

APPROPRIATE ASSESSMENT OF HORSHAM DISTRICT COUNCIL'S CORE STRATEGY

INTRODUCTION

In October 2005, the European Court of Justice ruled that land-use plans should be subject to an "Appropriate Assessment" of their implications for European Sites, which are nature conservation sites designated as Special Protection Areas (SPAs) and Special Areas of Conservation (SACs), as well as species outlined in Regulation 10 of the Habitats Regulations 1994. This ruling was communicated to Chief Planning Officers in a letter from the ODPM in March 2006.

The purpose of an Appropriate Assessment is to assess the impacts of a land-use plan against the conservation objectives of the European Site. The assessment must determine whether the plan would adversely affect the integrity of the site in terms of its nature conservation objectives. Where negative effects are identified other options should be examined to avoid any potential damaging effects.

ACTION BY HORSHAM DISTRICT COUNCIL

The majority of the Arun Valley SPA is situated in Horsham District, and other European sites are located relatively close to the District's boundaries. In response to this, the Council commissioned Levett-Therivel Sustainability Consultants to undertake an Appropriate Assessment of Horsham District's Core Strategy.

Following receipt of the draft Appropriate Assessment from the Consultants on 10th August 2006, the Council sent the study to English Nature, the Environment Agency and Southern Water. These organisations had been consulted as part of the preparation of the Appropriate Assessment, and it was considered that it would be beneficial to seek their final comments on the study, prior to making the document available for the Examination.

In light of the responses from these organisations, the Appropriate Assessment report has been updated by Levett-Therivel to take make necessary clarifications and factual changes.

Following these final amendments and the submission of the report, the Council has also added in its own response to the issues and suggested avoidance measures, and how these relate to the Core Strategy or other Development Plan Documents.

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Summary

This appropriate assessment tests whether Horsham's Core Strategy is likely, in combination with other plans and projects, to have an adverse impact on the integrity of any Special Area of Conservation (SAC) for habitats, or Special Protection Area (SPA) for birds, jointly known as 'European sites'. The European sites that could potentially be affected by the Core Strategy are:

- Arun Valley SPA/Ramsar: important winter site for tundra swans
- The Mens SAC and Ebernoe Common SAC: beech forests with rich lichen communities and populations of barbastelle and Bechstein's bats
- Mole Gap SAC: calcareous grassland important for its box scrub and orchids
- Castle Hill SAC: chalk grassland known for its spider orchids, burnt orchids and early gentians
- Thursley, Ash, Pirbright and Chobham SAC, and Woolmer Forest SAC: lowland heaths
- Ashdown Forest SAC/SPA: lowland heath with important populations of nightjar, Dartford warblers and great crested newts.

Horsham's Core Strategy is for 9,335 new dwellings and 190,000m² of new employment floorspace by 2016 (average 620 homes/year), plus an additional 1240 homes and 25,000m² employment floorspace in 2017-2018. Much of the new housing and employment development would be west of Crawley and west of Horsham.

An initial list was prepared of possible impacts that the Core Strategy could have on the European sites. Subsequent consultation with English Nature, the Environment Agency and a range of other experts suggest that some of these impacts were not likely to be significant and could be 'screened out', mostly because the sites were too far away from Horsham District Council's boundaries to be affected. These were:

- impacts on Mole Gap and Castle Hill generally
- recreational impacts on Thursley, Ash, Pirbright and Chobham; Woolmer Forest; and Ashdown Forest SAC/SPAs
- most impacts on bats at The Mens and Ebernoe Common

Remaining impacts that need to be avoided through the Horsham Core Strategy are:

- *Changes to water levels Arun Valley.* The Environment Agency's abstraction consent process should avoid impacts to water levels. Such impacts can also be dealt with, as a default measure, by requiring new development in the Horsham district to be 'water neutral': water abstraction after a new development should not be greater than abstraction before the development. If subsequent discussions with the Environment Agency and others suggest that such tight measures are not necessary, the requirement can be relaxed.
- *Changes to water quality at Arun Valley.* No major new development is proposed that would affect the wastewater treatment works closest to the site, and the Environment Agency's discharge consent process should not permit development that leads to degraded river conditions. Nevertheless, there is a risk of cumulative impacts on river water quality due to general development and increased run off from hard standings. Pre-treatment of wastewater from new developments that ultimately discharges into the River Arun could avoid water quality impacts.

- *Air pollution impacts.* Diffuse air pollution impacts associated with new housing, other development and associated traffic in the district has been screened out at this stage because this issue needs to be dealt with at a regional level. If the appropriate assessment for the South East Plan identifies avoidance measures for all local authorities, then Horsham will need to take these on board. More localised air pollution impacts, where increased traffic resulting from the Core Strategy would significantly increase traffic levels within 200 metres of relevant European sites, would require appropriate assessment at a local level.
- *Barbastelle bat foraging grounds at The Mens.* To protect the bats' foraging grounds, the Core Strategy should prohibit any development that could affect trees and hedges within 8km of the edge of the site, unless/until a more detailed study is carried out which would allow a more specific (location-wise) requirement to be put in place.

1. Introduction

Levett-Therivel and Treweek Environmental Consultants were commissioned to carry out an Appropriate Assessment of Horsham District Council's Core Strategy. This report discusses Stage 1 (screening) and Stage 2 (appropriate assessment).

1.1 Requirements of the Habitats Directive

Appropriate Assessment of plans that could affect Special Protection Areas for birds (SPAs) or Special Areas of Conservation for habitats (SACs) is required by Article 6(3) of the European Habitats Directive¹:

Any plan or project not directly connected with or necessary to the management of the site but likely to have a significant effect thereon, either individually or in combination with other plans or projects, shall be subject to appropriate assessment of its implications for the site in view of the site's conservation objectives. In the light of the conclusions of the assessment of the implications for the site and subject to the provisions of paragraph 4, the competent national authorities shall agree to the plan or project only after having ascertained that it will not adversely affect the integrity of the site concerned and, if appropriate, after having obtained the opinion of the general public.

Article 6(4) of the Habitats Directive goes on to discuss alternative solutions, the test of 'imperative reasons of overriding public interest' (IROPI) and compensatory measures:

If, in spite of a negative assessment of the implications for the site and in the absence of alternative solutions, a plan or project must nevertheless be carried out for imperative reasons of overriding public interest, including those of social or economic nature, the Member State shall take all compensatory measures necessary to ensure that the overall coherence of Natura 2000 is protected. It shall inform the Commission of the compensatory measures adopted.

The Habitats Directive applies the precautionary principle to SPAs and SACs ('European sites'). Plans and projects can only be permitted having ascertained that there will be no adverse effect on the integrity of the site(s) in question. Plans and projects may still be permitted if there are no alternatives to them and there are imperative reasons of overriding public interest as to why they should go ahead. In such cases, compensation will be necessary to ensure the overall integrity of the site network.

1.2 Methodology used for this Appropriate Assessment

European guidance on Appropriate Assessment (AA) recommends a process of up to four stages:

1. Screening. Determining whether the plan 'in combination' is likely to have a significant effect on a European site
2. Appropriate Assessment. Determining whether, in view of the site's conservation objectives, the plan 'in combination' would have an adverse effect (or risk of this) on the integrity of the site. If not, the plan can proceed.

¹ Directive 92/43/EEC on the Conservation of Natural Habitats and Wild Fauna and Flora

3. Assessment of alternative solutions. Where the plan is assessed as having an adverse effect (or risk of this) on the integrity of a site, there should be an examination of alternatives.
4. Assessment where no alternative solutions remain and where adverse impacts remain

This AA covers Stages 1 and 2 of this process. The two stages were carried out in an iterative manner in April 2006 and August 2006: as more information about the sites and the plan's impacts became available, some impacts could be screened out and new ones came to light. Broadly the AA process involved:

- identification of European sites that could possibly be affected by Horsham's Core Strategy, qualifying features of those sites, and key environmental conditions to support the sites' integrity;
- identification of possible impacts on the sites arising from Horsham's Core Strategy;
- draft identification of impacts and sites that could be screened out, and those that were likely to require more detailed appropriate assessment;
- early discussions with English Nature to confirm that the proposed approach to the AA was acceptable, and what additional information would be needed to complete the analysis;
- collection of more detailed data from a wide range of sources: these are listed at the beginning of each section in Chapter 3;
- conclusions about the likely 'in combination' impacts of Horsham's Core Strategy on the European sites identified earlier, and conclusions about the measures needed to avoid these impacts;
- preparation of a draft AA report, and formal consultation in late August with English Nature, Environment Agency and Southern Water on the report; and
- preparation of this final AA report, taking into account the responses of English Nature, Environment Agency and Southern Water. Appendix A provides a summary of the responses and how they were taken into account in this report.

This AA is one of the first AAs carried out for a Local Development Document in the UK. No formal UK government guidance on AA for plans exists to date, although guidance from the DCLG is expected imminently. English Nature released draft guidance on AA for Regional Spatial Strategies on 8 August². The guidance is in draft form, does not strictly relate to Local Development Documents, and came out after the great majority of this AA had already been completed, but the methodology used in this report broadly accords with the guidance. The methodology used for this report is also consistent with that used for the AA for the South East Plan, and in fact had considerable influence on the approach used for that AA.

This report discusses stages 1 (screening) and 2 (Appropriate Assessment).

² David Tyldesley and Associates (2006) Draft Guidance: The Assessment of Regional Spatial Strategies and Sub-Regional Strategies under the Provisions of the Habitats Regulations, prepared for English Nature.

2. Screening

The screening process aims to be a first rough sieve of European sites which the proposed Core Strategy could possibly affect. This section identifies sites within 15km of Horsham's boundaries; summarises what the possible effects of Horsham's Core Strategy on those sites could be; lists existing trends that could affect the sites 'in combination' with the Core Strategy; and screens out sites that are unlikely to be affected by the Core Strategy.

2.1 European sites

Table 2.1 lists the European sites that are within 15 km of the boundary of Horsham District Council, and Figure 2.1 shows their locations vis-a-vis Horsham's boundaries. The very generous³ 15km buffer zone was chosen as a precautionary measure, to reflect the fact that the South East region as a whole is already under considerable pressure in terms of water abstraction, air pollution, recreational impacts etc. Only Arun Valley SPA is within the boundaries of Horsham District Council. Mole Gap to Reigate Escarpment and Castle Hill SACs were screened out at a very early stage in agreement with English Nature, and are not discussed further in this report.

