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East Hampshire District Local Plan: Joint Core Strategy Revised Housing Numbers

Habitats Regulations Assessment – Appropriate Assessment report

July 2013




Prepared for

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Revision Schedule

Habitat Regulations Assessment Report
July 2013

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Introduction

1.1 Background

1.1.1 The need for Habitat Regulations Assessment is set out within Article 6 of the EC Habitats Directive 1992, and interpreted into British law by the Conservation of Habitats & Species Regulations 2010. Under these Regulations, land use plans must be subject to Appropriate Assessment if they are likely to have a significant [adverse] effect on a Natura 2000 site (Special Areas of Conservation, SACs and Special Protection Areas, SPAs). It is Government policy (as described in Planning Policy Statement 9: Biodiversity & Geological Conservation) for sites designated under the Convention on Wetlands of International Importance (Ramsar sites) to be treated as having equivalent status to Natura 2000 sites. As such, Appropriate Assessments should also cover these sites.

1.1.2 The Habitats Directive applies the precautionary principle to protected areas; 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. In the case of the Habitats Directive, plans and projects may still be permitted if there are no alternatives to them and there are Imperative Reasons of Overriding Public Interest (IROPI) as to why they should go ahead. In such cases, compensation would be necessary to ensure the overall integrity of the site network.

1.1.3 In order to ascertain whether or not site integrity will be affected, an HRA should be undertaken of the plan or project in question.

Habitats Directive 1992

Article 6 (3) states that:

"*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."*

Conservation of Habitats & Species Regulations 2010

The Regulations state that:

"*A competent authority, before deciding to … give any consent for a plan or project which is likely to have a significant effect on a European site … shall make an appropriate assessment of the implications for the site in view of that sites conservation objectives*".

1.2 This report

1.2.1 URS has been appointed by East Hampshire District Council ("the Council") to assist in undertaking a Habitat Regulations Assessment (HRA) of the potential effects of the East Hampshire District Local Plan: Joint Core Strategy, on the Natura 2000 network and Ramsar sites. The Joint Core Strategy was subject to screening during 2007 in order to confirm that an Appropriate Assessment would be required, since significant effects on European sites could not be described as 'unlikely'. The Appropriate Assessment is the subject of this current document.

1.2.2 Following the suspension of the Local Plan Examination, East Hampshire District Council has revised its housing requirement based on locally determined need. This HRA report evaluates that housing requirement.

1.2.3 Chapter 2 of this report explains the process by which the Appropriate Assessment has been carried out. Chapter 3 explores the relevant pathways of impact resulting from the scale of development that will be delivered in East Hampshire. Chapters 4 to 11 provide an initial screening exercise, followed, if necessary, by more detailed Appropriate Assessment, for the Joint Core Strategy as a whole organised on the basis of one chapter per European site, except where multiple sites overlap in a particular geographic area (e.g. the Solent European sites). Each chapter begins with a consideration of the interest features and ecological condition of the site and environmental process essential to maintain site integrity. A brief assessment of the Joint Core Strategy in respect of each European site (both in isolation and in combination with other projects and plans) is then carried out, including potential impacts.

Housing figures used in this HRA

1.2.4 The total quantity of housing for East Hampshire and South Downs National Park identified in the new requirement is 10,060 dwellings to be delivered between 2011 and 2028, That figure includes completions and 'commitment' sites (i.e. those which already have planning permission). The actual quantity of 'new' (i.e. uncommitted) housing that is being delivered is 2,725 as part of the Whitehill & Bordon strategic allocation and 3,200 elsewhere in East Hampshire. Other than Whitehill & Bordon, Alton, Petersfield and Horndean are the three settlements that will receive the greatest additional housing (700 dwellings each). .

1.2.5 For the purposes of this HRA:

- Uncommitted housing (i.e. Local Plan: Second Review reserve sites (which although allocated under the Local Plan: Second Review have not previously been subject to AA), Strategic Housing Land Availability Assessment (SHLAA) sites and windfalls) are considered part of new delivery under the Joint Core Strategy;
- Commitment sites (i.e. those that already have planning permission but which have not yet been completed), although they count towards the Council's overall housing supply, are essentially 'future baseline' and are considered 'in combination' only; and
- Completions (i.e. those that have been delivered on the ground), although they count towards the Council's overall housing supply, are considered part of the background situation for the purposes of this HRA.

1.2.6 There have been numerous changes to the text of the Local Plan and its policies. However, a review of these changes indicates that, other than the changes in housing numbers and employment area, the changes do not alter the principal thrust of any policies and would not change the conclusions of the original HRA. This HRA therefore focuses on the housing numbers.

2 Methodology

2.1 Introduction

2.1.1 This section sets out our approach and methodology for undertaking the HRA. Habitat Regulations Assessment itself operates independently from the Planning Policy system, being a legal requirement of a discrete Statutory Instrument.

2.2 A Proportionate Assessment

2.2.1 Project-related HRA often requires bespoke survey work and novel data generation in order to accurately determine the significance of adverse effects. In other words, to look beyond the risk of an effect to a justified prediction of the actual likely effect and to the development of avoidance or mitigation measures.

2.2.2 However, the draft CLG guidance[1] makes it clear that when implementing HRA of land-use plans, the AA should be undertaken at a level of detail that is appropriate and proportional to the level of detail provided within the plan itself:

2.2.3 "*The comprehensiveness of the [Appropriate] assessment work undertaken should be proportionate to the geographical scope of the option and the nature and extent of any effects identified. An AA need not be done in any more detail, or using more resources, than is useful for its purpose. It would be inappropriate and impracticable to assess the effects [of a strategic land use plan] in the degree of detail that would normally be required for the Environmental Impact Assessment (EIA) of a project*."

2.2.4 In other words, there is a tacit acceptance that appropriate assessment can be tiered and that all impacts are not necessarily appropriate for consideration to the same degree of detail at all tiers (**Figure 1**).

2.2.5 For a Local Plan the level of detail concerning the developments that will be delivered is usually insufficient to make a highly detailed assessment of significance of effects. For example, precise and full determination of the impacts and significant effects of a new settlement will require extensive details concerning the design of the town, including layout of greenspace and type of development to be delivered in particular locations, yet these data will not be decided until subsequent stages.

2.2.6 The most robust and defensible approach to the absence of fine grain detail at this level is to make use of the precautionary principle. In other words, the plan is never given the benefit of the doubt; it must be assumed that a policy/measure is likely to have an impact leading to a significant adverse effect upon a European site unless it can be clearly established otherwise.

[1] CLG (2006) Planning for the Protection of European Sites, Consultation Paper

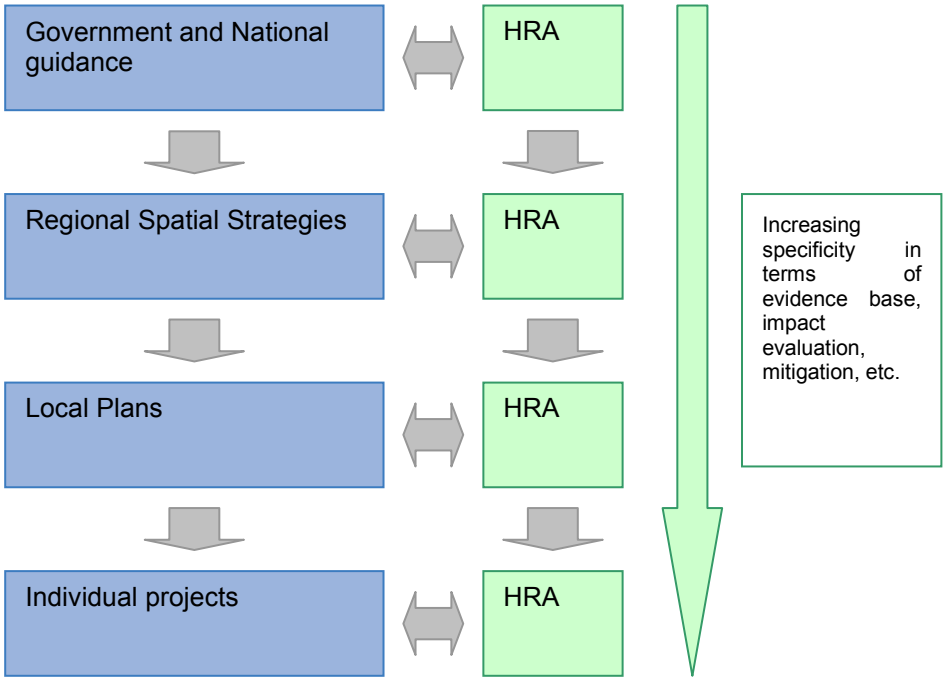


Figure 1: Tiering in HRA of Land Use Plans

2.3 The Process of HRA

2.3.1 The HRA is likely to be carried out in the continuing absence of formal Government guidance. CLG released a consultation paper on AA of Plans in 2006[2]. As yet, no further formal guidance has emerged.

2.3.2 **Figure 2** below outlines the stages of HRA according to current draft CLG guidance. The stages are essentially iterative, being revisited as necessary in response to more detailed information, recommendations and any relevant changes to the plan until no significant adverse effects remain.

[2] CLG (2006) Planning for the Protection of European Sites, Consultation Paper

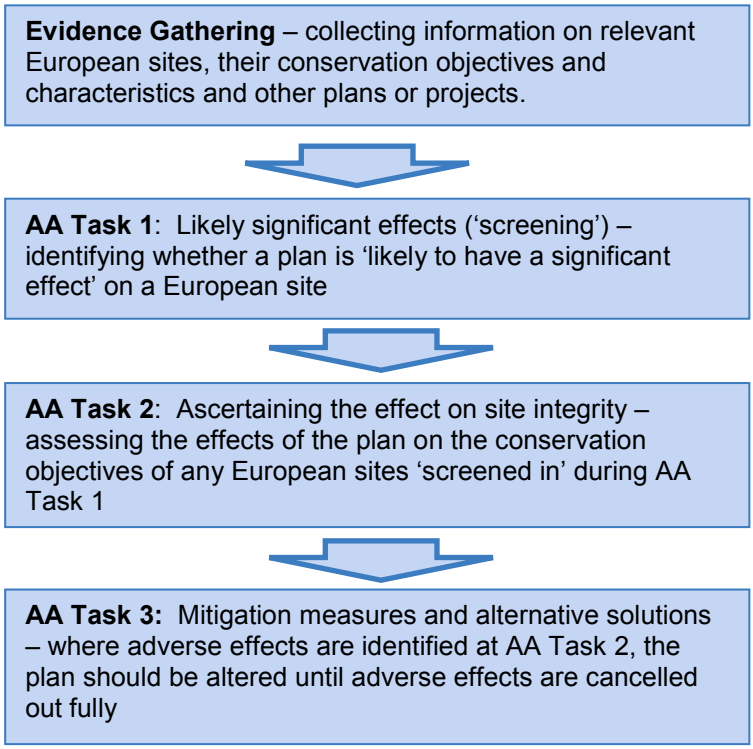


Figure 2: Four-Stage Approach to Habitat Regulations Assessment

2.3.3 In practice, we and other practitioners have discovered that this broad outline requires some amendment in order to feed into a developing land use plan such as a Core Strategy. The following process has been adopted for carrying out the subsequent stages of the HRA.

2.4 Stage One: Likely Significant Effect Test (Screening)

2.4.1 The first stage of any Habitat Regulations Assessment is a Likely Significant Effect (LSE) test - essentially a high level risk assessment to decide whether the full subsequent stage known as Appropriate Assessment is required. The essential question is:

2.4.2 "*Is the Plan, either alone or in combination with other relevant projects and plans, likely to result in a significant effect upon European sites*?"

2.4.3 The objective is to 'screen out' those plans and projects (or site allocations/policies) that can, without any detailed appraisal, be said to be unlikely to result in significant adverse effects upon European sites, usually because there is no mechanism or pathway for an adverse interaction with European sites.

2.4.4 Where the screening stage is unable to determine no likely significant effect, it is often possible to suggest amendments to emerging policy that will act as sufficient avoidance or mitigation. The understanding in such cases is that if the Council is able to incorporate and deliver on such wording, then once the revisions are made, a conclusion of no likely significant effects will be possible.

2.4.5 Nonetheless, there remains the possibility that even with policy modification, in some cases there will be an inability to conclude no likely significant effects of an element of the Local Plan on a given European site. This may arise through, for example, a quantum of development at a location where impacts on a European site are unavoidable, through 'in combination' effects not fully within the Council's power to influence, or simply through a lack of information on which to be able to form a valid conclusion of no likely significant effect. In these cases, there is the possibility of needing to obtain bespoke survey or other relevant information.

2.4.6 A Screening Report was produced relating to the Core Strategy Issues & Options (2007).

2.5 Stage Two: Appropriate Assessment

2.5.1 The level of detail concerning developments that will be permitted under Core Strategies (and to an extent, knowledge concerning the sensitivities and vulnerabilities of European sites) is insufficient to make a detailed assessment of significance of effects, beyond the levels of risk identified in preceding sections either practical or reasonable. Therefore, we find it most productive to take a precautionary approach (in the absence of more precise data) and essentially combine AA Stages 2 and 3 of the CLG guidance, assuming that all those impacts identified as 'likely' are actual impacts that will require mitigation. The purpose of this section of the report will therefore be to try and incorporate measures that would enable the Council and the National Park Authority to be confident that the Joint Core Strategy is unlikely to lead to significant adverse effects on European sites.

2.5.2 A draft Appropriate Assessment was produced in 2009. Since that time considerable further data and analysis has become available which has caused the Appropriate Assessment to be extensively re-worked for this current report. This assessment has had reference to a range of data sources including data on nightjar, Dartford warbler and woodlark populations and distribution made available through Natural England or the Whitehill & Bordon Eco-town team, detailed visitor surveys undertaken for Whitehill & Bordon in addition to surveys undertaken of parts of Wealden Heaths Phase 2 SPA by Footprint Ecology for the National Trust and air quality modelling also undertaken for Whitehill & Bordon.

2.6 Physical scope of the HRA

2.6.1 As a result of the Screening Report (2007) it was determined that the physical scope of the HRA would be as shown in Table 1 and Figure 3.

Table 1: Physical scope of the HRA

European site
East Hampshire Hangers SAC
Shortheath Common SAC
Wealden Heaths Phase 2 SPA
Woolmer Forest SAC
Butser Hill SAC
Thursley, Ash, Pirbright and Chobham SAC
Thursley, Hankley and Frensham Commons SPA
Solent Maritime SAC
Solent and Isle of Wight Lagoons SAC

European site
Chichester and Langstone Harbours SPA
Chichester and Langstone Harbours Ramsar
Thames Basin Heaths SPA
River Itchen SAC
Kingley Vale SAC
Rook Clift SAC
Thursley and Ockley Bogs Ramsar
Portsmouth Harbour SPA
Portsmouth Harbour Ramsar
Ebernoe Common SAC
Singleton and Cocking Tunnels SAC
Solent and Southampton Water SPA
Solent and Southampton Water Ramsar

- Following a more detailed examination of the Joint Core Strategy, its policies and the likely locations of future development it has been determined that five sites listed above can be excluded from further consideration:

- **Singleton & Cocking Tunnels SAC** – this site is designated for its populations of hibernating barbastelle and Bechstein bats. The nearest significant settlement in East Hampshire will be Rowlands Castle approximately 15km to the west; there is no mechanism whereby development in this location could impact on the hibernating bats of this SAC. As such, it is not considered further in this document;

- **Rook Clift SAC**, **Kingley Vale SAC** and **Ebernoe Common SAC** – these sites are designated for their woodland interest (in addition to elements of calcareous grassland in the case of Kingley Vale and bats in the case of Ebernoe Common). However, each site is situated more than 10km from the nearest significant settlement in East Hampshire; moreover, East Hampshire has several much larger internationally important woodlands (East Hampshire Hangers SAC, Woolmer Forest SAC) located much closer to and more easily reached from the major settlements in the district, such that impacts on Rook Clift and Kingley Vale are considered inherently unlikely from this district. They are therefore not considered further in this document; and

- **Solent & Southampton Water SPA/Ramsar site -** The Solent & Southampton Water is situated considerably further from East Hampshire than other similar sites (Portsmouth Harbour, Chichester Harbour and Langstone Harbour) and it is unlikely therefore that it will attract significant numbers of visitors from East Hampshire district when compared to them. It is therefore not considered further in this document.

2.7 The 'in combination' scope

2.7.1 It is a requirement of the Regulations that the impacts and effects of any land use plan being assessed are not considered in isolation but in combination with other plans and projects that may also be affecting the European site(s) in question. In practice, 'in combination assessment' is of greatest importance when the DPD would otherwise be screened out because the individual contribution is inconsequential. It is neither practical nor necessary to assess the 'in combination' effects of the DPD within the context of all other plans and projects within the region. The principal other plans and projects that have been considered for in combination effects are:

- Existing commitment sites (i.e. those with planning permission but which have not yet been delivered) within East Hampshire;
- Waverley Local Plan (submitted 2013)
- Havant LDF Core Strategy (Adopted, March 2011)
- The Portsmouth Plan (Adopted, 2012)
- Gosport Local Plan (Draft Plan, 2013)
- Fareham LDF Core Strategy (Adopted, 2011)
- Southampton LDF Core Strategy (Adopted, 2010)
- New Forest LDF Core Strategy (Adopted, 2010)
- South Downs National Park Management Plan (2013 – onwards; draft plan)
- Hampshire Local Transport Plan 2011-2031
- Solent Transport Strategy 2011-2031
- Hampshire, Portsmouth, Southampton and New Forest National Park Minerals and Waste Core Strategy (Adopted, 2007)

2.7.2 In practice, in combination assessment is of greatest relevance when the plan would otherwise be screened out because its individual contribution is inconsequential. For the purposes of this assessment, we have determined that, due to the nature of the identified impacts, the key other plans and projects relate to the additional housing and commercial/industrial allocations, along with infrastructure improvements proposed for neighbouring authorities over the lifetime of the Joint Core Strategy.

3 Pathways of Impact

3.1 Introduction

3.1.1 In carrying out an HRA it is important to determine the various ways in which land use plans can impact on European sites by following the pathways along which development can be connected with European sites, in some cases many kilometres distant. Briefly defined, pathways are routes by which a change in activity associated with a development can lead to an effect upon a European site. The following indirect pathways of impact were considered relevant to the Habitat Regulations Assessment of the Joint Core Strategy.

3.2 Urbanisation/ Urban edge impacts

3.2.1 This impact is closely related to recreational pressure, in that they both result from increased populations within close proximity to sensitive sites. Urbanisation is considered separately as the detail of the impacts is distinct from the trampling, disturbance and dog-fouling that results specifically from recreational activity and is more related to close proximity of large scale urban development. The list of urbanisation impacts can be extensive[3], but core impacts can be singled out:

- Increased fly-tipping - Rubbish tipping is unsightly but the principle adverse ecological effect of tipping is the introduction of invasive alien species with garden waste. Garden waste results in the introduction of invasive aliens precisely because it is the 'troublesome and over-exuberant' garden plants that are typically thrown out[4]. Alien species may also be introduced deliberately or may be bird-sown from local gardens.
- Arson – Heathlands are particularly susceptible to arson or accidental fires. Consultations reported in the Whitehill & Bordon HRA have revealed a snapshot of the extent of fire on European sites over recent years. Monitoring has not always been carried out uniformly, but site managers logged two incidences of fire on Shortheath Common in 2010, with none in the preceding two years. The total area of Shortheath Common lost to wildfire in 2010 was 0.92 hectares, representing about 1.6% of the site, much of which is not heathland (pers. comm., 2011). On Broxhead Common, four fires were logged between 2008 and 2010, totalling 5.60 hectares.
- Cat predation - A survey performed in 1997 indicated that nine million British cats brought home 92 million prey items over a five-month period[5]. A large proportion of domestic cats are found in urban situations, and increasing urbanisation is likely to lead to increased cat predation.

3.2.2 The most detailed consideration of the link between relative proximity of development to European sites and damage to interest features has been carried out with regard to the Thames Basin Heaths SPA.

[3] Underhill Day, JC. 2005. A Literature Review of Urban Effects on Lowland Heaths and their Wildlife: English Nature Research Report 623
[4] Gilbert, O. & Bevan, D. 1997. The effect of urbanisation on ancient woodlands. British Wildlife 8: 213-218.
[5] Woods, M. et al. 2003. Predation of wildlife by domestic cats *Felis catus* in Great Britain. Mammal Review 33, 2 174-188.

3.2.3 After extensive research, Natural England and its partners produced a 'Delivery Plan'[5] which made recommendations for accommodating development while also protecting the interest features of the European site. This included the recommendation of implementing a series of zones within which varying constraints would be placed upon development. While the zones relating to recreational pressure expanded to 5km (as this was determined from visitor surveys to be the principal recreational catchment for this European site), that concerning other aspects of urbanisation (particularly predation of the chicks of ground-nesting birds by domestic cats but also including other disturbance) was determined at 400m from the SPA boundary. The delivery plan concluded that the adverse effects of development located within 400m of the SPA boundary could not be mitigated and as such, no new housing should be located within this zone.

3.2.4 No exact correlation can be made between the incidence of fly-tipping and deliberate arson and the specific proximity of large-scale human settlement, since it does depend on circumstances. However, it is reasonable to conclude that the risk will be particularly high when large amounts of human settlement is very near (for the purposes of this assessment we have as a precaution defined 'very near' as being within 400-500m rather than immediately adjacent). While this is not an empirically derived distance, it does enable urbanisation effects to be defined and the likelihood assessed at this scale.

3.3 Recreational pressure

Trampling and nutrient enrichment

3.3.1 Most types of aquatic or terrestrial European site can be affected by trampling, which in turn causes soil compaction and erosion. Walkers with dogs contribute to pressure on sites through nutrient enrichment via dog fouling and also have potential to cause greater disturbance to fauna as dogs are less likely to keep to marked footpaths. Motorcycle scrambling and off-road vehicle use can cause more serious erosion, as well as disturbance to sensitive species.

3.3.2 There have been several papers published that empirically demonstrate that damage to vegetation in woodlands and other habitats can be caused by vehicles, walkers, horses and cyclists:

- Wilson & Seney (1994)[6] examined the degree of track erosion caused by hikers, motorcycles, horses and cyclists from 108 plots along tracks in the Gallatin National Forest, Montana. Although the results proved difficult to interpret, It was concluded that horses and hikers disturbed more sediment on wet tracks, and therefore caused more erosion, than motorcycles and bicycles.
- Cole et al (1995a, b)[7] conducted experimental off-track trampling in 18 closed forest, dwarf scrub and meadow & grassland communities (each tramped between 0 – 500 times) over five mountain regions in the US. Vegetation cover was assessed two weeks and one year after trampling, and an inverse relationship with trampling intensity was discovered, although this relationship was weaker after one year than two weeks indicating some

[5] http://www.southeast-ra.gov.uk/documents/sustainability/thames_basin_heaths/delivery_framework_march2009.pdf
[6] Wilson, J.P. & J.P. Seney. 1994. Erosional impact of hikers, horses, motorcycles and off road bicycles on mountain trails in Montana. Mountain Research and Development 14:77-88
[7] Cole, D.N. 1995a. Experimental trampling of vegetation. I. Relationship between trampling intensity and vegetation response. Journal of Applied Ecology 32: 203-214
Cole, D.N. 1995b. Experimental trampling of vegetation. II. Predictors of resistance and resilience. Journal of Applied Ecology 32: 215-224

recovery of the vegetation. Differences in plant morphological characteristics were found to explain more variation in response between different vegetation types than soil and topographic factors. Low-growing, mat-forming grasses regained their cover best after two weeks and were considered most resistant to trampling, while tall forbs (non-woody vascular plants other than grasses, sedges, rushes and ferns) were considered least resistant. Cover of hemicryptophytes and geophytes (plants with buds below the soil surface) was heavily reduced after two weeks, but had recovered well after one year and as such these were considered most resilient to trampling. Chamaephytes (plants with buds above the soil surface) were least resilient to trampling. It was concluded that these would be the least tolerant of a regular cycle of disturbance.

