Significant Effect (LSE)?</b>	The impacts of the nominated site at Hinkley Point on water quality at River Wye SAC are unknown.
<b>Potential Impacts - other Plans and Programmes</b>	<p><b>Severn Barrage – Feasibility Study</b> – Water quality, habitat loss, fragmentation</p> <p><b>Local Development Frameworks</b> (Gloucester, Bristol, Somerset, south-east Wales) Water quality (abstraction, pollution) Habitat disturbance (recreation, infrastructure development)</p> <p><b>Catchment Abstraction Management Strategies</b></p> <p><b>Coastal Habitat Management Plans Frameworks</b></p> <p><b>Severn Barrage – Feasibility Study</b> – Water quality, habitat loss, fragmentation</p> <p><b>Local Development Frameworks</b> (Gloucester, Bristol, Somerset, south-east Wales)</p>

River Wye SAC: Construction (duration approx 5 years)	
Water Quality	
	Water quality (abstraction, pollution) Habitat disturbance (recreation, infrastructure development)
<b>Risk from 'In Combination' Effects?</b>	Potential indirect effects.  Diffuse pollution/ development pressures/ growth in recreational pressure/ disturbance.
<b>AA Required?</b>	Yes

River Wye SAC: Construction (duration approx 5 years)	
Habitats (& Species) Loss and Fragmentation	
<b>Potential Impacts: Pathway</b>	Construction of infrastructure, extension of site into 'buffer' habitats, possible development at the coastal fringes
<b>Potential effects on the SAC: Receptor</b>	Adverse impacts upon migratory fish species further along the coast at the proposed nominated site may be transferred to populations at the River Wye.  Any significant effects upon fish populations at the River Wye may also negatively impact upon other populations.
<b>Risk of Likely Significant Effect (LSE)?</b>	The impacts of habitat and species loss and fragmentation from construction of the nominated site at Hinkley Point are likely.
<b>Potential Impacts - other Plans and Programmes</b>	<p><b>Severn Barrage – Feasibility Study</b> – Water quality, habitat loss, fragmentation</p> <p><b>Local Development Frameworks</b> (Gloucester, Bristol, Somerset, south-east Wales) Water quality (abstraction, pollution) Habitat disturbance (recreation, infrastructure development)</p> <p><b>Catchment Abstraction Management Strategies</b></p> <p><b>Coastal Habitat Management Plans Frameworks</b></p> <p><b>Severn Barrage – Feasibility Study</b> – Water quality, habitat loss, fragmentation</p> <p><b>Local Development Frameworks</b> (Gloucester, Bristol, Somerset, south-east Wales) Water quality (abstraction, pollution) Habitat disturbance (recreation, infrastructure development)</p>
<b>Risk from 'In Combination' Effects?</b>	Potential indirect effects.

<b>River Wye SAC: Construction (duration approx 5 years)</b>	
<b>Habitats (&amp; Species) Loss and Fragmentation</b>	
	Diffuse pollution/ development pressures/ growth in recreational pressure/ disturbance.
<b>AA Required?</b>	Yes

River Wye SAC: Construction (duration approx 5 years)	
Noise/Light/Visual Disturbance	
<b>Potential Impacts: Pathway</b>	The construction phase extends over 5-6 years with potential for significant increases in noise/ light and visual changes during the construction period.
<b>Potential effects on the SAC: Receptor</b>	Impacts to migratory fish species that travel between this SAC and the Severn Estuary SAC/SPA/Ramsar site.  Potential disturbance impacts such as fluctuating water levels and/or the change in flow may impact upon on the feeding and breeding cycles of the migratory fish, in particular Allis and Twaite Shad.
<b>Risk of Likely Significant Effect (LSE)?</b>	Direct and Indirect impacts of disturbance on migratory fish species unknown.
<b>Potential Impacts - other Plans and Programmes</b>	<p><b>Severn Barrage – Feasibility Study</b> – Water quality, habitat loss, fragmentation</p> <p><b>Local Development Frameworks</b> (Gloucester, Bristol, Somerset, south-east Wales) Water quality (abstraction, pollution) Habitat disturbance (recreation, infrastructure development)</p> <p><b>Catchment Abstraction Management Strategies</b></p> <p><b>Coastal Habitat Management Plans Frameworks</b></p> <p><b>Severn Barrage – Feasibility Study</b> – Water quality, habitat loss, fragmentation</p> <p><b>Local Development Frameworks</b> (Gloucester, Bristol, Somerset, south-east Wales) Water quality (abstraction, pollution) Habitat disturbance (recreation, infrastructure development)</p>
<b>Risk from ‘In Combination’ Effects?</b>	Potential indirect effects.

River Wye SAC: Construction (duration approx 5 years)	
Noise/Light/Visual Disturbance	
	Diffuse pollution/ development pressures/ growth in recreational pressure/ disturbance.
<b>AA Required?</b>	Yes

## Source: Operation (duration approx 60 years)

River Wye SAC: Operation (duration approx 60 years)	
Water Quality	
<b>Potential Impacts: Pathway</b>	Potential impacts on water quality and drainage from planned and accidental discharges (radioactive and non-radioactive), and from the abstraction and discharge of water for cooling (heated water up to 10° warmer than the receiving environment).
<b>Potential effects on the SAC: Receptor</b>	<p>Potential impacts on quality from discharges (radioactive and non-radioactive). Changes to water quality and of water temperature can impact species composition/ encourage excessive algal growth – results in wider impacts on dependant bird species and otter populations.</p> <p>Potential disturbance impacts such as fluctuating water levels and/or the change in flow may impact upon on the feeding and breeding cycles of the migratory fish, in particular Allis and Twaite Shad.</p>
<b>Risk of Likely Significant Effect (LSE)?</b>	The indirect impacts to water quality from operation at the nominated site are unknown.
<b>Potential Impacts - other Plans and Programmes</b>	<p><b>Severn Barrage – Feasibility Study</b> – Water quality, habitat loss, fragmentation</p> <p><b>Local Development Frameworks</b> (Gloucester, Bristol, Somerset, south-east Wales)                      Water quality (abstraction, pollution)                      Habitat disturbance (recreation, infrastructure development)</p> <p><b>Catchment Abstraction Management Strategies</b></p> <p><b>Coastal Habitat Management Plans Frameworks</b></p> <p><b>Severn Barrage – Feasibility Study</b> – Water quality, habitat loss, fragmentation</p>



River Wye SAC: Operation (duration approx 60 years)	
Water Quality	
	<p><b>Local Development Frameworks</b> (Gloucester, Bristol, Somerset, south-east Wales)</p> <p>Water quality (abstraction, pollution)</p> <p>Habitat disturbance (recreation, infrastructure development)</p>
<b>Risk from 'In Combination' Effects?</b>	<p>Potential indirect effects.</p> <p>Diffuse pollution/ development pressures/ growth in recreational pressure/ disturbance.</p>
<b>AA Required?</b>	Yes

River Wye SAC: Operation (duration approx 60 years)	
Habitats (& Species) Loss and Fragmentation	
<b>Potential Impacts: Pathway</b>	Impingement and entrainment of fish (larvae and eggs) and other aquatic species at water intakes/condenser units. The presence of physical barriers such as marine off-shore landing facility and water cooling infrastructure can impact upon breeding and movement of migratory fish species.
<b>Potential effects on the SAC: Receptor</b>	Impacts to migratory fish species that travel between this SAC and the Severn Estuary SAC/SPA/Ramsar site.  Potential disturbance impacts such as fluctuating water levels and or the change in flow may impact upon on the feeding and breeding cycles of the migratory fish, in particular Allis and Twaite Shad.
<b>Risk of Likely Significant Effect (LSE)?</b>	The impacts of habitat and species loss and fragmentation from operation of the nominated site at Hinkley Point are likely.
<b>Potential Impacts - other Plans and Programmes</b>	<p><b>Severn Barrage – Feasibility Study</b> – Water quality, habitat loss, fragmentation</p> <p><b>Local Development Frameworks</b> (Gloucester, Bristol, Somerset, south-east Wales) Water quality (abstraction, pollution) Habitat disturbance (recreation, infrastructure development)</p> <p><b>Catchment Abstraction Management Strategies</b></p> <p><b>Coastal Habitat Management Plans Frameworks</b></p> <p><b>Severn Barrage – Feasibility Study</b> – Water quality, habitat loss, fragmentation</p> <p><b>Local Development Frameworks</b> (Gloucester, Bristol, Somerset, south-east Wales) Water quality (abstraction, pollution)</p>

River Wye SAC: Operation (duration approx 60 years)	
Habitats (& Species) Loss and Fragmentation	
	Habitat disturbance (recreation, infrastructure development)
<b>Risk from 'In Combination' Effects?</b>	Potential indirect effects.  Diffuse pollution/ development pressures/ growth in recreational pressure/ disturbance.
<b>AA Required?</b>	Yes

River Wye SAC: Operation (duration approx 60 years)	
Noise/Light/Visual Disturbance	
<b>Potential Impacts: Pathway</b>	Operational activity may result in significant local increases in noise and vibration events, light pollution and visual disturbance in and around the immediate vicinity of the site.
<b>Potential effects on the SAC: Receptor</b>	<p>Impacts to migratory fish species that travel between this SAC and the Severn Estuary SAC/SPA/Ramsar site.</p> <p>Potential disturbance impacts such as fluctuating water levels and or the change in flow may impact upon on the feeding and breeding cycles of the migratory fish, in particular Allis and Twaite Shad.</p>
<b>Risk of Likely Significant Effect (LSE)?</b>	The impacts of disturbance arising from the operation of the nominated site at Hinkley Point are unknown.
<b>Potential Impacts - other Plans and Programmes</b>	<p><b>Severn Barrage – Feasibility Study</b> – Water quality, habitat loss, fragmentation, barriers to migration.</p> <p><b>Local Development Frameworks.</b> Water quality, habitat disturbance (recreation, infrastructure, development).</p> <p><b>Catchment Abstraction Management Plans</b></p> <p><b>Coastal Habitat Management Plans Frameworks</b></p> <p><b>Severn Barrage – Feasibility Study</b> – Water quality, habitat loss, fragmentation, barriers to migration.</p> <p><b>Local Development Frameworks.</b> Water quality, habitat disturbance (recreation, infrastructure, development).</p>
<b>Risk from ‘In Combination’ Effects?</b>	<p>Unknown</p> <p>Potential indirect effects.</p> <p>Diffuse pollution/ development pressures/ growth in recreational pressure/ disturbance.</p>
<b>A Required?</b>	Yes

## Source: Decommissioning (duration approx 30 years)

River Wye SAC: Decommissioning (duration approx 30 years)	
Water Quality	
<b>Potential Impacts: Pathway</b>	Potential effects on water quality and drainage from [de]construction activities, earthworks, infrastructure, waste storage.
<b>Potential effects on the SAC: Receptor</b>	This SAC is vulnerable to changes in nutrient loading and toxic compounds. Addition of (warmer) water to aquatic system. Potential for thermal inclines/ barriers to migration as a result of thermal discharges.
<b>Risk of Likely Significant Effect (LSE)?</b>	The indirect impacts of decommissioning on water and air quality on the River Wye SAC are unknown.
<b>Potential Impacts - other Plans and Programmes</b>	<p><b>Severn Barrage – Feasibility Study</b> – Water quality, habitat loss, fragmentation</p> <p><b>Local Development Frameworks</b> (Gloucester, Bristol, Somerset, south-east Wales)                      Water quality (abstraction, pollution)                      Habitat disturbance (recreation, infrastructure development)</p> <p><b>Catchment Abstraction Management Strategies</b></p> <p><b>Coastal Habitat Management Plans Frameworks</b></p> <p><b>Severn Barrage – Feasibility Study</b> – Water quality, habitat loss, fragmentation</p> <p><b>Local Development Frameworks</b> (Gloucester, Bristol, Somerset, south-east Wales)                      Water quality (abstraction, pollution)                      Habitat disturbance (recreation, infrastructure development)</p>

River Wye SAC: Decommissioning (duration approx 30 years)	
Water Quality	
Risk from 'In Combination' Effects?	Unknown
AA Required?	Yes

River Wye SAC: Decommissioning (duration approx 30 years)	
Habitats (& Species) Loss and Fragmentation	
<b>Potential Impacts: Pathway</b>	Changes to footprint of site through decommissioning activities e.g. to accommodate waste storage, develop infrastructure.
<b>Potential effects on the SAC: Receptor</b>	Additional construction activities required during decommissioning may impact upon migratory fish species at European sites adjacent to the proposed development. This may affect the population dispersal of those species to the River Wye SAC, as species of migratory fish move through the estuary between the sea and the River Wye.  Any loss or reduction of fish populations may impact upon otters.
<b>Risk of Likely Significant Effect (LSE)?</b>	The impacts of habitat and species loss and fragmentation from decommissioning of the nominated site at Hinkley Point are likely.
<b>Potential Impacts - other Plans and Programmes</b>	<p><b>Severn Barrage – Feasibility Study</b> – Water quality, habitat loss, fragmentation</p> <p><b>Local Development Frameworks</b> (Gloucester, Bristol, Somerset, south-east Wales) Water quality (abstraction, pollution) Habitat disturbance (recreation, infrastructure development)</p> <p><b>Catchment Abstraction Management Strategies</b></p> <p><b>Coastal Habitat Management Plans Frameworks</b></p> <p><b>Severn Barrage – Feasibility Study</b> – Water quality, habitat loss, fragmentation</p> <p><b>Local Development Frameworks</b> (Gloucester, Bristol, Somerset, south-east Wales) Water quality (abstraction, pollution) Habitat disturbance (recreation, infrastructure development)</p>
<b>Risk from 'In</b>	Potential indirect effects.