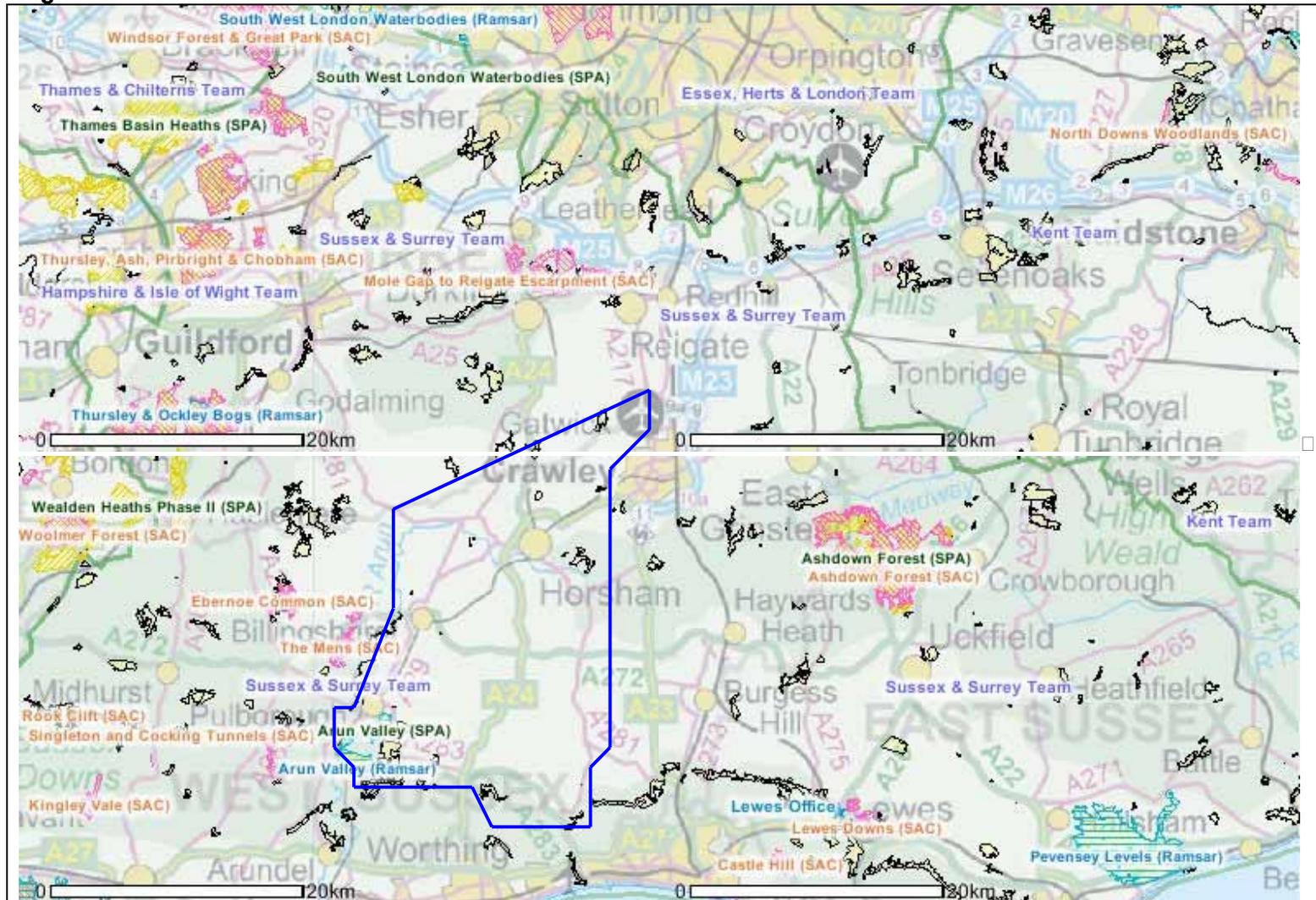
Table 2.1 European sites that could possibly be adversely affected by the Horsham Core Strategy (Source: AA of South East Plan, 2006)

Name of site	approx. distance (km) from Horsham DC boundary	Reason for designation
Arun Valley SPA/Ramsar	inside boundary	Internationally important wintering population of tundra swan
The Mens SAC	2 straight line 3.5 by road	Extensive area of mature beech woodland rich in lichens, bryophytes, fungi and saproxylic invertebrates. One of the largest tracts of Atlantic acidophilous beech forests in the south-eastern part of the habitat's UK range. Also supports barbastelle bats.
Ebernoe Common SAC	8 straight line 10 by road	Extensive block of beech high forest and former wood-pasture and has a very rich epiphytic lichen flora. Represents Atlantic acidophilous beech forests in the south-eastern part of the habitat's UK range. Also supports maternity colonies of Bechstein's and barbastelle bats.
Mole Gap to Reigate Escarpment SAC	10 straight line 10 by road	Supports the only area of stable box scrub in the UK. Also supports a wide range of calcareous grassland types and is particularly important for orchids including the nationally scarce musk orchid and man orchid. Significant in exhibiting transitions to scarce scrub, woodland and dry heath types, notably yew woods and chalk heath. Supports populations of Bechstein's bat and great crested newt.

³ For instance we know of at least one other district council that is using a 1-2km buffer

Name of site	approx. distance (km) from Horsham DC boundary	Reason for designation
Castle Hill SAC	13 straight line 18 by road	This chalk grassland consists of a mosaic of calcareous semi-natural dry grassland communities. The important assemblage of rare and scarce species includes early spider-orchid (one of the largest colonies in the UK), early gentian and burnt orchid.
Thursley, Ash, Pirbright and Chobham SAC	13.5 straight line 18 by road	This site represents lowland northern Atlantic wet heaths, dry heathland and depressions on peat substrates of the <i>Rhynchosporion</i> in south-east England and is an important site for invertebrates, including the nationally rare white-faced darter.
Woolmer Forest SAC	13.5 straight line 20+ by road	Woolmer Forest contains the second largest area of lowland heathland in Hampshire. The site also represents natural dystrophic lakes and ponds and depressions on peat substrates of the <i>Rhynchosporion</i> in south-east England
Ashdown Forest SAC	15 straight line 18 by road	Contains one of the largest single continuous blocks of lowland heath (both dry and wet heath) in southeast England. Also has a population of great crested newt.
Ashdown Forest SPA		Nationally important breeding populations of nightjar and Dartford warbler

Figure 2.1 Horsham District Council boundaries



2.2 Horsham District Core Strategy

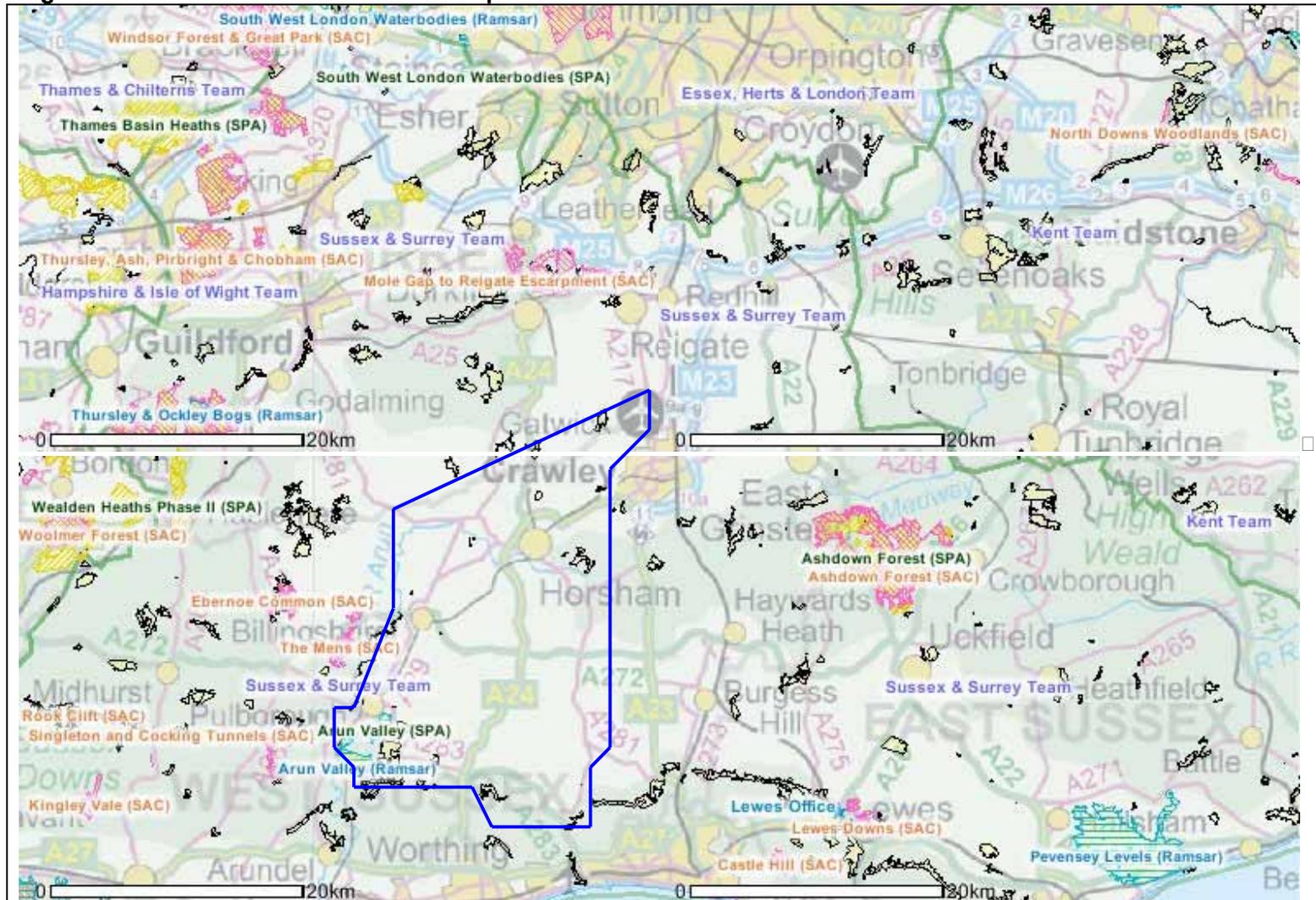
Horsham's Core Strategy provides for:

- 9,335 dwellings and 190,000m² of employment floorspace in the period 2001-2016 (average 620 homes/year), plus an additional 1240 homes and 25,000m² employment floorspace in 2017-2018.
- Westward expansion of Crawley: a new neighbourhood of up to 2,500 homes plus employment land, by 2018. In an area to the north of the A264 within a broad area of search including land both to the north and south of the railway line.
- Concentration of other new development in or immediately west of Horsham town, including land south of Broadbridge Heath (2,000 homes by 2018). The development should enhance the environment and landscape, including the quality of open spaces and links to the countryside. Boundaries are the railway line south-west of Horsham, River Arun and its floodplain south of Broadbridge Heath, A281 and A264. It is not anticipated that the long term boundaries to development will be breached.
- Limited number small-scale development on the edge of some of the smaller towns and villages of the District;
- No provision before 2018 for any further large scale development at Billingshurst or Southwater, but recognition that this position may need to be reviewed in the future.
- Employment provision to include:
 - i. development within or related to two Strategic Locations west of Crawley and west of Horsham
 - ii. development of Chichester College Brinsbury Campus as a Centre of Rural Excellence;
 - iii. development as part of the regeneration and restoration package for the Shoreham Cement Worksite;
 - iv. the reuse of land at the Warnham and Wealden Brickworks site.

As such, the main impacts of the Core Strategy are likely to be in the form of:

- land take, although this is very unlikely to take place on the European sites themselves
- urbanisation generally: more development, more activity, more noise, light etc.
- increased visits to the European sites, possibly with associated disturbance of fauna and impacts on the habitats (e.g. through trampling)
- increased traffic, leading to increased air pollution, which could affect species that are sensitive to air quality (e.g lichens)
- increased water use, which could – depending on where the water comes from – affect water levels at the European sites.