- Cole (1995c)[8] conducted a follow-up study (in 4 vegetation types) in which shoe type (trainers or walking boots) and trampler weight were varied. Although immediate damage was greater with walking boots, there was no significant difference after one year. Heavier tramplers caused a greater reduction in vegetation height than lighter tramplers, but there was no difference in effect on cover.

- Cole & Spildie (1998)[9] experimentally compared the effects of off-track trampling by hiker and horse (at two intensities – 25 and 150 passes) in two woodland vegetation types (one with an erect forb understorey and one with a low shrub understorey). Horse traffic was found to cause the largest reduction in vegetation cover. The forb-dominated vegetation suffered greatest disturbance, but recovered rapidly. Higher trampling intensities caused more disturbance.

Disturbance of wildlife

3.3.3 Concern regarding the effects of disturbance on birds in particular, stems from the fact that they are expending energy unnecessarily and the time they spend responding to disturbance is time that is not spent feeding[10]. Disturbance therefore risks increasing energetic output while reducing energetic input, which can adversely affect the 'condition' and ultimately survival of the birds. In addition, displacement of birds from one feeding site to others can increase the pressure on the resources available within the remaining sites, as they have to sustain a greater number of birds.[11] Moreover, the more time a breeding bird spend disturbed from its nest, the more its eggs are likely to cool and the more vulnerable they are to predators.

3.3.4 The potential for disturbance may be less in winter than in summer, in that there are often a smaller number of recreational users. However, winter activity can still cause important disturbance, especially as birds are particularly vulnerable at this time of year due to food shortages. Several empirical studies have, through correlative analysis, demonstrated that out-of-season recreational activity can result in quantifiable disturbance:

- Tuite et al[12] found that during periods of high recreational activity, bird numbers at Llangorse Lake decreased by 30% as the morning progressed, matching the increase in recreational activity towards midday. During periods of low recreational activity, however,

[8] Cole, D.N. 1995c. Recreational trampling experiments: effects of trampler weight and shoe type. Research Note INT-RN-425. U.S. Forest Service, Intermountain Research Station, Utah.
[9] Cole, D.N., Spildie, D.R. 1998. Hiker, horse and llama trampling effects on native vegetation in Montana, USA. Journal of Environmental Management 53: 61-71
[10] Riddington, R. *et al*. 1996. The impact of disturbance on the behaviour and energy budgets of Brent geese. *Bird Study* 43:269-279
[11] Gill, J.A., Sutherland, W.J. & Norris, K. 1998. The consequences of human disturbance for estuarine birds. *RSPB Conservation Review* 12: 67-72
[12] Tuite, C. H., Owen, M. & Paynter, D. 1983. Interaction between wildfowl and recreation at Llangorse Lake and Talybont Reservoir, South Wales. *Wildfowl* 34: 48-63

no change in numbers was observed as the morning progressed. In addition, all species were found to spend less time in their 'preferred zones' (the areas of the lake used most in the absence of recreational activity) as recreational intensity increased.

- Underhill et al[13] counted waterfowl and all disturbance events on 54 water bodies within the South West London Water bodies Special Protection Area and clearly correlated disturbance with a decrease in bird numbers at weekends in smaller sites and with the movement of birds within larger sites from disturbed to less disturbed areas.
- Evans & Warrington[14] found that on Sundays total water bird numbers (including shoveler and gadwall) were 19% higher on Stocker's Lake LNR in Hertfordshire, and attributed this to observed greater recreational activity on surrounding water bodies at weekends relative to week days. However, recreational activity was not quantified in detail, nor were individual recreational activities evaluated separately.
- Tuite et al[15] used a large (379 site), long-term (10-year) dataset (September – March species counts) to correlate seasonal changes in wildfowl abundance with the presence of various recreational activities. They found that shoveler was one of the most sensitive species to disturbance. The greatest impact on winter wildfowl numbers was associated with sailing/windsurfing and rowing.

3.3.5 Human activity can affect birds either directly (e.g. through causing them to flee) or indirectly (e.g. through damaging their habitat). The most obvious direct effect is that of immediate mortality such as death by shooting, but human activity can also lead to behavioural changes (e.g. alterations in feeding behaviour, avoidance of certain areas *etc.*) and physiological changes (e.g. an increase in heart rate) that, although less noticeable, may ultimately result in major population-level effects by altering the balance between immigration/birth and emigration/death.[16]

3.3.6 The degree of impact that varying levels of noise will have on different species of bird is poorly understood except that a number of studies have found that an increase in traffic levels on roads does lead to a reduction in the bird abundance within adjacent hedgerows - Reijnen et al (1995) examined the distribution of 43 passerine species (i.e. 'songbirds'), of which 60% had a lower density closer to the roadside than further away. By controlling vehicle usage they also found that the density generally was lower along busier roads than quieter roads[17].

3.3.7 Activity will often result in a flight response (flying, diving, swimming or running) from the animal that is being disturbed. This carries an energetic cost that requires a greater food intake. Research that has been conducted concerning the energetic cost to wildlife of disturbance indicates a significant negative effect.

3.3.8 Disturbing activities are on a continuum. The most disturbing activities are likely to be those that involve irregular, infrequent, unpredictable loud noise events, movement or vibration of long duration. Birds are least likely to be disturbed by activities that involve regular, frequent,

[13] Underhill, M.C. *et al.* 1993. *Use of Waterbodies in South West London by Waterfowl. An Investigation of the Factors Affecting Distribution, Abundance and Community Structure.* Report to Thames Water Utilities Ltd. and English Nature. Wetlands Advisory Service, Slimbridge
[14] Evans, D.M. & Warrington, S. 1997. The effects of recreational disturbance on wintering waterbirds on a mature gravel pitlake near London. International Journal of Environmental Studies 53: 167-182
[15] Tuite, C.H., Hanson, P.R. & Owen, M. 1984. Some ecological factors affecting winter wildfowl distribution on inland waters in England and Wales and the influence of water-based recreation. *Journal of Applied Ecology* 21: 41-62
[16] Riley, J. 2003. Review of Recreational Disturbance Research on Selected Wildlife in Scotland. Scottish Natural Heritage.
[17] Reijnen, R. et al. 1995. The effects of car traffic on breeding bird populations in woodland. III. Reduction of density in relation to the proximity of main roads. Journal of Applied Ecology 32: 187-202

predictable, quiet patterns of sound or movement or minimal vibration. The further any activity is from the birds, the less likely it is to result in disturbance.

3.3.9 The factors that influence a species response to a disturbance are numerous, but the three key factors are species sensitivity, proximity of disturbance sources and timing/duration of the potentially disturbing activity.

Sensitivity of species

3.3.10 The distance at which a species takes flight when approached by a disturbing stimulus is known as the 'tolerance distance' (also called the 'escape flight distance') and differs between species to the same stimulus and within a species to different stimuli. These are given in Table 2, which compiles 'tolerance distances' from across the literature. It is reasonable to assume from this that disturbance is unlikely to be experienced more than a few hundred metres from the birds in question. In addition, the regular mechanized noise that is associated with waste sites is likely to be less disturbing that the presence of visible human activity in areas in which the birds are not used to observing such activity.

Table 3 - Tolerance distances of 21 water bird species to various forms of recreational disturbance, as described in the literature. All distances are in metres. Single figures are mean distances; when means are not published, ranges are given. [1] Tydeman (1978), [2] Keller (1989), [3] Van der Meer (1985), [4] Wolff et al (1982), [5] Blankestijn et al (1986).[18]

Species	Type of disturbance		
	Rowing boats/kayak	Sailing boats	Walking
Little grebe		60 – 100 [1]	
Great crested grebe	50 – 100 [2]	20 – 400 [1]	
Mute swan		3 – 30 [1]	
Teal		0 – 400 [1]	
Mallard		10 – 100 [1]	
Shoveler		200 – 400 [1]	
Pochard		60 – 400 [1]	
Tufted duck		60 – 400 [1]	
Goldeneye		100 – 400 [1]	
Smew		0 – 400 [1]	
Moorhen		100 – 400 [1]	
Coot		5 – 50 [1]	
Curlew			211 [3]; 339 [4]; 213 [5]

[18] Tydeman, C.F. 1978. *Gravel Pits as conservation areas for breeding bird communities*. PhD thesis. Bedford College
Keller, V. 1989. Variations in the response of Great Crested Grebes *Podiceps cristatus* to human disturbance - a sign of adaptation? *Biological Conservation* 49:31-45
Van der Meer, J. 1985. *De verstoring van vogels op de slikken van de Oosterschelde*. Report 85.09 Deltadienst Milieu en Inrichting, Middelburg. 37 pp.
Wolf, W.J., Reijenders, P.J.H. & Smit, C.J. 1982. The effects of recreation on the Wadden Sea ecosystem: many questions but few answers. In: G. Luck & H. Michaelis (Eds.), *Schriftenreihe M.E.L.F., Reihe A: Agnew. Wissensch* 275: 85-107
Blankestijn, S. *et al.* 1986. *Seizoensverbreding in de recreatie en verstoring van Wulp en Scholkester op hoogwatervluchplaatsen op Terschelling*. Report Projectgroep Wadden, L.H. Wageningen. 261pp.

Species	Type of disturbance		
	Rowing boats/kayak	Sailing boats	Walking
Shelduck			148 [3]; 250 [4]
Grey plover			124 [3]
Ringed plover			121 [3]
Bar-tailed godwit			107 [3]; 219 [4]
Brent goose			105 [3]
Oystercatcher			85 [3]; 136 [4]; 82 [5]
Dunlin			71 [3]; 163 [2]

Heathland birds

3.3.11 Work by Liley and Clarke[19] [20](2002, 2003) also found that the density of nightjar on heathland sites in Dorset was directly related to the amount of surrounding development; sites surrounded by a high amount of development supported fewer nightjars. A study of nightjars by Murison (2002) noted that nightjar breeding success differed between heavily visited sites and those with little public access. Breeding success and nest density was lower on sites with higher levels of use. The proximity of paths to the nest also correlated strongly with nest failure, up to 225m from the path edge. Murison also noted that the study appeared to show a strong link between increased site disturbance, higher predator numbers such as corvids on disturbed sites, and subsequent high predation rates of nightjar nests.

3.3.12 Woodlark also appears to be sensitive to disturbance. A study by Mallord (2005)[21], referenced by Liley (2005)[22], on sixteen heathland sites in southern England found that density of woodlarks appeared to be correlated to disturbance levels, with lower densities where disturbance levels were higher. Overall Mallord estimated that if there was no disturbance on any of the sites, 34% more woodlark chicks would be raised (Liley, 2005).

3.3.13 Dartford Warblers are not ground nesting, unlike nightjar and woodlark, nesting and foraging instead in gorse bushes. Research by Murison (2006) showed clear associations between Dartford warbler breeding parameters and levels of disturbance by humans and their pets.

3.3.14 Mallord et al (2007) assessed the impacts of recreational disturbance on woodlark at a population scale. They found that across all sites studied, woodlark density (per hectare of suitable habitat) was lower in sites with higher levels of disturbance. Within sites with recreational access, the probability of suitable habitat being colonized was lower in those areas with greater disturbance; this was reduced to below 50% at around eight disturbance events per hour.

3.3.15 Less research has been undertaken into the effects of recreational disturbance on Dartford warbler. In general, these birds appear to be more tolerant of people but their nest site choice within gorse scrub and tall heather makes them particularly vulnerable to impacts of fire. In

[19] Liley, D. & Clarke, R. T. (2003) The impact of urban development and human disturbance on the numbers of nightjar Caprimulgus europaeus on heathlands in Dorset, England. Biological Conservation, 114, 219 - 230.
[20] Liley, D. & Clarke, R. T. (2002) The impact of human disturbance and urban development on key heathland bird species in Dorset. . Sixth National Heathland Conference (eds J. C. Underhill-Day & D. Liley). RSPB, Bournemouth.
[21] Mallord J. (2005) Predicting the consequences of human disturbance, urbanisation and fragmentation for a woodlark Lullula arborea population. PhD Thesis, University of East Anglia, Norwich, UK.
[22] Liley, D. (2005) A summary of the evidence base for disturbance effects to Annex 1 bird species on the Thames Basin Heaths & research on human access patterns to heathlands in southern england. Footprint Ecology / English Nature.

urban edge heathlands with heightened incidents of fire the availability of suitable Dartford warbler nesting habitat might be reduced, and on small sites, totally lost as a result of fire.

3.3.16 Dogs have been recorded preying on ground nesting birds and studies have shown nightjars to have been flushed from their nest by dogs. Studies have also shown birds to be warier of dogs and people with dogs than people alone, with birds flushing (flying away) more readily, more frequently and at greater distances and staying longer off the nest when disturbed (Langston et al., 2007).

3.4 Atmospheric pollution

3.4.1 Current levels of understanding of air quality effects on semi-natural habitats are not adequate to allow a rigorous assessment of the likelihood of significant effects on the integrity of key European sites.

Table 4. Main sources and effects of air pollutants on habitats and species

Pollutant	Source	Effects on habitats and species
Acid deposition	SO_2, NOx and ammonia all contribute to acid deposition. Although future trends in S emissions and subsequent deposition to terrestrial and aquatic ecosystems will continue to decline, it is likely that increased N emissions may cancel out any gains produced by reduced S levels.	Can affect habitats and species through both wet (acid rain) and dry deposition. Some sites will be more at risk than others depending on soil type, bed rock geology, weathering rate and buffering capacity.
Ammonia (NH_3)	Ammonia is released following decomposition and volatilisation of animal wastes. It is a naturally occurring trace gas, but levels have increased considerably with expansion in numbers of agricultural livestock. Ammonia reacts with acid pollutants such as the products of SO_2 and NO_X emissions to produce fine ammonium (NH_4+)-containing aerosol which may be transferred much longer distances (can therefore be a significant trans-boundary issue.)	Adverse effects are as a result of nitrogen deposition leading to eutrophication. As emissions mostly occur at ground level in the rural environment and NH_3 is rapidly deposited, some of the most acute problems of NH_3 deposition are for small relict nature reserves located in intensive agricultural landscapes.
Nitrogen oxides NO_x	Nitrogen oxides are mostly produced in combustion processes. About one quarter of the UK's emissions are from power stations, one-half from motor vehicles, and the rest from other industrial and domestic combustion processes.	Deposition of nitrogen compounds (nitrates (NO_3), nitrogen dioxide (NO_2) and nitric acid (HNO_3)) can lead to both soil and freshwater acidification. In addition, NO_x can cause eutrophication of soils and water. This alters the species composition of plant communities and can eliminate sensitive species.
Nitrogen (N) deposition	The pollutants that contribute to nitrogen deposition derive mainly from NO_X and NH_3 emissions. These pollutants cause acidification (see also acid deposition) as well as eutrophication.	Species-rich plant communities with relatively high proportions of slow-growing perennial species and bryophytes are most at risk from N eutrophication, due to its promotion of competitive and invasive species which can respond readily to elevated levels of N. N deposition can also increase the risk of damage from abiotic factors, e.g. drought and frost.
Ozone (O_3)	A secondary pollutant generated by photochemical reactions from NO_x and volatile organic compounds (VOCs). These are mainly released by the combustion of fossil fuels. The increase in combustion of fossil fuels in the UK has led to a large increase in background ozone concentration, leading to an increased number of	Concentrations of O_3 above 40 ppb can be toxic to humans and wildlife, and can affect buildings. Increased ozone concentrations may lead to a reduction in growth of agricultural crops, decreased forest production and altered species composition in semi-natural plant communities.

Pollutant	Source	Effects on habitats and species
	days when levels across the region are above 40ppb. Reducing ozone pollution is believed to require action at international level to reduce levels of the precursors that form ozone.	
Sulphur Dioxide SO_2	Main sources of SO_2 emissions are electricity generation, industry and domestic fuel combustion. May also arise from shipping and increased atmospheric concentrations in busy ports. Total SO_2 emissions have decreased substantially in the UK since the 1980s.	Wet and dry deposition of SO_2 acidifies soils and freshwater, and alters the species composition of plant and associated animal communities. The significance of impacts depends on levels of deposition and the buffering capacity of soils.

3.4.2 The main pollutants of concern for European sites are oxides of nitrogen (NOx), ammonia (NH_3) and sulphur dioxide (SO_2). NOx can have a directly toxic effect upon vegetation. In addition, greater NOx or ammonia concentrations within the atmosphere will lead to greater rates of nitrogen deposition to soils. An increase in the deposition of nitrogen from the atmosphere to soils is generally regarded to lead to an increase in soil fertility, which can have a serious deleterious effect on the quality of semi-natural, nitrogen-limited terrestrial habitats.

3.4.3 Sulphur dioxide emissions are overwhelmingly influenced by the output of power stations and industrial processes that require the combustion of coal and oil as well (particularly on a local scale) shipping. Ammonia emissions are dominated by agriculture, with some chemical processes also making notable contributions. As such, it is unlikely that material increases in SO_2 or NH_3 emissions will be associated with Local Plans. NOx emissions, however, are dominated by the output of vehicle exhausts (more than half of all emissions). Within a 'typical' housing development, by far the largest contribution to NOx (92%) will be made by the associated road traffic. Other sources, although relevant, are of minor importance (8%) in comparison[23]. Emissions of NOx could therefore be reasonably expected to increase as a result of greater vehicle use as an indirect effect of the Local Plan.

3.4.4 According to the World Health Organisation, the critical NOx concentration (critical threshold) for the protection of vegetation is 30 μgm^{-3}; the threshold for sulphur dioxide is 20 μgm^{-3}. In addition, ecological studies have determined 'critical loads'[24] of atmospheric nitrogen deposition (that is, NOx combined with ammonia NH_3).

3.4.5 The National Expert Group on Transboundary Air Pollution (2001)[25] concluded that:

- In 1997, critical loads for acidification were exceeded in 71% of UK ecosystems. This was expected to decline to 47% by 2010.
- Reductions in SO_2 concentrations over the last three decades have virtually eliminated the direct impact of sulphur on vegetation.
- By 2010, deposited nitrogen was expected to be the major contributor to acidification, replacing the reductions in SO_2.
- Current nitrogen deposition is probably already changing species composition in many nutrient-poor habitats, and these changes may not readily be reversed.
- The effects of nitrogen deposition are likely to remain significant beyond 2010.

[23] Proportions calculated based upon data presented in Dore CJ et al. 2005. UK Emissions of Air Pollutants 1970 – 2003. UK National Atmospheric Emissions Inventory. http://www.airquality.co.uk/archive/index.php
[24] The critical load is the rate of deposition beyond which research indicates that adverse effects can reasonably be expected to occur
[25] National Expert Group on Transboundary Air Pollution (2001) Transboundary Air Pollution: Acidification, Eutrophication and Ground-Level Ozone in the UK.

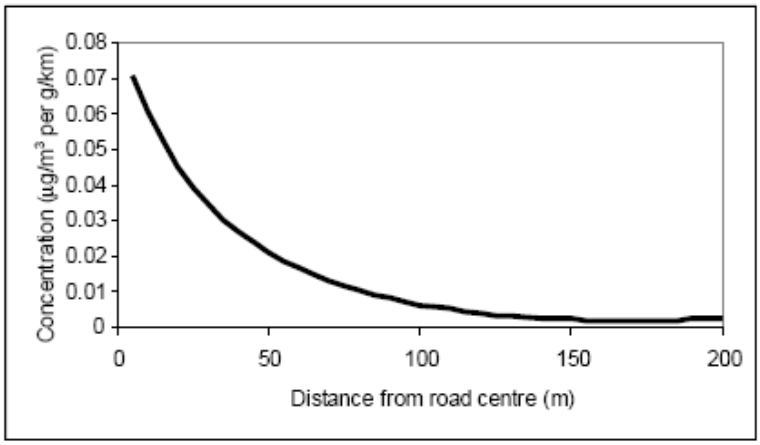
- Current ozone concentrations threaten crops and forest production nationally. The effects of ozone deposition are likely to remain significant beyond 2010.
- Reduced inputs of acidity and nitrogen from the atmosphere may provide the conditions in which chemical and biological recovery from previous air pollution impacts can begin, but the timescales of these processes are very long relative to the timescales of reductions in emissions.

3.4.6 Grice et al[26] [27] do however suggest that air quality in the UK will improve significantly over the next 15 years due primarily to reduced emissions from road transport and power stations.

Local air pollution

3.4.7 According to the Department of Transport's Transport Analysis Guidance, "Beyond 200m, the contribution of vehicle emissions from the roadside to local pollution levels is not significant"[28].

Figure 4. Traffic contribution to concentrations of pollutants at different distances from a road (Source: DfT)



3.4.8 This is therefore the distance that has been used throughout this HRA in order to determine whether European sites are likely to be significantly affected by development under the Joint Core Strategy.

Diffuse air pollution

3.4.9 In addition to the contribution to local air quality issues, development can also contribute cumulatively to an overall change in background air quality across an entire region (although individual developments and plans are – with the exception of large point sources such as power stations – likely to make very small individual contributions). In July 2006, when this issue was raised by Runnymede District Council in the South East, Natural England advised that their Local Development Framework *'can only be concerned with locally emitted and short*

[26] Grice, S., T. Bush, J. Stedman, K. Vincent, A. Kent, J. Targa and M. Hobson (2006) Baseline Projections of Air Quality in the UK for the 2006 Review of the Air Quality Strategy, report to the Department for Environment, Food and Rural Affairs, Welsh Assembly Government, the Scottish Executive and the Department of the Environment for Northern Ireland.
[27] Grice, S., J. Stedman, T. Murrells and M. Hobson (2007) Updated Projections of Air Quality in the UK for Base Case and Additional Measures for the Air Quality Strategy for England, Scotland, Wales and Northern Ireland 2007, report to the Department for Environment, Food and Rural Affairs, Welsh Assembly Government, the Scottish Executive and the Department of the Environment for Northern Ireland.
[28] www.webtag.org.uk/archive/feb04/pdf/feb04-333.pdf

range locally acting pollutants' [29] as this is the only scale which falls within a local authority remit. It is understood that this guidance was not intended to set a precedent, but it inevitably does so since (as far as we are aware) it is the only formal guidance that has been issued to a Local Authority from any Natural England office on this issue.