River Wye SAC: Decommissioning (duration approx 30 years)	
Habitats (& Species) Loss and Fragmentation	
<b>Combination' Effects?</b>	Diffuse pollution/ development pressures/ growth in recreational pressure/ disturbance.
<b>AA Required?</b>	Yes



River Wye SAC: Decommissioning (duration approx 30 years)	
Noise/ Light/ Visual Disturbance	
<b>Potential Impacts: Pathway</b>	Decommissioning activity and associated de-construction likely to result in significant local increases in noise events, light pollution and visual disturbance in and around the immediate vicinity of the site.
<b>Potential effects on the SAC: Receptor</b>	Impacts to migratory fish species that travel between this SAC and the Severn Estuary SAC/SPA/Ramsar site.  Potential disturbance impacts such as fluctuating water levels and or the change in flow may impact upon on the feeding and breeding cycles of the migratory fish, in particular Allis and Twaite Shad.
<b>Risk of Likely Significant Effect (LSE)?</b>	The indirect impacts of disturbance arising from the decommissioning of Hinkley Point to the River Wye SAC are unknown.
<b>Potential Impacts - other Plans and Programmes</b>	<p><b>Severn Barrage – Feasibility Study</b> – Water quality, habitat loss, fragmentation</p> <p><b>Local Development Frameworks</b> (Gloucester, Bristol, Somerset, south-east Wales) Water quality (abstraction, pollution) Habitat disturbance (recreation, infrastructure development)</p> <p><b>Catchment Abstraction Management Strategies</b></p> <p><b>Coastal Habitat Management Plans Frameworks</b></p> <p><b>Severn Barrage – Feasibility Study</b> – Water quality, habitat loss, fragmentation</p> <p><b>Local Development Frameworks</b> (Gloucester, Bristol, Somerset, south-east Wales) Water quality (abstraction, pollution) Habitat disturbance (recreation, infrastructure development)</p>

River Wye SAC: Decommissioning (duration approx 30 years)	
Noise/ Light/ Visual Disturbance	
Risk from 'In Combination' Effects?	Unknown
AA Required?	Yes

## Somerset Levels and Moors, SPA/ Ramsar

Unitary Authority: Somerset

### Source: Construction (duration approx 5 years)

Somerset Levels and Moors, SPA/Ramsar: Construction (duration approx 5 years)	
Water Quality	
<b>Potential Impacts: Pathway</b>	Potential effects on water quality and drainage from earthworks/ excavations, infrastructure provision (sedimentation, pollution incidents).
<b>Potential effects on the SPA/Ramsar: Receptor</b>	Potential impacts arising from Hinkley Point in relation to water quality are unlikely to result in direct impacts at this designation. However, the European site's interest features are shared with the Severn Estuary, and there are potential for indirect impacts (i.e. where transitory/ migratory birds common to both sites are affected).
<b>Risk of Likely Significant Effect (LSE)?</b>	Yes.
<b>Potential Impacts - other Plans and Programmes</b>	<p><b>Local Development Frameworks</b> (Somerset, Devon, Dorset) – Water quality (abstraction, pollution) Habitat disturbance (recreation, infrastructure development)</p> <p>Of relevance to understanding environmental condition:</p> <ul style="list-style-type: none"> <li>• Catchment Abstraction Management Strategies</li> <li>• Coastal Habitat Management Plans Frameworks</li> </ul>
<b>Risk from 'In Combination' Effects?</b>	Potential indirect effects in particular from population growth/ disturbance/ human interference both landward and on water.
<b>AA Required?</b>	Yes

## Source: Operation (duration approx 60 years)

Somerset Levels and Moors, SPA/Ramsar: Operation (duration approx 60 years)	
Water Resources/ Quality	
<b>Potential Impacts: Pathway</b>	Potential impacts on quality from discharges (radioactive and non-radioactive). Intake of water for cooling and discharge of (heated) cooling water to main estuary.
<b>Potential effects on the SPA/Ramsar: Receptor</b>	Changes to water quality and of water temperature can impact species composition/ encourage excessive algal growth – results in wider impacts on dependant bird species, which transit from and between the Severn Estuary and the Somerset Levels and Moors SPA/Ramsar.
<b>Risk of Likely Significant Effect (LSE)?</b>	Yes.
<b>Potential Impacts - other Plans and Programmes</b>	<p><b>Local Development Frameworks</b> (Somerset, Devon, Dorset)</p> <p>Water quality (abstraction, pollution)</p> <p>Habitat disturbance (recreation, infrastructure development)</p> <p>Of relevance to understanding environmental condition:</p> <ul style="list-style-type: none"> <li>• Catchment Abstraction Management Strategies</li> <li>• Coastal Habitat Management Plans Frameworks</li> </ul>
<b>Risk from 'In Combination' Effects?</b>	Potential indirect effects in particular from population growth/ disturbance/ human interference both landward and on water.
<b>AA Required?</b>	Yes

**Source: Decommissioning (duration approx 30 years)**

Somerset Levels and Moors, SPA/Ramsar: Decommissioning (duration approx 30 years)	
Water Resources / Quality	
<b>Potential Impacts: Pathway</b>	Potential for effects on quality/ drainage from interim storage general and radioactive (accidental leakage/ pollution incidents). Potential impacts of toxins/ pollution noted above.
<b>Potential effects on the SPA/Ramsar: Receptor</b>	Potential for effects on quality/ drainage from interim storage general and radioactive (accidental leakage/ pollution incidents). Potential impacts of toxins/ pollution noted above.
<b>Risk of Likely Significant Effect (LSE)?</b>	Yes.
<b>Potential Impacts - other Plans and Programmes</b>	<p><b>Local Development Frameworks</b> (Somerset, Devon, Dorset)</p> <p>Water quality (abstraction, pollution)</p> <p>Habitat disturbance (recreation, infrastructure development)</p> <p>Of relevance to understanding environmental condition:</p> <ul style="list-style-type: none"> <li>• Catchment Abstraction Management Strategies</li> <li>• Coastal Habitat Management Plans Frameworks</li> </ul>
<b>Risk from 'In Combination' Effects?</b>	Potential indirect effects in particular from population growth/ disturbance/ human interference both landward and on water.
<b>AA Required?</b>	Yes

## Appendix 4: HRA/ Appropriate Assessment Proforma

### Severn Estuary SAC

- Location: ST321748
- Size (ha): 73715.4
- Designation: SAC

	Severn Estuary SAC
Qualifying Features	<p>Annex I Habitats primary reason for selection:</p> <ul style="list-style-type: none"> <li>• <a href="#">Estuaries</a></li> <li>• <a href="#">Mudflats and sandflats not covered by seawater at low tide</a></li> <li>• <a href="#">Atlantic salt meadows (<i>Glauco-Puccinellietalia maritima</i>)</a></li> </ul> <p>Annex I Habitats qualifying feature:</p> <ul style="list-style-type: none"> <li>• <a href="#">Sandbanks which are slightly covered by sea water all the time</a></li> <li>• <a href="#">Reefs</a></li> </ul> <p>Annex II Species primary reason for selection:</p> <ul style="list-style-type: none"> <li>• <a href="#">Sea lamprey</a> <i>Petromyzon marinus</i></li> <li>• <a href="#">River lamprey</a> <i>Lampetra fluviatilis</i></li> <li>• <a href="#">Twaite shad</a> <i>Alosa fallax</i></li> </ul>
Conservation Objectives	<ul style="list-style-type: none"> <li>• No conservation objectives currently available for this site.</li> </ul>
Key Environmental Conditions (factors that	<ul style="list-style-type: none"> <li>• <b>Hydrodynamic and sedimentary regime</b> - 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</li> </ul>

Severn Estuary SAC	
<p><b>maintain site integrity)</b></p>	<p>seabed and strong tidal streams result in natural erosion of the habitats and the presence of high sediment loads.</p> <ul style="list-style-type: none"> <li>• <b>Maintain suitable distance between the site and development</b> - to allow for managed retreat of intertidal habitats and avoid coastal squeeze.</li> <li>• <b>Manage public access and activities.</b></li> </ul>
<p><b>Vulnerabilities (includes existing pressures and trends)</b></p> <p><i>Details at Appendix 1</i></p>	<ul style="list-style-type: none"> <li>• Physical loss of supporting habitats through removal</li> <li>• Contamination by synthetic and/or non-synthetic toxic compounds</li> <li>• Damage by abrasion or selective extraction</li> <li>• Changes in nutrient and/or organic loading</li> <li>• Inappropriate grazing</li> </ul>
<p><b>Predicted Impacts</b></p> <p><i>What are the issues arising from the plan and how might the site be affected?</i></p>	<p><b>Water Resources and Quality</b></p> <ul style="list-style-type: none"> <li>• Increased/ altered drainage from earthworks and excavation</li> <li>• Potential for toxic contamination from accidental leakage</li> <li>• Radioactive discharges (accidental and routine)</li> <li>• Alteration of flow from abstraction</li> <li>• Changes to water temperature from controlled discharge</li> </ul> <p><b>Habitat Loss and Fragmentation</b></p> <ul style="list-style-type: none"> <li>• Direct impacts, loss of sandflats/ estuary margins from extension of site boundary/construction of sea wall</li> <li>• Fragmentation from encroachment onto surrounding habitats during construction phases</li> <li>• Impingement of fish and larvae on water intake filters</li> </ul> <p><b>Coastal Squeeze</b></p> <ul style="list-style-type: none"> <li>• Reduction of coastal margin by movement of fixed landward boundary into designated space</li> </ul>

Severn Estuary SAC	
	<p><b>Air Quality</b></p> <ul style="list-style-type: none"> <li>Local level impacts (reduced air quality, NOx gases from road/ transport/ generation sources) arising from construction, operation, decommissioning activities.</li> </ul>
<p><b>Potential In-combination effects (screening)</b></p> <p><i>What other plans and programmes could lead to in-combinations effects?</i></p>	<p>The following plans have the potential to contribute ‘in-combination’ impacts in relation to the key issues identified. In-combination impacts may be positive where the plans’ function is to actively management those identified issues (for example Catchment Abstraction Management Strategies).</p> <p><b>Water Resources and Quality</b></p> <ul style="list-style-type: none"> <li>Local Development Frameworks (Somerset, Devon, Bristol, South East Wales and Gloucestershire)</li> <li>Environment Agency Catchment Abstraction Management Strategies (West Somerset Streams, Parrett, Bristol Avon)</li> </ul> <p><b>Habitat Loss and Fragmentation</b></p> <ul style="list-style-type: none"> <li>Local Transport Plans (Somerset 2006-2011)</li> <li>West Somerset Coastal Habitat Action Plan</li> </ul> <p><b>Coastal Squeeze</b></p> <ul style="list-style-type: none"> <li>The North Devon and Somerset Shoreline Management Plan (review 2007)</li> </ul> <p><b>Air Quality</b></p> <ul style="list-style-type: none"> <li>Local Development Frameworks (Somerset, Devon, Bristol, South East Wales and Gloucestershire)</li> </ul>
<p><b>Appropriate Assessment</b></p> <p><b>Likelihood of adverse</b></p>	<p><b>Water Resources and Quality</b></p> <ul style="list-style-type: none"> <li>Current Environment Agency data<sup>13</sup> indicates that, the ecological and chemical status of the estuarine environments near to Hinkley Point are assessed as ‘moderate’ and ‘high’ respectively. By 2015 the EA</li> </ul>

<sup>13</sup> Environment Agency River Basin Management Plans: South West River Basin District, 2008.

UKTG – Water Framework Directive Website: <http://www.wfduk.org/>

Environmental Agency – [http://maps.environment-agency.gov.uk/wiyby/wiybyController?ep=maptopics&lang=\\_e](http://maps.environment-agency.gov.uk/wiyby/wiybyController?ep=maptopics&lang=_e)



Severn Estuary SAC	
<b>effect on integrity:</b>	<p>predicts that the ecological status will be maintained, but that the chemical quality of the water will decrease to 'good' status.</p> <ul style="list-style-type: none"> <li>• The assessments for the coastal water quality, downstream from Hinkley Point mirror those for the estuarine environment, with a prediction that the chemical quality of the water will decline.</li> <li>• The ecological status of the rivers around Hinkley Point is assessed as ranging from 'moderate' to 'good' ecological quality – the chemical condition of these rivers has yet to be assessed. Groundwater chemical quality around Hinkley Point is assessed by the EA as being 'good'.</li> <li>• Radioactive discharges are subject to targets monitored by the EA and of the non-radioactive discharges, nitrate contributions are considered to be the most significant (research cited by the EA in the nuclear sector report). In particular it is noted that there can be measurable localised impacts on sea nutrient levels in the vicinity of discharges.</li> <li>• Environmental condition data for the Severn Estuary SAC (Appendix 1, Site Characterisations) indicates that while water quality (as illustrated by EA data) has improved, where there are areas of local concern, nutrient loading should be avoided. Therefore, whilst current water quality indicators show ecological and chemical levels around Hinkley Point to be 'moderate' or higher, it is not possible (without further information on discharge levels and quality) to conclude that discharges both radioactive and non-radioactive will not have an adverse effect on the SAC.</li> <li>• The water resource management unit around Hinkley Point is not managed through the EA CAMS process due its tidal nature. The nearest WRMU to Hinkley Point at Cannington is over abstracted and identified as having no water available. It may therefore be a requirement for any new developments at Hinkley Point to provide water supply strategies. Given that water abstraction requirements and locations for Hinkley Point are currently unknown, it is not possible to conclude that water supply to the development will avoid levels of abstraction that lead to adverse effects on the SAC.</li> </ul> <p><b>Habitat Loss and Fragmentation/ Coastal Squeeze</b></p> <ul style="list-style-type: none"> <li>• The Severn Estuary Coastal Habitat Management Plan (CHaMP) produced by the Environment Agency<sup>14</sup> indicates that the Estuary is changing progressively.<sup>15</sup> In particular, sea level rise is resulting in coastal</li> </ul>

<sup>14</sup> The Severn Estuary Coastal Habitat Management Plan: Technical Summary (EA, 2006)

<sup>15</sup> CHaMPs are specifically focused on the integrity of European and Ramsar sites.

	Severn Estuary SAC
	<p>squeeze and a net loss of intertidal habitat. Analysis indicates that the saltmarsh and mudflat/sandflat habitats around Hinkley Point (Habitat Behaviour Unit 1) will be subject to a net decrease over the next 20 years (predicted to be 7% over for the estuary as a whole). However, the area around Bridgwater Bay is also identified as a location where accretion may result in habitat extension and the CHAMP indicates that areas of undeveloped land around Hinkley Point may be suitable for intertidal habitat creation.</p> <ul style="list-style-type: none"> <li>• The extent of loss to marine and terrestrial habitats from the construction of cooling water culverts, sea wall and a marine landing facility is currently unknown, and its significance in the context of wider habitat changes cannot be assessed. It is possible that these changes may act cumulatively or accelerate changes identified by the CHaMP in relation the primary designation features. At this strategic stage where detailed development plans are unknown, it is not possible to conclude that that there will not be adverse effects through habitat loss and coastal squeeze on the SAC.</li> </ul> <p><b>Air Quality</b></p> <ul style="list-style-type: none"> <li>• Information provided by the South West Observatory 2008<sup>16</sup> indicates that air quality in the south west is generally good with low levels of sulphur, nitrogen dioxide and particulates. Pollution levels for all key pollutants in the rural area around Hinkley Point are typically low.</li> <li>• The Environment Agency assesses that, non-radioactive aerial emissions (sulphur dioxide, nitrogen oxides and volatile organic compounds) from nuclear power stations are extremely low compared with other regulated industries and the Agency does not consider them to be an environmental priority.</li> <li>• The Agency's most recent available assessment of radioactive aerial emissions indicates that all fall within authorised limits.<sup>17</sup></li> <li>• Air quality issues around Hinkley Point are considered to potentially most significant during construction and decommissioning phases (transport etc). The potential for cumulative effects from other plans and programmes is minimised by sustainable transport measures set out in the Local Transport Plan, and the main focus of new housing development being located away from Hinkley Point to the east of the nearest main town Bridgwater. Therefore, in the context of: known air quality conditions; existing plans and (local level) management activities to regulate impacts; the European site characterisation data which indicates that the</li> </ul>

<sup>16</sup> <http://www.swo.org.uk/observatory/links-1/state/state-of-the-south-w-1.shtm>

<sup>17</sup> Measuring Environmental Performance: Sector Report for the Nuclear Industry (Environment Agency, Nov 2005).