Figure 2.2. Location of screened-in European sites v. Horsham District Council boundaries



2.3 Existing Trends and Possible Future Development

The Sustainability Appraisal report and Appropriate Assessment Screening Report for the South East Plan⁴ identifies a range of existing trends that could have an ‘in combination’ effect with the Horsham Core Strategy:

- Imbalance between water demand and water supply, possibly leading to reduced water ground- and surface-water levels. This would be exacerbated with climate change.
- Traffic growth
- Worsening air quality due to traffic growth, the growth of Gatwick Airport, and increased energy consumption generally
- More recreational pressure on green areas throughout the South East from increased population predicted in the South East Plan and London Plan, leading to increased disturbance of wildlife, trampling of habitats, etc.
- Increased difficulty in managing green areas (e.g. through cattle grazing) due to possible conflict with dog walkers, fragmentation and closure of farms etc.
- Climate change and resulting extreme events, leading to problems of drought and flooding

The South East Plan proposes the following developments in Local Authorities adjoining and close to Horsham, notably additional housing, that could lead to an ‘in combination’ effect with the Horsham Core Strategy: these are shown in Table 2.2. Table 2.2 also lists other developments that could occur in nearby districts but that are not shown in the South East Plan.

Table 2.2 Developments in nearby districts that could possibly lead to ‘in combination’ impacts with Horsham Core Strategy

	House construction proposed in South East Plan to 2026	Other Development
Adur	2600	Range of road/transport improvements along coast
Arun	9300	Range of road/transport improvements along coast
Brighton & Hove	11,000	Range of road/transport improvements along coast
Chichester	8,600	Reservoir in NW Sussex, on Horsham-Chichester boundary
Crawley	7,000	Improvements to M23 junctions near Gatwick Gatwick airport expansion is a possibility improvements to Gatwick railway station
Horsham	12,400*	A24 Horsham to Capel improvements Additional Park & Ride to west of Horsham

⁴ ERM (2006) Sustainability Appraisal Report of the Draft South East Plan, report to SEERA, http://www.southeast-ra.gov.uk/southeastplan/key/sustainability/Sustainability_Appraisal_Report.pdf; Scott Wilson and Levett-Therivel (2006) Appropriate Assessment of the Draft South East Plan, report to SEERA.

		Reservoir in NW Sussex, on Horsham-Chichester boundary
Mid Sussex	14,100	Bypass around East Grinstead
Mole Valley	3,420	
Waverley	4,600	
Worthing	4,000	Range of road/transport improvements along coast

Sources: see footnote 4. * The Annual average house construction set out here is covered by the Core strategy to 2018, but would continue beyond that date.

2.4 Screening

Table 2.3 shows the initial screening process for the SPA/SACs potentially affected by the Horsham Core Strategy. Those possible impacts of the Core Strategy not screened out at this point are:

- 3.1 Water abstraction at Arun Valley
- 3.2 Water quality at Arun Valley
- 3.3 Air quality at The Mens; Ebenoe Common; Thisrley, Ash, Pirbright and Chobham SAC; Woolmer Forest SAC and Ashdown Forest
- 3.4 Barbastelle bat foraging grounds at The Mens
- 3.5 Recreational disturbance at Ashdown Forest SAC/SPA.

In all these cases there is a risk that the Horsham Core Strategy could have 'in combination' adverse effects which require further analysis. The results of this analysis are provided in Chapter 3.

Table 2.3 Initial screening table for the Horsham Core Strategy

Site	Qualifying features ⁵	Key environmental conditions to support site integrity	Possible impacts arising from Core Strategy	Is there a risk of a significant effect?	Possible impacts from other trends, plans etc.	Is there a risk of significant 'in combination' effects? ⁶
Arun Valley ¹ SPA/Ramsar	<ul style="list-style-type: none"> Used regularly by more than 1% of GB's population of Annex I species Bewick's swan (<i>Cygnus columbianus bewickii</i>) Supports internationally important wintering population of 20,000+ waterfowl including tundra swan The neutral wet grassland ditches support rich aquatic flora and invertebrate fauna. The area is of outstanding ornithological importance notably for wintering wildfowl and breeding waders. <p>The Ramsar site</p> <ul style="list-style-type: none"> holds 7 Red Data Book threatened species, one of which is endangered; plus 4 	Sympathetic management of lowland wet grassland /grazing marsh (including water level management).	None	No	None	No
		Maintenance of hydrological regime, including winter flooding	Development of 10,575 new homes in Horsham district would add to demand for water. Also urbanisation of the catchment may alter water flows and hydrology.	?	Water resources in the area are already a problem: Environment Agency has been unable to conclude no adverse effect upon integrity of SPA Housing proposed for Arun and Chichester districts (9,300 and 8,600 respectively to 2026) would result in additional demand for water Proposed investment by Southern Water and new reservoir on Chichester-Horsham boundary could reduce these impacts	Yes: see Section 3.1

¹ Also a Ramsar site designated under the Convention on Wetlands 1971

⁵ Qualifying features in brackets are those that are not a primary reason for selection of the site.

⁶ Numbers in bold denote section in this report (Chapter 3) that discusses the issue in greater depth. Where the penultimate column shows possible impacts from other trends etc., but the last column shows no 'in combination' risk, this is because the Horsham Core Strategy is expected to have essentially no impact: all of the impacts are from other sources, so no avoidance measures are needed.

Site	Qualifying features ⁵	Key environmental conditions to support site integrity	Possible impacts arising from Core Strategy	Is there a risk of a significant effect?	Possible impacts from other trends, plans etc.	Is there a risk of significant 'in combination' effects? ⁶
	<p>rare and 4 nationally scarce plant species.</p> <ul style="list-style-type: none"> • supports an internationally important waterfowl assemblage. 	Maintenance of adequate water quality	Development of 10,575 new homes in Horsham district would increase requirements for wastewater treatment	?	Housing proposed for Arun and (9,300 to 2026) would result in additional wastewater requiring treatment.	Yes: see Section 3.2.
The Mens SAC	<ul style="list-style-type: none"> • Atlantic acidophilous beech forests with <i>Ilex</i> and sometimes also <i>Taxus</i> in the shrublayer (<i>Quercion robur-petraeae</i> or <i>Ilici-Fagenion</i>) • (Barbastelle bat) 	Minimal atmospheric pollution - may increase the susceptibility of beech trees to disease	Potential air pollution emissions from housing and additional traffic related to the new housing and employment sites	?	Nitrogen, ozone and acid deposition at The Mens already exceeds critical loads for beech forests	Yes: see Section 3.3
		Limited impact on vegetation by visitors	Very limited at best. The site is not known for having a particularly large visitor catchment area (unlike, say, Ashdown Forest); it is 3.5km by road from the Horsham district boundary; and no development of any size is proposed near the site.	No	Most of the woodland is managed as an area of minimum intervention. Tenure for nature conservation is held by the Sussex Wildlife Trust. Registered Commoners and other smaller private landowners practice low-level woodland maintenance /management. New homes in Arun and Chichester districts (9,300 and 8,600 respectively to 2026) could increase recreational impacts.	No

Site	Qualifying features ⁵	Key environmental conditions to support site integrity	Possible impacts arising from Core Strategy	Is there a risk of a significant effect?	Possible impacts from other trends, plans etc.	Is there a risk of significant 'in combination' effects? ⁶
		Careful management of shrub layer and trees near bat roosts. Preservation of hedges and woodlands along flightlines between bat roosting and foraging sites: roughly 8km from roosting sites.	New development could lead to severance of flightlines between bat roosting and foraging sites. No development of any size is proposed for the area, and the site is already roughly 2km from border of Horsham DC.	Very limited at best	New homes in Chichester and Arun districts could be sited within 8km of bat roosting sites, but would require site level AA	Limited: see Section 3.4
Ebernoe Common SAC	Atlantic acidophilous beech forests with <i>Ilex</i> and sometimes also <i>Taxus</i> in the shrublayer <ul style="list-style-type: none"> • Barbastelle bat • (Bechstein's bat) 	Minimal atmospheric pollution - may increase the susceptibility of beech trees to disease and alter epiphytic communities	Potential air pollution emissions from housing and additional traffic related to the new housing and employment sites	?	Nitrogen, ozone and acid deposition at Ebernoe Common already exceeds critical loads for beech forests	?: see Section 3.3
		Careful management of shrub layer and trees near bat roosts. Preservation of hedges and woodlands along flightlines between bat roosting and foraging sites: roughly 6-8km from roosting sites for barbastelle bats, 2km for Bechstein's bats	No. Site is 8km from boundary of Horsham DC. Flightlines of only 6-8km from SAC boundary need to be protected	No	New homes in Chichester district could be sited within 8km of bat roosting sites, but would require site level AA	No

Site	Qualifying features ⁵	Key environmental conditions to support site integrity	Possible impacts arising from Core Strategy	Is there a risk of a significant effect?	Possible impacts from other trends, plans etc.	Is there a risk of significant 'in combination' effects? ⁶
		Minimal atmospheric pollution – may increase nutrient loading on dry grasslands	Very limited at best: potential air pollution emissions from housing and additional traffic related to the new housing and employment sites, but site is 10km away from border of Horsham District Council.	No	Air pollution at Mole Gap already exceeds critical loads for dry grasslands	No
Thursley, Ash, Pirbright and Chobham SAC	<ul style="list-style-type: none"> Wet heathland with cross-leaved heath Dry heaths Depressions on peat substrates 	Managed recreational disturbance. Traditional management, including grazing, bracken control and scrub clearance. Limited urbanisation effects, e.g. fly tipping.	No. The site is not known for having a large visitor catchment area (unlike, say, Ashdown Forest); it is 18+km by road from the Horsham district boundary; and no development of any size is proposed near the site.	No	Increased visitor numbers due to increased housing within visitor radius (15,400 within East Hampshire, Hart and Rushmoor (Hampshire), 10,789 within Bracknell Forest (Berkshire) and 19,620 in western Surrey) (Policy H1).	No
		Minimal atmospheric pollution	Potential air pollution emissions from housing and additional traffic related to the new housing and employment sites, but site is 13+km away from boundary of Horsham District Council.	Very limited at best	Increased traffic, with localized air quality implications on various roads that cross the SAC (including M3, A324, A3, A287 and A286).	?: See Section 3.3
		Water levels Water quality	None: affects different water sources and courses	No	Risk of effects on water levels if future water needs lead to abstraction from Folkestone beds (which is in hydraulic continuity with the heathlands) as well as the Hythe beds.	No