3.4.10 In the light of this and our own knowledge and experience, it is considered reasonable to conclude that it must be the responsibility of Regional Spatial Strategies and other higher-tier plans to set a policy framework for addressing the cumulative diffuse pan-authority air quality impacts, partly because such impacts stem from the overall quantum of development within a region (over which individual districts have little control), and since this issue can only practically be addressed at the highest pan-authority level. Diffuse air quality issues will not therefore be considered further within this HRA.

3.5 Water resources

3.5.1 The South East is generally an area of high water stress (see Figure 5).

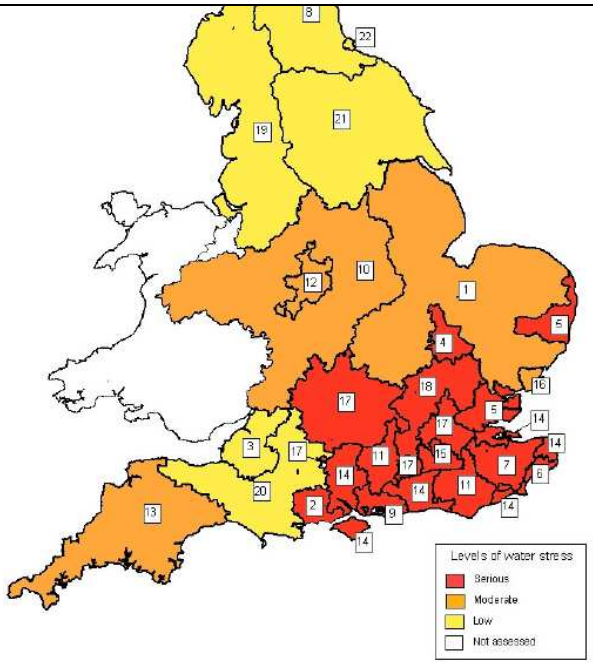


Figure 5. Areas of water stress within England. It can be seen from this map that Hampshire is classified as being an area of serious water stress (coded red).[30]

3.5.2 The East Hampshire district is covered by a number of EA Catchment Abstraction Management Strategies – the Wey[31], the East Hampshire[32], the Test and Itchen[33] and the Arun and Western Streams[34] (recently updated by the EA Abstraction Licensing Strategies). The Wey catchment units within East Hampshire are at either 'no water available' at low flows status, or are 'over-licenced.' The Wallington, Portsdown and Butser Chalk WRMU of the East Hampshire CAMS is currently 'over licenced.' The Test and Itchen CAMS status is at 'No Water Available', with the

[29] English Nature (16 May 2006) letter to Runnymede Borough Council, 'Conservation (Natural Habitats &c.) Regulations 1994, Runnymede Borough Council Local Development Framework'.
[30] Figure adapted from Environment Agency. 2007. Identifying Areas of Water Stress. http://publications.environment-agency.gov.uk/pdf/GEHO0107BLUT-e-e.pdf
[31] http://publications.environment-agency.gov.uk/pdf/GETH0308BNQT-e-e.pdf
[32] http://publications.environment-agency.gov.uk/pdf/GESO0503BNMR-e-e.pdf
[33] http://publications.environment-agency.gov.uk/pdf/GESO0306BKMB-e-e.pdf
[34] http://publications.environment-agency.gov.uk/pdf/GESO0403BNMT-e-e.pdf

Lasham area, the only public water supply affecting the groundwater availability from the East Hampshire district. The Arun and Western Streams CAMS lists the Upper Rother WRMU underlying Petersfield and surrounding areas as being 'over abstracted.'

3.5.3 East Hampshire's water supply is provided by Portsmouth Water in the south of the district (including Horndean), whilst the greater area of the district, including Petersfield and Alton is supplied by South East Water. Overall, Portsmouth Water supplies 300,000 properties in Hampshire and West Sussex. Horndean is located in the company's Water Resource Zone 1 (WRZ) – Gosport and Waterlooville[35]. This zone contains the River Itchen Source, and in the future will contain strategic housing development and possible transfers to Southern Water. Portsmouth Water is currently primarily reliant on groundwater supply, and under a scenario of critical demand, there may be shortfalls as early as 2011/12. Abstraction from some sources, notably the River Itchen, will be reduced in line with the Environment Agency's Review of Consents process. Portsmouth Water's draft Final Water Resource Management Plan (June 2011) has plans to ensure adequate supplies over the period covered by the Joint Core Strategy, including a winter storage reservoir due to be completed by 2035, and in the shorter term, increased efficiency measures, metering, and water recovery facilities.

3.5.4 The other company responsible for water supplies in East Hampshire is South East Water through Resource Zone 5. The RZ is relatively well-provisioned, with a baseline supply/demand forecast of remaining in surplus until 2026.

3.6 Water quality

3.6.1 Waste water within the district is dealt with by Thames Water and by Southern Water. According to the Joint Core Strategy, treatment works have been deemed adequate for current and future needs.

3.6.2 Increased amounts of housing or business development can lead to reduced water quality of rivers and estuarine environments. Sewage and industrial effluent discharges can contribute to increased nutrients on European sites leading to unfavourable conditions. In addition, diffuse pollution, partly from urban run-off has been identified during an Environment Agency (EA) Review of Consents process, as being a major factor in causing unfavourable condition of European sites.

3.6.3 The quality of the water that feeds European sites is an important determinant of the nature of their habitats and the species they support. Poor water quality can have a range of environmental impacts:

- At high levels, toxic chemicals and metals can result in immediate death of aquatic life, and can have detrimental effects even at lower levels, including increased vulnerability to disease and changes in wildlife behaviour. Eutrophication, the enrichment of plant nutrients in water, increases plant growth and consequently results in oxygen depletion. Algal blooms, which commonly result from eutrophication, increase turbidity and decrease light penetration. The decomposition of organic wastes that often accompanies eutrophication deoxygenates water further, augmenting the oxygen depleting effects of eutrophication. In the marine environment, nitrogen is the limiting plant nutrient and so eutrophication is associated with discharges containing available nitrogen.

[35] http://www.portsmouthwater.co.uk/uploadedFiles/Core/News/Publications/WtrResourcesPlnSbmsn2009DraftMay2008.pdf

- Some pesticides, industrial chemicals, and components of sewage effluent are suspected to interfere with the functioning of the endocrine system, possibly having negative effects on the reproduction and development of aquatic life.
- Increased discharge of treated sewage effluent can result both in greater scour (as a result of greater flow volumes) and in high levels of macroalgal growth, which can smother the mudflats of value to SPA birds.

3.6.4 For sewage treatment works close to capacity, further development may increase the risk of effluent escape into aquatic environments. In many urban areas, sewage treatment and surface water drainage systems are combined, and therefore a predicted increase in flood and storm events could increase pollution risk.

3.6.5 Nutrient enrichment does cause considerable problems on the south coast (particularly in the Solent) due to the abundance of smothering macroalgae that is produced. In its Review of Consents Stage 4 process, the EA has identified that discharge and abstraction consents will require modification in order to reduce such impacts at Solent Maritime SAC[36], Solent and Southampton Water SPA/Ramsar[37], River Itchen SAC[38], Chichester and Langstone Harbours SPA/Ramsar[39] and Portsmouth Harbour SPA/Ramsar[40], while discharge consent only modifications will be implemented in order to help protect Solent and Isle of Wight Lagoons SAC[41].

3.6.6 None of these discharge consent modifications appear to relate to treatment works within East Hampshire district.

3.6.7 Nonetheless, at this screening stage water quality impacts are considered to be an issue that requires investigation.

[36] http://www.netregs.gov.uk/static/documents/Business/Non-technical_summarySolent_maritime_v2.pdf
[37] http://www.environment-agency.gov.uk/static/documents/Business/Non-technical_summary_SolentSoton_v2.pdf
[38] http://www.environment-agency.gov.uk/static/documents/Business/Non-technical_summary_Itchen.pdf
[39] http://www.environment-agency.gov.uk/static/documents/Business/Non-technical_summary_Chi_Lang.pdf
[40] http://www.environment-agency.gov.uk/static/documents/Business/Non-technical_summary_Portsmouth.pdf
[41] http://www.environment-agency.gov.uk/static/documents/Business/Non-technical_summary_Lagoons.pdf

4 East Hampshire Hangers SAC

4.1 Introduction

4.1.1 The East Hampshire Hangers describe a series of woodlands on the western edge of the Weald. The SAC is made up of a number of SSSIs.

Upper Greensand Hangers: Empshott to Hawkley

4.1.2 A series of steep, rocky woodlands on calcareous soils. The dominant tree is ash *Fraxinus excelsior*, often with evidence of past coppicing. A variety of herb layer plants occurs, including ancient woodland indicators such as early purple orchid *Orchis mascula*, herb Paris *Paris quadrifolia*, butcher's broom *Ruscus aculeatus*, sanicle *Sanicula europaea*, wild daffodil *Narcissus pseudonarcissus* and sweet woodruff *Galium odoratum*. The woodland supports the nationally scarce Italian lords-and-ladies *Arum italicum* sub species *neglectum*. Bryophyte communities are ntable and include nationally scarce species. Molluscs and hoverflies are also represented by nationally scarce species.

Upper Greensand Hangers: Wyck to Wheatley

4.1.3 The geology and species supported are similar to those found at Empshott to Hawkley.

Coombe Wood and The Lythe

4.1.4 The hanger woodlands comprise a range of species including ash, oak *Quercus robur*, beech *Fagus sylvatica* and hazel *Corylus avellana*. These woods support a relatively rich calcareous ground flora with substantial populations of green hellebore *Helleborus viridis* and violet helleborine *Epipactis purpurata*. The hanger woods also possess a rich bryophyte flora, mostly epiphytic on the older trees.

Wick Wood and Worldham Hangers

4.1.5 The species rich ancient woodland associated with varied soils is ecologically distinct and contains a number of nationally rare woodland types. On the freely draining upper slopes ash and wych elm *Ulmus glabra* predominate forming an extremely rare woodland type. Beech, pedunculate oak and whitebeam *Sorbus aria* also occur on the upper slopes. A few large coppice stools of small leaved lime *Tilia cordata* occur in Wick Hill Hanger. Fifty-seven species of plant which are indicative of ancient woodlands have been found in the SSSI. Two ponds provide added diversity, which attracts a variety of common and uncommon birds, butterflies, dragonflies and damselflies.

Selborne Common

4.1.6 This SSSI is beech-dominated woodland on a steep east-facing chalk slope, grading to a more mixed plateau woodland with relict open acid grassland on clay-with-flints. The ground flora is well-developed, with a number of unusual plant species and rare moss species. On the clay-with-flints plateau, acid grassland adds variety, together with a small water body. A small area of downland turf also exists. Selborne Common is one of the most important mollusc sites in Britain, and a number of notable beetles and butterflies also occur.

Noar Hill

4.1.7 Noar Hill exhibits a range of chalk vegetation seral stages from open short-sward chalk grassland overlying ancient quarries, through invasive mixed scrub of hawthorn *Crataegus monogyna*, blackthorn *Prunus spinosa*, juniper *Juniperus communis*, and sweetbriar and southern downy roses *Rosa micrantha* and *R. tomentosa* to mature beech hanger woodland. In addition, hazel coppice is found on the top of the steep scarp slopes. Eleven species of orchid occur, and the site is of national importance for butterflies and grasshoppers.

Wealden Edge Hangers

4.1.8 The Wealden Edge Hangers comprise the mainly wooded easterly facing escarpment of the Hampshire chalk plateau, at the western extremity of the Weald. It exhibits a wide range of woodland types including mono-specific yew *Taxus baccata* (in some cases developed over former juniper scrub), yew/beech and beech/ash with beech/wych elm /field maple *Acer campestre*/ash, and oak /hazel, on deeper soils, and moist ash/alder *Alnus glutinosa* wood by escarpment-foot springs. Ash, beech and elm all occur in coppice forms. A wide range of calcareous shrubs occur. The bryophyte flora is extremely rich, and the lichen flora is the richest for any woodland on chalk in Britain, after Cranborne Chase, with 74 species. The total vascular flora of the area comprises a known 289 species.

4.2 Reasons for Designation

4.2.1 The East Hampshire Hangers qualify as a SAC for both habitats and species. Firstly, the site contains the Habitats Directive Annex I habitats of:

- Dry grasslands and scrublands on chalk or limestone, including important orchid sites: Noar Hill in particular, has an outstanding assemblage of orchids, including one of the largest UK populations of the nationally scarce musk orchid *Herminium monorchis*;
- Beech forests on neutral to rich soils: the site is extremely rich in terms of vascular plants;
- Mixed woodland on base-rich soils associated with rocky slopes: along with Rook Clift SAC, in the south-east of England, this habitat is only represented here;
- Dry grasslands or scrublands on chalk or limestone (though not a primary reason for site selection);
- Yew-dominated woodland (though not a primary reason for site selection).

4.2.2 Secondly, the site contains the Habitats Directive Annex II species early gentian *Gentianella anglica*, though this is not a primary reason for site selection.

4.3 Historic Trends and Current Pressures

4.3.1 The habitats of the East Hampshire Hangers SAC are dependent upon maintenance of appropriate species composition and cover. The great majority of the SAC is in favourable condition, and where not, this is due to factors such as non-native species present, inappropriate vegetation structure (e.g. lack of regeneration, or too much scrub), and inadequate grazing regimes.

4.3.2 The environmental requirements of the East Hampshire Hangers SAC are mainly:

- Low nutrient runoff from surrounding land - being steep and narrow, the Hanger woodlands are vulnerable to nutrient run-off leading to eutrophication.
- Maintenance of grazing
- Controlled off-track recreational activity (i.e. trampling)
- Minimal air pollution – nitrogen deposition may cause reduction in diversity, sulphur deposition can cause acidification
- Absence of direct fertilisation
- Well-drained soils

4.4 Effects of the Joint Core Strategy

4.4.1 These are described below, against each potential impact.

Urbanisation

4.4.2 The Joint Core Strategy seeks to allocate 2,150 currently uncommitted dwellings (i.e. not including those that already have planning permission) in Central Hampshire (which includes all major settlements in the district except Horndean, Clanfield and Rowlands Castle), in addition to a further 2,725 to be delivered at Whitehill & Bordon.

4.4.3 This development will be located in a hierarchical manner, concomitant with the size of existing settlements. The villages of Steep, Selborne and East Worldham will have a 'settlement policy boundary', where limited local development may be appropriate.

4.4.4 Selborne and East Worldham are adjacent to East Hampshire Hangers SAC, while Steep is just over 500m distant. None of these settlements have specific allocations in the Joint Core Strategy although they do fall within the category of 'other villages' within Policy CP8 across which a total of 250 dwellings will be distributed. Each settlement is therefore likely to receive a very small number of dwellings (e.g. c.10). In addition to this, very small amounts of windfall housing within the entirety of Selborne and Worldham parishes are expected (approximately 23 dwellings in total). It can therefore be assumed that the overall scale of development at these particular settlements is likely to be small.

4.4.5 Although there have been a small number of incidents of off-road vehicle use and fly-tipping within the southern section of the SAC (according to a workshop held in March 2011 for Whitehill & Bordon), there is no evidence that the integrity of the SAC currently suffers from urbanisation effects arising from these settlements. Given this and the very small amount of housing that is likely at these settlements they are unlikely to lead to significant adverse effect on the East Hampshire Hangers SAC either alone or in combination with each other or other projects and plans, and as such urbanisation as a pathway of impact can be screened out of the HRA with regard to this site.

4.4.6 All other settlements in which development is likely to be located are sufficiently distant from the SAC that urbanisation impacts e.g. fly-tipping are unlikely to be material. It is therefore considered that the Joint Core Strategy can be screened out as being unlikely to lead to significant adverse effects as a result of urbanisation.

4.4.7 This does not preclude project-level HRA for individual planning applications to evaluate the specific potential impacts of such proposals (particularly where housing in double figures is

proposed) within 500m of the SAC but there is no requirement for a strategic policy solution. The Council identifies in the Joint Core Strategy supporting text for Policy CP20 (Internationally Designated Sites) that in general the Council will endeavour to locate new housing more than 500m from SAC boundaries, although development within that zone is not precluded and this provides an effective safeguard by allowing for HRA of project-specific proposals very close to international site boundaries.

Recreation

4.4.8 Visitor surveys undertaken by UE Associates for Whitehill & Bordon indicate that the East Hampshire Hangers SAC has a median distance travelled of 10-12km. However, the median distance travelled does not take account of the relative balance of pressure – broadly speaking people living closer to the site are responsible for a greater number of visits than those living further away.

4.4.9 The section of scarp within the East Hampshire Hangers SAC is accessible due to the good network of public rights of way, including the Hangers Way. Land in National Trust ownership at Selborne Hanger provides further opportunities for countryside access.

4.4.10 While parts of the Hangers are used by visitors, the steepness of the scarps provides an inherent limit on human activity while the absence of car parks limits the number of people (except from the immediate local area) present at any time. Sunken lanes also physically limit the extent of off-track activity.

4.4.11 While anti-social damaging activity (i.e. off-roading on the tracks) is a risk, it is an illegal activity associated with a minority of people and cannot fairly be assumed to significantly increase due to a general increase in the population most of which abide by such controls.

4.4.12 Gradual track erosion is a potential issue within portions of the SAC. Where erosion has been greatest on the track and lane sides the chalk and greensand is exposed in places with overhanging tree roots. This erosion appears to stem from a combination of vehicles, surface water and people. However, it is localised and gradual and there is no indication that it is leading to or likely to lead to an adverse effect on the integrity of the SAC within the foreseeable future.

4.4.13 Levels of recreational use are relatively low on this SAC, such that there remains a '*sense of tranquillity, remoteness and space that results from the overall low incidence of human activity and absence of development*'[42]. This is supported by the visitor surveys undertaken for Whitehill & Bordon; the access points surveyed for East Hampshire Hangers SAC were among the least frequented by visitors – out of the twenty-nine access points included in the survey (distributed across all European sites of relevance to Whitehill & Bordon) the East Hampshire Hangers SAC access points ranked 25th and 28th in terms of numbers of visitor groups, with 11 and 5 groups respectively. In contrast, the ten most popular/well-used access points included in the survey each had over 30 visitor groups during the course of survey, with the 2 most popular having over 70 groups. Only 3% of the people included in the Whitehill & Bordon visitor survey visited East Hampshire Hangers SAC over the survey period (a total of 37 people compared to 1,278 people visiting all European sites taken together).

4.4.14 Other than Whitehill & Bordon, the foci of development within East Hampshire will be at Alton, followed by Petersfield, Liphook, Four Marks/South Medstead, Horndean and Clanfield. Petersfield and Alton are both located relatively close to the SAC (within 5km). Liss is also within 5km. However, further analysis of the visitor survey data indicates that none of the

[42] East Hampshire District Council Landscape Character Assessment

visitors to East Hampshire Hangers were from Petersfield, while only 17% came from Alton. The former statistic may be an artefact of the distribution of access points, since the two access points included were not located at the southern-most extent of the SAC near Petersfield. However the surveyed access points were well situated for Alton such that this percentage is likely to be an accurate reflection.

4.4.15 It is not unreasonable to conclude therefore that these 3 centres of development (Alton, Liss and Petersfield) are situated within sufficiently close proximity to the SAC to contribute to an increase in recreational visits to the woodlands. Approximately 1,550 currently uncommitted dwellings will be delivered in these three settlements over the plan period (almost half of these being at Alton) in addition to 2,725 at Whitehill & Bordon. However, the Whitehill & Bordon visitor surveys indicated that no Whitehill & Bordon residents were among those who visited East Hampshire Hangers SAC and on that basis it was concluded that Whitehill & Bordon was unlikely to contribute to an increase in visitor pressure.

4.4.16 Discounting Whitehill & Bordon, and assuming an average occupancy of 2.37 residents per dwelling, this will mean approximately 3,674 new residents will be situated within 5km of the SAC (at Alton, Petersfield and Liss)[43]. These new uncommitted dwellings need to be considered 'in combination' with the 472 houses (1,114 new residents, the vast majority at Alton) at Petersfield, Alton and Liss that already have planning permission but have not yet been completed. The current population within these three settlements is approximately 37,000 people[44]. A further 4,788 residents would therefore constitute a 13% increase in the potential local visitor population.

4.4.17 It is considered that significant effects are unlikely to occur and no specific measures are necessary, given:

- the current relatively low visitor pressure on this site compared to other European sites in the area;
- the modest increase in population close to (within 5km of) the SAC and the fact that a relatively small proportion (17%) of visitors to the SAC derive from the settlement within this zone that will receive the most housing (Alton); and
- the relatively low sensitivity of the SAC to recreational pressure (compared to the Special Protection Areas), including both greater resilience of interest features and inherent controls on recreational activity through topographical limitations to off-track activities.

Air Quality

4.4.18 No major roads run within 200m of the East Hampshire Hangers SAC. Development at Petersfield will result in increased traffic usage of the A325 and A3, and whilst these roads do not pass close to the hanger woodlands, there are routes between Whitehill & Bordon and Alton that do, notably the B3004 and B3006. Although these are not major roads, they can expect an increase in traffic as a result of new development in Alton and Whitehill & Bordon.

4.4.19 The East Hampshire Hangers SAC is already subject to excessive nitrogen deposition[45] (see Table 5).

[43] The distance from which the majority of the largest visitor group to the European sites in East Hampshire (dog walkers) originated.
[44] Alton (17,000), Petersfield (14,000) and Liss (6081)
[45] www.apis.ac.uk

Table 5. Summary of atmospheric pollutant levels and critical loads affecting East Hampshire Hangers SAC. Red shading indicates exceedance of thresholds.

Site	Grid reference	Most nitrogen sensitive habitat	Minimum critical loads (kg N/ha/yr)	Actual nitrogen deposition (kg N/ha/yr)	Actual NOx concentration (μgm^{-3})	Actual SO^2 concentration (μgm^{-3})
East Hampshire Hangers SAC	SU739268	Beech woodland	10-20	41	13.9	1.3

4.4.20 Road transport is currently responsible for 13.3% of deposition but in 2012 APIS predicted this to decrease to 9.5% by 2020 and it is likely to continue to decrease thereafter. Any consideration of air quality impacts from Joint Core Strategy development must therefore be set against the context of an improving background trend in air quality. The main contributor is actually agriculture (43%). Only a small proportion of the SAC lies within 200m of these roads and is not screened by housing or other development (1.5 ha amounting to 0.3% of the total area[46]).

4.4.21 Whitehill & Bordon will be the single largest development located within 5km of East Hampshire Hangers SAC and will be responsible for 70% of all new housing within that zone (including dwellings which already have planning permission but have not yet been delivered). According to transport and atmospheric emission modelling undertaken for Whitehill & Bordon the Hangers will not be affected as a result of increased atmospheric concentrations of NOx due to the most probable traffic or energy scenarios at Whitehill & Bordon. However, a very small part of the site near Wick Hill and Hartley Park, west of Oakhanger, will experience an increase in nutrient nitrogen deposition (<0.02% of the site) and acid nitrogen deposition (0.2% of the site). The calcareous substrate across most of the site will provide good buffering capacity against this increase, and the woodland habitats are likely to be robust enough to withstand this relatively small change without deleterious effects.