Severn Estuary SAC	
	<p>qualifying features are not considered vulnerable or at risk for issues of air quality; it is assessed that there is unlikely to be a significant effects on the SAC from air quality impacts.</p>
<p><b>Possible Avoidance and Mitigation Measures – includes recommendations for policy/proposals</b></p>	<p><b>Water Resource and Quality</b></p> <ul style="list-style-type: none"> <li>Avoiding adverse effects on surface, ground and estuarine waters is primarily the responsibility of the Water Companies (resource planning) and the Environment Agency (abstraction licensing and discharge regulation). However, the Nuclear NPS can direct requirements for efficiency of water use and require that issues relating to supply and discharge (including potential effects on European sites) are in place prior to the implementation of the nominated site proposals.</li> </ul> <p><b>Habitat Loss and Fragmentation/ Coastal Squeeze</b></p> <ul style="list-style-type: none"> <li>Where proposals for design and build remain under development, the Nuclear NPS should seek to prioritise the avoidance of direct habitat impacts, for example through amended boundaries for the sea wall or design alterations for the marine landing facility, that protect the integrity of the designated site. Any direct impacts that cannot be avoided, including through alternatives, or mitigated should be addressed by compensation measures agreed with the Statutory Bodies and implemented prior to the commencement of development proposals.</li> </ul> <p><b>Air Quality</b></p> <ul style="list-style-type: none"> <li>While air quality impacts are not assessed as being significant at this European site, it is appropriate that Nuclear NPS takes account of potential air quality impacts through requirements, particularly at a local level for sustainable transport plans including for example: the use of non-road transport where possible, phasing of development and robust monitoring at sites to track changes. In particular, the monitoring should account for the potential for cumulative impacts where the phasing between existing power stations and the new build overlaps.</li> </ul>
<p><b>Conclude no adverse effect on integrity?</b></p>	<ul style="list-style-type: none"> <li>It is not possible at this stage of the development of the Nuclear NPS to say that proposals at Hinkley Point will not have significant adverse effects on the Severn Estuary SAC as a result of impacts to water, changes to water quality, and habitat loss/ fragmentation, caused in part by coastal squeeze.</li> </ul>

	Severn Estuary SAC
	<ul style="list-style-type: none"><li>• It is, however, considered that air quality impacts are unlikely to be significant given current environmental conditions, known site vulnerabilities and available mitigation measures to address site level impacts.</li></ul>

## River Wye SAC

- Location: SO109369
- Size (ha): 2234.89
- Designation: SAC

River Wye SAC	
<b>Qualifying Features</b>	<p>Annex I habitats primary reason for selection:</p> <ul style="list-style-type: none"> <li>• <a href="#">Water courses of plain to montane levels with the <i>Ranunculion fluitantis</i> and <i>Callitricho-Batrachion</i> vegetation</a></li> </ul> <p>Annex I habitats qualifying feature:</p> <ul style="list-style-type: none"> <li>• <a href="#">Transition mires and quaking bogs</a></li> </ul> <p>Annex II species primary reason for selection:</p> <ul style="list-style-type: none"> <li>• <a href="#">White-clawed (or Atlantic stream) crayfish</a> <i>Austropotamobius pallipes</i></li> <li>• <a href="#">Sea lamprey</a> <i>Petromyzon marinus</i></li> <li>• <a href="#">Brook lamprey</a> <i>Lampetra planeri</i></li> <li>• <a href="#">River lamprey</a> <i>Lampetra fluviatilis</i></li> <li>• <a href="#">Twaite shad</a> <i>Alosa fallax</i></li> <li>• <a href="#">Atlantic salmon</a> <i>Salmo salar</i></li> <li>• <a href="#">Bullhead</a> <i>Cottus gobio</i></li> <li>• <a href="#">Otter</a> <i>Lutra lutra</i></li> </ul> <p>Annex II Species qualifying feature:</p> <p><a href="#">Allis shad</a> <i>Alosa alosa</i></p>
<b>Conservation Objectives</b>	<ul style="list-style-type: none"> <li>• To maintain and/or restore capacity of the habitats in the SAC to support each feature at near-natural population levels by maintaining unmodified ecological and hydromorphological processes and characteristics;</li> <li>• The ecological status of the water environment should be sufficient to maintain a stable or increasing population of each feature;</li> </ul>

River Wye SAC	
	<ul style="list-style-type: none"> <li>• To maintain and/or restore where necessary flow regime, water quality and physical habitat to, a near-natural state, to support the coherence of ecosystem structure and function across the SAC;</li> <li>• To maintain all known breeding, spawning and nursery sites of species features except where natural processes cause them to change;</li> <li>• To maintain flow, water quality, substrate quality and quantity at fish spawning sites and nursery areas and prevent their depletion;</li> <li>• To maintain the river platform and profile through minimizing or preventing any physical modification to the river;</li> <li>• To maintain the river habitat in a favourable condition;</li> <li>• To remove or modify man-made barriers to allow the passage of species and their occupation of their natural range;</li> <li>• To maintain natural factors which may otherwise limit the natural range or dispersal of populations;</li> <li>• To maintain the natural range of the feature in the SAC;</li> <li>• To maintain and increase the population of otters in the SAC over the long term;</li> <li>• To maintain or increase the natural range of the plant communities represented within the SAC;</li> <li>• To maintain or increase the natural range of the white-clawed crayfish represented within the SAC.</li> </ul> <p>Performance indicators can be found within the <a href="#">River Wye SAC Management Plan</a>.</p>
<b>Key Environmental Conditions (factors that maintain site integrity)</b>	<ul style="list-style-type: none"> <li>• <b>Hydrological processes</b> particularly river flow (level and variability) and water chemistry, determine a range of habitat factors of importance to the SAC features.</li> <li>• <b>Geomorphological processes</b> of erosion by water and subsequent deposition of eroded sediments downstream create the physical structure of the river habitats. These processes help to sustain the river ecosystem by allowing a continued supply of clean gravels and other important substrates to be transported downstream. In addition, the freshly deposited and eroded surfaces enable ecological succession required by specialist, early-successional species.</li> <li>• <b>Diverse riparian habitats</b> - The type and condition of riparian vegetation influences shade and water temperature, nutrient run-off from adjacent land, the availability of woody debris to the channel and inputs of leaf litter and invertebrates to support in-stream consumers.</li> </ul>

River Wye SAC	
	<ul style="list-style-type: none"> <li>• <b>Habitat connectivity</b> is an important property of river ecosystem structure and function. Many of the fish that spawn in the river are migratory and depend on the maintenance of suitable conditions on their migration routes to allow the adults to reach available spawning habitat and juvenile fish to migrate downstream.</li> <li>• <b>External factors</b> operating outside the SAC are influential particularly for migratory fish and otters.</li> </ul>
<p><b>Vulnerabilities (includes existing pressures and trends)</b></p> <p><i>Details at Appendix 1</i></p>	<ul style="list-style-type: none"> <li>• Abstraction levels</li> <li>• Eutrophication</li> <li>• Diffuse pollution</li> <li>• Barriers to migration</li> <li>• Development pressure</li> <li>• Invasive and non-native species</li> <li>• Artificially enhanced densities of other fish</li> <li>• External factors</li> </ul>
<p><b>Predicted Impacts</b></p> <p><i>What are the issues arising from the plan and how might the site be affected?</i></p>	<p><b>Water Resources and Quality</b></p> <ul style="list-style-type: none"> <li>• Increased/ altered drainage from earthworks and excavation</li> <li>• Potential for toxic contamination from accidental leakage</li> <li>• Radioactive discharges (accidental and routine)</li> <li>• Alteration of flow from abstraction</li> <li>• Changes to water temperature from controlled discharge</li> <li>• Sedimentation and changes in organic and nutrient loading arising from construction during the construction and decommissioning phases</li> </ul> <p><b>Habitat (and species) Loss and Fragmentation</b></p> <ul style="list-style-type: none"> <li>• Indirect loss and degradation of habitats and species arising from increased sedimentation and turbidity, and altered levels of dissolved oxygen and water temperatures</li> <li>• Impingement of fish and larvae on water intake filters during abstraction</li> </ul> <p><b>Disturbance</b></p>

River Wye SAC	
	<ul style="list-style-type: none"> <li>Construction activities resulting in vibration disturbance to marine communities adjacent to the proposed development site. Adverse effects of this disturbance on the migration and behaviour of migratory fish species may be transferred to species designated within the River Wye, with further impacts upon otters.</li> </ul>
<p><b>Potential In-combination effects (screening)</b></p> <p><i>What other plans and programmes could lead to in-combinations effects?</i></p>	<p>The following plans have the potential to contribute ‘in-combination’ impacts in relation to the key issues identified:</p> <p><b>Water Resources and Quality</b></p> <ul style="list-style-type: none"> <li>Bristol Deep Sea Container Terminal</li> <li>Severn Tidal Power Feasibility Study</li> <li>Decommissioning of Hinkley A and Hinkley B.</li> </ul> <p><b>Habitat (and Species) Loss and Fragmentation/ Coastal Squeeze</b></p> <ul style="list-style-type: none"> <li>Bristol Deep Sea Container Terminal</li> <li>Severn Tidal Power Feasibility Study</li> <li>Decommissioning of Hinkley A and Hinkley B.</li> </ul> <p><b>Disturbance</b></p> <ul style="list-style-type: none"> <li>Bristol Deep Sea Container Terminal</li> <li>Severn Tidal Power Feasibility Study</li> <li>Decommissioning of Hinkley A and Hinkley B.</li> </ul>
<p><b>Appropriate Assessment</b></p> <p><b>Likelihood of adverse effect on integrity:</b></p>	<p><b>Water Resources and Quality</b></p> <ul style="list-style-type: none"> <li>Current Environment Agency data<sup>18</sup> indicates that, the ecological status of the estuarine environments near to Hinkley Point are assessed as moderate and high respectively. By 2015 the EA predicts that the ecological status will be maintained, but the chemical quality of the water will decrease to ‘good’ status.</li> <li>The assessments for the coastal water, downstream from Hinkley Point mirror those for the estuarine</li> </ul>

<sup>18</sup> Environment Agency River Basin Management Plans: Severn River Basin District, 2008: <http://wfdconsultation.environment-agency.gov.uk/wfdcms/en/severn/Intro.aspx>



	River Wye SAC
	<p>environment with a prediction that the chemical quality will decline.</p> <ul style="list-style-type: none"> <li>• The ecological status of the rivers around Hinkley Point is assessed as ranging from moderate to good ecological quality – the chemical condition of the River Wye has yet to be assessed.</li> <li>• Groundwater around chemical quality around Hinkley Point is assessed by the EA as being good.</li> <li>• Radioactive discharges are subject to targets monitored by the EA and of the non-radioactive discharges, nitrate contributions are considered to be the most significant (research cited by the EA in the nuclear sector report). In particular it is noted that there can be measurable localised impacts on sea nutrient levels in the vicinity of discharges.</li> <li>• “Key Environmental Conditions (factors maintaining site integrity)” (Appendix 1, Site Characterisations) for the Wye Valley SAC indicate that any increase in nutrient loading through discharge of synthetic and non-synthetic toxic compounds and in increased sediment loading through runoff during construction (and deconstruction) should be avoided given their likely impact upon the migratory fish (sea, brook and river lamprey, twaite shad, Atlantic salmon and Bullhead) and otter populations designated within the SAC.</li> <li>• As such, whilst current water quality indicators at the River Wye illustrate “moderate” to “good” ecological status, it is not possible to conclude, without further information on discharge levels and quality of discharge arising from the development, that planned radioactive and non-radioactive discharges will not adversely impact upon the SAC.</li> <li>• Given that water abstraction requirements, mechanisms used during abstraction and their locations at Hinkley Point are currently unknown, it is not possible to conclude that water supply to the development will avoid resulting in indirect adverse impacts upon those species designated within the SAC, particularly upon those whose natural cycles require movement between the estuary and the River Wye.</li> </ul> <p><b>Habitat (and Species) Loss and Fragmentation/ Coastal Squeeze</b></p> <ul style="list-style-type: none"> <li>• Indirect loss and degradation of habitats and species will have adverse effects on site integrity. Increased levels of turbidity can reduce amount of available photosynthetic light, and together with increased sediment loads can impact upon the development and maintenance of plant communities associated with the intertidal habitats. Altered levels of oxygen and changes in water temperature can affect spawning cycles of migratory</li> </ul>

	River Wye SAC
	<p>fish species designated within the River Wye SAC, such as for shad species, where upstream migration to spawning sites is triggered earlier in the season by increased water temperatures<sup>19</sup>. Moreover evidence shows that a greater number of warmer water species resulting in increased species richness are being captured on intake screens of Hinkley Point 'B' Power station<sup>20</sup>, suggesting the potential for the discharge of warmer waters at Hinkley Point to detrimentally alter species composition within the Severn Estuary European sites and River Wye SAC.</p> <ul style="list-style-type: none"> <li>The potential construction of a marine off-shore landing facility and associated dredging will also lead to loss of benthic and intertidal habitats and fauna under the footprint of the landing facility, with an associated increase in nutrient loading and remobilisation of sediment affecting the overall nutrient and sediment budgets upon which designated habitats rely. These impacts may be further exacerbated by the proposed Bristol Deep Sea Container Terminal<sup>21</sup> whereby extensive dredging works are required as part of the development to the south of the proposed new nuclear power station at Avonmouth. Extensive dredging may increase erosion as the estuary tries to rebalance the sediment budget, whilst the re-dispersal of sediment can increase turbidity at receptor areas and result in the release of sediment-bound contaminants, with impacts potentially transferred up the estuary.</li> </ul> <p><b>Disturbance</b></p> <ul style="list-style-type: none"> <li>Extensive construction activity will be concentrated at the coastal fringe and within the estuary (i.e. the construction of off-shore infrastructure), resulting in vibration disturbance to marine communities adjacent to the proposed development site. Adverse effects of this disturbance on the migration and behaviour of migratory fish species may occur given that fish nursery areas are concentrated here, with invertebrate food resources being most abundant within intertidal mudflat and upper estuarine habitats<sup>22</sup>. Few species are dependant on the deep-water channel for feeding where disturbance impacts are likely to be diffuse. Migratory fish species designated within the River Wye SAC may occur given that some of the fish species designated within the Severn Estuary SAC are shared with the River Wye SAC (sea lamprey, river lamprey, twaite shad),</li> </ul>

<sup>19</sup> <http://www.english-nature.org.uk/lifeinukrivers/publications/shad.pdf>

<sup>20</sup> Henderson, P.A., & Seaby, R.M.H. (2001). Fish and crustacean captures at Hinkley Point B Nuclear Power Station; report for the year April 2000 to March 2001). Pisces Conservation Ltd.