Site	Qualifying features ⁵	Key environmental conditions to support site integrity	Possible impacts arising from Core Strategy	Is there a risk of a significant effect?	Possible impacts from other trends, plans etc.	Is there a risk of significant 'in combination' effects? ⁶
Woolmer Forest SAC	<ul style="list-style-type: none"> • Acid peat-stained lakes and ponds • Dry heaths • Depressions on peat substrates • Wet heathland with cross-leaved heath • Very wet mires often identified by an unstable quaking surface 	Careful management of water levels	None: affects different water sources and courses (Woomer is Greatham source)	No	Water resources generally are a problem in the South East, and increased housing and employment proposed for Chichester district council could affect water levels at the site.	No
		Minimal air pollution; absence of direct fertilisation	Potential air pollution emissions from housing and additional traffic related to the new housing and employment sites, but site is 13+km away from boundary of Horsham District Council.	Very limited at best	The development of 102,888 new homes in Hampshire will contribute considerably to air quality impacts on this site, as the A3 is situated immediately adjacent and it is reasonable to assume that increased housing will lead to increased traffic movements.	? See Section 3.3
Ashdown Forest SAC/SPA	<ul style="list-style-type: none"> • Northern Atlantic wet heaths with Erica tetralix • European dry heaths • (Great crested newt) • Nationally important breeding populations of nightjar and Dartford warbler (SPA) 	Minimal air pollution (nitrogen deposition can cause compositional changes over time)	None: Potential air pollution emissions from housing and additional traffic related to the new housing and employment sites, but site is 15+km from boundary of Horsham District Council	No	Development of 14,000 new dwellings in Mid Sussex and 8000 new units in Wealden district could increase traffic levels; East Grinstead development area may result in by-pass making A22 more attractive route for traffic; Gatwick Airport is roughly 15km NW of the site, and would add to this pressure.	? See Section 3.3
		Suitable foraging and refuge habitat within 500m of the pond; unpolluted water; grazing management to prevent succession; balanced hydrological regime to maintain wet heath	None	No	Not considered further, as screened out early in AA process, in consultation with English Nature	

Site	Qualifying features ⁵	Key environmental conditions to support site integrity	Possible impacts arising from Core Strategy	Is there a risk of a significant effect?	Possible impacts from other trends, plans etc.	Is there a risk of significant 'in combination' effects? ⁶
		Low recreational disturbance of birds	New housing in Horsham DC could increase traffic and recreational pressure on the forest	Limited at best	Ashdown Forest has a wide recreational catchment area: people come to visit from far away. The increased housing proposed for the South East region could thus generally increase visitor levels at the site. Development of 14,000 new dwellings in Mid Sussex and 8000 new units in Wealden district, plus development at East Grinstead are most likely to increase recreational use	Very limited: see Section 3.5

3. Appropriate assessment

This chapter investigates the potential impacts identified at Chapter 2. It considers, in turn, changes to water levels and water quality at Arun Valley; air pollution at The Mens, Ebernoe Common, Thursley, Ash, Pirbright and Chobham (TAPC), Woolmer Forest and Ashdown Forest; impact on bats at The Mens; and recreational pressures at Ashdown Forest.

3.1 Changes to water levels at Arun Valley

Information in this section comes from:

- Environment Agency, appropriate assessment for Arun Valley SPA, confidential partial copy
- Environment Agency (2005) The Arun and Western Streams CAMS annual update 2005, http://www.environment-agency.gov.uk/commondata/acrobat/aws_update_2005_1190144.pdf
- ERM (2006) Sustainability appraisal of the South East Plan
- Institute for Public Policy Research (2005) Managing Water Resources and Flood Risk in the South East, <http://www.ippr.org.uk/ecomm/files/SE%20water%201.pdf>
- Mayer, P.W., W.B. DeOreo and D.M. Lewis (2000) Seattle Home Water Conservation Study, http://www.cuwcc.org/Uploads/product/Seattle_Final_Report_Dec-2000.pdf.
- New South Wales Government (2006) 2006 Metropolitan Water Plan, http://www.waterforlife.nsw.gov.au/p/06mwp_chapter_6.pdf
- Scott Wilson and Levett-Therivel (2006) Appropriate assessment of the South East Plan: screening report, report to SEERA, August.
- SEERA (2006c) Draft South East Plan Technical Note 4 (Update) *Water and Growth in the South East*.
- Therivel, R., H. Rutter, C. Day and I. Hepburn (2006) 'Achieving Water Neutrality in the South East Region: Discussion Paper', internal document.
- WRSE (2006) WRSE report on the latest South East Plan housing provision and distribution, May 2006, report to SEERA.
- Chris Kneale, Southern Water, e-mails to Horsham DC, 5 May 2006 .
- Telephone discussion with Louise Bardsley, English Nature, 3 August 2006
- Telephone discussion with Matt Eaves, Environment Agency, 3 August 2006
- Telephone discussion with Chris Kneale, Southern Water, 3 August 2006
- Consultation comments (see Appendix A)

The Arun Valley SPA consists of low-lying grazing marsh with an area of peat derived from a relict raised bog. Variation in soils and water supply lead to a wide range of ecological conditions and hence a rich flora and fauna. Drier fields are dominated by meadow grasses, crested dog's-tail and perennial rye-grass. Wetter areas contain more rushes, sedges and tufted hair-grass. Ungrazed fields have developed into fen, scrub or woodland. Fen areas consist of common reed, reed sweet-grass and greater tussock-sedge, often with scattered elder and willow scrub. On firmer ground, there is alder, willow, birch and sallow, with oak and hazel woodland on the driest ground. The ditches and margins between grazing marsh fields have an outstanding aquatic flora and invertebrate fauna. The site supports important numbers of wintering waterbirds – notably Bewick's swans - which feed in the wetter, low-lying fields and along the ditches.

The RSPB already manage part of the SPA so as to provide suitable habitats for the birds that are the qualifying feature for the site. This involves managing water levels to provide extensive flooding in the winter. (In a typical winter, water abstraction is not a problem. In dry winters, more careful management is required.) Water Level Management Plans exist for both Amberley Wildbrooks (the SSSI linked to the SAC) and Waltham Brooks. We understand that the Environment Agency plans to prepare WLMP for Pulborough in due course.

Horsham District Council's water is provided by Southern Water. Horsham is within Southern Water's Sussex North water supply area and most of its water comes from Hardham treatment works: it is abstracted from the River Rother (which feeds into the River Arun) and from boreholes at Hardham. The Environment Agency has concluded that groundwater abstraction at Hardham cannot be concluded to have no adverse effect on the SPA, and work is currently ongoing to demonstrate the effect which may not extend to the whole SPA. As such, further abstraction of water for new housing related to the Core Strategy could affect water levels in the River Arun and could affect groundwater levels within the Arun Valley SPA. Horsham is also served by 3 service reservoirs - Star, Itchingfield and Beedingwood⁷. At peak demand, Southern Water also transfers water from Portsmouth Water to the area.

Different reports and stakeholders give different views about future trends in water abstraction in the South East and their impacts on European sites.

The Environment Agency's 2005 update of the Catchment Abstraction Management Strategy for the River Arun and Western Streams indicates that there is more water available in the Upper Arun Water Resource Management Unit (WRMU), but that the lower WRMUs nearer the Arun Valley SPA are either at capacity or over licensed. The sustainability appraisal of the South East Plan (ERM, 2006) also suggests that water abstraction is already a problem and will become worse over time.

On the other hand, studies carried out on behalf of the South East of England Regional Assembly into the impact of the South East Plan on water abstraction (WRSE, 2006) suggest that enough water exists in the South East to accommodate the South East Plan's – and Horsham's – proposed population increases, as long as behavioural change takes place amongst users, and several new reservoirs are built. Southern Water also feel that water resources are not a constraint, provided that the water resources strategy outlined in the draft South East Plan comes to fruition. However the strategy is based on assumptions that do not, of themselves, provide the certainty required by the Habitat Directive.

In terms of behavioural change, Southern Water already install water meters in all new properties, in properties that use a lot of water (e.g. with swimming pools), in properties where customers opt for a free meter and, since April 2005, whenever there is a change of ownership of properties. As such, increasing numbers of Horsham District Council residents will be subject to metering in the future. Water metering trials in the UK about 15 years ago suggested that metering reduced households' water consumption by about 10% (Therivel et al., 2006). As such, water consumption per household may well

⁷ A service reservoir is an underground 'balancing' tank that stores treated water to meet the diurnal variation in customer demand. They are not surface water reservoirs (like Powdemill or Bewl Water) that store raw water.

decrease in the future, but there are no formal mechanisms in place to require such behavioural change. Making water metering compulsory is not in the remit of the district council.

In terms of new reservoirs, the South East Plan proposes a new reservoir on the Horsham/Chichester border, which could provide water for Horsham's residents in time. However this option is being investigated for feasibility by Southern Water; has not yet been licensed under the Environment Agency's abstraction licensing system; and could well take 15+ years to come on line, i.e. beyond the lifetime of the Core Strategy; and even then the water for the reservoir has to come from somewhere. Water companies have been funded to deliver a number of supply-demand balance schemes between 2005-10 and will submit their business cases for 2011-2015 in 2009.

The Environment Agency's abstraction licensing system (amended into more recent legislation by the Water Resources Act 1991, Environment Act 1995 and Water Act 2003) safeguards the water resource needs of protected areas and priority habitats. An environmental assessment is made of any license application, and all existing licenses and new license applications that could impact on Natura 2000 sites are subject to a review against the site's interest features. If the Environment Agency is unable to conclude that an existing license or new license application will not adversely effect the site integrity of the Arun Valley SPA, then changes to the license or alternative solutions will be required so no adverse effect occurs.

Proposed avoidance measures

The Environment Agency's abstraction licensing system should protect Arun Valley SPA from the negative effects of over-abstraction from the River Arun. However, to fully implement the precautionary principle, Horsham District Council should also:

1. Require new developments of any size to be 'water neutral': For every new development, total water use in the district after the development must be less than or equal to total water use in the region before the development.
2. For very small developments, require BREEAM 'excellent' standards with respect to water.

Neither English Nature nor the Environment Agency debate these conclusions. However Southern Water does not support them. Its response to the draft AA report was:

"We do not support the requirement for new developments to be 'water neutral'. This is a purely theoretical concept and there is no statutory mechanism for its implementation by developers, Southern Water, Local Authorities or the Environment Agency. There is no evidence to support how it can be successfully implemented and it would be irresponsible to allow new development to progress based on a dependence that there should be no additional water demands. We believe that its requirement would make the Core Strategy unsound.

We fully support the requirement for development to meet BREEAM 'excellent' standards but believe it should apply to all new developments not just small developments. However, there are currently no means of requiring developers to incorporate water efficiency other than via voluntary planning agreements."

Water neutrality essentially allows for any level of growth, provided that any *increase* in water use caused by the growth is fully offset by *decreases* achieved as part of the overall 'package': see Figure 3.1. Water neutrality can be achieved by a combination of strong water efficiency measures in new developments and measures to reduce water consumption. This is most likely to mean retrofitting of existing developments (difficult to do, particularly for small developers or individuals), but could, for example, include developers working with water providers to reduce leakage. Table 3.1 provides a SWOT analysis of water neutrality.

Figure 3.1 Water neutrality

Example 1: A new housing development of 100 houses is expected, without any constraining measures, to use 40,000 litres of water per day (400 l/household/day). Water efficiency measures of 40% in the new housing (low flow showers, dual flush loos, water butts, water efficient appliances) bring this down to 240 l/household/ day. Retrofits of 300 existing houses that reduce their water consumption by 20% (saving 80 l/household/day) would be needed to achieve water neutrality.