4.4.22 Since Whitehill & Bordon will be responsible for the vast majority of new housing within 5km of the SAC, it is unlikely that the relatively small additional housing at Alton will materially alter this conclusion.

4.4.23 Moreover, the Joint Core Strategy's policy on transport (CP29) lists a range of measures that will be implemented to maximise sustainable transport:

- Improve pedestrian and road safety;
- Promote integrated transport;
- Improve access to town and village centres … include improvements of routes for walking, cycling and public transport;
- Help tackle rural accessibility problems by non-transport improvements such as increasing services direct to residents ...

[46] According to the JNCC citation, the total area of the SAC is 571.83 ha

- Promotion of train and bus access to the district …
- Support the development of joined-up routes for non-motorised transport; and
- Improvements to make existing paths, tracks and roads more user friendly.

4.4.24 This is in addition to the sustainable transport initiatives set out in the Hampshire Local Transport Plan. In line with the Local Transport Plan a transport objective will be to improve air quality. If supplied on routes between Alton and Liss, these would all help to reduce risk of reduced air quality at the East Hampshire Hangers SAC.

4.4.25 Given these measures, the small amount of the SAC which lies within 200m of the B3004 and B3006 and the relatively small contribution that vehicle emissions make to nitrogen deposition within the SAC (and are predicted to make in the future), it is considered unlikely that an adverse effect would result due to development under the Joint Core Strategy.

4.5 Conclusion

4.5.1 It has been possible to determine that significant urbanisation, recreation and air quality effects on the SAC as a result of Joint Core Strategy development are unlikely.

5 Shortheath Common SAC

5.1 Introduction

5.1.1 Shortheath Common SAC is a heathland site located on the western Weald. Large areas of open heathland and habitats and the seral stages of the succession to oakwood contribute to the considerable habitat diversity of the site as a whole. A substantial valley mire exists, dominated by *Sphagnum* mosses, but with a large population of cranberry *Vaccinium oxycoccus*, a low-growing shrub now rare and declining in southern England. The invertebrate fauna includes 23 breeding species of dragonflies, including a number which are rare or local, e.g. *Cordulia aenea, Erythromma najas, Orthetrum coerulescens* and *Anax imperator*, and a colony of the rare damselfly *Ceriagrion tenellum*. The full heathland range of Orthoptera is represented, including a recent re-introduction of the field cricket *Gryllus campestris* and grayling *Hipparchia semele*, purple hairstreak *Quercusia quercus* and purple emperor *Apatura iris* butterflies are present in substantial populations.

5.2 Reasons for Designation

5.2.1 Shortheath Common qualifies as a SAC for its habitats. The site contains the Habitats Directive Annex I habitats of:

- Very wet mires often identified by an unstable 'quaking' surface: this habitat forms the focal point of the SAC.
- Dry heaths (though not a primary reason for site selection)
- Bog woodland (though not a primary reason for site selection)

5.2.2 In addition to this, surveys in 2010 have identified a pair of nightjar nesting on Shortheath Common SAC, although these are not a designated feature of the site. Woodlark has also been recorded on Shortheath Common.

5.3 Historic Trends and Current Pressures

5.3.1 The Common was not managed for conservation until its purchase by Hampshire County Council in 1994. Though this site has been historically grazed, this has since ceased and much of the site is now in a position of recovery from encroachment of scrub, whilst conversely, in some of the acid grassland, rabbit control has been required. The most recent condition assessment by Natural England (2003) found that almost 10% of the site had been destroyed by the presence of 4-5 recently built houses and part of Oakhanger village green. The village green is used for recreation, contains a children's play area, and the grassland is regularly mown. Opportunities for recreation at Shortheath Common include horse riding, walking, jogging and angling. There have been occasional incidents of fire and fly-tipping on the Common.

5.3.2 The site is within the Wey catchment, close to the source of its tributaries, the River Slea, Kingsley Stream and the Oakhanger Stream. The underlying groundwater source is Lower Greensand, in the form of the Folkestone Formation and the underlying Hythe Formation. The Folkestone Formation is already locally exploited with several abstractors licensed to abstract

for spray irrigation and quarrying.[47] Where the Folkestone Formation is found in an unconfined state groundwater can be of local importance to surface water features. At times where the piezometric surface is at or near ground level, base flow to watercourses and water features can therefore occur.

5.3.3 The environmental requirements of Shortheath Common SAC are mainly:

- Careful management of water levels;
- Good air quality;
- Careful management of recreational activity.

5.4 Effects of the Joint Core Strategy

5.4.1 These are described below, against each potential impact.

Urbanisation

5.4.2 The policies contained within the Joint Core Strategy do not promote development at Oakhanger, the only settlement within 500m of the SAC. Therefore it is only likely to receive windfall housing; however, the Council and the National Park Authority do not expect more than 12 windfall dwellings within the entire Selborne parish over the Joint Core Strategy period such that the number of dwellings that can be expected at Oakhanger is very small.

5.4.3 The nearest major settlement (other than Whitehill & Bordon, located over 500m to the east at its closest) is Alton, located over 5km to the west and separated from the Common by the A3. Urbanisation (defined as general impacts arising from encroachment of urban development) can therefore be screened out as an impact of the Joint Core Strategy on this SAC. However, some similar impacts (e.g. fly tipping) can be linked to recreational activity from further afield which is considered below.

Recreational Impacts

5.4.4 The latest condition assessment of the site clearly indicates that recreation can and does have an effect on the habitats present. Off-road vehicle use of the Common already causes problems for the conservation of this SAC.

5.4.5 Visitor surveys of Shortheath Common SAC undertaken for Whitehill & Bordon by UE Associates indicate that the recreational catchment for the Common is relatively restricted, with the median travel distance being less than 5km. The visitor survey data indicated that the majority of visitors to the European sites covered by the survey were dog walkers (58%), most of whom (68.8%) travelled by car and generally travelled less than 5km to reach the sites (67.8% of car users travelled less than 5km). Most of the remaining dog walkers travelled on foot and generally travelled less than 3km (87.9% of dog walkers travelling by foot travelled less than 3km).

5.4.6 Other than Whitehill & Bordon, the closest settlements at which significant housing will be delivered under the Joint Core Strategy are Alton (>5km distant) and Petersfield (12km distant). As such, recreational pressure on the SAC can be screened out as an impact of the Joint Core Strategy, except arising from the 2,725 dwellings to be delivered through the Whitehill Bordon Strategic Allocation, which at an occupancy rate of 2.37 will deliver 6,458 new residents within

[47] South East Water, personal communication

the catchment of the SAC during the plan period. The Whitehill & Bordon HRA identified a potential increase in visitors to the SAC of 58.88% by the time Phase 3 of the development is complete (after the Local Plan Core Strategy period), which was concluded could result in an adverse effect without mitigation.

5.4.7 The policy for Whitehill & Bordon (CSWB9) is explicit regarding impacts on European sites in that it specifically states that '*Development at Whitehill & Bordon will be guided by its Habitats Regulations Assessment, Green Infrastructure Strategy and Local Biodiversity Action Plan. Where mitigation, as required in the Habitats Regulations Assessment, takes the form of provision of a Suitable Alternative Natural Greenspace (SANG), a minimum requirement of 8 hectares of land should be provided per 1,000 new occupants (after discounting to account for the existing ecological value of the sites and for current access and capacity within reasonable access of the new dwellings). Provision is made in the masterplan for approximately 127 hectares of SANGs and 30 hectares of SANG network. Integrated Access Management provision should be delivered throughout the local European designated sites and other greenspaces, such as SANGs over a period of time, but not less than 80 years'.*

5.4.8 As such, it is possible to conclude that the Joint Core Strategy contains an adequate policy framework under which measures to mitigate adverse effects on Shortheath Common SAC can be delivered. No further measures within the Joint Core Strategy are therefore required.

Air Quality

5.4.9 Transition mires & quaking bogs and acid heathland are both susceptible to the effects of nitrogen deposition. Shortheath Common SAC is already suffering from excessive and damaging nitrogen deposition[48] (see Table 6).

Table 6. Summary of atmospheric pollutant levels and critical loads affecting Shortheath Common SAC. Red shading indicates exceedance of thresholds.

Site	Grid reference	Most nitrogen sensitive habitat	Minimum critical loads (kg N/ha/yr)	Actual nitrogen deposition (kg N/ha/yr)	Actual NOx concentration (μgm^{-3})	Actual SO^2 concentration (μgm^{-3})
Shortheath Common SAC	SU774367	Raised bog/blanket bog	5-10	19.5	14.3	2

5.4.10 The Whitehill & Bordon HRA identifies that there are minor roads within 200m of Shortheath Common SAC that could potentially become rat-runs as a result of the Whitehill & Bordon development (the only significant development proposed within 5km of the SAC). A recent survey found that, during 24 survey hours over a two week period, 143 vehicles were recorded using tracks on Shortheath Common. After accounting for legitimate access, this can be extrapolated to estimate the rate of cut-throughs at 7,446 annually between 7am and 7pm. The peak time was found to be between 3pm-5pm weekdays (suggesting a possible correlation with the school run), and 1pm-3pm weekends (Hampshire County Council, 2011).

[48] www.apis.ac.uk

5.4.11 The traffic and air quality modelling undertaken for Whitehill & Bordon indicated that there is the potential for adverse effects across 11.8% of Shortheath Common SAC. The only traffic scenario which would cause an exceedence of the critical level is scenario 17 which would involve the closure of the A325 to through traffic. Under this scenario, parts of the site, including areas of dry heath and acid grassland close to the road, will be affected by increases in nutrient nitrogen deposition (1.7%) and acid nitrogen deposition (11.8%).

5.4.12 The Whitehill & Bordon HRA identifies a series of specific mitigation measures which need to be delivered in order to avoid a significant effect on Shortheath Common SAC as a result of rat-running and associated air quality deterioration:

5.4.13 *'In order to prevent illegal rat-running on Shortheath Common SAC, a Traffic Regulation Order should be imposed, and options explored to support this through installation of a permanent or temporary barrier (while ensuring valid rights of access are maintained). This would also help to reduce future increases in air pollutant emissions at the site'.*[49]

5.4.14 Since this is a very specific measure relating to a single development it is inappropriate for this to be inserted into Joint Core Strategy policy but it is understood that Hampshire County Council has accepted that inappropriate access along Gibbs Lane and through Shortheath Common should be reduced and addressed and that this will be considered in detail as part of the Traffic Management Strategy being developed for the Eco-town[50]. With this control in place, air quality impacts on Shortheath Common are unlikely to be significant.

Water Resources

5.4.15 The bog habitats at Shortheath Common SAC require a sufficiently high water table to prevent the habitat drying out.

5.4.16 Approximately 150 uncommitted dwellings are planned for Liss (i.e. within the WRMU that includes Shortheath Common). Limited development may also take place at local villages such as Headley and Headley Down. Whitehill & Bordon could lead to 2,725 new dwellings within this catchment, which will have a significant demand for water. However, a Detailed Water Cycle Study[51] has indicated that improved efficiency and reduced losses may result in a lower daily demand for water than current.

5.4.17 Increased abstraction from the Folkestone Formation aquifer to supply housing or commercial development in East Hampshire could affect groundwater (and potentially surface water) features. Currently, there is no public water supply from this aquifer, and the draft policies do not include significant development plans requiring supply for alternative purposes.

5.4.18 The EA CAMS for the WRMU states that there is currently 'no water available' and this remains the target for the future. The EA will not licence abstraction that will damage sites such as Shortheath Common SAC.

5.4.19 The SAC is within South East Water's RZ5 zone, where no shortfalls within the lifetime of the CS are predicted.

5.4.20 The Detailed Water Cycle Study (WCS) carried out for proposed development of Whitehill & Bordon has indicated that with efficiency savings and reduced water losses, the new

[49] UE Associates. July 2011. Final Habitat Regulations Assessment for the Whitehill & Bordon project. Paragraph E4.9
[50] Email from Tim Wall, Highways Development Planning Team Leader at Hampshire County Council, to Amanda Dunn, East Hampshire District Council, dated 12/10/11
[51] Water Resources and Wastewater Management in Hampshire to 2026 Draft Final Report. Hampshire County Council

community may make less demands on water than currently[52]. The report states that per capita consumption of existing households as 110 litres per households per day (l/h/d). Per capita consumption of new households will be less than 80l/h/d, with an increase in non-domestic consumption of 0.3 Megalitres per day (Ml/d). Water losses will be reduced by at least 0.4Ml/d. This will lead to a decrease in abstraction of 0.83Ml/d. The detailed WCS has identified that there are sufficient water resources in the locality of the Eco-town to sustain the increased development by utilising an innovative and sustainable water management system, thus avoiding reliance on increasing the current yields of groundwater from either the MoD boreholes, which could have detrimental impacts on nearby European Designated Sites that rely upon the prevailing hydrogeological conditions.

5.4.21 In addition, the Council and the National Park Authority have a number of measures within its policies that will help to reduce demand on water resources.

- **CP22 - Sustainable Construction:** "*Planning permission will only be granted for development … which on completion meets the following minimum Code for Sustainable Homes threshold level … 3 until end of 2012, 4 from 2013 and 5 from 2016*."
- **CP24 - Water Resources and Quality:** "*Development will be required to protect the quality and quantity of water, and make efficient use of water. Development will only be permitted where: a) it protects and enhances the quality and quantity of groundwater, surface water features and controls aquatic pollution to help to achieve the requirements of the European Water Framework Directive … b) it has an adequate means of water supply (even in a drought), sufficient foul and surface water drainage and adequate sewage treatment capacity. Development must be phased to take into account the timing of any water and/or sewerage infrastructure required which should be in place prior to the occupation of development'*.

5.4.22 Given the limited scale of development proposed near to Shortheath Common SAC within the Joint Core Strategy, the confidence of the water suppliers in being able to maintain supplies, the security provided by the EA licencing process, the findings of the Whitehill & Bordon Detailed Water Cycle Study, and the water conservation and supply policies to be adopted by the Council and the National Park Authority, it is possible to conclude that the Joint Core Strategy is unlikely to lead to a significant effect on Shortheath Common SAC as a result of changes in water levels.

5.5 Conclusion

5.5.1 Given the assessment above, it is possible to conclude that significant effects on Shortheath Common SAC as a result of Joint Core Strategy development are inherently unlikely, other than recreational and air quality effects arising from Whitehill & Bordon and these will be rendered unlikely through the implementation of the recommendations generated by the Whitehill & Bordon HRA.

[52]Peter Brett Associates (2011): Detailed Water Cycle Study for the Whitehill & Bordon Eco-town

6 Wealden Heaths Phase 2 SPA and Woolmer Forest SAC

6.1 Introduction

6.1.1 The Wealden Heaths Phase 2 SPA is made up of four separate SSSI units.

Woolmer Forest SSSI and SAC

6.1.2 Woolmer Forest SSSI contains the largest and most diverse area of lowland heathland habitats in Hampshire (outside the New Forest) and is considered the most important area of heathland in the Weald of southern England. Woolmer Forest SSSI is of international importance for its rich diversity of breeding and wintering heathland birds including nationally important breeding populations of nightjar *Caprimulgus europaeus*, woodlark *Lullula arborea* and Dartford warbler *Sylvia undata*. The heathland also supports breeding hobby *Falco subbuteo*, breeding populations of stonechat *Saxicola torquata*, tree pipit *Anthus trivialis* and linnet *Acanthis cannabina*. In winter up to two roosts of hen harrier *Circus cyaneus*, as well as merlin *Falco columbarius* and great grey shrike *Lanius excubitor* are regularly recorded in the heathland. The valley mires and wetlands around Woolmer and Cranmer Ponds attract breeding curlew *Numenius arquata*, redshank *Tringa totanus* and snipe *Gallinago gallinago*. The sandy shores of Woolmer Pond also provide habitat for nesting little-ringed plover. The woodlands of Holm and Holly Hills and Passfield Common support redstart *Phoenicurus phoenicurus*. These mature pasture woodlands have also attracted several breeding pairs of wood warbler *Phylloscopus sibilatrix*.

Broxhead and Kingsley Commons SSSI

6.1.3 The site comprises a mosaic of heathland and acid grassland with areas of scrub and secondary woodland. The bird fauna includes breeding populations of nightjar, woodlark and Dartford warbler. Other heathland species include stonechat and tree pipit.

Bramshott and Ludshott Commons SSSI

6.1.4 Bramshott and Ludshott Commons support extensive tracts of mature heathland vegetation dominated by heather *Calluna vulgaris*, bell heather *Erica cinerea*, dwarf gorse *Ulex minor* and common gorse *U. europaeus*. Dartford warbler, woodlark, stonechat, nightjar and hobby breed.

Devil's Punch Bowl SSSI

6.1.5 This site, comprising Hindhead Common, the Devil's Punch Bowl and the Highcomb Valley supports an excellent series of semi-natural habitats including broadleaved and coniferous woodland, heathland, scrub and small meadows. The site contains an outstanding variety of birdlife, with over sixty breeding species. The Highcombe Valley supports breeding wood warblers. Rarer woodland breeding species include firecrest, redpoll and crossbill whilst siskin and hawfinch may breed occasionally. Heathland breeding species include nightjar, woodlark, Dartford warbler, stonechat, and tree pipit.

6.2 Reasons for Designation

6.2.1 Wealden Heaths Phase 2 qualifies as a SPA for its breeding bird species. The site contains:

- 1.3% of the British breeding population of nightjar *Caprimulgus europaeus* (5 year mean, 1989-1993)
- 2.5% of the British breeding population of woodlark *Lullula arborea* (1997)
- 1% of the British breeding population of Dartford warbler *Sylvia undata* (5 year mean 1989-1993; 1994)

6.2.2 The SAC interest features of Woolmer Forest are:

- Acid peat-stained lakes and ponds: Cranmer Pond is a southern example of this habitat in Britain.
- Dry heaths: Woolmer Forest contains the largest and most diverse area of lowland heathland in Hampshire, outside the New Forest, representing a transition between this and the Surrey heaths.
- Depressions on peat substrates: seepage mires and other waterlogged areas are a minor feature amongst predominantly wet heath habitat.
- Wet heathland with cross-leaved heath (though not a primary reason for site selection)
- Very wet mires often identified by an unstable 'quaking' surface (though not a primary reason for site selection)

6.3 Historic Trends and Current Pressures

6.3.1 In the most recent Condition Assessment process (2010), almost all of the Devil's Punch Bowl SSSI was considered to be recovering from unfavourable condition that had resulted largely from inappropriate grazing regimes. The other SSSI components of the Wealden Heaths Phase 2 SPA were also largely recovering from unfavourable status. Although many constituent units lie adjacent to the A3, air quality was not implicated as a factor in unfavourable status during these assessments.

6.3.2 The SPA is designated for ground-nesting bird species that would be particularly vulnerable to cat predation, and the heathland habitat itself is extremely vulnerable to accidentally or deliberately started fires. Urbanisation also increases the risk of introducing invasive species such as Japanese knotweed that can out-compete native vegetation, and reduce breeding site availability for birds.

6.3.3 The heathland habitats of the Special Protection Area are very dependent upon grazing and other traditional management practices. In the absence of a functional commoning system the re-establishment of successful grazing management is dependent on the involvement of county-based Heathland Management Projects. The Special Protection Area is vulnerable to heathland fires and there has been pressure for development associated with military training activities. This and the problems caused by formal and informal recreation activities (e.g. mountain biking, orienteering, car and motorcycle events) that are a potential threat to the breeding success of the Annex 1 birds are being addressed by improved liaison and annual consultation meetings with the Ministry of Defence and through management plans on National Trust land.

6.3.4 In connection with assessment of recreational access the Devil's Punchbowl and Hindhead Common as a result of the tunnelling of the A3 that has historically run through the SPA/SSSI,

a visitor survey was commissioned[53]. Among the main findings of the report were that the site receives approximately 1830-1930 visitors per week (the survey was carried out between June-October). Most visitors were relatively local, with 75% of dog walkers and 54% of visitors generally coming from within 5km, and the majority of the remaining visitors origins (those outside 5km) showed clear correlation with the A3 corridor. Haslemere, Grayshott and Beacon Hill were clearly foci from which visitors journeyed. Eighty percent of visitors travelled to the site by car. Once on the site, 82% of visitors travelled 1km, with 70% travelling over 2km. 60% of dog walkers were found to travel over 2.8km.

6.3.5 The study mapped visitor movements and the territories of the bird species for which the SPA is designated. There was found to be no correlation between the visitor distribution and bird distribution. UE Associates undertook a similar exercise for the Wealden Heaths Phase 2 SPA as a whole as part of their work for Whitehill & Bordon (UE Associates, 2009). Appendices VIII and IX contain maps showing the routes walked by existing visitors superimposed over woodlark, nightjar and Dartford warbler territories. These maps concur with the separate work undertaken by Footprint Ecology in that there appears to be no pattern between existing visitor routes and SPA bird territories.

6.3.6 The Hindhead Concept Statement HRA (RPS, 2010; the report is called a Conservation Regulations Assessment on the report cover) examined the status of bird populations for which the Wealden Heaths SPA has been designated, at Hindhead. The report identifies that at present SPA bird territory distribution does not correlate to patterns of visitor activity, indicating that there is no evidence of SPA birds consistently avoiding areas of high visitor usage at present.

6.3.7 The Hindhead Concept Statement HRA states on pages 27 and 28 that '*The results of the study of visitors to the Hindhead area undertaken in 2009* [by Footprint Ecology] *were combined with the results of the surveys of the distribution of territories of the Annex 1 birds in 2008 and 2009 to evaluate the extent to which existing access intensity and patterns affects the number and distribution of those birds. The result of this assessment was that visitor numbers do not currently seem to be affecting the distribution of Annex I birds. The overall conclusion was that there was no evidence, from the years 2008 and 2009, that the distribution of the three Annex I bird species is related to the spatial distribution of visitors*'. The report also cites a letter from Natural England (Nigel Jennings) of 15/10/10 to Paul Falconer at Waverley Council which supports this view: '*The visitor survey commissioned by the National Trust indicates that the distribution of SPA Annex I bird species (woodlark, nightjar and Dartford warbler) are not currently being impacted by existing visitor numbers'*.