<sup>21</sup> <http://www.mfa.gov.uk/environment/works/documents/screening%20scoping/construction-07/Bristol-Container-Terminal.pdf>

<sup>22</sup> <http://www.english-nature.org.uk/science/natural/profiles%5CnaProfile116.pdf>

River Wye SAC	
	<p>such that any adverse impacts to their migratory and reproductive behaviour arising near the source of the disturbance may be transferred to the River Wye SAC, with further impacts upon otters designated within the River Wye SAC.</p>
<p><b>Possible Avoidance and Mitigation Measures – includes recommendations for policy/proposals</b></p>	<p><b>Water Resource and Quality</b></p> <ul style="list-style-type: none"> <li>• Avoiding adverse effects upon surface, ground and estuarine waters is the responsibility of the developer, but is subject to a stringent management and regulatory frameworks by the Water Companies (resource planning) and the Environment Agency (EA) (abstraction licensing and discharge consents, to be reviewed under the Review of Consents process to be completed by 2010). Thermal, radioactive and non-radioactive discharges should go beyond complying with existing standards, with radioactive discharges required to be As Low As Reasonably Achievable (ALARA)<sup>23</sup> and that all other discharge levels are required to be an improvement on existing standards. All discharges which lead to adverse effects on the integrity of European sites should not be permitted.</li> <li>• The IPC, as guided by the NPS, can also direct requirements for the efficiency of water use and the protection of water quality. This may include requiring that management measures relating to supply and discharge (including potential effects on European sites), are in place prior to site development, with decisions made taking into account Best Available Technology (BAT) which ensure protection of the sensitivities of the receiving environments.</li> <li>• The majority of remaining adverse effects upon water quality and resources will be effectively mitigated for through the implementation of suitable design (including use of Sustainable Urban Drainage Systems (SuDS)) and through the required selection of appropriate construction measures. Cooling water culverts should be designed to avoid effects on the existing thermal regime of the Severn Estuary, including the use of modern tunneling techniques for cabling and cooling water culverts where appropriate to avoid surface impacts. Their design should also aim to avoid, reduce or mitigate adverse effects on sedimentary processes or thermal regime, this design taking account of route, length and design of intake/outfall structures. Impacts upon groundwater flow should also be effectively avoided or mitigated by requiring that suitable design in abstraction mechanisms is employed.</li> </ul>

<sup>23</sup> ALARA is not a dose limit; it is a practice that has as its objective the attainment of dose levels as far below applicable limits as possible.

River Wye SAC	
	<p><b>Habitat (and Species) Loss and Fragmentation/ Coastal Squeeze</b></p> <ul style="list-style-type: none"> <li>• Any direct or indirect loss of habitats and species (temporary or permanent) arising from construction/operation or decommissioning will have the potential to have knock-on effects throughout the food chain (for example the impacts on breeding and/or wintering birds and migratory fish) and development proposals for design and build should avoid any direct habitat impacts that may lead to a loss of species or fragmentation.</li> <li>• The use of modern tunneling techniques for cabling and remote infrastructure, including cooling water culverts, where appropriate should be employed to ensure no surface impacts or adverse effects on sedimentary processes or thermal regime.</li> <li>• In terms of coastal erosion, should it be necessary to extend the sea defences to provide protection to the nominated site, it is envisaged that this could be done by the construction of new hard coastal defences and although the precise type and detail of the measures cannot be determined at this stage, the works on coastal defences would be designed to secure the site against coastal erosion and as well as provide the necessary coastal protection. It is therefore reasonable to conclude that a strategic level the new nuclear development within the nominated site could be protected against coastal erosion.</li> <li>• Connectivity of important wildlife corridors around the site should be maintained, enhanced and restored. Management plans should be in place and incorporated into the overall mitigation package as good practice. In addition, an ecological mitigation and management plan for the nominated site should link to existing integrated land management plans.</li> <li>• Avoiding adverse effects on fish species is in part influenced by the efficiencies achieved within the industrial process and the nature of the technologies proposed by developments (extent of cooling water requirements). Fish protection measures could be incorporated within cooling water intake/system design. There is, therefore, a role for the IPC to ensure that developments at Hinkley Point incorporate technologies and operating practices that take account of identified sensitivities in fish populations (breeding and feeding cycles) in particular in the estuarine environment around the proposed development.</li> </ul> <p><b>Disturbance</b></p> <ul style="list-style-type: none"> <li>• The implementation of avoidance and mitigation measures aimed to reduce noise, vibration, light and visual disturbance arising from the development of the site and associated induced and ancillary infrastructure during construction, operation and decommissioning is required to ensure no adverse impacts upon the</li> </ul>

River Wye SAC	
	<p>integrity of European sites will occur. Mitigation measures required include:</p> <ul style="list-style-type: none"> <li>○ the requirement for technologies and operating practices which take account identified sensitivities in fish (particularly in relation to vibration impacts and low frequency noise) and bird populations (particularly in regard to the regularity of disturbance) in the estuarine environment to be implemented where practicable;</li> <li>○ the requirement to restrict encroachment of construction areas into sensitive habitats through site design; the requirement to implement appropriate screening of disturbance impacts arising during construction (and deconstruction) works;</li> <li>○ the requirement for the phasing and timing of development works which take into account breeding and feeding cycles and habitats, and the flight lines and migration routes of sensitive species including birds, fish and otter; and</li> <li>○ the requirement for construction environmental management plans to be implemented at the site level which require the management of disturbance impacts through appropriate avoidance or mitigation to ensure no adverse impacts upon site integrity will arise. There is also a role for the IPC to ensure that developments at Hinkley Point incorporate technologies and operating practices which take into account identified sensitivities of species in the estuarine environment around the proposed development at Hinkley Point.</li> </ul>
<b>Conclude no adverse effect on integrity?</b>	<ul style="list-style-type: none"> <li>• It is not possible at this stage of the development of the Nuclear NPS to say that proposals at Hinkley Point will not have significant adverse effects on the River Wye SAC as a result of impacts to water quality and water resources, habitats and species, or as a result of disturbance.</li> </ul>

## River Usk SAC

- Location: SO301113
- Size (ha): 1007.71
- Designation: SAC

River Usk SAC	
<b>Qualifying Features</b>	<p>Annex I Habitats qualifying feature:</p> <ul style="list-style-type: none"> <li>• <a href="#">Water courses of plain to montane levels with the <i>Ranunculion fluitantis</i> and <i>Callitricho-Batrachion</i> vegetation</a></li> </ul> <p>Annex II Species primary reason for selection:</p> <ul style="list-style-type: none"> <li>• <a href="#">Sea lamprey</a> <i>Petromyzon marinus</i></li> <li>• <a href="#">Brook lamprey</a> <i>Lampetra planeri</i></li> <li>• <a href="#">River lamprey</a> <i>Lampetra fluviatilis</i></li> <li>• <a href="#">Twaite shad</a> <i>Alosa fallax</i></li> <li>• <a href="#">Atlantic salmon</a> <i>Salmo salar</i></li> <li>• <a href="#">Bullhead</a> <i>Cottus gobio</i></li> <li>• <a href="#">Otter</a> <i>Lutra lutra</i></li> </ul> <p>Annex II Species qualifying feature:</p> <p><a href="#">Allis shad</a> <i>Alosa alosa</i></p>
<b>Conservation Objectives</b>	<p><b>The ecological status of the water course is a major determinant of Favourable Condition Status (FCS) for all features. The required conservation objective for the water course is defined below.</b></p> <p><b>Conservation Objective for the water course</b></p> <ul style="list-style-type: none"> <li>• The capacity of the habitats in the SAC to support each feature at near-natural population levels, as determined by predominantly unmodified ecological and hydromorphological processes and characteristics,</li> </ul>

	River Usk SAC
	<p>should be maintained as far as possible, or restored where necessary.</p> <ul style="list-style-type: none"> <li>• The ecological status of the water environment should be sufficient to maintain a stable or increasing population of each feature. This will include elements of water quantity and quality, physical habitat and community composition and structure. It is anticipated that these limits will concur with the relevant standards used by the Review of Consents process given in Annexes 1-3.</li> <li>• Flow regime, water quality and physical habitat should be maintained in, or restored as far as possible to, a near-natural state, in order to support the coherence of ecosystem structure and function across the whole area of the SAC.</li> <li>• All known breeding, spawning and nursery sites of species features should be maintained as suitable habitat as far as possible, except where natural processes cause them to change.</li> <li>• Flows, water quality, substrate quality and quantity at fish spawning sites and nursery areas will not be depleted by abstraction, discharges, engineering or gravel extraction activities or other impacts to the extent that these sites are damaged or destroyed.</li> <li>• The river platform and profile should be predominantly unmodified. Physical modifications having an adverse effect on the integrity of the SAC, including, but not limited to, revetments on active alluvial river banks using stone, concrete or waste materials, unsustainable extraction of gravel, addition or release of excessive quantities of fine sediment, will be avoided.</li> <li>• River habitat SSSI features should be in favourable condition. In the case of the Usk Tributaries SSSI, the SAC habitat is not underpinned by a river habitat SSSI feature. In this case, the target is to maintain the characteristic physical features of the river channel, banks and riparian zone.</li> <li>• Artificial factors impacting on the capability of each species feature to occupy the full extent of its natural range should be modified where necessary to allow passage, e.g. weirs, bridge sills, acoustic barriers.</li> <li>• Natural factors such as waterfalls, which may limit the natural range of a species feature or dispersal between naturally isolated populations, should not be modified.</li> <li>• Flows during the normal migration periods of each migratory fish species feature will not be depleted by abstraction to the extent that passage upstream to spawning sites is hindered.</li> <li>• Flow objectives for assessment points in the Usk Catchment Abstraction Management Strategy will be agreed between EA and CCW as necessary. It is anticipated that these limits will concur with the standards used by the Review of Consents process given in Annex 1 of this document.</li> </ul>

	River Usk SAC
	<ul style="list-style-type: none"> <li>• Levels of nutrients, in particular phosphate, will be agreed between EA and CCW for each Water Framework Directive water body in the Usk SAC, and measures taken to maintain nutrients below these levels. It is anticipated that these limits will concur with the standards used by the Review of Consents process given in Annex 2 of this document.</li> <li>• Levels of water quality parameters that are known to affect the distribution and abundance of SAC features will be agreed between EA and CCW for each Water Framework Directive water body in the Usk SAC, and measures taken to maintain pollution below these levels. It is anticipated that these limits will concur with the standards used by the Review of Consents process given in Annex 3 of this document.</li> <li>• Potential sources of pollution not addressed in the Review of Consents, such as contaminated land, will be considered in assessing plans and projects.</li> <li>• Levels of suspended solids will be agreed between EA and CCW for each Water Framework Directive water body in the Usk SAC. Measures including, but not limited to, the control of suspended sediment generated by agriculture, forestry and engineering works, will be taken to maintain suspended solids below these levels.</li> </ul> <p><b>Conservation Objective for Features 1-5:</b></p> <ul style="list-style-type: none"> <li>- <b>Sea lamprey</b> <i>Petromyzon marinus</i>;</li> <li>- <b>Brook lamprey</b> <i>Lampetra planeri</i>;</li> <li>- <b>River lamprey</b> <i>Lampetra fluviatilis</i>;</li> <li>- <b>Twaite shad</b> <i>Alosa fallax</i>;</li> <li>- <b>Allis shad</b> <i>Alosa alosa</i>;</li> <li>- <b>Atlantic salmon</b> <i>Salmo salar</i>;</li> <li>- <b>Bullhead</b> <i>Cottus gobio</i>.</li> </ul> <p><b>Vision for features 1-5</b> The vision for this feature is for it to be in a favourable conservation status, where all of the following conditions are satisfied:</p> <ul style="list-style-type: none"> <li>• The conservation objective for the water course as defined in 4.1 above must be met.</li> </ul>



	<b>River Usk SAC</b>
	<ul style="list-style-type: none"> <li>• The population of the feature in the SAC is stable or increasing over the long term.</li> <li>• The natural range of the feature in the SAC is neither being reduced nor is likely to be reduced for the foreseeable future. The natural range is taken to mean those reaches where predominantly suitable habitat for each life stage exists over the long term. Suitable habitat is defined in terms of near-natural hydrological and geomorphological processes and forms e.g. suitable flows to allow upstream migration, depth of water and substrate type at spawning sites, and ecosystem structure and functions e.g. food supply. Suitable habitat need not be present throughout the SAC but where present must be secured for the foreseeable future. Natural factors such as waterfalls may limit the natural range of individual species. Existing artificial influences on natural range that cause an adverse effect on site integrity, such as physical barriers to migration, will be assessed in view of the following bullet point.</li> <li>• There is, and will probably continue to be, a sufficiently large habitat to maintain the feature's population in the SAC on a long-term basis.</li> </ul> <p><b>Performance indicators for features 1-5</b></p> <p>The performance indicators are part of the conservation objective, not a substitute for it. Assessment of plans and projects must be based on the entire conservation objective, not just the performance indicators. The performance indicators can be found within the <a href="#">River Usk SAC Management Plan</a>.</p> <p><b>Conservation Objective for Feature 6:</b>  <b>- European otter <i>Lutra lutra</i></b></p> <p><b>Vision for feature 6</b>  The vision for this feature is for it to be in a favourable conservation status, where all of the following conditions are satisfied:</p> <ul style="list-style-type: none"> <li>• The population of otters in the SAC is stable or increasing over the long term and reflects the natural carrying capacity of the habitat within the SAC, as determined by natural levels of prey abundance and associated territorial behaviour.</li> </ul>

	River Usk SAC
	<ul style="list-style-type: none"> <li>• The natural range of otters in the SAC is neither being reduced nor is likely to be reduced for the foreseeable future. The natural range is taken to mean those reaches that are potentially suitable to form part of a breeding territory and/or provide routes between breeding territories. The whole area of the Usk SAC is considered to form potentially suitable breeding habitat for otters. The size of breeding territories may vary depending on prey abundance. The population size should not be limited by the availability of suitable undisturbed breeding sites. Where these are insufficient they should be created through habitat enhancement and where necessary the provision of artificial holts. No otter breeding site should be subject to a level of disturbance that could have an adverse effect on breeding success. Where necessary, potentially harmful levels of disturbance must be managed.</li> <li>• The safe movement and dispersal of individuals around the SAC is facilitated by the provision, where necessary, of suitable riparian habitat, and underpasses, ledges, fencing etc at road bridges and other artificial barriers.</li> </ul> <p>Performance indicators for feature 6 (see performance indicators for features 1 - 5)</p> <p><b>Conservation Objective for Feature 7:</b>  <b>- Water courses of plain to montane levels with the <i>Ranunculion fluitantis</i> and <i>Callitriche-Batrachion</i> vegetation</b></p> <p><b>Vision for feature 7</b></p> <p>The performance indicators are part of the conservation objective, not a substitute for it. Assessment of plans and projects must be based on the entire conservation objective, not just the performance indicators.</p> <ul style="list-style-type: none"> <li>• The conservation objectives for the water course as defined above must be met.</li> <li>• The natural range of the plant communities represented within this feature should be stable or increasing in the SAC.</li> <li>• The natural range is taken to mean those reaches where predominantly suitable habitat exists over the long term.</li> </ul>