Example 2: Same scenario, but radical water efficiency measures of 80% in the new housing (rainwater harvesting, composting toilets, greywater recycling etc.) bring this down to 80 l/household/ day. Retrofits of 40 existing houses that reduce their water consumption by half would be needed to achieve water neutrality.

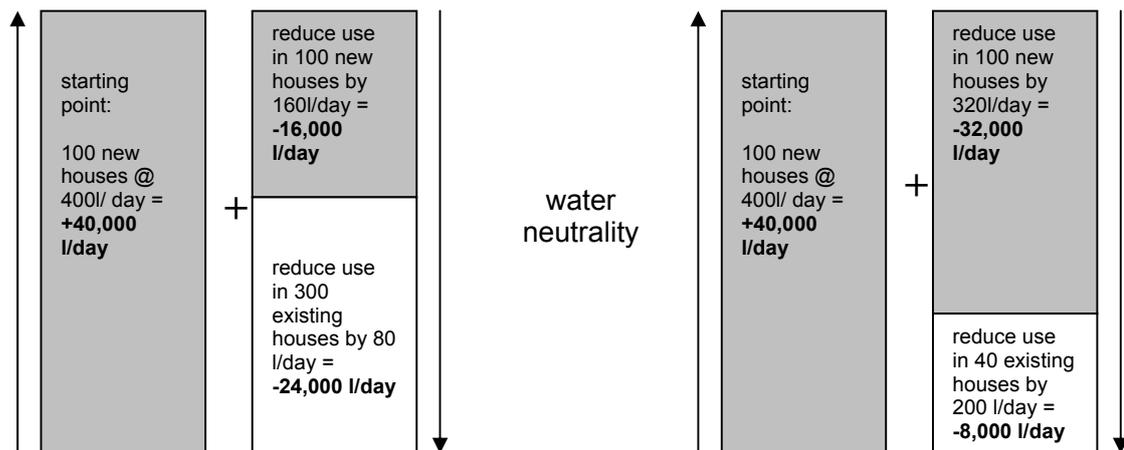


Table 3.1 SWOT analysis of water neutrality

<p>Strengths</p> <ul style="list-style-type: none"> • Harnesses creativity of private sector; fosters innovative market solutions • Achieves sustainable development • Enables development to go ahead: removes major planning hurdles • Promotes more efficient usage of water • Technical innovations around retrofitting could turn into an economic benefit for the region • High, positive profile for the district • Some of this may happen anyway due to water companies applying for water scarcity status, e.g. compulsory water meters 	<p>Weaknesses</p> <ul style="list-style-type: none"> • May be seen as promoting a monitoring culture • New and thus effectiveness, implementability etc. are unknown • Cost - Could have disproportionate impact on affordable housing • Does not account for people buying housing and changing fittings and appliances – though neither do BREEAM and other standards
<p>Opportunities</p> <ul style="list-style-type: none"> • There is a well-recognised need for action on this topic • Drought orders, hosepipe bans – public is aware that the current situation is problematic • There is anxiety and controversy about the assumptions in the South East Plan 	<p>Threats</p> <ul style="list-style-type: none"> • May need new powers to put this in place: does the district have the authority to make these changes? If not, who does? • Resistance to change among those affected

Response by Horsham District Council to Issue 3.1

Responses from the Environment Agency and Southern Water suggest that the abstraction issues set in the Sustainability Appraisal of the South East Plan are a worst-case scenario, should no measures be put in place to help improve water availability. Southern Water has confirmed that they are undertaking major investment in the period to 2010, which they state will restore the supply balance in the North Sussex resource area in which Horsham District lies.

The housing trajectory shows that larger developments such as West of Horsham are unlikely to have significant numbers of completions prior to 2010, when Southern Water state that they will have completed works to restore the water balance in the area. On this basis, it is considered that significant adverse effects on the SPA are unlikely.

Notwithstanding this however, the Council accepts that water abstraction / consumption is an issue that could affect proposed development and Policy CP2 sets out that planning proposals must reduce levels of water consumption. The Council will work to achieve water neutrality, although it must be noted that issues such as water metering lie outside the Council's jurisdiction. It is considered that the most appropriate means of working towards water neutrality will be to ensure that the General Development Control Policies document and the masterplan for the West of Horsham Strategic Location for development set out that development must conform to the highest levels of water efficiency that economically available technologies can provide.

3.2 Changes to water quality at Arun Valley

Information in this section comes from:

- Environment Agency (2006) *Creating a Better Place: Planning for Water Quality and Growth in the South East*, http://www.southeast-ra.gov.uk/southeastplan/publications/research/wq_and_growth-report.pdf
 - Telephone discussion with Louise Bardsley, English Nature, 3 August 2006
 - Telephone discussion with Chris Kneale, Southern Water, 3 August 2006
- Consultation comments (see Appendix A)

English Nature has raised concerns about water quality at Arun Valley. Water quality problems arise in part from overloading of wastewater treatment works (WWTW), and in part from other sources, notably agricultural run-off. The Environment Agency is currently assessing all discharge consents that could affect the site integrity of the SPA. If the Agency is unable to conclude that these discharges do not affect site integrity then changes to licences or alternative solutions will be required.

The Environment Agency has assessed the capacity of WWTWs in the South East region to accommodate the growth proposed in the South East Plan. Where WWTWs are close to capacity, increases in new housing (more wastewater discharged) must be matched with improvements in technology (more pollutants removed per unit of wastewater discharged), so that the final pollutant input to the receiving river does not exceed the river's capacity to accommodate those pollutants.

The Environment Agency's report *Creating A Better Place* divides WWTWs into those that can accommodate the projected growth, those that can accommodate growth only with stricter discharge consents, and those that can accommodate only a limited number of additional houses using currently established technology. The WWTWs that could affect Arun Valley are Pulborough (which is adjacent to Pulborough Brooks component of the SPA) and Horsham (roughly 30km upriver). Both are near capacity: see Table 3.2. Coldwaltham WWTW also affects Waltham Brooks SSSI, a component of the SPA.

Table 3.2 WWTW discharging to the River Arun which constrain development and/or require stricter discharge consents (Environment Agency, 2006)

Name of WWTW	<i>Creating A Better Place</i> comments on WWTS
Horsham	Can only accommodate another 3760 houses
Pulborough	Can only accommodate another 640 houses

Horsham's Core Strategy proposes roughly 2000 new homes near Horsham by 2018, which is within the capacity of the Horsham WWTW. Some of the new homes could also go into the Pulborough area, although this number is likely to be well under 640 houses. Runoff into the River Arun from additional hard surfacing is also unlikely to cause a significant impact. Southern Water is undertaking a study of the technological improvements needed at its WWTWs, which is due at the end of 2006. It does not feel that the proposed housing would be a problem: Environment Agency consent requirements will ensure that river quality is maintained, and where necessary Southern Water could divert the wastewater to WWTWs discharging into other water courses.

Southern Water note, in their consultation response, that although the limits on the Horsham WWTW may not be a constraint in the period to 2018, an alternative wastewater treatment facility in the district will be needed to accommodate future development. In the view of the long lead times for the provision of new facilities, Southern Water believe that this issue needs to be recognised within the plan period.

Proposed avoidance measures

Water quality is firmly within the remit of the Environment Agency and the water companies. Horsham's Core Strategy is not proposing more houses than can theoretically be accommodated by the existing WWTWs with, in some cases, additional technological upgrades. The Environment Agency will only give consent to developments that will allow water quality standards to be met. If further studies show that the actual capacity of the WWTWs is lower and that they can accommodate only fewer houses, then the Council would need to amend the housing allocation figures accordingly.

Using the precautionary principle, the plan could require pre-treatment of wastewater from new (and/or existing) developments that ultimately discharges into the River Arun as a default, unless the Environment Agency and Southern Water indicate that this is not necessary. This could be done, for instance, by passing sewage through a reed bed.

Again, neither English Nature nor the Environment Agency debate these conclusions. However Southern Water note that:

"The effluent quality standards required for discharge to the River Arun cannot be met by reedbed treatment alone and we do not support the pre-treatment of wastewater. Treatment works, including reed beds, require maintenance and in the longer term, capital replacement. In our experience treatment plant in private ownership is not properly maintained and eventually falls into disrepair. Failure can lead to overloading of the public sewerage and wastewater treatment infrastructure, which have to deal with flows for which they are not designed. In our view it is more sustainable to centralise wastewater treatment."

A reedbed is a sewage treatment system that can clean household and some industrial wastes. A reedbed is usually a shallow pond filled with gravel and planted with the common reed, *Phragmites australis*. The reeds supply, via their roots, oxygen to bacteria that live in the gravel. The bacteria clean the sewage.

Response by Horsham District Council to Issue 3.2

As has been set out in this report this Council is not proposing development levels that exceed the existing capacity of waste water treatment works in the District and it is therefore considered that there is unlikely to be a significant effect on the water quality of the Arun Valley SPA.

Policy CP2 of the Core Strategy already requires that development does not have an adverse effect on water quality, and the Council will therefore investigate opportunities for reedbeds within developments for example through the masterplanning process. Such schemes could also help assist the capacity of waste water treatment works). It should be noted that such areas could also have potential benefits for biodiversity and open space requirements.

3.3 Air pollution at The Mens; Ebernoe Common; Thursley, Ash, Pirbright and Chobham; Woolmer Forest; and Ashdown Forest

Information in this section comes from:

- Air Pollution Information System (2006) 'Eutrophication', http://www.apis.ac.uk/overview/issues/overview_eutrophication.htm
- Air Quality Archive, Air Pollution Standards and Banding, <http://www.airquality.co.uk/archive/standards.php>
- Telephone conversation with Peter Creasey, warden at Mole Gap, 1 August 2006
- Telephone conversation with Matt Eaves, Environment Agency, 3 August 2006
- Defra (2005) UK Waters Recovering from Acid Rain, <http://www.defra.gov.uk/news/2005/051115a.htm>.
- ERM (2006) Sustainability appraisal of the South East Plan
- English Nature (16 May 2006) letter to Runnymede Borough Council, 'Conservation (Natural Habitats &c.) Regulations 1994, Runnymede Borough Council Local Development Framework'.

Air pollution from the Core Strategy is a potential impact at all the European sites except Arun Valley. Air pollution can have a range of impacts:

- SO₂ and nitrogen compounds (nitrate (NO₃), nitrogen oxides (NO₂) and nitric acid (HNO₃) can increase acidification of soils. They are primarily caused by power stations, industrial boilers, motor vehicles and domestic heating;
- Nitrogen oxides (NO_x) and ammonia (NH₃) can increase eutrophication. They essentially they act as artificial fertilisers which cause some competitive plant species to dominate over slower-growing and generally rarer species. This is a well documented issue in wet heathlands such as those in the Ashdown Forest;
- Ground-level ozone, formed when NO_x and unburnt hydrocarbons from engine exhausts react together, damages plants.