6.3.8 The Whitehill & Bordon HRA (UE Associates, 2009 and 2010) compared population trends in European protected bird species at the national level with those for the Wealden Heaths Phase 1 SPA (Thursley Hankley & Frensham Commons SPA) and Phase 2 SPA, to help determine whether the European sites around Whitehill & Bordon are in favourable conservation status. For example, if the national population for a certain species is growing, whereas the local population is declining, it might be surmised that conservation status within the local site is unfavourable. The data are summarised below for Dartford warbler, nightjar and woodlark[54]:

- Dartford warbler: between 1994 and 2006 the England population grew by 70%, from 1,800 to 3,214. Over the same period, the Wealden Heaths (both Phase 1 and Phase 2)

[53] Sharp, J. & Liley, D. (2010). Visitor flow monitoring and analysis at Hindhead Common and the Devil's Punchbowl. Footprint Ecology.
[54] Email correspondence between UE Associates and Nick Radford, Senior Specialist, Natural England (Lyndhurst), cited in the draft UE Associates HRA for Whitehill & Bordon Masterplan (2009), updated by reference to the final Whitehill & Bordon Eco-town HRA Report (July 2011)

population grew by 81%, from 152 pairs to 275 (146 pairs in Phase 1 and 129 pairs in Phase 2);

- Nightjar: between 1992/93 and 2004/05 the UK population grew by 36% to 4,605 males. Over the same period, the Wealden Heaths (Phase 1 and 2) population grew by 117%, from 63 pairs to 133; and
- Woodlark: between 1997 and 2006 the England population grew by 88%, from 1,552 to 3,064. Over the same period, the Wealden Heaths (Phase 1 and 2) population grew by 36%, from 84 pairs to 114[55].

6.3.9 In other words, data from the early nineties to 2006 indicate that the increases in the populations of Dartford warbler and nightjar on the Wealden Heaths Phase 1 and 2 exceeded the national trend while for all three species (including woodlark) the numbers at 2006 exceeded the numbers at the time of designation. The increase in both the SPA bird populations and housing in proximity to the SPA since designation does not constitute evidence that further housing could not have an adverse effect. It is likely that habitat improvements over the same time period have contributed to the population increase, along with other factors such as more thorough surveying, and any effect from new housing will be dependent upon the scale and location/density of that housing.

6.3.10 Analysis by 2J's Ecology of data specific to Wealden Heaths Phase 2 SPA and covering the period 2006-2010 does confirm that the populations of woodlark and nightjar are 'stable' and although the population of Dartford warbler is currently lower than it has been for some years, this is most likely attributable to adverse winters. The 2J's analysis is presented in full in Appendix 2.

6.3.11 As a summary therefore, SPA bird populations are identified as being 'stable' at current levels of recreational activity (with the exception of Dartford warbler, which has been affected by recent poor weather rather than anthropogenic impacts, and is expected to recover) and studies have not identified any evidence of a negative correlation between areas of current greatest recreational activity and territory density/location.

6.3.12 The environmental requirements of the Wealden Heaths Phase 2 SPA are mainly:

- Appropriate management
- Management of disturbance during breeding season (March to July)
- Minimal air pollution
- Absence or control of urbanisation effects, such as fires and introduction of invasive non-native species
- Maintenance of appropriate water levels
- Maintenance of water quality

6.4 Effects of the Joint Core Strategy

6.4.1 These are described below, against each potential impact.

[55] The sedentary woodlark population of the Hampshire/Surrey border is more susceptible to cold winters which may explain why the scale of increase locally was lower than the national figure

Recreational Pressure

6.4.2 East Hampshire District has extensive semi-natural green infrastructure as identified in the East Hampshire Green Infrastructure (GI) Strategy 2011 – 2028, particularly in the area around Liphook and Liss (even if the Wealden Heaths Phase 2 SPA is discounted). The GI Strategy identifies that the district's green infrastructure could be improved in areas of deficit by taking a strategic approach to deliver a range of benefits. The details will be set out in the East Hampshire Green Infrastructure Implementation Plan but conceptually it is presented in the GI Strategy. In particular, there are two major green infrastructure corridors identified for improvement over the Local Plan period in the vicinity of Liphook and Liss – the River Rother Green & Blue Corridor and the Southern Wey Green & Blue Corridor. Whitehill & Bordon has its own Green Infrastructure Strategy but in addition the East Hampshire Green Infrastructure Strategy identifies the area including and surrounding the site of the Eco-town as a Green Infrastructure Investment Area. This will involve developing an integrated approach to visitor management that includes a potential Green Visitor Hub into the South Downs National Park, links to the access network in the surrounding countryside and new areas of accessible greenspace just beyond the boundary. The overall context for the Local Plan is therefore one of increasing accessible semi-natural green infrastructure.

6.4.3 More detailed analysis of Wealden Heaths Phase 2 SPA visitor data than was undertaken for the Preferred Options Joint Core Strategy draft HRA in 2009 has indicated that the SPA has a 'core catchment' of 5km (in that this is the zone within which the majority of visitors, particularly dog-walkers, to the SPA derive[56]). This comes from two separate studies – the Whitehill & Bordon visitor surveys undertaken by UE Associates and a separate piece of work undertaken by Footprint Ecology for The National Trust[57] in relation to the Hindhead Common/Devil's Punchbowl section of the SPA.

6.4.4 Using the new housing requirement, the currently uncommitted housing to be delivered in East Hampshire within 5km of the Wealden Heaths Phase 2 SPA during the Local Plan period would be as follows:

- The Whitehill & Bordon Strategic Allocation will seek to deliver 2,725 currently uncommitted dwellings;
- Liphook would be allocated 175 currently uncommitted dwellings; and
- Liss would be allocated 150 currently uncommitted dwellings.

6.4.5 In addition, East Hampshire District Council expects windfall applications for up to 521 dwellings to come forward within 5km of the Wealden Heaths Phase 2 SPA (including up to 131 at Whitehill & Bordon) over the plan period.

6.4.6 Whitehill & Bordon will therefore be responsible for approximately 80% of all the currently uncommitted housing that East Hampshire District Council expect to be delivered within 5km of the SPA.

6.4.7 The policy for Whitehill & Bordon (CSWB9) is explicit regarding impacts on European sites in that it specifically states that '*Development at Whitehill & Bordon will be guided by its Habitats Regulations Assessment, Green Infrastructure Strategy and Local Biodiversity Action Plan.*

[56] For no part of the SPA do more than 30% of surveyed dog walkers live more than 5km away, and for some parts of the SPA such as Broxhead Common, over 90% of dog walkers lived within 4km. Non-dog walkers come from a more widespread area but the majority of visitors still live within 5km of the SPA.

[57] Sharp, J. & Liley, D. (2010). Visitor flow monitoring and analysis at Hindhead Common and the Devil's Punchbowl. Footprint Ecology

Where mitigation, as required in the Habitats Regulations Assessment, takes the form of provision of a Suitable Alternative Natural Greenspace (SANG), a minimum requirement of 8 hectares of land should be provided per 1,000 new occupants (after discounting to account for the existing ecological value of the sites and for current access and capacity within reasonable access of the new dwellings). Provision is made in the masterplan for approximately 127 hectares of SANGs and 30 hectares of SANG network. Integrated Access Management provision should be delivered throughout the local European designated sites and other greenspaces, such as SANGs over a period of time, but not less than 80 years'.

6.4.8 The fact that Whitehill & Bordon is already committed to providing mitigation in the form of alternative greenspace at 8ha/1000 population and access/site management inputs to the SPA means that 80% of the additional residents within the catchment of the SPA will effectively be neutralised in terms of impacts on the SPA and can therefore be disregarded from further consideration.

6.4.9 The total population within 5km of the Wealden Heaths Phase 2 is approximately 64,000[58], of which almost 50% live at either Whitehill & Bordon (in East Hampshire district) or Haslemere (in Waverley district). Assuming 2.37 people per dwelling, 846 new (currently uncommitted) houses within 5km of the SPA means approximately 2,005 people. Within Waverley, 3 main settlements to which housing has been allocated lie within 5km of Wealden Heaths Phase 2 – Haslemere, Hindhead and Beacon Hill. The Waverley Core Strategy allocates 253 uncommitted dwellings between these settlements, which assuming a population multiplier of 2.37 residents/dwelling, would mean 600 additional residents[59].

6.4.10 So, excluding 2,725 dwellings at Whitehill & Bordon, approximately 2,258 new residents can be expected as a worst case within 5km of the SPA as a result of additional uncommitted housing being proposed in the East Hampshire & South Downs National Park Joint Core Strategy and Waverley Core Strategy and windfalls, or a population increase of approximately 3.5%. One can broadly calculate that a 3.5% increase in residents within 5km could equate to an increase in visitors to the SPA of a similar order of magnitude.

6.4.11 Even when considered 'in combination' with those committed dwellings that have planning permission but have not yet been delivered the figures are still modest. There are 622 un-built commitment dwellings (i.e. those with planning permission) at Liphook, Liss, Grayshott and Whitehill & Bordon in addition to the 846 uncommitted dwellings, which raises the overall housing figure to 1,468. However, this would still be an increase in residents of just over 5% compared to current levels.

6.4.12 This average will be an over-estimate for some parts of the SPA since it does not take account of relative proximity. For example, the HRA for Whitehill & Bordon indicates that the average percentage increase in visitors on completion of Phase 3 (not taking account of the alternative greenspace they intend to deliver as mitigation/avoidance) would be expected to be approximately 21%, but on a parcel by parcel basis could actually vary from approximately 2%

[58] This figure is derived from 2011 census data for Bramshott & Liphook ward (8,503), Grayshott ward (2,410), Haslemere (12,545), Hindhead ward (4,282), Selborne ward (2,248), Headley ward (5,625), Whitehill & Bordon (including Lindford) (16,200), Fernhurst ward (5,370), Liss ward (5,111) and The Hangers and Forest Ward (2,482)

[59] Following suspension of the Examination in Public into the Waverley Local Plan, Waverley Borough Council are commencing a similar exercise to that which has been undertaken for East Hampshire District in reconsidering housing numbers. Until that process is completed it is not possible to know what change in proposed housing allocations may come forward in Waverley Borough. However, the only significant sized settlement that lies within 5km of the Wealden Heaths Phase 2 SPA in Waverley borough is the Haslemere/Hindhead/Beacon Hill area. Due to the limited number of Strategic Housing Land Availability Assessment (SHLAA) sites in that settlement, it has been acknowledged by Waverley Borough Council that it is unlikely that additional housing will be allocated within this area as a result of the studies being commenced by Waverley Borough Council.

at Longmoor Enclosure and Ludshott Common, which are several kilometres from the settlement, to approximately 40% at Woolmer Forest and Broxhead Common, which are the two parts of the SPA adjacent to Whitehill & Bordon.

6.4.13 To take account of this a ratio of 'population increase at Whitehill & Bordon' to 'increase in visitors on the SPA' has been calculated for Broxhead Common which is the closest part of the SPA to Whitehill & Bordon and is situated a similar distance from that settlement as Longmoor Enclosure is from Liss and Bramshott Common is from Liphook. This was then used to calculate the probable additional increase in visitors at the closest parts of the SPA from these two settlements, assuming behaviour patterns of residents were the same as for Whitehill & Bordon.

6.4.14 Whitehill & Bordon was (at the time the Whitehill & Bordon HRA was undertaken) intended to be a 5,300 dwelling development and it was calculated that it was likely to lead to an increase in visitors per annum at Broxhead Common on completion of Phase 3 equivalent to 6.5 times the number of additional residents. Applying that same multiplier to the ~ 238 uncommitted dwellings at Liss (150 allocated dwellings and 88 potential windfalls) and 249 at Liphook (175 allocated dwellings and 74 potential windfalls) would indicate a broad increase in visitors as follows:

- Liss – 238 new dwellings means approximately 564 additional residents and therefore (using a multiplier of 6.5) an increase of approximately 3,666 visitors per annum at Longmoor Enclosure (an average of 10 extra visitors per day), which would mean an increase of approximately 1% over current levels[60]. The increase at parts of the SPA further from Liss will be even smaller.
- Liphook – 249 new dwellings means approximately 590 additional residents and therefore (using a multiplier of 6.5) an increase of approximately 3,835 visitors per annum at Bramshott Common (an average of 11 extra visitors per day), which would mean an increase of approximately 1.4% over current levels[61]. The increase at parts of the SPA further from Liphook would be even smaller.

6.4.15 While there would be a significant effect 'in combination' with Whitehill & Bordon (as that development, if unmitigated, could raise visitor numbers on some parts of the SPA by 40%), that would only arise if the Whitehill & Bordon development was not mitigated i.e. did not provide sufficient alternative greenspace or access management measures. Provided that Whitehill & Bordon can adequately mitigate its role as required by policy therefore the conclusion is that there would be no need to provide alternative greenspace for the remaining additional housing as they will constitute a sufficiently small increase (which would only be fully felt at the end of the Joint Core Strategy period) that the effect would be barely perceptible.

6.4.16 Note that this conclusion does not preclude individual planning applications from undertaking their own Habitat Regulations Assessments or providing additional greenspace or access management to address their own impacts if project-specific appraisals identify particular details that cannot be identified at this strategic level. However, based on the preceding analysis there is no indication that a strategic district-wide solution to new housing-related recreational activity on the Wealden Heaths SPA, beyond that already identified for Whitehill & Bordon, is necessary.

6.4.17 Finally, much of the new housing identified for delivery at Liphook and Liss will be associated with LIP004, LIP021 and LIP028 each being over 12ha and therefore having much greater capacity than is actually required to meet the 175 new dwellings allocated to Liphook. Equally

[60] According to the Whitehill & Bordon HRA report the total number of visitors per annum to Longmoor Enclosure is 312,289

at Liss, site LIS008 is over 8ha, while LIS003 is over 12ha and also therefore includes additional capacity beyond that required to meet the 150 new dwellings allocated to Liss. Therefore, the main likely housing sites at both settlements may well each include several hectares of accessible natural greenspace as part of individual planning applications, further reducing the likelihood that residents will rely on the Wealden Heaths Phase 2 for recreation.

Urbanisation

6.4.18 The Joint Core Strategy does not allocate any housing within 400m of the SPA and there are no SHLAA sites that would deliver housing within 400m of the SPA in East Hampshire[62]. The Joint Core Strategy does not seek to allocate any new gypsy and traveller sites within 400m of the SPA[63]. Although gypsy and traveller sites may be proposed in the district over the Joint Core Strategy period (outside the Core Strategy process) they will have to be subject to project level HRA. Therefore the only possible housing that might come forward within 400m of the SPA in East Hampshire is 'windfall'. Based purely on a statistical analysis, applications for approximately 33 windfall dwellings could be expected to come forward during the plan period. This is effectively the same figure as was used in the HRA of the Submitted Local Plan. However, East Hampshire Council has confirmed that housing within 400m of the SPA would only be permitted in exceptional circumstances. Therefore, in reality it is quite likely that no windfall dwellings will be delivered within 400m of the SPA at all.

6.4.19 As a further safeguard, Policy CP20 states that '*Any new housing that is proposed to be located within 400m of the boundary of the Wealden Heaths (Phase 2) SPA will be required to undertake a project-specific Habitats Regulations Assessment (HRA) as part of the planning application process to demonstrate that either no adverse effects on the ecological integrity of the SPA will occur or that adequate measures will be put in place to avoid any potential adverse effects and then, as a secondary solution, mitigate any adverse effects. Such measures must be agreed with Natural England and the local planning authority.'* This will provide an additional safeguard to enable any deviations from the assumptions made at the strategic Joint Core Strategy level to be picked up at the planning application stage. Given the strategic assessment and its conclusions, in most cases it will simply be necessary at the planning application stage to confirm that there is nothing in the planning application that deviates from the assumptions made for the strategic Joint Core Strategy HRA (for example, as they relate to the scale of development within 400m of the SPA).

6.4.20 Specific protection to the SPA from development in Whitehill & Bordon is provided through policy CSWB9 which states that *'No part of the Whitehill & Bordon development will be permitted within 400 metres of the Wealden Heaths Phase II SPA unless it can be demonstrated that adequate measures have been put in place to avoid or (as a secondary solution) adequately mitigate impacts such that there will be no adverse effect on the ecological integrity of the SPA. Such measures must be agreed with Natural England and the local planning authority.'* This specific measure relating to Whitehill & Bordon is entirely appropriate given that settlement will be the focus for housing delivery in Central Hampshire, accommodating approximately 95% of all housing to be delivered within 5km of the SPA.

[62] There is a single SHLAA site (LIP003 - Land at Lowsley Farm, Liphook) which does have its boundary within 400m of the SPA. However, the housing is all located more than 400m away and the site is considered acceptable by Natural England. This site provides 4ha of alternative greenspace which was identified through discussion between the developer and Natural England and is appropriate to the scale of development on this parcel, representing as it does by far the largest SHLAA site near the SPA (capable of accommodating over 100 dwellings)

[63] Council statistics indicate that there are eleven authorised/permanent pitches for gypsies & travelling showpeople within 400m of the SPA spread across five sites; this is a sufficiently small number that it does not affect the analysis

Air Quality

6.4.21 The Wealden Heaths Phase 2 SPA lies within 200m of substantial stretches of the A3 and A325 trunk roads which will be used by much of the new development within East Hampshire, particularly from Whitehill & Bordon but also from Petersfield and Alton.

6.4.22 The SPA is already suffering from excessive and damaging nitrogen deposition (see Table 7).

Table 7. Summary of atmospheric pollutant levels and critical loads affecting Wealden Heaths Phase 2 SPA. Red shading indicates exceedance of thresholds.

Site	Grid reference	Most nitrogen sensitive habitat	Minimum critical loads (kg N/ha/yr)	Actual nitrogen deposition (kg N/ha/yr)	Actual NOx concentration (μgm^{-3})	Actual SO_2 concentration (μgm^{-3})
Wealden Heaths Phase 2 SPA	SU811315	Heathland	10-20	20.44	15.4	1.9

6.4.23 Only 13% of nitrogen deposition within the Wealden Heaths Phase 2 SPA is predicted to derive from road transport by 2020, with the largest contributor being agriculture (38%). Nonetheless, if the SPA will already be in exceedence of its critical load, and the A3 and A325 are major strategic routes, it is reasonable to conclude that development along these corridors at locations such as Petersfield, Whitehill & Bordon, Liphook and Clanfield is likely to lead to increased traffic on the A3 and that this will contribute cumulatively to an 'in combination' effect when considered alongside the housing to be delivered throughout this corridor in other districts. Nonetheless, it must be acknowledged that road transport is likely to remain a relatively minor contributor to nitrogen deposition on the site as a whole.

6.4.24 According to APIS, the nightjar is likely to be relatively impervious to habitat deterioration due to increased nitrogen deposition, but the woodlark and Dartford warbler require a large, unbroken dwarf-shrub layer, mainly heather and gorse for nesting and feeding. Deterioration of heathland due to increased competition by coarser more invasive scrub and grasses will also lead to adverse effects on Woolmer Forest SAC.

6.4.25 Development along these trunk road corridors is likely to lead to increased traffic on the A3 and A325, from figures of between 10-50,000 vehicles per weekday as calculated in 2004 (Hampshire Local Transport Plan[64]). Traffic growth on local roads has averaged just over 1% per year over the last five years. For many years growth has been higher on the national road network in Hampshire than on local roads.

6.4.26 Transport modelling and air quality assessment work for Whitehill & Bordon shows that significant impacts cannot be discounted across 1% of Wealden Heaths Phase 2 SPA, particularly at Broxhead Common.

6.4.27 Across the whole of this composite site, 0.19% of the land area would be affected by exceedence of the critical NOx level. Habitat data were not available for parts of the site in

[64] www3.hants.gov.uk/hampshire-transport/local-transport-plan.htm

Surrey, but this would include extents close to the A3 at Hindhead, Thursley and Witley Commons. Small areas close to the A325 at Woolmer Forest (without heathland) and Broxhead Common (with a little dry heath) are also affected, while Kingsley Common would be unaffected.

6.4.28 Across the site, 1.3% would be affected by acid deposition in excess of the critical load. Areas of wet or dry heathland close to the A325 at Woolmer Forest are affected. Substantial parts of Broxhead Common including areas of dry heath, and a moderate extent of Kingsley Common that does not appear to include any heathland would be affected as well. Hindhead, Thursley and Witley Commons are unaffected.

6.4.29 Across the site, 0.68% would experience exceedence of the critical nutrient nitrogen load. This includes a small area of dry heath at Woolmer Forest close to the A325, and a moderate area of dry heath at Broxhead Common close to the A325 and B3004. A moderate area of Kingsley Common would also be affected, but this does not appear to include any heathland. Hindhead, Thursley and Witley Commons are unaffected.

6.4.30 In consultation on Core Strategies for surrounding local authorities, Natural England have referred to the following document for mitigation measures that could be included in Core Strategies: http://www.westlondonairquality.org.uk/uploads/documents/Best%20Practice%20Guide/WLA%20Best%20Practice%20Air%20Quality%20and%20Transport%20Guide%2020051.pdf.

6.4.31 The report identifies four broad types of mitigation measure:

- Behavioural measures and modal shift - reducing the amount of traffic overall;
- Traffic management - modifying traffic behaviour to control where emissions are generated;
- Emissions reduction at source - reducing the emissions level per vehicle; and
- Roadside barriers - reducing the impact on the public of emissions.

6.4.32 The measures identified in the Joint Core Strategy's policy on transport (CP29) cover all of these categories, except for the fourth (roadside barriers) which is not within the remit of local planning policy. The Joint Core Strategy does contain positive measures that should aim to mitigate or avoid the likelihood of significant adverse effects from reduced air quality on the SPA:

- Improve pedestrian and road safety;
- Promote integrated transport;
- Improve access to town and village centres … include improvements of routes for walking, cycling and public transport;
- Help tackle rural accessibility problems by non-transport improvements such as increasing services direct to residents ...
- Promotion of train and bus access to the district …
- Support the development of joined-up routes for non-motorised transport; and
- Improvements to make existing paths, tracks and roads more user friendly.

6.4.33 This is in addition to the sustainable transport initiatives set out in the Hampshire Local Transport Plan. In line with the Local Transport Plan a transport objective will be to improve air quality.

6.4.34 In addition to the Joint Core Strategy itself, the following plans and projects require consideration for the potential to create adverse effects on the Wealden Heaths Phase 2 SPA through reduced air quality:

- Housing development in surrounding local authorities, in particular those with settlements along the A3 corridor between London and Portsmouth.
- The A3 Hindhead Scheme, the Hindhead Concept Statement and the Visit Surrey Partnership aim to develop Hindhead as a tourism and recreation hub, all have potential to lead to adverse effects on the SPA through reduced air quality. The Preferred Options and Draft Policies document does note that "*the Hindhead Tunnel, which is due to open in Summer 2011 is likely to bring forward new proposals for development in central Hindhead, in close proximity to the Wealden Heaths SPA. The Council is in discussions with Natural England and the National Trust to identify any specific mitigation measures that may be required as a result*." Whilst being receptive future development opportunities at Hindhead, the Council will have regard to the Hindhead Concept Statement. The HRA of this statement determined that as a result of development at Hindhead:
    1. The A3 Hindhead Scheme would attract further visitors
    2. Significant habitat improvement would occur for the bird species of concern
    3. Approximately 100 new dwellings may be delivered under the scheme
    4. Monitoring of the success of access management approaches should take place
    5. SANGS should be provided
    6. Developer contributions should be sought for access management and SANGS provision
    7. Partnership working should take place

6.4.35 Generally, development at Hindhead is considered likely to lead to habitat improvements, and the re-routing of the A3 is likely to be the over-riding consideration with respect to air quality. The Waverley Transport Assessment of 2010 indicated that compared to a 2005 baseline figure, development in Waverley was likely to increase daily rush hour flow past the Hindhead on the A3 from 518 trips to 864. However, no detrimental impacts were predicted and the scheme effectively removes these vehicle movements from within 200m of the SPA through the creation of a tunnel. Nonetheless, it should be considered that Bramshott and Ludshott Commons and Woolmer Forest also lie adjacent to the A3 and that some extra traffic will pass these designations.