River Usk SAC	
	<ul style="list-style-type: none"> <li>• Suitable habitat and associated plant communities may vary from reach to reach.</li> <li>• Suitable habitat is defined in terms of near-natural hydrological and geomorphological processes and forms e.g. depth and stability of flow, stability of bed substrate, and ecosystem structure and functions e.g. nutrient levels, shade.</li> <li>• Suitable habitat for the feature need not be present throughout the SAC but where present must be secured for the foreseeable future, except where natural processes cause it to decline in extent.</li> <li>• The area covered by the feature within its natural range in the SAC should be stable or increasing.</li> <li>• The conservation status of the feature's typical species should be favourable. The typical species are defined with reference to the species composition of the appropriate JNCC river vegetation type for the particular river reach, unless differing from this type due to natural variability when other typical species may be defined as appropriate.</li> </ul> <p>Performance indicators for feature 7 (see performance indicators for features 1 - 5)</p>
<p><b>Key Environmental Conditions (factors that maintain site integrity)</b></p>	<p><b>Hydrological processes:</b>  <b>River flow</b> (level and variability) and water chemistry, determine a range of habitat factors of critical importance to the SAC features, including current velocity, water depth, wetted area, substrate quality, dissolved oxygen levels and water temperature. Maintenance of both high 'spate' flows and base-flows is essential. Reduction in flows may reduce the ability of the adults of migratory fish to reach spawning sites. Water-crowfoot vegetation thrives in relatively stable, moderate flows and clean water. The flow regime should be characteristic of the river in order to support the functioning of the river ecosystem.</p> <p><b>Geomorphological processes</b> - of erosion by water and subsequent deposition of eroded sediments downstream, create the physical structure of the river habitats. Whilst some sections of the river are naturally stable, especially where they flow over bedrock, others undergo constant and at times rapid change through the erosion and deposition of bed and bank sediments as is typical of meandering sections within floodplains (called 'alluvial' rivers). These processes help to sustain the river ecosystem by allowing a continued supply of clean gravels and other important substrates to be transported downstream. In addition, the freshly deposited and eroded surfaces, such as shingle banks and earth cliffs, enable processes of ecological succession to begin</p>

	River Usk SAC
	<p>again, providing an essential habitat for specialist, early-successional species. Lampreys need clean gravel for spawning, and marginal silt or sand for the burrowing juvenile ammocoetes. Processes at the wider catchment scale generally govern processes of erosion and deposition occurring at the reach scale, although locally, factors such as the effect of grazing levels on riparian vegetation structure may contribute to enhanced erosion rates. In general, management that interferes with natural geomorphological processes, for example preventing bank erosion through the use of hard revetments or removing large amounts of gravel, are likely to be damaging to the coherence of the ecosystem structure and functions.</p> <p><b>Riparian habitats</b> - including bank sides and habitats on adjacent land, are an integral part of the river ecosystem. Diverse and high quality riparian habitats have a vital role in maintaining the SAC features in a favourable condition. The type and condition of riparian vegetation influences shade and water temperature, nutrient run-off from adjacent land, the availability of woody debris to the channel and inputs of leaf litter and invertebrates to support in-stream consumers. Light, temperature and nutrient levels influence in-stream plant production and habitat suitability for the SAC features. Woody debris is very important as it provides refuge areas from predators, traps sediment to create spawning and juvenile habitat and forms the base of an important aquatic food chain. Otters require sufficient undisturbed riparian habitats as breeding and resting sites. It is important that appropriate amounts of tree cover, in general at least 50% high canopy cover, tall vegetation and other semi-natural habitats are maintained on the riverbanks and in adjacent areas, and that they are properly managed to support the SAC features. This may be achieved, for example, through managing grazing levels, selective coppicing of riparian trees and restoring adjacent wetlands. In the urban sections the focus may be on maintaining the river as a communication corridor but this will still require that sufficient riparian habitat is present and managed to enable the river corridor to function effectively.</p> <p><b>Habitat connectivity</b> - is an important property of a river ecosystem structure and function. Many of the fish that spawn in the river are migratory, depending on the maintenance of suitable conditions on their migration routes to allow the adults to reach available spawning habitat and juvenile fish to migrate downstream. For resident species, dispersal to new areas, or the prevention of dispersal causing isolated populations to become genetically distinct, may be important factors. Naturally isolated feature populations that are identified as having important genetic distinctiveness should be maintained. Artificial obstructions including weirs and bridge sills can reduce connectivity for some species. In addition, reaches subject to depleted flow levels, pollution, or disturbance due to</p>

River Usk SAC	
	<p>noise, vibration or light, can all inhibit the movement of sensitive species. The dispersal of semi-terrestrial species such as the otter can be adversely affected by structures such as bridges under certain flow conditions; therefore, these must be designed to allow safe passage. The continuity of riparian habitats enables a wide range of terrestrial species, for example lesser horseshoe bats, to migrate and disperse through the landscape. Connectivity should be maintained or restored where necessary as a means to ensure access for the features to sufficient habitat within the SAC.</p>
<p><b>Vulnerabilities (includes existing pressures and trends)</b></p> <p><i>Details at Appendix 1</i></p>	<ul style="list-style-type: none"> <li>• Abstraction levels</li> <li>• Eutrophication</li> <li>• Diffuse Pollution</li> <li>• Barriers to migration</li> <li>• Development pressure</li> <li>• Invasive non-native plants</li> <li>• Artificially enhanced densities of other fish</li> <li>• External factors</li> </ul>
<p><b>Predicted Impacts</b></p> <p><i>What are the issues arising from the plan and how might the site be affected?</i></p>	<p><b>Water Resources and Quality</b></p> <ul style="list-style-type: none"> <li>• Increased/ altered drainage from earthworks and excavation</li> <li>• Potential for toxic contamination from accidental leakage</li> <li>• Radioactive discharges (accidental and routine)</li> <li>• Alteration of flow from abstraction</li> <li>• Changes to water temperature from controlled discharge</li> <li>• Sedimentation and changes in organic and nutrient loading arising from construction during the construction and decommissioning phases</li> </ul> <p><b>Habitat (and species) Loss and Fragmentation</b></p> <ul style="list-style-type: none"> <li>• Indirect loss and degradation of habitats and species arising from increased sedimentation and turbidity, and altered levels of dissolved oxygen and water temperatures.</li> <li>• Impingement of fish and larvae on water intake filters during abstraction.</li> </ul>

River Usk SAC	
	<p><b>Disturbance</b></p> <ul style="list-style-type: none"> <li>• Construction activities resulting in vibration disturbance to marine communities adjacent to the proposed development site. Adverse effects of this disturbance on the migration and behaviour of migratory fish species may be transferred to species designated within the River Wye, with further impacts upon otters.</li> </ul>
<p><b>Potential In-combination effects (screening)</b></p> <p><i>What other plans and programmes could lead to in-combinations effects?</i></p>	<p>The following plans have the potential to contribute ‘in-combination’ impacts in relation to the key issues identified:</p> <p><b>Water Resources and Quality</b></p> <ul style="list-style-type: none"> <li>• Bristol Deep Sea Container Terminal</li> <li>• Severn Tidal Power Feasibility Study</li> <li>• Decommissioning of Hinkley A and Hinkley B.</li> </ul> <p><b>Habitat (and Species) Loss and Fragmentation/ Coastal Squeeze</b></p> <ul style="list-style-type: none"> <li>• Bristol Deep Sea Container Terminal</li> <li>• Severn Tidal Power Feasibility Study</li> <li>• Decommissioning of Hinkley A and Hinkley B.</li> </ul> <p><b>Disturbance</b></p> <ul style="list-style-type: none"> <li>• Bristol Deep Sea Container Terminal</li> <li>• Severn Tidal Power Feasibility Study</li> <li>• Decommissioning of Hinkley A and Hinkley B.</li> </ul>
<p><b>Appropriate Assessment</b></p> <p><b>Likelihood of adverse</b></p>	<p><b>Water Resources and Quality</b></p> <ul style="list-style-type: none"> <li>• Current Environment Agency data<sup>24</sup> indicates that, the ecological status of the estuarine environments near to Hinkley Point are assessed as moderate and high respectively. By 2015 the EA predicts that the ecological status will be maintained, but the chemical quality of the water will decrease to ‘good’ status.</li> </ul>

<sup>24</sup> Environment Agency River Basin Management Plans: Severn River Basin District, 2008: <http://wfdconsultation.environment-agency.gov.uk/wfdcms/en/severn/Intro.aspx>

River Usk SAC	
<b>effect on integrity:</b>	<ul style="list-style-type: none"> <li>• The assessments for the coastal water, downstream from Hinkley Point mirror those for the estuarine environment with a prediction that the chemical quality will decline.</li> <li>• Groundwater around chemical quality around Hinkley Point is assessed by the EA as being good.</li> <li>• Radioactive discharges are subject to targets monitored by the EA and of the non-radioactive discharges, nitrate contributions are considered to be the most significant (research cited by the EA in the nuclear sector report). In particular it is noted that there can be measurable localised impacts on sea nutrient levels in the vicinity of discharges.</li> <li>• “Key Environmental Conditions (factors maintaining site integrity)” (Appendix 1, Site Characterisations) for the River Usk SAC state that river (level and variability) and water chemistry, determine a range of habitat factors of critical importance to the SAC features, including current velocity, water depth, wetted area, substrate quality, dissolved oxygen levels and water temperature. Maintenance of both high ‘spate’ flows and base-flows is essential. Reduction in flows may reduce the ability of the adults of migratory fish to reach spawning sites. Water-crowfoot vegetation thrives in relatively stable, moderate flows and clean water. The flow regime should be characteristic of the river in order to support the functioning of the river ecosystem.</li> <li>• Given that water abstraction requirements, mechanisms used during abstraction and their locations at Hinkley Point are currently unknown, it is not possible to conclude that water supply to the development will avoid resulting in indirect adverse impacts upon those species designated within the SAC, particularly upon those whose natural cycles require movement between the estuary and the River Usk.</li> </ul> <p><b>Habitat (and Species) Loss and Fragmentation/ Coastal Squeeze</b></p> <ul style="list-style-type: none"> <li>• Indirect loss and degradation of habitats and species will have adverse effects on site integrity. Increased levels of turbidity can reduce amount of available photosynthetic light, and together with increased sediment loads can impact upon the development and maintenance of plant communities associated with the intertidal habitats. Altered levels of oxygen and changes in water temperature can affect spawning cycles of migratory fish species designated within the River Usk SAC, such as for shad species, where upstream migration to spawning sites is triggered earlier in the season by increased water temperatures<sup>25</sup>. Moreover evidence</li> </ul>

<sup>25</sup> <http://www.english-nature.org.uk/lifeinukrivers/publications/shad.pdf>

	River Usk SAC
	<p>shows that a greater number of warmer water species resulting in increased species richness are being captured on intake screens of Hinkley Point 'B' Power station<sup>26</sup>, suggesting the potential for the discharge of warmer waters at Hinkley Point to detrimentally alter species composition within the Severn Estuary European sites and River Usk SAC.</p> <ul style="list-style-type: none"> <li>The potential construction of a marine off-shore landing facility and associated dredging will also lead to loss of benthic and intertidal habitats and fauna under the footprint of the landing facility, with an associated increase in nutrient loading and remobilisation of sediment affecting the overall nutrient and sediment budgets upon which designated habitats rely. These impacts may be further exacerbated by the proposed Bristol Deep Sea Container Terminal<sup>27</sup> whereby extensive dredging works are required as part of the development to the south of the proposed new nuclear power station at Avonmouth. Extensive dredging may increase erosion as the estuary tries to rebalance the sediment budget, whilst the re-dispersal of sediment can increase turbidity at receptor areas and result in the release of sediment-bound contaminants, with impacts potentially transferred up the estuary.</li> </ul> <p><b>Disturbance</b></p> <ul style="list-style-type: none"> <li>Extensive construction activity will be concentrated at the coastal fringe and within the estuary (i.e. the construction of off-shore infrastructure), resulting in vibration disturbance to marine communities adjacent to the proposed development site. Adverse effects of this disturbance on the migration and behaviour of migratory fish species may occur given that fish nursery areas are concentrated here, with invertebrate food resources being most abundant within intertidal mudflat and upper estuarine habitats<sup>28</sup>. Few species are dependant on the deep-water channel for feeding where disturbance impacts are likely to be diffuse. Migratory fish species designated within the River Usk SAC may occur given that some of the fish species designated within the Severn Estuary SAC are shared with the River Usk SAC (sea lamprey, river lamprey, twaite shad), such that any adverse impacts to their migratory and reproductive behaviour arising near the source of the disturbance may be transferred to the River Usk SAC, with further impacts upon otters designated within the River Usk SAC.</li> </ul>

<sup>26</sup> Henderson, P.A., & Seaby, R.M.H. (2001). Fish and crustacean captures at Hinkley Point B Nuclear Power Station; report for the year April 2000 to March 2001. Pisces Conservation Ltd.

<sup>27</sup> <http://www.mfa.gov.uk/environment/works/documents/screening%20scoping/construction-07/Bristol-Container-Terminal.pdf>

<sup>28</sup> <http://www.english-nature.org.uk/science/natural/profiles%5CnaProfile116.pdf>



River Usk SAC	
<p><b>Possible Avoidance and Mitigation Measures – includes recommendations for policy/proposals</b></p>	<p><b>Water Resource and Quality</b></p> <ul style="list-style-type: none"> <li>• Avoiding adverse effects upon surface, ground and estuarine waters is the responsibility of the developer, but is subject to a stringent management and regulatory frameworks by the Water Companies (resource planning) and the Environment Agency (EA) (abstraction licensing and discharge consents, to be reviewed under the Review of Consents process to be completed by 2010). Thermal, radioactive and non-radioactive discharges should go beyond complying with existing standards, with radioactive discharges required to be As Low As Reasonably Achievable (ALARA)<sup>29</sup> and that all other discharge levels are required to be an improvement on existing standards. All discharges which lead to adverse effects on the integrity of European sites should not be permitted.</li> <li>• The IPC, as guided by the Nuclear NPS, can also direct requirements for the efficiency of water use and the protection of water quality. This may include requiring that management measures relating to supply and discharge (including potential effects on European sites), are in place prior to site development, with decisions made taking into account Best Available Technology (BAT) which ensure protection of the sensitivities of the receiving environments.</li> <li>• The majority of remaining adverse effects upon water quality and resources will be effectively mitigated for through the implementation of suitable design (including use of Sustainable Urban Drainage Systems (SuDS)) and through the required selection of appropriate construction measures. Cooling water culverts should be designed to avoid effects on the existing thermal regime of the Severn Estuary, including the use of modern tunneling techniques for cabling and cooling water culverts where appropriate to avoid surface impacts. Their design should also aim to avoid, reduce or mitigate adverse effects on sedimentary processes or thermal regime, this design taking account of route, length and design of intake/outfall structures. Impacts upon groundwater flow should also be effectively avoided or mitigated by requiring that suitable design in abstraction mechanisms is employed.</li> </ul> <p><b>Habitat (and Species) Loss and Fragmentation/ Coastal Squeeze</b></p> <ul style="list-style-type: none"> <li>• Any direct or indirect loss of habitats and species (temporary or permanent) arising from construction/operation or decommissioning will have the potential to have knock-on effects throughout the</li> </ul>

<sup>29</sup> ALARA is not a dose limit; it is a practice that has as its objective the attainment of dose levels as far below applicable limits as possible.