Table 3.2 summarises existing air quality problems at the relevant sites: it does not include NO₂, SO₂ and ammonia levels, Where deposition of those pollutants at the European sites do not exceed the sites' critical load ranges. Table 3.2 shows that all of the sites have existing problems of acid deposition, nitrogen deposition and ozone. Nitrogen deposition at The Mens and Ebernoe Common is a particular problem, possibly from agricultural activities. Ozone levels are high at all sites, probably due to reactions from pollutants produced many miles away (e.g. London). Acid deposition at Thursley, Ash, Pirbright and Chobham, Woolmer Forest and Ashdown Forest is a problem, primarily because lowland heaths are so sensitive to acid deposition.

Table 3.2 Existing air pollution problems at European sites near Horsham District

site & grid reference ⁸	habitat	pollutant, measurement	critical load range	deposition
The Mens	beech woodland (ground vegetation)	acid deposition, keq/ha/yr	2.54	2.67
		N deposition, kg N/ha/yr	10-15	33.2
		ozone, ppb hours	5000	8201
Ebernoe Common	beech woodland (lichens & algae)	acid deposition, keq/ha/yr	2.50	2.57
		N deposition, kg N/ha/yr	10-15	32.1
		ozone, ppb hours	5000	8168
Thursley, Ash, Pirbright and Chobham	lowland heathland	acid deposition, keq/ha/yr	0.1	1.81
		N deposition, kg N/ha/yr	10-20	20.3
		ozone, ppb hours	3000	4763
Woolmer Forest	lowland heathland	acid deposition, keq/ha/yr	0.1	1.74
		N deposition, kg N/ha/yr	10-20	19.5
		ozone, ppb hours	3000	4912
Ashdown Forest	lowland heathland	acid deposition, keq/ha/yr	0.10	1.5
		N deposition (dry heath), kg N/ha/yr	10-20	16.8
		N deposition (wet heath), kg N/ha/yr	10-25	
		ozone, ppb hours	3000	5015

Note: Based on information provided by the Air Pollution Information System (www.apis.ac.uk). It provides information on critical air pollution loads – for acidification, ammonia, N deposition, NO_x, ozone and SO₂ - that are acceptable for different habitats, and what the actual loads on sites with that habitat are. The table shows only where pollutant deposition is a problem, i.e. where it is close to or above critical load range.

Key:

	deposition is within critical load range		deposition exceeds critical load range by 25-100%
	deposition exceeds critical load range by <25%		deposition exceeds critical load range by >100%

Ebernoe Common is particularly sensitive to air pollution impacts due to its “outstanding assemblage of lichens which includes four Red Data Book species, 12 nationally scarce species, one nationally rare species and 20 New Index of Ecological Continuity species” (English Nature, 2003). Ebernoe Common is possibly the best known site for lichens on the Weald clay. Box 3.1 lists some of the key lichens at Ebernoe Common. Lichens are particularly susceptible to air pollution, particularly SO₂ but also often NO_x and ozone (Anon., 2002; Lambley & Wolseley, 2004). Air pollution can inhibit lichen growth and fertility, bleach and contort thalli (the main growth of the lichen), and either restrict available habitat or make it entirely unsuitable. Generally, low air pollution leads to a richer diversity of lichens, and lichen diversity and/or cover is often used an indicator of air quality (e.g. Blett *et al.*, 2003).

Lichen species with a more restricted distribution in the UK are likely to have more exacting ecological requirements (e.g. narrower bark pH tolerance for some epiphytic species), making them more vulnerable to pollution. Distribution and abundance will be affected depending on whether a lichen is acidophytic (acid-tolerant) or nitrophytic (N-tolerant). Bark pH is considered critical in the establishment of acidophilous species

⁸ From <http://jncc.gov.uk/page-1458>

(Farmer *et al.*, 1992). However, information on the sensitivity of any lichen species to air pollution is limited at best.

Box 3.1 Key lichens at Ebernoe Common

Over 100 species of lichen are recorded for Ebernoe Common SSSI, including:
Red Data Book species:

- *Agonimia octospora* – Nationally scarce, near threatened, found on mature oak trunks in sheltered areas⁹
- *Micarea pycnidiophora* – Nationally scarce, near threatened
- *Pertusaria pustulata* – Nationally rare, vulnerable. A crustose epiphytic lichen.
- *Ramonia chrysophaea* – Nationally scarce, near threatened

Other noted species:

- *Catillaria atropurpurea* – a species indicative of ancient woodland; requires base-rich bark, could be affected by increase in nitrogen deposition?¹⁰. A crustose lichen.
- *Stenocybe septata*¹¹ – a species specific to old Holly trees¹²

They are all likely to be sensitive to air pollution, as their ecological requirements are narrow.

Information on air quality impacts on lichens comes from:

- Anon. (2002) *Effects of NO_x and NH₃ on lichen communities and urban ecosystems: a pilot study*. Imperial College & the Natural History Museum/Air Pollution Research in London research network, London, http://www.airquality.co.uk/archive/reports/cat10/DEFRA_LICHEN_NOX_NH3_final.pdf
- Blett, T., Geiser, L., and Porter, E. (2003) *Air Pollution-Related Lichen Monitoring in National Parks, Forests, and Refuges: Guidelines for Studies Intended for Regulatory and Management Purposes*. US Fish and Wildlife Service Air Quality Branch, Denver, Colorado, http://www2.nature.nps.gov/air/Pubs/pdf/Lichen_Studies.pdf
- English Nature (2003) *Ebernoe Common SSSI, West Sussex: notification under section 28C of the Wildlife and Countryside Act 1981*. English Nature, Sussex and Surrey team.
- English Nature (16 May 2006) letter to Runnymede Borough Council, 'Conservation (Natural Habitats &c.) Regulations 1994, Runnymede Borough Council Local Development Framework'.
- Farmer, A.M., Bates, J.W. and Bell, J.N.B.. (1992) Ecophysiological effects of acid rain on bryophytes and lichens. In: Bates, J.W., and A. M. Farmer (eds.). *Bryophytes and Lichens in a Changing Environment*. Clarendon Press, Oxford
- Lambley, P. and Wolseley, P. (eds) (2004) *Lichens in a changing pollution environment*. English Nature Research Reports No. 525. English Nature, <http://www.english-nature.org.uk/pubs/publication/PDF/525.pdf>

Heathland sites. The Air Pollution Information System (2006) provides some information on the impact of air pollution on heaths such as those found at Thursley, Ash, Pirbright and Common; Woolmer Forest; and Ashdown Forest:

“In heathland communities, rapid changes in the species composition have occurred as a result of increased nutrient availability. In the Netherlands this has resulted in a dramatic decrease in species diversity, because many (rare)

⁹ Hampshire Biodiversity Partnership, Habitat Action Plan: Wood pasture and parkland <http://www3.hants.gov.uk/woodland-woodpasture.pdf>

¹⁰ Hampshire Biodiversity Partnership, Species Action Plan: Woodland Lichens <http://www.hampshirebiodiversity.org.uk/pdf/PublishedPlans/Woodlands%20Lichens%20SAP1.pdf>

¹¹ http://www.english-nature.org.uk/special/sssi/images/uploaded_files/1004246.pdf

¹² <http://www.countrysideinfo.co.uk/lichens/index.htm>

species, which were characteristic of the Calluna or Erica Sp. dominated heathlands, have disappeared and been replaced by the grasses Molinia caerulea and Deschampsia flexuosa. More than 35% of former Dutch heathland is estimated to have changed into grassland (Bobbink et al., 1993). Both increased N deposition (largely in the form of NH₃ from intensive stock units) and heather beetle damage (Brunsting, 1982) have been implicated... Such changes in these plant communities have also been linked to the disappearance of some butterflies, amphibians and birds in these habitats (Bobbink et al., 1995; Fangmeier et al., 1994)."

In other words, increased traffic and associated N deposition could lead to a change in the flora of these sites.

APIS (2006) and Creasey (2006) suggest that the combination of eutrophication from Nitrogen (N) deposition and insufficient grazing could have a particularly strong effect on vegetation at some sites. This could occur at Ashdown Forest, where grazing levels are already sub-optimal (though this is being addressed through a Grazing Strategy).

Air pollution trends. Air pollution in the UK has generally fallen over time, due primarily to tougher air quality standards and emissions technologies in vehicles. For instance, since 1970 there has been an 84% decline in SO₂ emissions (from 3.8M tonnes to 1M tonnes in 2002) and a 37% decline in emissions of NO_x. High levels of ozone have declined by 30% since 1986. SO₂ and NO₂ levels in the South East are expected to continue to decline to roughly 2010. For instance, Figure 3.2 shows NO₂ levels in the South East region since 1991, and Figure 3.3 shows predicted NO₂ levels in 2010: the provisional UK NO_x standard for vegetation of 30 µg/m³ is unlikely to be exceeded in more than a few limited locations in the region. Typically, as the impacts of acidification on plants decline, those of eutrophication are becoming more apparent.

However it is not at all certain that these downward trends will also be true for acid deposition and N deposition; and the incidence of low-level ozone pollution is expected to increase over time. Traffic increases are likely, in the short term, to be accompanied by technological improvements to cars that reduce vehicle emissions, but over the longer term pollution levels are likely to rise again due to increasing traffic.

Declining air quality could become a particular problem at Ashdown Forest because of predicted increases in traffic on the A22. Proposals for a relief road between the A22 and A264 around East Grinstead are predicted to raise traffic levels by up to 20% on the A22 (AA workshops for the South East Plan).

Figure 3.2 NO2 Levels in the South East region, 1991-2004 (source: ERM, 2006)

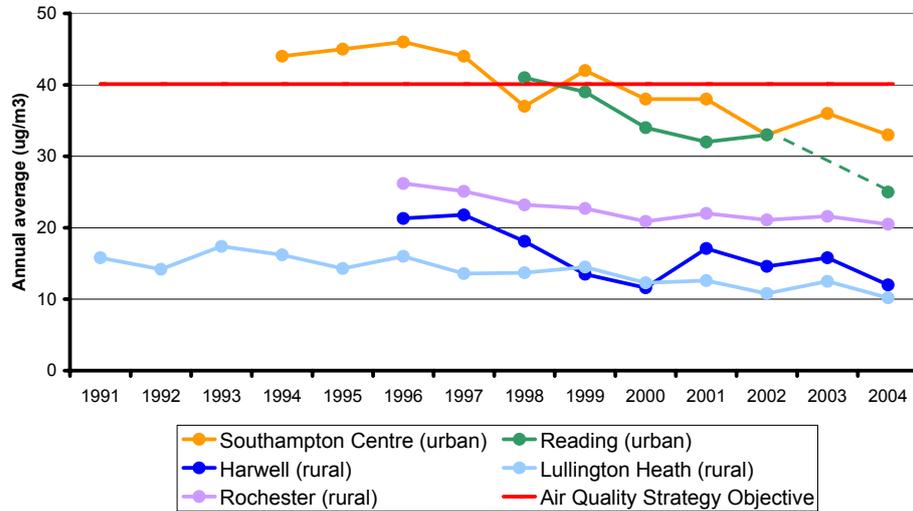
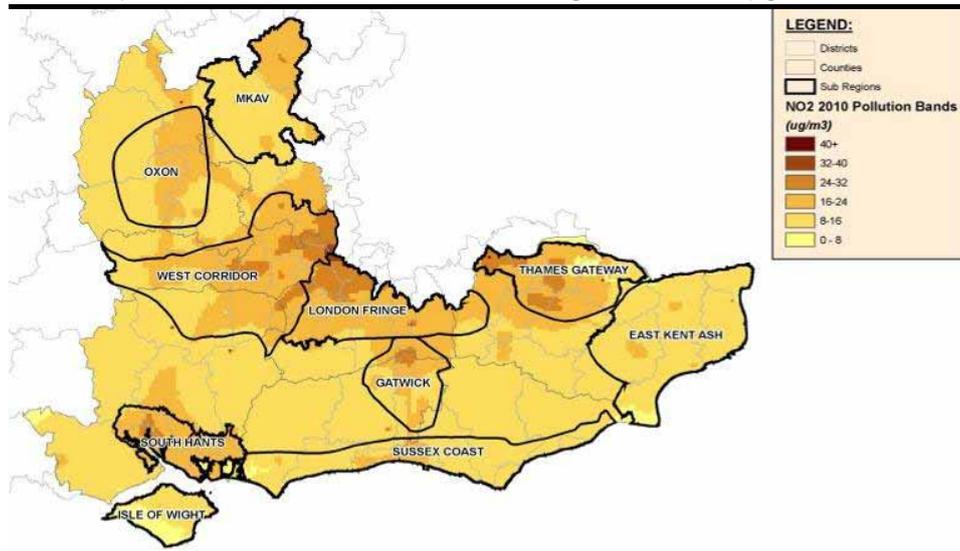