6.4.36 For those sustainable transport measures which are available at the strategic planning level, it is not possible to predict in advance the precise quantum of improvement that can be delivered by a given mitigation measure due to both the novel nature of the mitigation tools available and the limitations of the science. Vegetative changes that theory identifies as being likely to result from changes (either negative or positive) in atmospheric nitrogen deposition can fail to appear in practice since they are relatively subtle and can be dwarfed by changes in management regime. Moreover, it is rarely possible to separate the effects of atmospheric nitrogen deposition and other causes and the effects of atmospheric nitrogen deposition arising from vehicle exhausts from those arising from other sources (e.g. agriculture). For example, a policy to 'require developers to produce travel plans indicating that they have maximised opportunities for sustainable transport' may prove effective in practice, but cannot be predictively linked to a specific scale of improvement of air quality.

6.4.37 It is therefore important that where air quality problems are identified there is also a mechanism established to monitor the effectiveness of the measures adopted (using the critical load/level as a monitoring target against which the success or failure of mitigation measures can be evaluated) and amend them as required.

6.4.38 This is in line with the precautionary principle as set out in EC Guidance[65] on its use:

6.4.39 '*If a preliminary scientific evaluation shows that there are reasonable grounds for concern that a particular activity might lead to damaging effects on the environment, or on human, animal or plant health, which would be inconsistent with the protection normally afforded to these within the European Community, the Precautionary Principle is triggered.*

6.4.40 *Decision-makers then have to determine what action to take. They should take account of the potential consequences of taking no action, the uncertainties inherent in the scientific evaluation, and they should consult interested parties on the possible ways of managing the risk. Measures should be proportionate to the level of risk, and to the desired level of protection. They should be provisional in nature pending the availability of more reliable scientific data.*

6.4.41 *Action is then undertaken to obtain further information enabling a more objective assessment of the risk. The measures taken to manage the risk should be maintained so long as the scientific information remains inconclusive and the risk unacceptable*'.

6.4.42 This is addressed in the Joint Core Strategy by Policy CP25 (Pollution) which states that *'Any development which is likely to lead to a significant effect on an internationally designated site is required to undertake an appropriate assessment under the Habitats Regulations. As part of any mitigation/avoidance package any impacts on air quality will require a regime for continued air quality monitoring to be set up before, and for a number of years after, the introduction of any mitigation measures'.* The supporting text for the Policy also states that '*To avoid potential impacts of new development and increased traffic levels on internationally designated nature conservation sites Policy CP25 seeks to ensure that adequate measures are in place to avoid or mitigate any potential adverse effects. One form of avoidance is that the Council and the National Park Authority will need to explore with other local authorities (e.g. Waverley Borough Council) a framework for undertaking air quality monitoring along the main roads that traverse the Wealden Heaths. The monitoring is required before and for a number of years after the introduction of sustainable transport measures, such that further measures can be devised if air quality does not improve. The monitoring also forms part of the avoidance/mitigation package set out for the development at Whitehill & Bordon'.*

6.4.43 While not mitigation in itself, monitoring is an essential factor when dealing with an issue such as air quality which has a high degree of uncertainty, since it will enable the effectiveness of air quality improvement measures to be evaluated and amended over the Joint Core Strategy period. Therefore it can be concluded that an adequate policy framework is in place to ensure that there will be no likely significant effects on the Wealden Heaths Phase 2 SPA from the Joint Core Strategy through the pathway of atmospheric pollution either alone or in combination with other plans and projects.

Water Resources

6.4.44 Housing development planned for Liphook, Liss and Grayshott will amount to around 600 new dwellings (including both commitment sites and currently unallocated dwellings), these lie within the WRMU that encompasses the Wealden Heaths Phase 2 SPA/Woolmer Forest SAC.

[65] European Commission (2000): Communication from the Commission on the use of the Precautionary Principle.

The aquifer underlying the Wealden Heaths is the Folkestone Formation. Where this aquifer is found in an unconfined state (i.e. outcropping with no Gault Formation cover) groundwater can be of local importance to surface water features, as in the Woolmer Forest SAC. Abstraction from this aquifer could therefore potentially alter groundwater flows.

6.4.45 Whitehill & Bordon could lead to 4,000 new dwellings within this catchment, which will have a significant demand for water. However, a Detailed Water Cycle Study for the Eco-town has indicated that improved efficiency, and reduced losses may lower the daily demand for water than currently. This is further supported by Policy CSWB8 for Whitehill & Bordon which states that all development will be required to contribute to the Eco-town target of achieving water neutrality.

6.4.46 The Folkestone Formation is locally exploited with several abstractors licensed to abstract water for spray irrigation and quarrying purposes, but increased abstraction is not expected in order to meet water supply requirements for new growth according to the Water Resource Management Plan. The Hythe Formation is exploited for the public water supply but in contrast to the Folkestone Formation, the lower Hythe Formation aquifer in the vicinity of the Wealden Heaths is found both in a confined state[66] and at depth, over 100m below ground level.

6.4.47 In addition, the Council and the National Park Authority have a number of measures within its policies that will help to reduce demand on water resources:

- **CP22 - Sustainable Construction:** "*Planning permission will only be granted for development … which on completion meets the following minimum Code for Sustainable Homes threshold level … 3 until end of 2012, 4 from 2013 and 5 from 2016*."
- **CP24 - Water Resources and Quality:** "*Development will be required to protect the quality and quantity of water, and make efficient use of water. Development will only be permitted where: a) it protects and enhances the quality and quantity of groundwater, surface water features and controls aquatic pollution to help to achieve the requirements of the European Water Framework Directive … b) it has an adequate means of water supply (even in a drought), sufficient foul and surface water drainage and adequate sewage treatment capacity. Development must be phased to take into account the timing of any water and/or sewerage infrastructure required which should be in place prior to the occupation of development'*.

6.4.48 As such, increased abstraction for the public water supply is unlikely to lead to significant effects on the wet heathland interest features of the SAC.

6.5 Conclusion

6.5.1 It has been possible to determine that significant urbanisation, air quality and water resource effects are unlikely to occur as a result of Joint Core Strategy development and that following the introduction of a policy to address the recreational pressure impacts of Whitehill & Bordon (responsible for 95% of all currently uncommitted housing within 5km of the SPA) the residual increase in recreational activity due to the small amount of development elsewhere in central Hampshire is unlikely to lead to significant effects and thus will not require further strategic mitigation.

[66] In other words, the aquifer is not in contact with the surface, being overlain by the interbedded clays and sands of the Sandgate Formation, which are typically 50 m thick and serve as an aquiclude.

7 Butser Hill SAC

7.1 Introduction

7.1.1 Butser Hill is a chalk massif with a discontinuous cap of clay-with-flints. The massif has been eroded to leave a series of deep combes in which the modern spring-line is about 1 km from the combe-head. The combes on the south-east flank support dense yew *Taxus baccata* woods and the remaining slopes of the Hill are sheep-grazed chalk grassland. The calcareous yew woods are outstanding examples of a habitat with a very small representation in Britain. The series of vegetation types represented in the SSSI – chalk grassland, mixed scrub and yew wood – were the subject of a series of pioneer ecological studies.

7.2 Reasons for Designation

7.2.1 Butser Hill qualifies as a SAC for its habitats. The site contains the Habitats Directive Annex I habitats of:

- Dry grasslands and scrublands on chalk or limestone: the richest terricolous lichen flora of any chalk grassland site in England. Also supports the distinctive *Scapanietum asperae* or southern hepatic mat association of leafy liverworts and mosses on north-facing chalk slopes. This association is very rare in the UK and Butser Hill supports the largest known example.
- Yew-dominated woodland

7.3 Historic Trends and Current Pressures

7.3.1 The site has traditionally been vulnerable to the effects of surrounding agriculture – i.e. spray – drift causing eutrophication. The SAC is now within the boundary of the South Downs National Park. Most of the SAC is in favourable condition, and landowners, in conjunction with English Woodland Grant Schemes have been removing inappropriate conifers and clearing excessive scrub.

7.3.2 The environmental requirements of Butser Hill SAC are mainly:

- Maintenance of grazing
- Minimal air pollution – nitrogen deposition may cause reduction in diversity, sulphur deposition can cause acidification
- Absence of direct fertilisation
- Well-drained soils
- Controlled recreational pressure
- No spray-drift (i.e. eutrophication) from surrounding intensive arable land.

7.4 Effects of the Joint Core Strategy

7.4.1 These are described below, against each potential impact.

Recreational Pressure

7.4.2 Part of the site lies within the Queen Elizabeth Country Park, run by Hampshire County Council and the Hampshire Wildlife Trust. Butser Hill does have footpaths and public rights of way crossing it and has been subject to organised recreational events numerous times in the past (such as 'Butserfest' and various country fairs). This implies that while calcareous grassland can be damaged by repeated excessive recreational trampling over long periods of time, the grasslands of Butser Hill SAC are not considered to be particularly vulnerable to well-managed recreational pressure and activity, even when relatively large events are held.

7.4.3 As such, while Butser Hill SAC is located close to several of the key areas of future development in East Hampshire (it lies approximately 4.5km north of Horndean, 4km south of Petersfield and 3km north of Clanfield) and therefore will certainly fall within their recreational catchment, adverse effects from this source are considered unlikely to occur.

Air Quality

7.4.4 Butser Hill SAC lies adjacent to the A3 on its eastern border. By car, access to the site is via minor roads from the A3. There is a car park on the reserve near Butser Hill and others in the Queen Elizabeth Country Park. Approximately 20.8ha of the SAC (8.7% of the total area of the SAC67) lies within 200m of the centre-line of the A3 and is therefore exposed to local deposition of atmospheric nitrogen from traffic using the road.

7.4.5 The SAC is already subject to nitrogen deposition exceeding the minimum threshold for adverse effects on calcareous grassland (see table 8).

Table 8. Summary of atmospheric pollutant levels and critical loads affecting Butser Hill SAC. Red shading indicates exceedance of thresholds.

Site	Grid reference	Most nitrogen sensitive habitat	Minimum critical loads (kg N/ha/yr)	Actual nitrogen deposition (kg N/ha/yr)	Actual NOx concentration (μgm^{-3})	Actual SO^2 concentration (μgm^{-3})
Butser Hill SAC	SU716197	Calcareous grassland	15-25	21.98	16.7	1.9

7.4.6 The SAC will already be in exceedence of its critical load by 2028, and the A3 is a major strategic route. It is therefore reasonable to conclude that development along the A3 corridor at locations such as Petersfield, Whitehill & Bordon, Liphook and Clanfield is likely to lead to increased traffic on the A3 and that this will contribute cumulatively to an 'in combination' effect when considered alongside the housing in other districts to be delivered along this corridor. Nonetheless, it must be acknowledged that road transport is likely to remain a relatively minor contributor to nitrogen deposition on the site as a whole.

7.4.7 In consultation on Core Strategies for surrounding local authorities, Natural England have referred to the following document for mitigation measures that could be included in Core Strategies:

[67] According to the JNCC citation, the total area of the SAC is 238.71ha

http://www.westlondonairquality.org.uk/uploads/documents/Best%20Practice%20Guide/WLA%20Best%20Practice%20Air%20Quality%20and%20Transport%20Guide%2020051.pdf.

7.4.8 The report identifies four broad types of mitigation measure:

- Behavioural measures and modal shift - reducing the amount of traffic overall;
- Traffic management - modifying traffic behaviour to control where emissions are generated;
- Emissions reduction at source - reducing the emissions level per vehicle; and
- Roadside barriers - reducing the impact on the public of emissions.

7.4.9 The measures identified in the policy on transport (CP29) cover all of these categories, except for the fourth (roadside barriers) which is not within the remit of local planning policy. The Joint Core Strategy does contain positive measures that should aim to mitigate or avoid the likelihood of significant adverse effects from reduced air quality on the SAC:

- Improve pedestrian and road safety;
- Promote integrated transport;
- Improve access to town and village centres … include improvements of routes for walking, cycling and public transport;
- Help tackle rural accessibility problems by non-transport improvements such as increasing services direct to residents ...
- Promotion of train and bus access to the district …
- Support the development of joined-up routes for non-motorised transport; and
- Improvements to make existing paths, tracks and roads more user friendly.

7.4.10 This is in addition to the sustainable transport initiatives set out in the Hampshire Local Transport Plan. In line with the Local Transport Plan a transport objective will be to improve air quality.

7.4.11 For those sustainable transport measures which are available at the strategic planning level, it is not possible to predict in advance the precise quantum of improvement that can be delivered by a given mitigation measure due to both the novel nature of the mitigation tools available and the limitations of the science. Vegetative changes that theory identifies as being likely to result from changes (either negative or positive) in atmospheric nitrogen deposition can fail to appear in practice since they are relatively subtle and can be dwarfed by changes in management regime. Moreover, it is rarely possible to separate the effects of atmospheric nitrogen deposition and other causes and the effects of atmospheric nitrogen deposition arising from vehicle exhausts from those arising from other sources (e.g. agriculture). For example, a policy to 'require developers to produce travel plans indicating that they have maximised opportunities for sustainable transport' may prove effective in practice, but cannot be predictively linked to a specific scale of improvement of air quality.

7.4.12 It is therefore important that where air quality problems are identified there is also a mechanism established to monitor the effectiveness of the measures adopted (using the critical load/level as a monitoring target against which the success or failure of mitigation measures can be evaluated) and amend them as required.

7.4.13 This is in line with the precautionary principle as set out in EC Guidance[68] on its use:

7.4.14 '*If a preliminary scientific evaluation shows that there are reasonable grounds for concern that a particular activity might lead to damaging effects on the environment, or on human, animal or plant health, which would be inconsistent with the protection normally afforded to these within the European Community, the Precautionary Principle is triggered.*

7.4.15 *Decision-makers then have to determine what action to take. They should take account of the potential consequences of taking no action, the uncertainties inherent in the scientific evaluation, and they should consult interested parties on the possible ways of managing the risk. Measures should be proportionate to the level of risk, and to the desired level of protection. They should be provisional in nature pending the availability of more reliable scientific data.*

7.4.16 *Action is then undertaken to obtain further information enabling a more objective assessment of the risk. The measures taken to manage the risk should be maintained so long as the scientific information remains inconclusive and the risk unacceptable'*.

7.4.17 This is addressed in the Joint Core Strategy by Policy CP25 (Pollution) which states that *'Any development which is likely to lead to a significant effect on an internationally designated site is required to undertake an appropriate assessment under the Habitats Regulations. As part of any mitigation/avoidance package any impacts on air quality will require a regime for continued air quality monitoring to be set up before, and for a number of years after, the introduction of any mitigation measures'.* While not mitigation in itself, monitoring is an essential factor when dealing with an issue such as air quality which has a high degree of uncertainty, since it will enable the effectiveness of air quality improvement measures to be evaluated and amended over the Joint Core Strategy period. Therefore it can be concluded that an adequate policy framework is in place to ensure that there will be no likely significant effects on the Butser Hill SAC from the Joint Core Strategy through the pathway of atmospheric pollution either alone or in combination with other plans and projects.

7.5 Conclusion

7.5.1 It has been possible to determine that significant recreational pressure or air quality effects are unlikely to occur as a result of Joint Core Strategy development.

[68] European Commission (2000): Communication from the Commission on the use of the Precautionary Principle.

8 Thursley, Hankley & Frensham Commons (Wealden Heaths Phase 1) SPA, Thursley, Ash, Pirbright & Chobham SAC and Thursley & Ockley Bogs Ramsar site

8.1 Introduction

8.1.1 At its closest point, this SPA is 100m from the boundary of East Hampshire district.

8.1.2 This extensive site represents some of the finest remaining heathland on the Lower Greensand in Southern England. The valley mire on Thursley Common is regarded as one of the best in Britain. The site is of national importance for its bird, reptile and invertebrate populations.

8.1.3 Hankley Common has the most extensive tracts of dry heath, but the habitat is also well represented on the other Commons. Peatland is of greatest value on Thursley Common, but on the other commons is less extensive but still important.

8.1.4 The site is one of the richest for birds in Southern England. Breeding birds specifically associated with the heathland include woodlark, Dartford warbler, and nightjar.

8.2 Reasons for Designation

8.2.1 Thursley, Hankley and Frensham Commons SPA is designated for its breeding bird populations, specifically:

- 0.6% of the British breeding population of nightjar *Caprimulgus europaeus* (5 year mean, 1985-1990)
- 1.8% of the British breeding population of woodlark *Lullula arborea* (1994)
- 1.3% of the British breeding population of Dartford warbler *Sylvia undata* (1984)

8.2.2 Thursley, Ash, Pirbright and Chobham qualifies as a SAC for its habitats. The site contains the Habitats Directive Annex I habitats of:

- Wet heathland with cross-leaved heath
- Dry heaths: This site contains a series of large fragments of once-continuous heathland
- Depressions on peat substrates

8.2.3 The reasons for designation of Thursley and Ockley Bogs as a Ramsar site are illustrated in Table 9.

Table 9: Thursley and Ockley Bogs Ramsar site criteria

Ramsar criterion	Description of Criterion	Chichester and Langstone Harbours
2	A wetland should be considered internationally important if it supports vulnerable, endangered, or critically endangered species or threatened ecological communities	Supports a community of rare wetland invertebrate species including notable numbers of breeding dragonflies.
3	A wetland should be considered internationally important if it supports populations of plant and/or animal species important for maintaining the biological diversity of a particular biogeographic region.	It is one of few sites in Britain to support all six native reptile species. The site also supports nationally important breeding populations of European nightjar *Caprimulgus europaeus* and woodlark *Lullula arborea*.

8.3 Historic Trends and Current Pressures

8.3.1 Thursley, Hankley and Frensham Commons together incorporate a heath and valley mire complex. Much of the site is in secure tenure. Thursley Common is a National Nature Reserve managed by Natural England. Frensham and Witley Commons are managed by the National Trust and a large part of the site is owned by the MoD (Hankley Common and Ockley Common), being regularly used for military activities and informal recreation.

8.3.2 The Whitehill & Bordon HRA (UE Associates, 2009 and 2010) compared population trends in European protected bird species at the national level with those for the Wealden Heaths Phase 1 SPA (Thursley Hankley & Frensham Commons SPA) and Phase 2 SPA, to help determine whether the European sites around Whitehill & Bordon are in favourable conservation status. For example, if the national population for a certain species is growing, whereas the local population is declining, it might be surmised that conservation status within the local site is unfavourable. The data are summarised below for Dartford warbler, nightjar and woodlark[69]:

- Dartford warbler: between 1994 and 2006 the England population grew by 70%, from 1,800 to 3,214. Over the same period, the Wealden Heaths (both Phase 1 and Phase 2) population grew by 81%, from 152 pairs to 275 (146 pairs in Phase 1 and 129 pairs in Phase 2);
- Nightjar: between 1992/93 and 2004/05 the UK population grew by 36% to 4,605 males. Over the same period, the Wealden Heaths (Phase 1 and 2) population grew by 117%, from 63 pairs to 133; and
- Woodlark: between 1997 and 2006 the England population grew by 88%, from 1,552 to 3,064. Over the same period, the Wealden Heaths (Phase 1 and 2) population grew by 36%, from 84 pairs to 114[70].

8.3.3 In other words, data from the early nineties to 2006 indicate that the increases in the populations of Dartford warbler and nightjar on the Wealden Heaths Phase 1 and 2 exceeded the national trend while for all three species (including woodlark) the numbers at 2006

[69] Email correspondence between UE Associates and Nick Radford, Senior Specialist, Natural England (Lyndhurst), cited in the draft UE Associates HRA for Whitehill & Bordon Masterplan (2009)
[70] The sedentary woodlark population of the Hampshire/Surrey border is more susceptible to cold winters which may explain why the scale of increase locally was lower than the national figure

exceeded the numbers at the time of designation despite the fact that recreational usage of the site is likely to have increased over the same period, on the same basis that it is expected to continue to increase over the next twenty years.

8.3.4 Neglect/lack of appropriate management still exists as a potential threat to the site especially on the site margins, however, the majority of the site is in conservation management and this situation is generally improving with the existence of countryside management schemes. The lowering of water levels due to water abstraction from the Greensand aquifer has affected the wet heath and bog components of the site.

8.3.5 The key environmental conditions of the SPA are mainly:

- Maintenance of grazing and other traditional management practices.
- Un-fragmented habitat
- Minimal recreational pressure and a low incidence of wildfires;
- Maintenance of water levels.

8.4 Effects of the Joint Core Strategy

8.4.1 These are described below, against each potential impact.

Recreational Pressure

8.4.2 Visitor surveys were undertaken by UE Associates for Whitehill & Bordon in East Hampshire in 2009 for Thursley, Hankley & Frensham Commons SPA and those parts of Thursley, Ash, Pirbright & Chobham SAC that overlap. Further analysis of the data has been undertaken by UE Associates for the purposes of this HRA. That analysis indicates that 85% of all dog walkers surveyed and 70% of all visitors generally derived from within 9km of the SPA. Beyond this distance the source of origin for visitors becomes dispersed[71]. For the purposes of this assessment therefore 9km has been adopted as the figure indicative of the 'core catchment' i.e. the zone within which the majority of relevant visitors (primarily dog walkers) derive.[72] As with Thames Basin Heaths, it is the change in population within this zone that will be of greatest importance in influencing impacts on the SPA. A substantial increase in residents of this zone would be likely to relate to a substantial increase in visitors to the SPA and an adverse effect on the interest features.

8.4.3 The surveys also identified that visitors to these European sites and others in the vicinity of Whitehill & Bordon (including other commons and heathland sites) primarily used the sites for dog walking (58%), with walking (22%) and jogging/running (6%) making up the main further activities on the sites. Due to the rural setting and dispersed catchment of the SPA 69% of dog walkers travelled by car, and 66% of these travelled more than 2km in order to reach the site.

8.4.4 In terms of use of sites, the data showed that the average distance that dog walkers journeyed inside the European sites from access points was 2.7km, whilst cyclists reached 4.4km – the penetration distance means were 780m and 1.5km respectively. Data for the access points

[71] For example, the 15% of dog walkers/groups who were covered by the survey and originated from more than 9km away were spread across an area of up to 100km from the SPA

[72] Defining this catchment must be a compromise between ensuring that one captures the majority of visitors and avoiding setting a zone that is so vast it becomes impractical if it is identified that mitigation is required. In this case it was considered that a distance of less than 9km did not capture a sufficiently high proportion of the dog walkers visiting the site, while a catchment of 10km would only increase the percentage of dog walkers included by 1.7%

within the Thursley, Hankley and Frensham Commons SPA indicates that in parts of the SPA dog-walkers penetrated on average further than 1km into the SPA (South Hankley Common and Hankley Common). For all surveyed access points to the SPA, the majority (over 70%) of dog owners indicated that they allowed their dogs off the lead for the duration of the visit.