	River Usk SAC
	<p>food chain (for example the impacts on breeding and/or wintering birds and migratory fish) and development proposals for design and build should avoid any direct habitat impacts that may lead to a loss of species or fragmentation.</p> <ul style="list-style-type: none"> <li>• The use of modern tunneling techniques for cabling and remote infrastructure, including cooling water culverts, where appropriate should be employed to ensure no surface impacts or adverse effects on sedimentary processes or thermal regime.</li> <li>• In terms of coastal erosion, should it be necessary to extend the sea defences to provide protection to the nominated site, it is envisaged that this could be done by the construction of new hard coastal defences. Although the precise type and detail of the measures cannot be determined at this stage, the works on coastal defences would be designed to secure the site against coastal erosion and as well as provide the necessary coastal protection. It is therefore reasonable to conclude that a strategic level the new nuclear development within the nominated site could be protected against coastal erosion.</li> <li>• Connectivity of important wildlife corridors around the site should be maintained, enhanced and restored. Management plans should be in place and incorporated into the overall mitigation package as good practice. In addition, an ecological mitigation and management plan for the nominated site should link to existing integrated land management plans.</li> <li>• Avoiding adverse effects on fish species is in part influenced by the efficiencies achieved within the industrial process and the nature of the technologies proposed by developments (extent of cooling water requirements). Fish protection measures could be incorporated within cooling water intake/system design. There is, therefore, a role for the IPC to ensure that developments at Hinkley Point incorporate technologies and operating practices that take account of identified sensitivities in fish populations (breeding and feeding cycles) in particular in the estuarine environment around the proposed development.</li> </ul> <p><b>Disturbance</b></p> <ul style="list-style-type: none"> <li>• The implementation of avoidance and mitigation measures aimed to reduce noise, vibration, light and visual disturbance arising from the development of the site and associated induced and ancillary infrastructure during construction, operation and decommissioning is required to ensure no adverse impacts upon the integrity of European sites will occur. Mitigation measures required include:             <ul style="list-style-type: none"> <li>○ the requirement for technologies and operating practices which take account identified sensitivities in fish (particularly in relation to vibration impacts and low frequency noise) and bird populations</li> </ul> </li> </ul>

	River Usk SAC
	<p>(particularly in regard to the regularity of disturbance) in the estuarine environment to be implemented where practicable;</p> <ul style="list-style-type: none"> <li>○ the requirement to restrict encroachment of construction areas into sensitive habitats through site design; the requirement to implement appropriate screening of disturbance impacts arising during construction (and deconstruction) works;</li> <li>○ the requirement for the phasing and timing of development works which take into account breeding and feeding cycles and habitats, and the flight lines and migration routes of sensitive species including birds, fish and otter; and</li> <li>○ the requirement for construction environmental management plans to be implemented at the site level which require the management of disturbance impacts through appropriate avoidance or mitigation to ensure no adverse impacts upon site integrity will arise. There is also a role for the IPC to ensure that developments at Hinkley Point incorporate technologies and operating practices which take into account identified sensitivities of species in the estuarine environment around the proposed development at Hinkley Point.</li> </ul>
<p><b>Conclude no adverse effect on integrity?</b></p>	<ul style="list-style-type: none"> <li>• It is not possible at this stage of the development of the Nuclear NPS to say that proposals at Hinkley Point will not have significant adverse effects on the River Usk SAC as a result of impacts to water quality and water resources, habitats and species, or as a result of disturbance.</li> </ul>

## Severn Estuary SPA

- Location: 511329N/030257W
- Size (ha): 2466.2
- Designation: SPA

Severn Estuary SPA	
<b>Qualifying Features</b>	<p>Article 4.1 Qualification</p> <p>Over winter the area regularly supports:</p> <ul style="list-style-type: none"> <li>• <a href="#">Bewick's Swan</a> <i>Cygnus columbianus bewickii</i> 3.9% of the GB population</li> </ul> <p>Article 4.2 Qualification</p> <p>Over winter the area regularly supports:</p> <ul style="list-style-type: none"> <li>• <a href="#">Gadwall</a> <i>Anas strepera</i> 0.9% of the population</li> <li>• <a href="#">White-fronted Goose</a> <i>Anser albifrons albifrons</i> 0.4% of the population</li> <li>• <a href="#">Dunlin</a> <i>Calidris alpina alpina</i> 3.3% of the population</li> <li>• <a href="#">Shelduck</a> <i>Tadorna tadorna</i> 1.1% of the population</li> <li>• <a href="#">Redshank</a> <i>Tringa totanus</i> 1.3% of the population</li> </ul> <p>Article 4.2 Qualification: Internationally Important Assemblage of Birds</p> <p>Over winter the area regularly supports:</p> <ul style="list-style-type: none"> <li>• 84317 waterfowl</li> </ul>
<b>Conservation Objectives</b>	To maintain all interest features in favourable condition as defined by conservation management plans.
<b>Key Environmental Conditions (factors that maintain site integrity)</b>	<ul style="list-style-type: none"> <li>• Intertidal mudflats and sandflats</li> <li>• Saltmarsh communities</li> <li>• Shingle and rocky shores</li> <li>• Wet coastal grazing marsh, improved grassland and open standing waters</li> <li>• Hydrodynamic and sedimentary regime</li> <li>• Maintain suitable distance between the site and development</li> </ul>

Severn Estuary SPA	
	<ul style="list-style-type: none"> <li>• Manage/restrict public access</li> <li>• Maintain levels of prey.</li> </ul>
<b>Vulnerabilities (includes existing pressures and trends)</b>	<ul style="list-style-type: none"> <li>• Physical loss through removal</li> <li>• Damage by abrasion or selective extraction</li> <li>• Noise or visual disturbance</li> <li>• Contamination by synthetic and/or non-synthetic toxic compounds</li> <li>• Changes in nutrient and/or organic loading</li> <li>• Biological disturbance through the selective extraction of species</li> </ul>
<p><b>Predicted Impacts</b></p> <p><i>What are the issues arising from the plan and how might the site be affected?</i></p>	<p><b>Water Resources and Quality</b></p> <ul style="list-style-type: none"> <li>• Increased/ altered drainage from earthworks and excavation</li> <li>• Potential for toxic contamination from accidental leakage</li> <li>• Radioactive discharges (accidental and routine)</li> <li>• Alteration of flow from abstraction</li> <li>• Changes to water temperature from controlled discharge</li> </ul> <p><b>Habitat Loss and Fragmentation/ Coastal Squeeze</b></p> <ul style="list-style-type: none"> <li>• Direct impacts, loss of sandflats/ estuary margins from extension of site boundary/construction of sea wall</li> <li>• Fragmentation from encroachment onto surrounding habitats during construction phases</li> <li>• Impingement of fish and larvae on water intake filters</li> <li>• Reduction of coastal margin by movement of fixed landward boundary into designated space</li> </ul> <p><b>Disturbance (noise, light and visual)</b></p> <ul style="list-style-type: none"> <li>• Local level impacts relating primarily to construction and decommissioning activities, also relevant offsite.</li> </ul> <p><b>Air Quality</b></p> <ul style="list-style-type: none"> <li>• Local level impacts (reduced air quality, NOx gases from road/ transport/ generation sources) arising from construction, operation, decommissioning activities.</li> </ul>

Severn Estuary SPA	
<p><b>Potential In-combination effects (screening)</b></p> <p><i>What other plans and programmes could lead to in-combinations effects?</i></p>	<p>The following plans have the potential to contribute ‘in-combination’ impacts in relation to the key issues identified. In-combination impacts may be positive where the plans’ function is to actively management those identified issues (for example Catchment Abstraction Management Strategies).</p> <p><b>Water Resources and Quality</b></p> <ul style="list-style-type: none"> <li>• Local Development Frameworks (Somerset, Devon, Bristol, South East Wales and Gloucestershire)</li> <li>• Environment Agency Catchment Abstraction Management Strategies (West Somerset Streams, Parrett, Bristol Avon)</li> </ul> <p><b>Habitat Loss and Fragmentation</b></p> <ul style="list-style-type: none"> <li>• Local Transport Plans (Somerset 2006-2011)</li> <li>• West Somerset Coastal Habitat Action Plan</li> </ul> <p><b>Coastal Squeeze</b></p> <ul style="list-style-type: none"> <li>• The North Devon and Somerset Shoreline Management Plan (review 2007)</li> </ul> <p><b>Disturbance</b></p> <ul style="list-style-type: none"> <li>• Tourism/ recreation strategies</li> </ul> <p><b>Air Quality</b></p> <ul style="list-style-type: none"> <li>• Local Development Frameworks (Somerset, Devon, Bristol, South East Wales and Gloucestershire)</li> </ul>
<p><b>Appropriate Assessment</b></p>	<p><b>Water Resources and Quality</b></p> <ul style="list-style-type: none"> <li>• Current Environment Agency data<sup>30</sup> indicates that, the ecological and chemical status of the estuarine environments near to Hinkley Point are assessed as ‘moderate’ and ‘high’ respectively. By 2015 the EA</li> </ul>

<sup>30</sup> Environment Agency River Basin Management Plans: South West River Basin District, 2008.  
 UKTG – Water Framework Directive Website: <http://www.wfduk.org/>  
 Environmental Agency – <http://maps.environment-agency.gov.uk/wiyby/wiybyController?ep=maptopics&lang= e>

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<b>Likelihood of adverse effect on integrity:</b>	<p>predicts that the ecological status will be maintained, but that the chemical quality of the water will decrease to 'good' status.</p> <ul style="list-style-type: none"> <li>• The assessments for the coastal water quality, downstream from Hinkley Point mirror those for the estuarine environment, with a prediction that the chemical quality of the water will decline.</li> <li>• The ecological status of the rivers around Hinkley Point is assessed as ranging from 'moderate' to 'good' ecological quality – the chemical condition of these rivers has yet to be assessed. Groundwater chemical quality around Hinkley Point is assessed by the EA as being 'good'.</li> <li>• Radioactive discharges are subject to targets monitored by the EA and of the non-radioactive discharges, nitrate contributions are considered to be the most significant (research cited by the EA in the nuclear sector report). In particular it is noted that there can be measurable localised impacts on sea nutrient levels in the vicinity of discharges.</li> <li>• Environmental condition data for the Severn Estuary SPA (Appendix 1, Site Characterisations) indicates that while water quality (as illustrated by EA data) has improved, where there are areas of local concern, nutrient loading should be avoided. Therefore, whilst current water quality indicators show ecological and chemical levels around Hinkley Point to be 'moderate' or higher, it is not possible (without further information on discharge levels and quality) to conclude that discharges both radioactive and non-radioactive will not have an adverse effect on the SPA.</li> <li>• The water resource management unit around Hinkley Point is not managed through the EA CAMS process due its tidal nature. The nearest WRMU to Hinkley Point at Cannington is over abstracted and identified as having no water available. It may therefore be a requirement for any new developments at Hinkley Point to provide water supply strategies. Given that water abstraction requirements and locations for Hinkley Point are currently unknown, it is not possible to conclude that water supply to the development will avoid levels of abstraction that lead to adverse effects on the SPA.</li> </ul>

Severn Estuary SPA	
	<p><b>Habitat Loss and Fragmentation/ Coastal Squeeze</b></p> <ul style="list-style-type: none"> <li>• The Severn Estuary Coastal Habitat Management Plan (CHaMP) produced by the Environment Agency<sup>31</sup> indicates that the Estuary is changing progressively.<sup>32</sup> In particular, sea level rise is resulting in coastal squeeze and a net loss of intertidal habitat. Analysis indicates that the saltmarsh and mudflat/sandflat habitats around Hinkley Point (Habitat Behaviour Unit 1) will be subject to a net decrease over the next 20 years (predicted to be 7% over for the estuary as a whole). However, the area around Bridgwater Bay is also identified as a location where accretion may result in habitat extension and the CHAMP indicates that areas of undeveloped land around Hinkley Point may be suitable for intertidal habitat creation.</li> <li>• The extent of loss to marine and terrestrial habitats from the construction of cooling water culverts, sea wall and a marine landing facility is currently unknown, and its significance in the context of wider habitat changes cannot be assessed. It is possible that these changes may act cumulatively or accelerate changes identified by the CHaMP in relation the primary designation features. At this strategic stage where detailed development plans are unknown, it is not possible to conclude that that there will not be adverse effects through habitat loss and coastal squeeze on the SPA.</li> </ul> <p><b>Disturbance (noise, light and visual)</b></p> <ul style="list-style-type: none"> <li>• Information provided by the Severn Estuary Partnership<sup>33</sup> to plan makers indicates that the wading birds and wildfowl of the Estuary, are particularly vulnerable to disturbance from close human proximity and the screening noted the potential for construction and decommissioning phases in particular to create disturbance events (this may for example, include the diversion of rights of way around Hinkley Point, resulting in greater or additional recreational pressures for birds).</li> <li>• Site information for the SSSI units underpinning the SPA indicates that currently over 95% of the habitats supporting the interest feature species are in favourable condition, providing a strong foundation for species survival.</li> <li>• However, Hinkley Point lies directly adjacent to the SPA designation and given that the full extent and nature of the development proposals is currently unknown, it is not possible to determine how the nature or timing of the</li> </ul>

<sup>31</sup> The Severn Estuary Coastal Habitat Management Plan: Technical Summary (EA, 2006)

<sup>32</sup> CHaMPs are specifically focused on the integrity of European and Ramsar sites.

<sup>33</sup> The Habitats and Species of the Severn Estuary: A basic introduction for developers and decision makers. Severn Estuary Partnership



Severn Estuary SPA	
	<p>development may affect interest feature birds or to conclude that there will be no significant effect.</p> <p><b>Air Quality</b></p> <ul style="list-style-type: none"> <li>Information provided by the South West Observatory 2008<sup>34</sup> indicates that air quality in the south west is generally good with low levels of sulphur, nitrogen dioxide and particulates. Pollution levels for all key pollutants in the rural area around Hinkley Point are typically low.</li> <li>The Environment Agency assesses that, non-radioactive aerial emissions (sulphur dioxide, nitrogen oxides and volatile organic compounds) from nuclear power stations are extremely low compared with other regulated industries and the Agency does not consider them to be an environmental priority.</li> <li>The Agency's most recent available assessment of radioactive aerial emissions indicates that all fall within authorised limits.<sup>35</sup></li> <li>Air quality issues around Hinkley Point are considered to potentially most significant during construction and decommissioning phases (transport etc). The potential for cumulative effects from other plans and programmes is minimised by sustainable transport measures set out in the Local Transport Plan, and the main focus of new housing development being located away from Hinkley Point to the east of the nearest main town Bridgwater. Therefore, in the context of: known air quality conditions; existing plans and (local level) management activities to regulate impacts; the European site characterisation data which indicates that the qualifying features are not considered vulnerable or at risk for issues of air quality; it is assessed that there is unlikely to be a significant effects on the SPA from air quality impacts.</li> </ul>
<b>Possible Avoidance and Mitigation Measures – includes recommendations for policy/proposals</b>	<p><b>Water Resource and Quality</b></p> <ul style="list-style-type: none"> <li>Avoiding adverse effects on surface, ground and estuarine waters is primarily the responsibility of the Water Companies (resource planning) and the Environment Agency (abstraction licensing and discharge regulation). However, the Nuclear NPS can direct requirements for efficiency of water use and require that issues relating to supply and discharge (including potential effects on European sites) are in place prior to the implementation</li> </ul>

<sup>34</sup> <http://www.swo.org.uk/publications/state-of-the-south-west/>

<sup>35</sup> Measuring Environmental Performance: Sector Report for the Nuclear Industry (Environment Agency, November 2005).