Figure 3.3 Predicted NO2 Levels in the South East region, 2010 (Source: ERM, 2006) n.b. the provisional UK NO_x standard for vegetation is 30 µg/m³



Assessment. Air pollution is clearly already a problem at all the relevant sites, and may well get worse. It is likely that the increased development proposed by Horsham’s Core Strategy would increase emissions from traffic and buildings, and energy requirements (and thus pollution from power station). However, it is impossible to clearly show the link between this development and air quality levels at the sites, in the way that it is possible, for instance, to link the new housing with changes in water quality. For instance, there are no clear, direct road links between the proposed new housing at Horsham and the European sites discussed here.

In addition, a letter from English Nature to Runnymede Borough Council, responding to Runnymede's assertion that any development in the borough could significantly affect European sites through air pollution, suggests that local authorities should focus on local air pollution impacts:

"The LDF-CS can only be concerned with locally emitted and short range locally acting pollutants. In terms of pollution from vehicular emissions the concentrations decline exponentially from the road edge. Though it varies with a range of factors and from pollutant to pollutant the concentrations of pollutants from roads can be said to have localised impacts up to 200m from the road side. Therefore for the LDF-CS effects of vehicular atmospheric emissions should be considered if the roads on which the vehicles travel are closer than 200m from the Natura 2000 site."

This is not to say that general air pollution should not be addressed, but rather than it is a region-wide problem that can only be addressed regionally. The issue is being considered as part of the appropriate assessment of the South East Plan.

Proposed avoidance measures

We recommend that diffuse air pollution issues should be screened out for the purposes of this assessment. However Horsham District Council should be aware that the appropriate assessment for the South East Plan may recommend measures to be followed by all local authorities in the South East, and that are not currently covered in the Core Strategy: in such a case, the Core Strategy may need to be amended to take these measures on board.

Furthermore, where significant localised effects are identified, for instance where proposed developments would result in increases in traffic along the roads within 200m of Natura 2000 sites, then these should be assessed at the local level as part of the AA and sustainability appraisal of more detailed Local Development Documents, and/or site environmental impact statements/AAs.

Response by Horsham District Council to Issue 3.3

This Council agrees that it would be most appropriate to assess the effects of diffuse air pollution arising from development at a regional level. Policy CP2 of the Core Strategy does however state that development should minimise the emission of pollutants into the wider environment, which will ensure this matter is given consideration as part of planning proposals. Any further recommendations for avoidance measures that emerge from the SE Plan will be addressed in the review of the Core Strategy.

Where significant localised effects are identified it is agreed that it would be most appropriate to assess the effects at a more local level, for example in relation to the Site Specific Allocations of Land. The Council will also ensure that modelling of transport effects of larger developments also takes place at the masterplanning stage to enable these potential impacts to be investigated fully.

3.4 Barbastelle bat foraging grounds at The Mens

The information in this section comes from:

- Greenaway, F. (2004) *Advice for the management of flightlines and foraging habitats of the barbastelle bat *Barbastella barbastellus**, English Nature Research Report 657.
- Greenaway, F. and D. Hill (2004) *Woodland management advice for Bechstein's bat and barbastelle bat*, English Nature Research Report 658.
- Telephone conversation with Frank Greenaway, 28 July 2006.

Bechstein's bats and barbastelle bats both require minimal disturbance within 2km of their roosts. Bechstein's bats only forage within 2km of their roosts, but barbastelle bats forage much further afield, up to 20km but more typically about 6-8km.

Ebernoe Common and The Mens are both designated in part because of their bat populations – barbastelle at The Mens, and barbastelle and Bechstein's at Ebernoe Common. Only the foraging areas of the barbastelle bats are of concern here. Horsham District Council's boundary is 8km away from Ebernoe Common, and thus development resulting from the Horsham Core Strategy is unlikely to affect the roosts or flightlines of either bat species from that site¹³. Horsham's boundary is about 2km away from The Mens, so development resulting from Horsham's Core Strategy is unlikely to affect the barbastelle bats' roosts at The Mens.

Barbastelle bats' foraging routes radiate out from their roosting sites using a limited number of main routes, which split into major limbs and then into small branches (rather like a tree seen from above), each branch ending in a discrete individual foraging area. The main routes and limbs are typically shaded woodland tracks and overgrown hedges strung in a linear fashion. Often they follow watercourses.

"Woodland and hedgerow structure along flightlines is of more importance to barbastelles than the particular plant species. It is the degree of shade cast and the directness of the route that matters.... unbroken dense strips of mature woodland connecting down to water with continued wooded features is an ideal pattern of vegetation... Tree species producing a low spreading twiggy structure over a thick understorey will increase shade, but the bats do require a clear central trackway." (Greenaway, 2004).

As such, protection of the woodlands and hedges along the flightlines is essential to maintaining the bats' foraging routes. These could be affected by development, if this destroys or harms the woodlands and hedges. They could also be affected by agricultural practices (e.g. grazing, use of herbicides).

Although the foraging routes of the barbastelle bats at Ebernoe Common SAC have been extensively studied and mapped (e.g. at p.17 of Greenaway, 2004), the same work has not been carried out for The Mens. As such, a precautionary approach should be taken in the Horsham Core Strategy:

Proposed avoidance measures

¹³ Greenaway and Hill's (2004) report provides detailed information on flightlines from Ebernoe Common used for foraging, and does not suggest that these cross into Horsham District. Neither Mr. Greenaway nor English Nature consider bats at Ebernoe Common to be affected by Horsham's Core Strategy.

Until more information exists on the foraging habits of the Barbastelle bats at The Mens SAC is available, any development that could affect any trees, hedges or water bodies within 8km of the boundary of The Mens SAC should require appropriate assessment to ensure that Barbastelle bat foraging grounds are not negatively affected. English Nature report no. 657 provides information on what could negatively affect the foraging grounds. If more detailed information becomes available (e.g. if a bat foraging survey is carried out) then this could reduce the need for project appropriate assessments.

In its consultation response to the draft AA report, which recommended a 6km buffer for The Mens, the Environment Agency noted that it would like a more precautionary approach used for the bats at both Ebernoe Common and The Mens. The Environment Agency did not object to the recommendations in the draft report. For precaution's sake, 8km are recommended here, but discussions with Mr. Greenaway did not suggest that any more stringent actions are needed.

Ideally the vegetation along the bat flightlines should be managed and enhanced to at least 8km from the roosting woodlands:

“Where woodland connectivity breaks down into small hedgerows, increasing the hedgerow width to about ten metres by planting a second line of trees and shrubs parallel to the existing hedgerow will eventually create effective flightline conditions. A central pathway should be left between the hedgelines. There is frequently scope for public footpaths to be treated in this way... Trimmed hedges provide very poor cover to commuting bats and when essential, such work should be confined to a single side of the double hedge line in any one year” (Greenaway, 2004).

Response by Horsham District Council to Issue 3.4

This Council agrees that the Core Strategy will not have any effects on Bechstein's bats. It is agreed that there is some potential for Barbastelle foraging grounds to be affected.

Policy CP1 of the Core Strategy states that the biodiversity of the District must be conserved and enhanced (which includes species that feed here even if they roost in another authorities area). As this is a detailed issue, it is considered that it is most appropriate for this matter to be covered by the General Development Control Policies document or, if necessary Supplementary Planning Guidance.

3.5 Recreational pressures on Ashdown Forest

The information in this section comes from:

- English Nature (2006) Thames Basin Heaths Special Protection Area: Mitigation standards for residential development, http://www.english-nature.org.uk/about/teams/team_photo/Thames%20Basin%20Heaths%20Delivery%20Plan%20website%20version.pdf
- Tourism South East (2005). *Ashdown Forest Visitor Monitoring Survey 2004/5, Draft Report*, prepared for Wealden District Council and Ashdown Forest Tourism Forum.

The impact of recreational pressures on European sites have recently been subject to a great deal of discussion between English Nature and local authorities, notably in relation to the Thames Basin Heaths SPA. For the Thames Basin Heaths SPA, English Nature has proposed a delivery plan that aims to mitigate the additional recreational pressures caused by new development within 5km of the heaths¹⁴. The delivery plan is contentious, and is for mitigation rather than avoidance. However it does give an indication of the kind of distance over which one might expect to see a significant recreational impact.

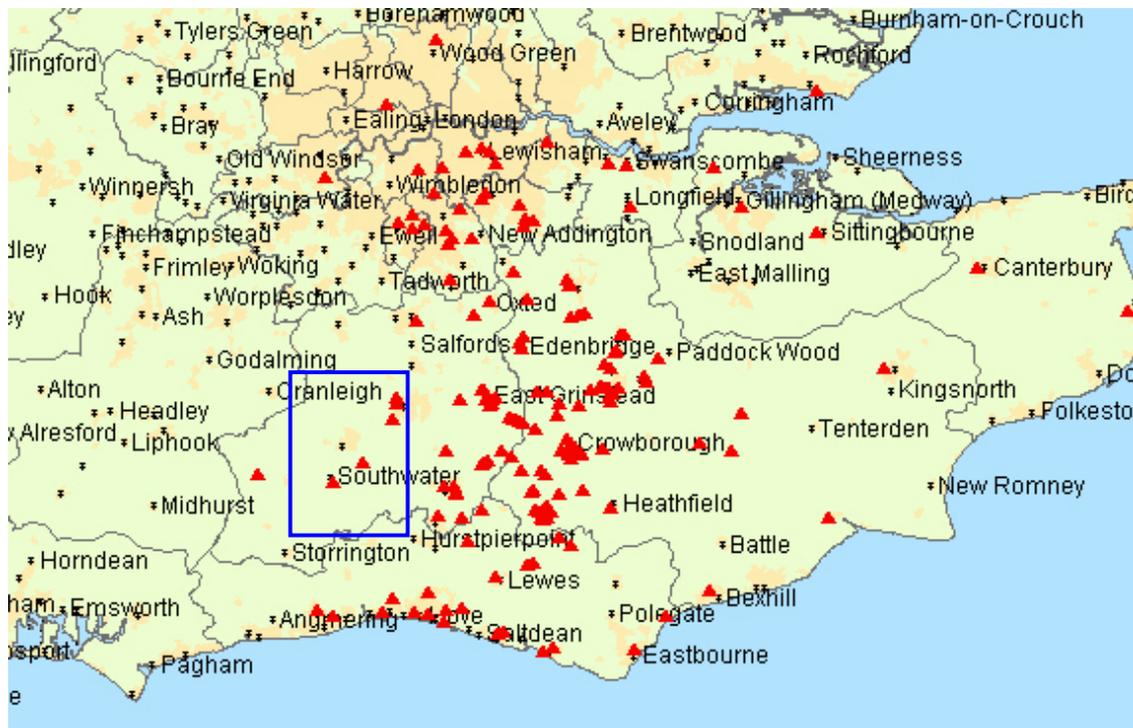
The Woolmer Forest and Thursley, Ash, Pirbright and Chobham SACs have similar characteristics and face similar recreational pressures to those at the Thames Basin Heaths. They are located roughly 13km from the border of Horsham District as the crow flies, and roughly 20km by road. There are no large settlements currently near the border, nor are any planned as a result of the Horsham Core Strategy. As such, recreational impacts on these sites have been screened out.