8.4.5 The exact number of visitors the SPA receives depends on the assumptions one makes in the calculation but surveys have indicated approximately 25,000 p.a. to Thursley Common[73].

8.4.6 For Whitehill & Bordon UE Associates overlaid the current recreational routes used within the SPA onto a plan of known SPA bird territories. These are presented in Appendices VIII and XI in the Whitehill & Bordon visitor surveys report and illustrates that there appears to be no pattern of SPA bird territories avoiding the most used recreational routes on this site.

8.4.7 The latest Natural England condition assessment of Thursley, Hankley and Frensham Commons SSSI (2006-2010) determined that 47% of the site was in favourable condition, whilst the remainder was recovering from unfavourable status. The improvements predominantly stemmed from the introduction of Higher Level Stewardship schemes, including for wetter habitats and water bodies on the SSSI.

8.4.8 Whitehill & Bordon lies just over 5km from the SPA, while Liphook lies approximately 7km from Frensham Country Park. There is no direct access from the latter settlement, but the A287 runs through the SAC and links to the A31 and A3. All other significant settlements in East Hampshire lie outside the 9km core catchment.

8.4.9 It is clear that if any settlement in East Hampshire was to make a significant contribution to visits to Thursley, Hankley & Frensham Commons SPA it would be Whitehill & Bordon since it is situated significantly closer to Thursley, Hankley & Frensham Commons SPA than Liphook and will be responsible for delivering almost half the new housing in central Hampshire.

8.4.10 However, analysis of visitor survey data as presented within Whitehill & Bordon HRA shows that none of the visitors recorded using Thursley, Hankley or Frensham Commons during the surveys derived from Whitehill & Bordon. In the 2012 visitor surveys, a single individual from Whitehil & Bordon visited Frensham Common. While this does not mean that Whitehill & Bordon residents never visit these Commons it does indicate that they do so sufficiently infrequently and in sufficiently small numbers that their contribution can be discounted. It is clear that while 9km is a typical catchment for Thursley, Hankley and Frensham Commons visitors are dominated by those settlements that lie within Waverley. The only other significant settlement in East Hampshire that lies within 9km of Thursley, Hankley and Frensham Commons is Liphook, but if 2,725 new dwellings at Whitehill & Bordon are unlikely to lead to a significant effect, the relatively small amount of housing to be delivered at Liphook can also be dismissed.

Water Resources

Housing development planned for Liphook, Liss and Grayshott will amount to around over 600 new dwellings (including both commitment sites and currently unallocated dwellings), which lie within the WRMU that encompasses part of Thursley, Hankley and Frensham Commons SPA. The aquifer underlying the SAC/SPA is the Folkestone Formation. Where this aquifer is found in an unconfined state (i.e. outcropping with no Gault Formation cover) groundwater can be of local importance to surface water features, as in the Woolmer Forest SAC. Abstraction from this aquifer could therefore potentially alter groundwater flows.

[73] Underhill-Day, J. (2010). An appraisal of actions for future management of Thursley, Ockley, Elstead, Royal and Bagmoor Commons. Prepared for Surrey Wildlife Trust.

8.4.11 Whitehill & Bordon could lead to 2,725 new dwellings within this catchment, which will have a significant demand for water. However, a Detailed Water Cycle Study for the Eco-town has indicated that improved efficiency, and reduced losses may lower the daily demand for water than currently.

8.4.12 The Folkestone Formation is locally exploited with several abstractors licensed to abstract water for spray irrigation and quarrying purposes, but increased abstraction is not expected in order to meet water supply requirements for new growth according to the Water Resource Management Plan. The Hythe Formation is exploited for the public water supply but in contrast to the Folkestone Formation, the lower Hythe Formation aquifer in the vicinity of the Wealden Heaths is found both in a confined state[74] and at depth, over 100m below ground level.

8.4.13 In addition, the Council and the National Park Authority have a number of measures within its policies that will help to reduce demand on water resources:

- **CP22 - Sustainable Construction:** "*Planning permission will only be granted for development … which on completion meets the following minimum Code for Sustainable Homes threshold level … 3 until end of 2012, 4 from 2013 and 5 from 2016*."
- **CP24 - Water Resources and Quality:** "*Development will be required to protect the quality and quantity of water, and make efficient use of water. Development will only be permitted where: a) it protects and enhances the quality and quantity of groundwater, surface water features and controls aquatic pollution to help to achieve the requirements of the European Water Framework Directive … b) it has an adequate means of water supply (even in a drought), sufficient foul and surface water drainage and adequate sewage treatment capacity. Development must be phased to take into account the timing of any water and/or sewerage infrastructure required which should be in place prior to the occupation of development'*.

8.4.14 As such, increased abstraction for the public water supply is unlikely to lead to significant effects on the wet heathland interest features of the SAC.

Air Quality

8.4.15 Thursley, Ash, Pirbright and Chobham SAC is bisected by the A3 at Thursley and A287 at Frensham. Given that the A3 is a major arterial route in East Hampshire it is reasonable to assume a connection between increased development in the district and increased vehicle movements along the A3 through the SAC.

8.4.16 The SAC is already subject to excessive nitrogen deposition (see table 10).

[74] In other words, the aquifer is not in contact with the surface, being overlain by the interbedded clays and sands of the Sandgate Formation, which are typically 50 m thick and serve as an aquiclude.

Table 10. Summary of atmospheric pollutant levels and critical loads affecting Thursley, Ash, Pirbright and Chobham SAC. Red shading indicates exceedance of thresholds.

Site	Grid reference	Most nitrogen sensitive habitat	Minimum critical loads (kg N/ha/yr)	Actual nitrogen deposition (kg N/ha/yr)	Actual NOx concentration (μgm^{-3})	Actual SO_2 concentration (μgm^{-3})
Thursley, Ash, Pirbright and Chobham SAC	SU908541	Raised bog/blanket bog	10-15	18.76	20.9	1.9

8.4.17 The SPA will already be in exceedence of its critical load, and the A3 is a major strategic route. It is therefore reasonable to conclude that development along this corridor at locations such as Petersfield, Whitehill & Bordon, Liphook and Clanfield is likely to lead to increased traffic on the A3 and that this will contribute cumulatively to an 'in combination' effect when considered alongside the housing that will be delivered in other districts along this corridor. Nonetheless, it must be acknowledged that road transport is likely to remain a relatively minor contributor to nitrogen deposition on the site as a whole.

8.4.18 According to APIS, the nightjar is likely to be relatively impervious to habitat deterioration due to increased nitrogen deposition, but the woodlark and Dartford warbler require a large, unbroken dwarf-shrub layer, mainly heather and gorse for nesting and feeding. Deterioration of heathland due to increased competition by coarser more invasive scrub and grasses will also lead to adverse effects on Woolmer Forest SAC.

8.4.19 An extensive interim transport assessment has been prepared (WSP, 2008) in order to inform Whitehill & Bordon masterplan proposals, containing broad predictions of traffic increases on the A325 and A3 in the Whitehill & Bordon area, in advance of the development of a multi-modal model. The combination of adjusted existing plus additional Eco-town a.m. peak traffic flows northbound on the A3, during results in a maximum change in traffic flows of +9% for northbound trips north of the junction with the A325.

8.4.20 In consultation on Core Strategies for surrounding local authorities, Natural England have referred to the following document for mitigation measures that could be included in Core Strategies: http://www.westlondonairquality.org.uk/uploads/documents/Best%20Practice%20Guide/WLA%20Best%20Practice%20Air%20Quality%20and%20Transport%20Guide%2020051.pdf.

8.4.21 The report identifies four broad types of mitigation measure:

- Behavioural measures and modal shift - reducing the amount of traffic overall;
- Traffic management - modifying traffic behaviour to control where emissions are generated;
- Emissions reduction at source - reducing the emissions level per vehicle; and

- Roadside barriers - reducing the impact on the public of emissions.

8.4.22 The measures identified in the policy on transport (CP29) cover all of these categories, except for the fourth (roadside barriers) which is not within the remit of local planning policy. The Joint Core Strategy does contain positive measures that should aim to mitigate or avoid the likelihood of significant adverse effects from reduced air quality on the SPA:

- Improve pedestrian and road safety;
- Promote integrated transport;
- Improve access to town and village centres … include improvements of routes for walking, cycling and public transport;
- Help tackle rural accessibility problems by non-transport improvements such as increasing services direct to residents ...
- Promotion of train and bus access to the district …
- Support the development of joined-up routes for non-motorised transport; and
- Improvements to make existing paths, tracks and roads more user friendly.

8.4.23 This is in addition to the sustainable transport initiatives set out in the Hampshire Local Transport Plan. In line with the Local Transport Plan a transport objective will be to improve air quality.

8.4.24 For those sustainable transport measures which are available at the strategic planning level, it is not possible to predict in advance the precise quantum of improvement that can be delivered by a given mitigation measure due to both the novel nature of the mitigation tools available and the limitations of the science. Vegetative changes that theory identifies as being likely to result from changes (either negative or positive) in atmospheric nitrogen deposition can fail to appear in practice since they are relatively subtle and can be dwarfed by changes in management regime. Moreover, it is rarely possible to separate the effects of atmospheric nitrogen deposition and other causes and the effects of atmospheric nitrogen deposition arising from vehicle exhausts from those arising from other sources (e.g. agriculture). For example, a policy to 'require developers to produce travel plans indicating that they have maximised opportunities for sustainable transport' may prove effective in practice, but cannot be predictively linked to a specific scale of improvement of air quality.

8.4.25 It is therefore important that where air quality problems are identified there is also a mechanism established to monitor the effectiveness of the measures adopted (using the critical load/level as a monitoring target against which the success or failure of mitigation measures can be evaluated) and amend them as required.

8.4.26 This is in line with the precautionary principle as set out in EC Guidance[75] on its use:

8.4.27 '*If a preliminary scientific evaluation shows that there are reasonable grounds for concern that a particular activity might lead to damaging effects on the environment, or on human, animal or plant health, which would be inconsistent with the protection normally afforded to these within the European Community, the Precautionary Principle is triggered.*

8.4.28 *Decision-makers then have to determine what action to take. They should take account of the potential consequences of taking no action, the uncertainties inherent in the scientific*

[75] European Commission (2000): Communication from the Commission on the use of the Precautionary Principle.

evaluation, and they should consult interested parties on the possible ways of managing the risk. Measures should be proportionate to the level of risk, and to the desired level of protection. They should be provisional in nature pending the availability of more reliable scientific data.

8.4.29 *Action is then undertaken to obtain further information enabling a more objective assessment of the risk. The measures taken to manage the risk should be maintained so long as the scientific information remains inconclusive and the risk unacceptable'*.

8.4.30 This is addressed in the Joint Core Strategy by Policy CP25 (Pollution) which states that *'Any development which is likely to lead to a significant effect on an internationally designated site is required to undertake an appropriate assessment under the Habitats Regulations. As part of any mitigation/avoidance package any impacts on air quality will require a regime for continued air quality monitoring to be set up before, and for a number of years after, the introduction of any mitigation measures'.* The supporting text for the Policy goes on to state that '*To avoid potential impacts of new development and increased traffic levels on internationally designated nature conservation sites Policy CP25 seeks to ensure that adequate measures are in place to avoid or mitigate any potential adverse effects. One form of avoidance is that the Council and the National Park Authority will need to explore with other local authorities (e.g. Waverley Borough Council) a framework for undertaking air quality monitoring along the main roads that traverse the Wealden Heaths. The monitoring is required before and for a number of years after the introduction of sustainable transport measures, such that further measures can be devised if air quality does not improve. The monitoring also forms part of the avoidance/mitigation package set out for the development at Whitehill & Bordon'.*

8.4.31 While not mitigation in itself, monitoring is an essential factor when dealing with an issue such as air quality which has a high degree of uncertainty, since it will enable the effectiveness of air quality improvement measures to be evaluated and amended over the Joint Core Strategy period. Therefore it can be concluded that an adequate policy framework is in place to ensure that there will be no likely significant effects on the Thursley, Hankley & Frensham Commons (Wealden Heaths Phase 1) SPA from the Joint Core Strategy through the pathway of atmospheric pollution either alone or in combination with other plans and projects.

8.5 Conclusion

8.5.1 It has been possible to determine that significant water resource, air quality and recreational pressure effects are unlikely to occur as a result of Joint Core Strategy development.

9 Solent European Sites

9.1 Introduction

9.1.1 There are several overlapping designations that cover the Solent. Although they have different interest features, the environmental conditions necessary to ensure their continuing favourable conservation status are similar as are the potential impacts of development in East Hampshire district. In order to reduce repetition, they are therefore considered collectively in this chapter.

9.1.2 These sites covered by this chapter are:

- Solent Maritime SAC;
- Portsmouth Harbour SPA and Ramsar site; and
- Chichester & Langstone Harbours SPA and Ramsar site.

9.1.3 Although the Solent & Southampton Water SPA and Ramsar site is also overlapped by the Solent Maritime SAC, it is considerably further from East Hampshire than the other components identified above and it is unlikely therefore that it will attract significant numbers of visitors from the district when compared to them.

9.2 Reasons for Designation

Solent Maritime SAC

9.2.1 Solent Maritime qualifies as a SAC for both habitats and species. Firstly, the site contains the following Habitats Directive Annex I habitats:

- Estuaries
- Cord-grass swards (*Spartina* swards *Spartinion maritimae*)
- Atlantic salt meadows (*Glauco-Puccinellietalia maritimae*)
- Subtidal sandbanks (sandbanks which are slightly covered by seawater all the time)
- Intertidal mudflats and sandflats (mudflats and sandflats not covered by seawater at low tide)
- Lagoons (coastal lagoons)
- Annual vegetation of drift lines
- Coastal shingle vegetation outside the reach of waves (perennial vegetation of stony banks)
- Glasswort and other annuals colonising mud and sand (*Salicornia* and other annuals colonising mud and sand)
- Shifting dunes with marram (shifting dunes along the shoreline with *Ammophila arenaria* 'white dunes')

9.2.2 Secondly, the site contains the following Habitats Directive Annex II species:

- Desmoulin's Whorl Snail *Vertigo moulinsiana*

Portsmouth Harbour SPA and Ramsar site

9.2.3 Portsmouth Harbour qualifies as a SPA for its passage bird species. The site contains:

- Dark-bellied Brent Goose *Branta bernicla bernicla*, 2,847 individuals representing at least 0.9% of the wintering Western Siberia/Western Europe population (5 year peak mean 1991/2 - 1995/6)

9.2.4 Portsmouth Harbour qualifies as a Ramsar as illustrated in Table 11.

Table 11: Portsmouth Harbour Ramsar site criteria

Ramsar criterion	Description of Criterion	Portsmouth Harbour
3	A wetland should be considered internationally important if it supports populations of plant and/or animal species important for maintaining the biological diversity of a particular biogeographic region.	The intertidal mudflat areas possess extensive beds of eelgrass *Zostera angustifolia* and *Zostera noltei* which support the grazing dark-bellied brent geese populations. The mud-snail *Hydrobia ulvae* is found at extremely high densities, which helps to support the wading bird interest of the site. Common cord-grass *Spartina anglica* dominates large areas of the saltmarsh and there are also extensive areas of green algae *Enteromorpha* spp. and sea lettuce *Ulva lactuca*. More locally the saltmarsh is dominated by sea purslane *Halimione portulacoides* which gradates to more varied communities at the higher shore levels. The site also includes a number of saline lagoons hosting nationally important species.
6	A wetland should be considered internationally important if it regularly supports 1% of the individuals in a population of one species or subspecies of waterbird.	Dark-bellied brent goose, *Branta bernicla bernicla*, 2105 individuals, representing an average of 2.1% of the GB population (5 year peak mean 1998/9-2002/3)

Chichester & Langstone Harbours SPA & Ramsar site

9.2.5 Chichester and Langstone Harbours qualify as a SPA for their breeding, passage and wintering bird species. As breeding species the site contains:

- Little Tern *Sterna albifrons*, 100 pairs representing up to 4.2% of the breeding population in Great Britain (5 year mean, 1992-1996)
- Sandwich Tern *Sterna sandvicensis*, 158 pairs representing up to 1.1% of the breeding population in Great Britain (1998)

9.2.6 On passage:

- Little Egret *Egretta garzetta*, 137 individuals representing up to 17.1% of the population in Great Britain (Count as at 1998)
- Ringed Plover *Charadrius hiaticula*, 2,471 individuals representing up to 4.9% of the Europe/Northern Africa - wintering population (5 year peak mean 1991/2 - 1995/6)

9.2.7 Overwintering:

- Bar-tailed Godwit *Limosa lapponica*, 1,692 individuals representing up to 3.2% of the wintering population in Great Britain (5 year peak mean 1991/2 - 1995/6)
- Little Egret *Egretta garzetta*, 100 individuals representing up to 20.0% of the wintering population in Great Britain (Count as at 1998)
- Black-tailed Godwit *Limosa limosa islandica*, 1,003 individuals representing up to 1.4% of the wintering Iceland - breeding population (5 year peak mean 1991/2 - 1995/6)
- Dark-bellied Brent Goose *Branta bernicla bernicla*, 17,119 individuals representing up to 5.7% of the wintering Western Siberia/Western Europe population (5 year peak mean 1991/2 - 1995/6)
- Dunlin *Calidris alpina alpina*, 44,294 individuals representing up to 3.2% of the wintering Northern Siberia/Europe/Western Africa population (5 year peak mean 1991/2 - 1995/6)
- Grey Plover *Pluvialis squatarola*, 3,825 individuals representing up to 2.5% of the wintering Eastern Atlantic - wintering population (5 year peak mean 1991/2 - 1995/6)
- Redshank *Tringa totanus*, 1,788 individuals representing up to 1.2% of the wintering Eastern Atlantic - wintering population (5 year peak mean 1991/2 - 1995/6)
- Ringed Plover *Charadrius hiaticula*, 846 individuals representing up to 1.7% of the wintering Europe/Northern Africa - wintering population (5 year peak mean 1991/2 - 1995/6)

9.2.8 The site also qualifies as it regularly supports 93,142 individual waterfowl (5 year peak mean 1991/2 - 1995/6)

9.2.9 Chichester and Langstone Harbours qualify as a Ramsar as illustrated in Table 12.

Table 12: Chichester and Langstone Harbours Ramsar site criteria

Ramsar criterion	Description of Criterion	Chichester and Langstone Harbours
1	A wetland should be considered internationally important if it contains a representative, rare, or unique example of a natural or near-natural wetland type found within the appropriate biogeographic region.	Two large estuarine basins linked by the channel which divides Hayling Island from the main Hampshire coastline. The site includes intertidal mudflats, saltmarsh, sand and shingle spits and sand dunes.
5	A wetland should be considered internationally important if it regularly supports assemblages of waterbirds of international importance.	76,480 waterfowl (5-year peak mean 1998/99 – 2002/03).
6	A wetland should be considered	*Species with peak counts in spring/autumn*:

	internationally important if it regularly supports 1% of the individuals in a population of one species or subspecies of waterbird.	Ringed plover *Charadrius hiaticula*: 853 individuals, representing an average of 1.1% of the population (5-year peak mean 1998/99 – 2002/03). Black-tailed godwit *Limosa limosa islandica*: 906 individuals, representing an average of 2.5% of the population (5-year peak mean 1998/99 – 2002/03). Common redshank *Tringa totanus totanus*: 2577 individuals, representing an average of 1% of the population (5-year peak mean 1998/99 – 2002/03). *Species with peak counts in winter:* Dark-bellied brent goose *Branta bernicla bernicla*: 12,987 individuals, representing an average of 6% of the populations (5-year peak mean 1998/99 – 2002/03). Common shelduck *Tadorna tadorna*: 1,468 individuals, representing an average of 1.8% of the GB population (5-year peak mean 1998/99 – 2002/03). Grey plover *Pluvialis squatarola*: 3,043 individuals, representing an average of 1.2% of the population (5-year peak mean 1998/99 – 2002/03). Dunlin *Calidris alpina alpina*: 33,436 individuals, representing an average of 2.5% of the population (5-year peak mean 1998/99 – 2002/03). *Species regularly supported during the breeding season:* Little tern *Sterna albifrons albifrons*: 130 apparently occupied nests, representing an average of 1.1% of the breeding populations (Seabird 2000 census)[76]

9.3 Historic Trends and Current Pressures

Solent Maritime SAC

9.3.1 The Solent Maritime SAC has a number of physical constraints including existing and flood defence and coast protection works that, coupled with predictions of rising sea levels may lead to coastal squeeze of intertidal habitats. Developmental pressures including ports, marinas, jetties etc, often involve capital/ maintenance dredging to provide/improve deep water access, and land-claim of coastal habitats. Such development along with ongoing port activities leads to an increased risk of accidental pollution from shipping, oil/chemical spills, heavy industrial activities, former waste disposal sites and waste water discharge, while there is risk of introduction of non-native species e.g. from shipping activity.

9.3.2 Solent Maritime SAC suffers from nutrient enrichment[77], which causes excessive growth of green weed across the site. This green weed can form dense mats within the intertidal areas throughout sheltered areas of the site, inhibiting the natural functioning of these habitats. There is evidence of toxic contamination within certain areas of the site, including tri-butyl tin (TBT) at the head of Southampton Water and in the middle of the Solent, arising from historic use as an anti-fouling paint on boats. The Review of Consents process has identified an area of thermal

[76] Species identified subsequent to designation for future possible consideration.
[77] http://www.environment-agency.gov.uk/static/documents/Business/solent_maritime_sac_1885867.pdf

pollution occurring over the shallow intertidal zone on the western shore of Southampton Water. Thermal plumes may affect the distribution of fish. There are areas of organic enrichment on the western shore of Southampton Water. This can make sediments anaerobic which can effect the distribution or composition of designated habitats.

9.3.3 Reductions in freshwater flows into the SAC may pose a risk to site's integrity. Estuaries are a very important feature of the site and implicitly require some freshwater input. It is also widely agreed that small freshwater flows may also be important to intertidal SAC habitats.

9.3.4 Changes in groundwater levels resulting from abstraction of groundwater have also been assessed as high groundwater levels throughout the year are considered to be one of the most important factors influencing the distribution of the Desmoulin's Whorl Snail, specific to Chichester Harbour.

9.3.5 These issues have been and are being addressed through a number of mechanisms including the review of consents procedure under the Habitats Regulations, Biodiversity Action Plans, and other coastal strategies, management plans and management agreements. In 2000, a collaborative Solent European Marine Sites project was set up with the aim of developing a strategy for managing the marine and coastal resources of the Solent in a more integrated and sustainable way[78].