Severn Estuary SPA	
	<p>of the nominated site proposals.</p> <p><b>Habitat Loss and Fragmentation/ Coastal Squeeze</b></p> <ul style="list-style-type: none"> <li>Where proposals for design and build remain under development, the Nuclear NPS should seek to prioritise the avoidance of direct habitat impacts, for example through amended boundaries for the sea wall or design alterations for the marine landing facility, that protect the integrity of the designated site. Any direct impacts that cannot be avoided or mitigated should be addressed by compensation measures agreed with the Statutory Bodies and implemented prior to implementation of development proposals.</li> </ul> <p><b>Disturbance (noise, light, visual)</b></p> <ul style="list-style-type: none"> <li>Disturbance events in relation to bird species are most significant when they are irregular/ sudden and unpredictable. Noise, light and visual impacts can be managed at a site level through phasing and timing that takes account of breeding and feeding cycles and should be supported by information on flight lines/ migration routes/ feeding and roosting areas should also be obtained. Precise detail and the nature of the measures required would need to be agreed with the Statutory Body prior to the commencement of development. These measures would form part of the wider site management plan that developers would be required to agree and implement prior to commencement.</li> </ul> <p><b>Air Quality</b></p> <ul style="list-style-type: none"> <li>While air quality impacts are not assessed as being significant at this European site, it is appropriate that Nuclear NPS takes account of potential air quality impacts through requirements, particularly at a local level for sustainable transport plans including for example: the use of non-road transport where possible, phasing of development and robust monitoring at sites to track changes. In particular, the monitoring should account for the potential for cumulative impacts where the phasing between the existing power station and the new build overlaps.</li> </ul>
<b>Conclude no adverse effect on integrity?</b>	<ul style="list-style-type: none"> <li>It is not possible at this stage of the development of the Nuclear NPS to say that proposals at Hinkley Point will not have significant adverse effects on the Severn Estuary SPA as a result of impacts to water, changes to water quality, disturbance impacts, and habitat loss/ fragmentation, caused in part by coastal squeeze.</li> <li>It is, however, considered that air quality impacts are unlikely to be significant given current environmental conditions, known site vulnerabilities and available mitigation measures to address site level impacts.</li> </ul>

## Severn Estuary Ramsar

- Location: 511329N/030257W
- Size (ha): 2466.298
- Designation: Ramsar

Severn Estuary Ramsar	
<b>Qualifying Features</b>	<p><b>Ramsar criterion 1</b></p> <ul style="list-style-type: none"> <li>• Immense tidal range (second-largest in world) creating diversity of physical environment and biological communities.</li> </ul> <p><b>Ramsar criterion 3</b></p> <ul style="list-style-type: none"> <li>• Due to unusual estuarine communities, reduced diversity and high productivity.</li> </ul> <p><b>Ramsar criterion 4</b></p> <ul style="list-style-type: none"> <li>• This site is important for the run of migratory fish between sea and river via estuary. Species include Salmon <i>Salmo salar</i>, sea trout <i>S. trutta</i>, sea lamprey <i>Petromyzon marinus</i>, river lamprey <i>Lampetra fluviatilis</i>, allis shad <i>Alosa alosa</i>, twaite shad <i>A. fallax</i>, and eel <i>Anguilla anguilla</i>. It is also of particular importance for migratory birds during spring and autumn.</li> </ul> <p><b>Ramsar criterion 5</b></p> <p>Species with peak counts in winter:</p> <ul style="list-style-type: none"> <li>• 70919 waterfowl</li> </ul> <p><b>Ramsar criterion 6</b></p> <p>Species with peak counts in winter:</p> <ul style="list-style-type: none"> <li>• Bewick's swan</li> <li>• Greater white-fronted goose</li> <li>• Common shelduck</li> <li>• Gadwall</li> <li>• Dunlin</li> <li>• Common redshank</li> </ul> <p><b>Ramsar criterion 8</b></p> <ul style="list-style-type: none"> <li>• The fish of the whole estuarine and river system is one of the most diverse in Britain, with over 110 species recorded. Salmon <i>Salmo salar</i>, sea trout <i>S. trutta</i>, sea lamprey <i>Petromyzon marinus</i>, river lamprey <i>Lampetra fluviatilis</i>, allis shad <i>Alosa alosa</i>, twaite shad <i>A. fallax</i>, and eel <i>Anguilla Anguilla</i> use the Severn Estuary as a</li> </ul>

Severn Estuary Ramsar	
	key migration route to their spawning grounds in the many tributaries that flow into the estuary. The site is important as a feeding and nursery ground for many fish species particularly allis shad <i>Alosa alosa</i> and twaite shad <i>A. fallax</i> which feed on mysid shrimps in the salt wedge.
<b>Conservation Objectives</b>	No conservation objectives currently available for this site.
<b>Key Environmental Conditions (factors that maintain site integrity)</b>	<ul style="list-style-type: none"> <li>• Intertidal mudflats and sandflats</li> <li>• Saltmarsh communities</li> <li>• Shingle and rocky shores</li> <li>• Wet coastal grazing marsh, improved grassland and open standing waters</li> <li>• Hydrodynamic and sedimentary regime</li> <li>• Maintain suitable distance between the site and development</li> <li>• Manage/restrict public access</li> <li>• Maintain levels of prey</li> </ul>
<b>Vulnerabilities (includes existing pressures and trends)</b>  <i>Details at Appendix 1</i>	<ul style="list-style-type: none"> <li>• Physical loss of supporting habitats through removal</li> <li>• Noise/ visual disturbance</li> <li>• Contamination by synthetic and/or non-synthetic toxic compounds</li> <li>• Damage by abrasion or selective extraction</li> <li>• Changes in nutrient and/or organic loading</li> <li>• Inappropriate grazing</li> </ul>
<b>Predicted Impacts</b>  <i>What are the issues arising from the plan and how might the site be affected?</i>	<p><b>Water Resources and Quality</b></p> <ul style="list-style-type: none"> <li>• Increased/ altered drainage from earthworks and excavation</li> <li>• Potential for toxic contamination from accidental leakage</li> <li>• Radioactive discharges (accidental and routine)</li> <li>• Alteration of flow from abstraction</li> <li>• Changes to water temperature from controlled discharge</li> </ul> <p><b>Habitat Loss and Fragmentation</b></p> <ul style="list-style-type: none"> <li>• Direct impacts, loss of sandflats/ estuary margins from extension of site boundary/construction of sea wall</li> </ul>

Severn Estuary Ramsar	
	<ul style="list-style-type: none"> <li>• Fragmentation from encroachment onto surrounding habitats during construction phases</li> <li>• Impingement of fish and larvae on water intake filters</li> </ul> <p><b>Disturbance</b></p> <ul style="list-style-type: none"> <li>• Noise, vibration and discharges can impact the course of migratory fish</li> </ul> <p><b>Coastal Squeeze</b></p> <ul style="list-style-type: none"> <li>• Reduction of coastal margin by movement of fixed landward boundary into designated space</li> </ul> <p><b>Air Quality</b></p> <ul style="list-style-type: none"> <li>• Local level impacts (reduced air quality, NOx gases from road/ transport/ generation sources) arising from construction, operation, decommissioning activities.</li> </ul>
<p><b>Potential In-combination effects (screening)</b></p> <p><i>What other plans and programmes could lead to in-combinations effects?</i></p>	<p>The following plans have the potential to contribute ‘in-combination’ impacts in relation to the key issues identified. In-combination impacts may be positive where the plans’ function is to actively management those identified issues (for example Catchment Abstraction Management Strategies).</p> <p><b>Water Resources and Quality</b></p> <ul style="list-style-type: none"> <li>• Local Development Frameworks (Somerset, Devon, Bristol, South East Wales and Gloucestershire)</li> <li>• Environment Agency Catchment Abstraction Management Strategies (West Somerset Streams, Parrett, Bristol Avon)</li> </ul> <p><b>Habitat Loss and Fragmentation</b></p> <ul style="list-style-type: none"> <li>• Local Transport Plans (Somerset 2006-2011)</li> <li>• West Somerset Coastal Habitat Action Plan</li> </ul> <p><b>Coastal Squeeze</b></p> <ul style="list-style-type: none"> <li>• The North Devon and Somerset Shoreline Management Plan (review 2007)</li> </ul> <p><b>Disturbance</b></p>

Severn Estuary Ramsar	
	<ul style="list-style-type: none"> <li>Bristol Ports Development</li> </ul> <p><b>Air Quality</b></p> <ul style="list-style-type: none"> <li>Local Development Frameworks (Somerset, Devon, Bristol, South East Wales and Gloucestershire)</li> </ul>
<p><b>Appropriate Assessment</b></p> <p><b>Likelihood of adverse effect on integrity:</b></p>	<p><b>Water Resources and Quality</b></p> <ul style="list-style-type: none"> <li>Current Environment Agency data<sup>36</sup> indicates that, the ecological and chemical status of the estuarine environments near to Hinkley Point are assessed as ‘moderate’ and ‘high’ respectively. By 2015 the EA predicts that the ecological status will be maintained, but that the chemical quality of the water will decrease to ‘good’ status.</li> <li>The assessments for the coastal water quality, downstream from Hinkley Point mirror those for the estuarine environment, with a prediction that the chemical quality of the water will decline.</li> <li>The ecological status of the rivers around Hinkley Point is assessed as ranging from ‘moderate’ to ‘good’ ecological quality – the chemical condition of these rivers has yet to be assessed. Groundwater chemical quality around Hinkley Point is assessed by the EA as being ‘good’.</li> <li>Radioactive discharges are subject to targets monitored by the EA and of the non-radioactive discharges, nitrate contributions are considered to be the most significant (research cited by the EA in the nuclear sector report). In particular it is noted that there can be measurable localised impacts on sea nutrient levels in the vicinity of discharges.</li> <li>Environmental condition data for the Severn Estuary (Appendix 1, Site Characterisations) indicates that while water quality (as illustrated by EA data) has improved, where there are areas of local concern, nutrient loading should be avoided. Therefore, whilst current water quality indicators show ecological and chemical levels around Hinkley Point to be ‘moderate’ or higher, it is not possible (without further information on discharge levels and quality) to conclude that discharges both radioactive and non-radioactive will not have an adverse effect on the designated site.</li> <li>The water resource management unit around Hinkley Point is not managed through the EA CAMS process</li> </ul>

<sup>36</sup> Environment Agency River Basin Management Plans: South West River Basin District, 2008.  
 UKTG – Water Framework Directive Website: <http://www.wfduk.org/>  
 Environmental Agency – [http://maps.environment-agency.gov.uk/wiyby/wiybyController?ep=maptopics&lang=\\_e](http://maps.environment-agency.gov.uk/wiyby/wiybyController?ep=maptopics&lang=_e)

	Severn Estuary Ramsar
	<p>due its tidal nature. The nearest WRMU to Hinkley Point at Cannington is over abstracted and identified as having no water available. It may therefore be a requirement for any new developments at Hinkley Point to provide water supply strategies. Given that water abstraction requirements and locations for Hinkley Point are currently unknown, it is not possible to conclude that water supply to the development will avoid levels of abstraction that lead to adverse effects on the designated site.</p> <p><b>Habitat Loss and Fragmentation/ Coastal Squeeze</b></p> <ul style="list-style-type: none"> <li>• The Severn Estuary Coastal Habitat Management Plan (CHaMP) produced by the Environment Agency<sup>37</sup> indicates that the Estuary is changing progressively.<sup>38</sup> In particular, sea level rise is resulting in coastal squeeze and a net loss of intertidal habitat. Analysis indicates that the saltmarsh and mudflat/sandflat habitats around Hinkley Point (Habitat Behaviour Unit 1) will be subject to a net decrease over the next 20 years (predicted to be 7% over for the estuary as a whole). However, the area around Bridgwater Bay is also identified as a location where accretion may result in habitat extension and the CHAMP indicates that areas of undeveloped land around Hinkley Point may be suitable for intertidal habitat creation.</li> <li>• The extent of loss to marine and terrestrial habitats from the construction of cooling water culverts, sea wall and a marine landing facility is currently unknown, and its significance in the context of wider habitat changes cannot be assessed. It is possible that these changes may act cumulatively or accelerate changes identified by the CHaMP in relation the primary designation features. At this strategic stage where detailed development plans are unknown, it is not possible to conclude that that there will not be adverse effects through habitat loss and coastal squeeze on the designated site.</li> </ul> <p><b>Disturbance</b></p> <ul style="list-style-type: none"> <li>• The screening noted the potential for disturbance (noise/ vibration) to affect the behaviour of migratory fish populations. Seven species of migratory fish move through the Estuary between the sea and rivers. There are particularly large numbers of Atlantic Salmon <i>Salmo salar</i> and Common Eel <i>Anguilla anguilla</i> within the</li> </ul>

<sup>37</sup> The Severn Estuary Coastal Habitat Management Plan: Technical Summary (EA, 2006)

<sup>38</sup> CHaMPs are specifically focused on the integrity of European and Ramsar sites.