Ashdown Forest is roughly 15km from Horsham's boundary as the crow flies and 18km by road. There are no large settlements on the border, nor are any planned as a result of the Horsham Core Strategy. Nevertheless, Ashdown Forest has a larger visitor catchment area than the Thames Basin Heaths, so development nearer the centre of the district resulting from the Core Strategy could potentially affect Ashdown Forest.

A tourist survey of Ashdown Forest carried out by Tourism South East in summer 2004 found that, of 218 visitors surveyed, 72% were day visitors from outside the forest area (including Horsham DC). However the number of these visitors that came from the Horsham area was very small: Figure 3.4 shows where visitors to the forest originated. This suggests that the new housing proposed by the Horsham's Strategy is unlikely to have a significant impact on Ashdown Forest, and that it, too, can be screened out.

¹⁴ One of the points of discussion has been about whether the 5km buffer should be for a straight line or distance along a road. English Nature's delivery plan has assumed a straight line. However objectors argue that one argument for a 5km buffer is that people visiting the SPA tend to travel less than 5km to get there; and these 5km would relate to distance travelled by people, not distance on a map.

Figure 3.4 Origin of visitors to Ashdown Forest



Rough location of forest is shown by the green circle; rough location of Horsham District Council is shown by the blue rectangle.

Response by Horsham District Council to Issue 3.5

This Council agrees that the effects of the Core Strategy on Ashdown Forest can be screened out.

3.6 Summary

Table 3.3 shows those impacts that were not screened out in Table 2.3 or Section 3.5; avoidance measures proposed in this chapter; and remaining post-avoidance impacts on European sites. Except for impacts on diffuse air quality, which need to be dealt with as a region-wide issue, all the remaining impacts are not significant.

Table 3.3 Post-avoidance measure risks to European sites related to the Horsham Core Strategy

Site	Key environmental conditions to support site integrity	Possible impacts arising from Core Strategy	Is there a risk of a significant effect	Possible impacts from other trends, plans etc.	Is there a risk of significant 'in combination' effects?	Avoidance measures for Horsham Core Strategy and/or related LDDs	Remaining risk of a significant effect
Arun Valley SPA/Ramsar	Maintenance of hydrological regime, including winter flooding	Development of 10,575 new homes in Horsham district would add to demand for water. Also urbanisation of the catchment may alter water flows and hydrology.	?	Water resources in the area are already a problem: Environment Agency has been unable to conclude no adverse effect upon integrity of SPA Housing proposed for Arun and Chichester districts (9,300 and 8,600 respectively to 2026) would result in additional demand for water Proposed investment by Southern Water and new reservoir on Chichester-Horsham boundary could reduce these impacts	Yes	Require new developments of any size to be 'water neutral': For every new development, total water use in the district after the development must be less than or equal to total water use in the region before the development. For very small developments, require BREEAM 'excellent' standards with respect to water.	Not significant, assuming that Environment Agency consent regime is effective
	Maintenance of adequate water quality	Development of 10,575 new homes in Horsham district would increase requirements for wastewater treatment	?	Housing proposed for Arun and (9,300 to 2026) would result in additional wastewater requiring treatment.	?: see Section 3.2.	Require pre-treatment of wastewater from new (and/or existing) developments that ultimately discharges into the River Arun as a default, unless the Environment Agency and Southern Water indicate that this is not necessary	Not significant, assuming that Environment Agency consent regime is effective

Site	Key environmental conditions to support site integrity	Possible impacts arising from Core Strategy	Is there a risk of a significant effect	Possible impacts from other trends, plans etc.	Is there a risk of significant 'in combination' effects?	Avoidance measures for Horsham Core Strategy and/or related LDDs	Remaining risk of a significant effect
The Mens SAC	Minimal atmospheric pollution	Potential air pollution emissions from housing and additional traffic related to the new housing and employment sites	?	Nitrogen, ozone and acid deposition at The Mens and Ebernoe Common already exceeds critical loads for beech forests	Yes	Revisit Core Strategy once AA for South East Plan has been carried out and any district-level mitigation measures have been identified. Require AA for developments that could add significant traffic to roads within 200m of the SAC	? Depends on measures proposed in AA of South East Plan
Ebernoe Common SAC			No				
Thursley, Ash, Pirbright and Chobham SAC		Potential air pollution emissions from housing and additional traffic related to the new housing and employment sites, but sites are 13+km away from border of Horsham District Council.	Increased traffic, with localized air quality implications on various roads that cross the SAC (including M3, A324, A3, A287 and A286).	?			
Woolmer Forest SAC					The development of 102,888 new homes in Hampshire will contribute considerably to air quality impacts on this site, as the A3 is situated immediately adjacent and it is reasonable to assume that increased housing will lead to increased traffic movements.		
Ashdown Forest SAC/SPA					Development of 14,000 new dwellings in Mid Sussex and 8000 new units in Wealden district could increase traffic levels; East Grinstead development area may result in by-pass making A22 more attractive route for traffic; Gatwick Airport is roughly 15km NW of the site, and would add to this pressure.		

Site	Key environmental conditions to support site integrity	Possible impacts arising from Core Strategy	Is there a risk of a significant effect	Possible impacts from other trends, plans etc.	Is there a risk of significant 'in combination' effects?	Avoidance measures for Horsham Core Strategy and/or related LDDs	Remaining risk of a significant effect
The Mens	Careful management of shrub layer and trees near bat roosts. Preservation of hedges and woodlands along flightlines between bat roosting and foraging sites: roughly 8km from roosting sites.	New development could lead to severance of flightlines between bat roosting and foraging sites. But no development of any size is proposed for the area, and the site is already roughly 2km from border of Horsham DC.	Very limited at best	New homes in Chichester and Arun districts could be sited within 8km of bat roosting sites, but would require site level AA	Limited	Until more information exists on the foraging habits of the Barbastelle bats at The Mens SAC is available, any development that could affect any trees, hedges or water bodies within 6km of the boundary of The Mens SAC should require appropriate assessment to ensure that Barbastelle bat foraging grounds are not negatively affected. English Nature report no. 657 provides information on what could negatively affect the foraging grounds. If more detailed information becomes available (e.g. if a bat foraging survey is carried out) then this could reduce the need for project appropriate assessments.	Not significant

* Where the penultimate column shows possible impacts from other trends etc., but the last column shows no 'in combination' risk, this is because the Horsham Core Strategy is expected to have essentially no impact: all of the impacts are from other sources, so no avoidance measures are needed.

Appendix A. Statutory consultee comments and response

Consultee	Summary of comment on draft AA report	How comment was taken on board in this report
English Nature	Welcomes report and is in broad agreement with the issues and impacts identified	
	Identifies Thursley, Ash, Pirbright and Chobham SAC; Wealden Heaths SPA (Woolmer Forest); and Castle Hill SAC as being less than 15 km from Horsham's boundary. Screens out Castle Hill.	Thursley, Ash, Pribright and Chobham and Woolmer Forest SACs added to analysis
	Recommends for air pollution impacts that, in addition to responding to any findings from the South East Plan AA, AA should be required for any proposed developments that would result in increases in traffic along roads within 200m of Natura 2000 sites.	Added to proposed avoidance measures.
Southern Water	Unhappy with use of figures showing available water headroom.	Figures deleted from report.
	Reiterates that water resources should not be a constraint provided that the water strategy outlined in the draft South East Plan is implemented.	Noted in text at Sec. 3.1.
	Does not support water neutrality in new development as an avoidance measure.	Reasons for lack of support cited in full at Sec. 3.1. Water neutrality kept as an avoidance measure because neither English Nature nor Environment Agency objected (though Environment Agency has doubts about feasibility).
	Notes that an alternative wastewater treatment facility for Horsham will be needed in time, and this should be recognised in the AA.	Noted at Sec. 3.1, but not an avoidance measure in the remit of Horsham Core Strategy.
	Does not support pre-treatment of sewage using e.g. reedbed treatment.	Reasons for lack of support cited in full at Sec. 3.2. Kept as an avoidance measure because neither English Nature nor Environment Agency objected
Environment Agency	Sent many detailed and helpful comments, the great majority of which were taken on board. The most significant were:	
	Distinguish between mitigation and avoidance. Promote avoidance rather than mitigation.	Correct terms now used throughout report

Consultee	Summary of comment on draft AA report	How comment was taken on board in this report
Environment Agency cont.	In Tables 2.3 and 3.3, distinguish between the impacts of the Horsham Core Strategy alone and 'in combination'.	Done
	Consider 'in combination' of different impacts on site, e.g. water quality and water resources at Arun Valley SPA	Difficult to see the links between them; not requested by English Nature; not done
	Revisions to information about Environment Agency's abstraction licensing system	Environment Agency proposed rewording included in this report
	Unhappy with use of figures showing available water headroom	Figures deleted
	Include information about water company resource plans, and analysis of reservoir proposal at Horsham/Chichester boundary	Note to this effect included at Sec. 3.1
	Query how water neutrality would account for people changing fittings and appliances in their 'neutral' houses, making them 'non-neutral'	Note included at Table 3.1: it would not be possible to prevent this, but neither is it possible to prevent negative behavioural change through e.g. BREEAM
	Note that the Environment Agency are currently assessing discharge consents that could affect the site integrity of Arun Valley	Included at Sec. 3.2
	Query whether, if WWTW capacity is found to accommodate fewer houses, Horsham District Council would amend its housing figures	Answer is yes; included in table of avoidance measures
	Recommend use of 7-8km as a buffer for the foraging area of barbastelle bats at The Mens, as a precautionary measure	8km buffer now used
	Recommend that similar buffers should be used at Ebernoe Common and include Bechstein's bats	Horsham District Council boundary is 8km from Ebernoe Common, so buffer is unnecessary