Severn Estuary Ramsar	
	<p>Estuary.</p> <ul style="list-style-type: none"> <li>• Information from surveys in the waters around Hinkley Point (2001)<sup>39</sup> suggests that fish abundance has improved, and this is tentatively correlated to trend in rising water temperatures brought in part by climate change. The study also notes however, that increases in abundance are coincident with a reduction in the number of direct cooled power stations but that observations cannot be regarded as directly linked.</li> <li>• Given that the cooling water and discharges requirements are currently unknown in relation to Hinkley Point, a precautionary approach requires that significant effects be assumed until greater detail (including on technology and mitigation measures) is known.</li> <li>• Disturbance issues for interest feature birds are addressed as part of the SPA AA proforma.</li> </ul> <p><b>Air Quality</b></p> <ul style="list-style-type: none"> <li>• Information provided by the South West Observatory 2008<sup>40</sup> indicates that air quality in the south west is generally good with low levels of sulphur, nitrogen dioxide and particulates. Pollution levels for all key pollutants in the rural area around Hinkley Point are typically low.</li> <li>• The Environment Agency assesses that, non-radioactive aerial emissions (sulphur dioxide, nitrogen oxides and volatile organic compounds) from nuclear power stations are extremely low compared with other regulated industries and the Agency does not consider them to be an environmental priority.</li> <li>• The Agency's most recent available assessment of radioactive aerial emissions indicates that all fall within authorised limits.<sup>41</sup></li> <li>• Air quality issues around Hinkley Point are considered to potentially most significant during construction and decommissioning phases (transport etc). The potential for cumulative effects from other plans and programmes is minimised by sustainable transport measures set out in the Local Transport Plan, and the main focus of new housing development being located away from Hinkley Point to the east of the nearest main town Bridgwater. Therefore, in the context of: known air quality conditions; existing plans and (local level) management activities to regulate impacts; the European site characterisation data which indicates that the qualifying features are not considered vulnerable or at risk for issues of air quality; it is assessed that there</li> </ul>

<sup>39</sup> Pisces Conservation Ltd <http://www.irchouse.demon.co.uk/index.html?2-hink2001>

<sup>40</sup> <http://www.swo.org.uk/observatory/links-1/state/state-of-the-south-w-1.shtm>

<sup>41</sup> Measuring Environmental Performance: Sector Report for the Nuclear Industry (Environment Agency, Nov 2005).



Severn Estuary Ramsar	
	are unlikely to be a significant effects on the designated site from air quality impacts.
<b>Possible Avoidance and Mitigation Measures – includes recommendations for policy/proposals</b>	<p><b>Water Resource and Quality</b></p> <ul style="list-style-type: none"> <li>Avoiding adverse effects on surface, ground and estuarine waters is primarily the responsibility of the Water Companies (resource planning) and the Environment Agency (abstraction licensing and discharge regulation). However, the Nuclear NPS can direct requirements for efficiency of water use and require that issues relating to supply and discharge (including potential effects on European sites) are in place prior to the implementation of the nominated site proposals.</li> </ul> <p><b>Habitat Loss and Fragmentation/ Coastal Squeeze</b></p> <ul style="list-style-type: none"> <li>Where proposals for design and build remain under development, the Nuclear NPS should seek to prioritise the avoidance of direct habitat impacts, for example through amended boundaries for the sea wall or design alterations for the marine landing facility, that protect the integrity of the designated site. Any direct impacts that cannot be avoided or mitigated should be addressed by compensation measures agreed with the Statutory Bodies and implemented prior to implementation of development proposals.</li> </ul> <p><b>Disturbance</b></p> <ul style="list-style-type: none"> <li>Avoiding adverse effects on fish species is in part influenced by the efficiencies achieved and the nature of the technologies proposed by developments. There is therefore a role for the Nuclear NPS to direct requirements for technologies and operating practices that take account of identified sensitivities in fish populations.</li> </ul> <p><b>Air Quality</b></p> <ul style="list-style-type: none"> <li>While air quality impacts are not assessed as being significant at this European site, it is appropriate that Nuclear NPS takes account of potential air quality impacts through requirements, particularly at a local level for sustainable transport plans including for example: the use of non-road transport where possible, phasing of development and robust monitoring at sites to track changes. In particular, the monitoring should account for the potential for cumulative impacts where the phasing between the existing power station and the new build overlaps.</li> </ul>
<b>Conclude no adverse effect on integrity?</b>	<ul style="list-style-type: none"> <li>It is not possible at this stage of the development of the Nuclear NPS to say that proposals at Hinkley Point will not have significant adverse effects on the Severn Estuary Ramsar as a result of impacts to water,</li> </ul>

	Severn Estuary Ramsar
	<p>changes to water quality, disturbance and habitat loss/ fragmentation, caused in part by coastal squeeze.</p> <ul style="list-style-type: none"><li>• It is, however, considered that air quality impacts are unlikely to be significant given current environmental conditions, known site vulnerabilities and available mitigation measures to address site level impacts.</li></ul>

## Somerset Levels and Moors SPA

Location: 025200W/511014N

Size (ha): 6388.9

Designation: SPA

Somerset Levels and Moors SPA	
<b>Qualifying Features</b>	<p>Annex 1 Primary Reason for selection</p> <ul style="list-style-type: none"> <li>• Over winter: Bewick's Swan <i>Cygnus columbianus bewickii</i>, Golden Plover <i>Pluvialis apricaria</i>,</li> <li>• Article 4.2 qualification: Shoveler <i>Anas clypeata</i>, Teal <i>Anas crecca</i>, Wigeon <i>Anas penelope</i>,</li> <li>• Article 4.2 qualification: overwintering waterfowl: Snipe <i>Gallinago gallinago</i>, Lapwing <i>Vanellus vanellus</i>, Pintail <i>Anas acuta</i>, Gadwall <i>Anas strepera</i>, Shoveler <i>Anas clypeata</i>, Teal <i>Anas crecca</i>, Golden Plover <i>Pluvialis apricaria</i></li> </ul>
<b>Conservation Objectives</b>	<ul style="list-style-type: none"> <li>• To maintain at, or restore to, favourable conservation status, the natural habitats and/or the populations of birds for which the Hinkley Point as been selected. The conservation status of a species is defined as favourable when the population, range and natural habitats of the species are stable or increasing.</li> </ul>
<b>Key Environmental Conditions (factors that maintain site integrity)</b>	<ul style="list-style-type: none"> <li>• Management of the habitats present on the site is required to maintain the diverse structure and composition of vegetation. This would include hay cutting, light grazing and ditch drainage.</li> <li>• Control of inappropriate or invasive species, an open landscape free of scrub is required for breeding waders.</li> <li>• Birdlife found on the site is vulnerable to disturbance.</li> </ul>
<b>Vulnerabilities (includes existing pressures and trends)</b>  <i>Details at Appendix 1</i>	<ul style="list-style-type: none"> <li>• Conversion of grassland to arable</li> <li>• Peat extraction and increasing levels of unmanaged scrub</li> <li>• Drainage and ditch management (winter ditch water levels not secured)</li> <li>• Nutrient enrichment due to sewage treatment facilities in to watercourses/ water pollution from agricultural run off.</li> <li>• Inappropriate water level management issues due to development on flood plain</li> <li>• Disturbance from access, shooting and other recreational activities</li> <li>• Invasive freshwater species</li> <li>• Undergrazing</li> </ul>

Somerset Levels and Moors SPA	
<p><b>Predicted Impacts</b></p> <p><i>What are the issues arising from the plan and how might the site be affected?</i></p>	<p><b>Water Resources and Quality</b></p> <ul style="list-style-type: none"> <li>No direct impacts at this site from developments at Hinkley Point, but potential indirect impacts on qualifying species common to related Severn SPA</li> </ul>
<p><b>Potential In-combination effects (screening)</b></p> <p><i>What other plans and programmes could lead to in-combinations effects?</i></p>	<p>The following plans have the potential to contribute ‘in-combination’ impacts in relation to the key issues identified. In-combination impacts may be positive where the plans’ function is to actively management those identified issues (for example Catchment Abstraction Management Strategies).</p> <p><b>Water Resources and Quality</b></p> <ul style="list-style-type: none"> <li>Local Development Frameworks (Somerset)</li> <li>Environment Agency Catchment Abstraction Management Strategies (Tone, Brue, Axe, North Somerset, West Somerset Streams, Parrett, Bristol Avon)</li> </ul>
<p><b>Appropriate Assessment</b></p> <p><b>Likelihood of adverse effect on integrity:</b></p>	<p><b>Water Resources and Quality</b></p> <ul style="list-style-type: none"> <li>The Somerset Levels and Moors SPA straddles Environmental Agency CAMS areas. However, in each case the SPA area is not covered by the management strategies because the water courses are not natural flowing rivers (they are managed using penning structures to minimise flood potential). Where abstractions and discharges occur that feed the designated area they are regulated in accordance with conservation objectives.</li> <li>Impacts on water quality at this site, which may have adverse effects for the qualifying species arise from local level management practices (for example the EA note that while biological and chemical water quality in the area’s Rivers is typically high (89% and 87% respectively) nitrate pollutant levels in the water courses across the Somerset Levels and Moors in particular are high due to agricultural discharges)<sup>42</sup>.</li> </ul>

<sup>42</sup> Environment Agency (2008)/ State of the Environment, South West Regional Observatory.

Somerset Levels and Moors SPA	
	<ul style="list-style-type: none"> <li>Recent surveys of the SPA's qualifying features indicate that there has been a decline in the Annex 1 qualifying feature (Bewick's Swan)<sup>43</sup>, with issues of land drainage and management practices implicated as a potential cause for the identified changes.</li> <li>The available environmental condition and survey data suggests that observed effects on the qualifying features at this site arise from a combination of local management practices (in particular drainage and land use issues). The data does not show any clear causal links between water quality/ flow changes beyond the immediate boundaries of the designated site (i.e. potential issues identified in the proximity of Hinkley Point) and the conditions status of the qualifying interests.</li> <li>This strategic level assessment suggests that issues identified in relation to water resources and quality at Hinkley Point, are unlikely to have a significant effect on the Somerset Levels and Moors SPA.</li> </ul>
<b>Possible Avoidance and Mitigation Measures – includes recommendations for policy/proposals</b>	<ul style="list-style-type: none"> <li>N/A</li> </ul>
<b>Conclude no adverse effect on integrity?</b>	<ul style="list-style-type: none"> <li>Developments at Hinkley Point are unlikely to have a significant effect on the integrity of the Somerset Levels and Moors SPA. Water issues at this European site are subject to local management regimes.</li> </ul>

<sup>43</sup> British Trust for Ornithology (2008). The Wetland Bird Survey (WeBS) Alerts, Somerset Levels and Moors.

## Somerset Levels and Moors Ramsar

- **Location:**
- **Size (ha): 6394.53**
- **Designation: Ramsar**

Somerset Levels and Moors Ramsar	
<b>Qualifying Features</b>	<p>2a – Supports an assemblage of rare, vulnerable or endangered species of sub species (specifically rare invertebrates, particularly beetles)</p> <p>3a – Regularly supports at least 20,000 waterfowl (specifically 73014 waterfowl)</p> <p>3c – Regularly supports at least 1% of all individuals in a waterfowl population (specifically Teal and Bewick's Swan [see SPA criteria])</p>
<b>Conservation Objectives</b>	<ul style="list-style-type: none"> <li>• To maintain at, or restore to, favourable conservation status, the natural habitats and/or the populations of birds for which the Hinkley Pointas been selected. The conservation status of a species is defined as favourable when the population, range and natural habitats of the species are stable or increasing.</li> </ul>
<b>Key Environmental Conditions (factors that maintain site integrity)</b>	<ul style="list-style-type: none"> <li>• Management of the habitats present on the site is required to maintain the diverse structure and composition of vegetation. This would include hay cutting, light grazing and ditch drainage.</li> <li>• Control of inappropriate or invasive species, an open landscape free of scrub is required for breeding waders.</li> <li>• Birdlife found on the site is vulnerable to disturbance.</li> </ul>
<b>Vulnerabilities (includes existing pressures and trends)</b>  <i>Details at Appendix 1</i>	<ul style="list-style-type: none"> <li>• Conversion of grassland to arable</li> <li>• Peat extraction and increasing levels of unmanaged scrub</li> <li>• Drainage and ditch management (winter ditch water levels not secured)</li> <li>• Nutrient enrichment due to sewage treatment facilities in to watercourses/ water pollution from agricultural run off.</li> <li>• Inappropriate water level management issues due to development on flood plain</li> <li>• Disturbance from access, shooting and other recreational activities</li> <li>• Invasive freshwater species</li> <li>• Undergrazing</li> </ul>

Somerset Levels and Moors Ramsar	
<p><b>Predicted Impacts</b></p> <p><i>What are the issues arising from the plan and how might the site be affected?</i></p>	<p><b>Water Resources and Quality</b></p> <ul style="list-style-type: none"> <li>No direct impacts at this site from developments at Hinkley Point, but potential indirect impacts on qualifying species common to related Severn SPA</li> </ul>
<p><b>Potential In-combination effects (screening)</b></p> <p><i>What other plans and programmes could lead to in-combinations effects?</i></p>	<p>The following plans have the potential to contribute ‘in-combination’ impacts in relation to the key issues identified. In-combination impacts may be positive where the plans’ function is to actively management those identified issues (for example Catchment Abstraction Management Strategies).</p> <p><b>Water Resources and Quality</b></p> <ul style="list-style-type: none"> <li>Local Development Frameworks (Somerset)</li> <li>Environment Agency Catchment Abstraction Management Strategies (Tone, Brue, Axe, North Somerset, West Somerset Streams, Parrett, Bristol Avon)</li> </ul>
<p><b>Appropriate Assessment</b></p> <p><b>Likelihood of adverse effect on integrity:</b></p>	<p><b>Water Resources and Quality</b></p> <ul style="list-style-type: none"> <li>The Somerset Levels and Moors Ramsar straddles Environmental Agency CAMS areas. However, in each case the Ramsar area is not covered by the management strategies because the water courses are not natural flowing rivers (they are managed using penning structures to minimise flood potential). Where abstractions and discharges occur that feed the designated area they are regulated in accordance with conservation objectives.</li> <li>Impacts on water quality at this site, which may have adverse effects for the qualifying species arise from local level management practices (for example the EA note that while biological and chemical water quality in the area’s Rivers is typically high (89% and 87% respectively) nitrate pollutant levels in the water courses across the Somerset Levels and Moors in particular are high due to agricultural discharges)<sup>44</sup>.</li> </ul>

<sup>44</sup> Environment Agency (2008)/ State of the Environment, South West Regional Observatory.

Somerset Levels and Moors Ramsar	
	<ul style="list-style-type: none"> <li>• Recent surveys of the area’s wetland birds indicate that there has been a decline in the Ramsar criteria Bewick’s Swan and Teal<sup>45</sup>, with issues of land drainage and management practices implicated as a potential cause for the identified changes.</li> <li>• The available environmental condition and survey data suggests that observed effects on the qualifying features at this site arise from a combination of local management practices (in particular drainage and land use issues). The data does not show any clear causal links between water quality/ flow changes beyond the immediate boundaries of the designated site (i.e. potential issues identified in the proximity of Hinkley Point) and the conditions status of the qualifying interests.</li> <li>• This strategic level assessment suggests that issues identified in relation to water resources and quality at Hinkley Point, are unlikely to have a significant effect on the Somerset Levels and Moors SPA.</li> </ul>
<b>Possible Avoidance and Mitigation Measures – includes recommendations for policy/proposals</b>	<ul style="list-style-type: none"> <li>• N/A</li> </ul>
<b>Conclude no adverse effect on integrity?</b>	<ul style="list-style-type: none"> <li>• Developments at Hinkley Point are unlikely to have a significant effect on the integrity of the Somerset Levels and Moors Ramsar. Water issues at this European site are subject to local management regimes.</li> </ul>

<sup>45</sup> British Trust for Ornithology (2008). The Wetland Bird Survey (WeBS) Alerts, Somerset Levels and Moors.



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