Portsmouth Harbour SPA & Ramsar site

9.3.6 Portsmouth Harbour SPA/Ramsar has a number of physical constraints including existing and flood defence and coast protection works that, coupled with predictions of rising sea levels may lead to coastal squeeze of intertidal habitats. Coastal squeeze is already considered an issue within the site. Developmental pressures including ports, marinas, jetties etc, often involve capital/ maintenance dredging to provide/ improve deep water access, and land-claim of coastal habitats. Small areas of the SPA/Ramsar have been lost in the recent past to dredging operations. Such development along with ongoing port activities leads to an increased risk of accidental pollution from shipping, oil/chemical spills, heavy industrial activities, former waste disposal sites and waste water discharge, while there is risk of introduction of non-native species e.g. from shipping activity.

9.3.7 Along with much of the Solent, the SPA and Ramsar suffers from nutrient enrichment, which causes excessive growth of green weed. This green weed can form dense mats within the intertidal areas throughout sheltered areas of the site, inhibiting the natural functioning of these habitats. Tri-butyl tin (TBT) concentrations exceed the Environment Quality Standard for this substance throughout the site and are thought to be present due to their historic use as an anti-fouling paint on boats.

9.3.8 Licenced abstractions which take significant amounts of water from the harbour's catchment pose a risk to the site. They may reduce the volume and rate of freshwater flowing across the intertidal areas.

9.3.9 These issues have been and are being addressed through a number of mechanisms including the review of consents procedure under the Habitats Regulations, Biodiversity Action Plans, and other coastal strategies, management plans and management agreements. In 2000, a collaborative Solent European Marine Sites project was set up with the aim of developing a strategy for managing the marine and coastal resources of the Solent in a more integrated and sustainable way.

[78] www.solentems.org.uk/

Chichester & Langstone Harbours SPA & Ramsar site

9.3.10 Langstone Harbour is fringed by urban and industrial development, whereas Chichester is surrounded mainly by high grade farmland. The site is subjected to significant recreational pressures, especially during summer months.

9.3.11 Effluent discharges and agricultural run-off can lead to localised eutrophication problems although recent studies carried out by the Environmental Agency have shown that elevated nutrient levels are maintained by inputs from coastal waters.

9.3.12 Sea-level rise and 'coastal squeeze' are significant threats to the long-term maintenance of habitat diversity and structural integrity. Incremental loss of fringing habitats and transitional communities is a threat as hard coastal defences are maintained by riparian land-owners.

9.3.13 Both harbours are managed by statutory bodies whose remits include conservation of the natural environment. Conservation bodies have an advisory input to the management of the harbours, and play an active role in the management of numerous Local Authority and RSPB nature reserves around the site. In 2000, a collaborative Solent European Marine Sites project was set up with the aim of developing a strategy for managing the marine and coastal resources of the Solent in a more integrated and sustainable way.

9.3.14 During the 2008 condition assessment process, Natural England recorded that both Chichester and Langstone Harbours were currently suffering from reduced water quality, partly due to discharge, and from coastal squeeze.

Environmental conditions

9.3.15 The key environmental conditions of this complex of European sites are mainly:

- Sufficient space between the site and development to allow for managed retreat of intertidal habitats and avoid coastal squeeze.
- No dredging or land-claim of coastal habitats.
- Unpolluted water.
- Absence of nutrient enrichment.
- Absence of non-native species.
- Maintenance of freshwater inputs.
- Balance of saline and non-saline conditions.
- Maintenance of grazing.
- Sufficient space between the site and development to allow for managed retreat of intertidal habitats and avoid coastal squeeze.
- Short grasslands surrounding the site are essential to maintaining interest features as they are now the key foraging resource for Brent goose.

9.4 Effects of the Joint Core Strategy

9.4.1 These are described below, against each potential impact. Since the southern-most settlement in East Hampshire (Horndean) lies 6.5km north of the Solent European sites at its closest (with

Rowlands Castle approximately 5km to the north of the Solent European sites), urbanisation and coastal squeeze impacts, while both important for the Solent sites, are unlikely to arise from development in East Hampshire District and are therefore not considered further.

Recreational Pressure

9.4.2 The key features for which SAC is designated are unlikely to be significantly damaged by recreational impacts, and so recreational pressure may be screened out as a pathway that could lead to a likely significant impact on the SAC. However, the two Special Protection Areas/ Ramsar sites identified above (Chichester & Langstone Harbours and Portsmouth Harbour) have interest features (principally the wintering bird interest) that are certainly likely to be vulnerable to recreational disturbance. Although recreational activity arising from southern East Hampshire may not alone prove significant, it is likely to be significant when considered 'in combination' with that arising from the rest of the South Hampshire sub-region.

9.4.3 The Solent provides locations for a wide range of recreational activities. In contrast to the long-term datasets on bird population sizes, there seems to be little systematic monitoring of recreational access and little information to determine how patterns of access have changed over time and how they may change in the future.

9.4.4 Disturbance levels within Chichester & Langstone Harbours SPA are generally high (particularly in Chichester Harbour). Water-based recreation causes disturbance in parts of the Harbour and encourages birds to move to the heads of the channels and smaller creeks where water depths are too shallow to allow boat movement. These are often areas favoured by the birds for other reasons: they are the areas where the intertidal mudflats are exposed for the longest periods, they provide shelter in times of storm, and they provide freshwater areas of importance for the birds. In these areas, disturbance is related more to walkers and their dogs passing along the shoreline. In some places, the footpaths along the channels are on the tops of flood defences, enhancing the potential for disturbance as the walker is silhouetted against the sky; elsewhere, the paths are partially concealed behind tall hedges.

9.4.5 This has potential to cause disturbance to bird species for which the site is designated, as outlined in section 3.3.

9.4.6 Table 13 highlights tolerance distances to land-based recreational disturbance for some of the species for which the Solent SPA's/Ramsar sites are designated.

Table 13 - Tolerance distances of water bird species to land-based recreational disturbance, as described in the literature. All distances are in metres. [2] Keller (1989), [3] Van der Meer (1985), [4] Wolff et al (1982)[79]

Species	Walking
Grey plover	124 [3]
Ringed plover	121 [3]
Bar-tailed godwit	107 [3]; 219 [4]
Brent goose	105 [3]

[79] Keller, V. 1989. Variations in the response of Great Crested Grebes *Podiceps cristatus* to human disturbance - a sign of adaptation? *Biological Conservation* 49:31-45
Van der Meer, J. 1985. *De verstoring van vogels op de slikken van de Oosterschelde*. Report 85.09 Deltadienst Milieu en Inrichting, Middelburg. 37 pp.
Wolf, W.J., Reijenders, P.J.H. & Smit, C.J. 1982. The effects of recreation on the Wadden Sea ecosystem: many questions but few answers. In: G. Luck & H. Michaelis (Eds.), *Schriftenreihe M.E.L.F., Reihe A: Agnew. Wissensch* 275: 85-107

Species	Walking
Dunlin	71 [3]; 163 [2]

9.4.7 The Solent Forum project is currently investigating recreational pressure issues and their mitigation[80] reviews the policies in the South East Plan for new housing within the local authority areas bordering the Solent SPA, SAC and Ramsar Sites and changes to the Plan that have been proposed by the Secretary of State to protect and enhance biodiversity. Phase 1 of this project has:

- Collated existing data on the distribution of housing and human activities around the Solent;
- Assessed stakeholder opinion of the importance of recreational disturbance on birds through a series of workshops and interviews;
- Collated data on bird distribution and abundance around the Solent; and
- Outlined the range of mitigation measures that could potentially minimise the impacts of increased recreational disturbance caused by increased housing in the Solent area.

9.4.8 Phase 2 of the project has assessed the impact of current visitor numbers and activities on the survival rates of shorebirds throughout the Solent[81]. Visitor surveys were undertaken during 2009/10 at a number of locations around the harbours. In contrast to the previous study[56] most visitors were local in origin, with median distances travelled to points around the harbours ranging from 2.3-9.1km. A core catchment area for the Solent European sites has been identified at 5.6km.

9.4.9 Only the southern-most tip of Rowlands Castle lies within 5.6km of the Solent European sites. Rowlands Castle will receive 150 uncommitted dwellings under the new preferred option. Given this small number of dwellings and the fact that Rowlands Castle lies on the outskirts of the identified core catchment it can be concluded that it is unlikely that development in East Hampshire will lead to a significant adverse effect on the Solent European sites through recreational pressure, even in combination with other plans and projects.

9.4.10 Nonetheless, East Hampshire District Council already participates in the Partnership for Urban South Hampshire and through this forum will continue to support the Solent Forum in its recreational disturbance research and site management activities.

9.4.11 Policy CP20 regarding the protection of internationally important sites specifically states that '*To help protect the Solent SPA, SAC and Ramsar sites along the coast the Council will work with local authorities to monitor the progress of ongoing assessments and recreational management studies being undertaken by the Solent Forum on these sites. Planning permission will only be granted for development that responds to the emerging evidence from the Solent Disturbance and Mitigation Project, the published recommendations, and future related research*'.

9.4.12 Since the Solent Disturbance and Mitigation Project is the agreed forum for addressing these issues, the inclusion of a clear policy commitment to that project enables us to conclude that significant effects on the Solent European sites through recreational pressure is unlikely.

[80] Stillman, R. A., Cox, J., Liley, D., Ravenscroft, N., Sharp, J. & Wells, M. (2009) Solent disturbance and mitigation project: Phase I report. Report to the Solent Forum
[81] Fearnley, H., Clarke, R. T. & Liley, D. (2010). The Solent Disturbance & Mitigation Project. Phase II - On-site visitor survey results from the Solent region. ©Solent Forum /Footprint Ecology.

Water Resources

9.4.13 Water supplies to the southern part of East Hampshire district are supplied by Portsmouth Water. This area lies within WRZ1 which is largely dependent on groundwater supplies, with a single significant surface water supply from the River Itchen.

9.4.14 Havant Thicket Reservoir (off the B2149 between Horndean and Rowlands Castle) is a winter storage reservoir advocated within the policy on Water Resources/Quality (CP24). This will store surplus water from the springs at Havant & Bedhampton Springs, which during the winter and spring, would otherwise flow into Langstone Harbour. This reservoir could theoretically reduce flows into the internationally designated site. However, the planning application is currently on hold and the reservoir is not likely to commence until 2025 with completion expected by 2035.

9.4.15 In addition, the Council has a number of measures within its policies that will help to reduce demand on water resources:

- **CP22 - Sustainable Construction:** "*Planning permission will only be granted for development … which on completion meets the following minimum Code for Sustainable Homes threshold level … 3 until end of 2012, 4 from 2013 and 5 from 2016*."
- **CP24 - Water Resources and Quality:** "*Development will be required to protect the quality and quantity of water, and make efficient use of water. Development will only be permitted where: a) it protects and enhances the quality and quantity of groundwater, surface water features and controls aquatic pollution to help to achieve the requirements of the European Water Framework Directive … b) it has an adequate means of water supply (even in a drought), sufficient foul and surface water drainage and adequate sewage treatment capacity. Development must be phased to take into account the timing of any water and/or sewerage infrastructure required which should be in place prior to the occupation of development'*.

9.4.16 Adverse water supply/flow impacts as a result of Joint Core Strategy development are therefore unlikely.

Water Quality

9.4.17 The corollary of increased water abstraction to supply new development in East Hampshire is that there will be increased pressure on waste water and sewerage infrastructure capacity. The southern-most part of East Hampshire district (including Clanfield, Horndean and Rowlands Castle) is serviced by Budd's Farm Sewage Treatment Works (STW) in Havant. This STW discharges treated effluent to watercourses that drain into the Solent Maritime SAC and Chichester & Langstone Harbours SPA.

9.4.18 The emerging River Basin Management Plan for the south-east notes that a number of European sites are currently suffering from reduced water quality as a result of discharges. These include the Solent Maritime SAC and the Special Protection Areas and Ramsar sites that overlap with the designation. Nutrient enrichment does cause considerable problems on the south coast (particularly in the Solent) due to the abundance of smothering macroalgae that is produced in an environment of relatively high water temperatures, low sediment loading and limited wave action to break up algal mats.

9.4.19 In its Review of Consents Stage 4 process, the EA identified that some discharge and abstraction consents will require modification in order to reduce such impacts at Solent Maritime SAC and it is therefore likely that future development throughout South Hampshire will

result in additional requirements to tighten discharge permissions. However, according to the Joint Core Strategy, treatment works have been deemed adequate for current and future needs. A study into Water Resources and Waste Water Management in Hampshire to 2026 has not indicated any predicted issues with capacity at works that service the south of the district.

9.4.20 Moreover, the Council and the National Park Authority include a number of policies within the Joint Core Strategy that reduce the likelihood of reduced water quality leading to an impact on Solent Maritime SAC:

- **CP24 - Water Resources and Quality:** "*Development will be required to protect the quality and quantity of water, and make efficient use of water. Development will only be permitted where: a) it protects and enhances the quality and quantity of groundwater, surface water features and controls aquatic pollution to help to achieve the requirements of the European Water Framework Directive … b) it has an adequate means of water supply (even in a drought), sufficient foul and surface water drainage and adequate sewage treatment capacity. Development must be phased to take into account the timing of any water and/or sewerage infrastructure required which should be in place prior to the occupation of development*'.

9.4.21 Given the above, it is considered that an adequate policy framework already exists for the avoidance of adverse water quality effects on the Solent European sites.

Air Quality

9.4.22 The northern limits of the Solent European sites are adjacent to major roads (M27 and A27) that could lead to nitrogen deposition and reduction of quality of some of the habitats supporting the bird life for which the sites were designated. Development of over 800 new dwellings within the likely recreational catchment of the Solent will inevitably contribute to increased traffic on these roads, since they are easily accessed from the A3, the main arterial route in East Hampshire.

9.4.23 Taken in the context of over 100,000 net increase in dwellings across South Hampshire and the rest of Hampshire by 2026, there is potential for significant impact upon the SPA. At points close to the A27, the SPA/Ramsar is already suffering exceedance of critical NOx thresholds (see Table 14).

Table 14. Summary of atmospheric pollutant levels and critical loads affecting Chichester and Langstone Harbours SPA. Red shading indicates exceedance of thresholds.

Site	Grid reference	Most nitrogen sensitive habitat	Minimum critical loads (kg N/ha/yr)	Actual nitrogen deposition (kg N/ha/yr)	Actual NOx concentration (μgm^{-3})	Actual SO_2 concentration (μgm^{-3})
Chichester and Langstone Harbours SPA/Ramsar	SU686046	Saltmarsh	20-30	14.56	34.8	6.5

9.4.24 An extensive transport assessment has been prepared on behalf of the four south-east Hampshire local authorities: Portsmouth, Fareham, Gosport and Havant and is reported in the Portsmouth Core Strategy HRA (UE Associates, 2010). The assessment uses pre-existing transport models, together with additional validating data and details of strategic housing, employment and retail development across the four authority areas and beyond. It makes predictions of traffic flow increases up to 2026 as a result of planned development. The assessment uses 22 key junctions to illustrate projected traffic growth, two of which are within 200m of Solent Maritime SAC and Chichester and Langstone Harbours SPA/Ramsar at Farlington and Broadmarsh.

9.4.25 The figures reported in the Portsmouth Core Strategy HRA demonstrate that increases in traffic on the strategic road network as a consequence of Core Strategy development in Portsmouth, in combination with that of Fareham, Gosport and Havant, will not have an adverse effect on the integrity of Solent Maritime SAC or Chichester and Langstone Harbours SPA/Ramsar as a result of air pollution at Farlington. Increases in traffic flow at Broadmarsh are greater but, with the addition of public transport measures including some proposed within the Core Strategy, the predicted increase by 2026 from South Hampshire is still unlikely to lead to significant effects.

9.4.26 Partly on the basis of this conclusion, the Portsmouth and Havant Core Strategies have since been adopted. Given that traffic movements along the M27/A27 corridor will be overwhelmingly dominated by vehicles arising from Portsmouth, Fareham, Gosport and Havant, additional traffic contributions due to East Hampshire will be minimal.

9.4.27 Moreover, the policy on transport (CP29) lists a range of measures that will be implemented to maximise sustainable transport:

- Improve pedestrian and road safety;
- Promote integrated transport;
- Improve access to town and village centres … include improvements of routes for walking, cycling and public transport;
- Help tackle rural accessibility problems by non-transport improvements such as increasing services direct to residents ...
- Promotion of train and bus access to the district …
- Support the development of joined-up routes for non-motorised transport; and
- Improvements to make existing paths, tracks and roads more user friendly.

9.4.28 This is in addition to the sustainable transport initiatives set out in the Hampshire Local Transport Plan. In line with the Local Transport Plan a transport objective will be to improve air quality.

9.4.29 Given these measures and the relatively small contribution that vehicle emissions arising from East Hampshire are likely to make to nitrogen deposition within the Solent European sites (compared to that arising from Havant, Portsmouth, Fareham and Gosport together) it is considered unlikely that a significant effect will occur even in combination.

9.5 Conclusions

9.5.1 It has been possible to determine that significant water quality, water resource and air quality effects are unlikely to occur as a result of Joint Core Strategy development and that the Council's ongoing commitment to the Solent Disturbance and Mitigation project will enable adequate strategic mitigation to be delivered for recreational pressure.

10 Solent and Isle of Wight Lagoons SAC

10.1 Introduction

10.1.1 The Solent on the south coast of England encompasses a series of coastal lagoons, including percolation, isolated and sluiced lagoons. The SAC lies 3.2km from the boundary of East Hampshire district at its closest point. The site includes a number of lagoons in the marshes in the Keyhaven – Pennington area, at Farlington Marshes in Chichester Harbour, behind the sea-wall at Bembridge Harbour and at Gilkicker, near Gosport. The lagoons show a range of salinities and substrates, ranging from soft mud to muddy sand with a high proportion of shingle, which support a diverse fauna including large populations of three notable species: the nationally rare foxtail stonewort *Lamprothamnium papulosum*, the nationally scarce lagoon sand shrimp *Gammarus insensibilis*, and the nationally scarce starlet sea anemone *Nematostella vectensis*.

10.1.2 The lagoons in Keyhaven – Pennington Marshes are part of a network of ditches and ponds within the saltmarsh behind a sea-wall. Farlington Marshes is an isolated lagoon in marsh pasture that, although separated from the sea by a sea-wall, receives sea water during spring tides. The lagoon holds a well-developed low-medium salinity insect-dominated fauna. Gilkicker Lagoon is a sluiced lagoon with marked seasonal salinity fluctuation and supports a high species diversity. The lagoons at Bembridge Harbour have formed in a depression behind the sea-wall and sea water enters by percolation. Species diversity in these lagoons is high and the fauna includes very high densities of *N. vectensis*.

10.2 Reasons for Designation

10.2.1 Solent and Isle of Wight lagoons qualifies as a SAC for the following Habitats Directive Annex I habitat:

- Lagoons: for which this is considered to be one of the best areas in the United Kingdom.

10.3 Historic Trends and Current Pressures

10.3.1 Various factors affect, or potentially threaten, the Solent and Isle of Wight Lagoons SAC. These include reduced water quality due to industrial waste disposal/landfill/discharges and diffuse pollution occurring off the site, the effects of sea-level rise, and coastal defence - water level management/sluice maintenance.

10.3.2 The EA Review of Consents process has found that Pennington lagoons are at risk from salinity, elevated nutrients and toxic contamination, while Bembridge lagoons were found to be at risk from elevated nutrients only.

10.3.3 These issues are being addressed through a number of mechanisms including Biodiversity Action Plans, Water Level Management Plans and management agreements. In 2000, a collaborative Solent European Marine Sites project was set up with the aim of developing a strategy for managing the marine and coastal resources of the Solent in a more integrated and sustainable way.

10.3.4 The key environmental conditions of the SAC are mainly:

- Salinity is the key water quality parameter for these lagoons. Therefore the relative balance of saltwater to freshwater inputs is critical. At the moment, most of these lagoons are considered to have a salt concentration that is below the desirable level (15 – 40%).
- Sufficient space between the site and development to allow for managed retreat of intertidal habitats and avoid coastal squeeze.
- No dredging or land-claim of coastal habitats.
- Unpolluted water.
- Absence of nutrient enrichment.
- Absence of non-native species.

10.4 Effects of the Joint Core Strategy

10.4.1 These are described below, against each potential impact.

Water Resources

The lagoons are typically supplied with freshwater by small streams that feed into them. Water supplies to the southern part of East Hampshire district are supplied by Portsmouth Water. This area is supplied by the WRZ1 of the company, and is largely dependent on groundwater supplies, with a single significant surface water supply from the River Itchen.

10.4.2 WRZ1 within the district and the overlapping East Hampshire CAMS WRMUs (Wallington, Portsdown and Butser Chalk; River Wallington; River Meon) do not overlap with Solent and Isle of Wight Lagoons SAC. Therefore the only way in which water resources for East Hampshire district can have an impact on the SAC is if there is an indirect effect of groundwater abstraction from WRZ1 on the surface waters that run into the lagoons. Groundwater from the CAMS unit underlying the area including Horndean feeds springs and rivers which flow into Chichester and Langstone Harbours where there are lagoons that form part of the SAC. In its latest Review of Consents Process (Stage 4), the EA has not revoked or amended any licences for abstraction on the basis of effects on Solent and Isle of Wight Lagoons SAC.

10.4.3 Adverse effects of the Joint Core Strategy are therefore considered unlikely.

Water Quality

10.4.4 These lagoons are generally vulnerable only to direct discharges, due to their physical separation from other waterbodies. If these discharges of freshwater are substantial, they can reduce the salinity of the lagoons.

10.4.5 In its most recent review of consents process, the EA deemed it necessary to modify discharge licences affecting lagoons on the Isle of Wight only.

10.4.6 Given that these lagoons lie outside of the East Hampshire district boundary, direct discharge to them is not possible, and so there is no obvious mechanism by which policies in the Joint Core Strategy could have a significant impact on Solent and Isle of Wight Lagoons via reduced water quality.

10.5 Conclusions

10.5.1 It is possible to conclude significant effects of the Joint Core Strategy on Solent and Isle of Wight Lagoons SAC are unlikely to occur.

11 River Itchen SAC

11.1 Introduction

11.1.1 This site comprises chalk stream and river, fen meadow, flood pasture and swamp habitats, particularly formations of in-channel vegetation dominated by water crowfoot *Ranunculus* spp, riparian vegetation communities (including wet woodlands) and side channels, runnels and ditches associated with the main river and former water meadows. There are significant populations of the nationally-rare southern damselfly *Coenagrion mercuriale* and assemblages of nationally-rare and scarce freshwater and riparian invertebrates, including the white-clawed crayfish *Austropotamobius pallipes*. Other notable species include otter *Lutra lutra*, water vole *Arvicola terrestris*, freshwater fishes including bullhead *Cottius gobbo*, brook lamprey *Lampetra planeri* and Atlantic salmon *Salmo salar*. A good range of wetland bird species breed.

11.2 Reasons for Designation

11.2.1 The River Itchen qualifies as a SAC for both habitats and species. Firstly, the site contains the Habitats Directive Annex I habitat:

- Rivers with floating vegetation often dominated by water crowfoot: The Itchen is a classic example of a sub-type 1 chalk river.

11.2.2 Secondly, the SAC also contains the following Annex II species:

- Southern damselfly: Representing one of the major population centres in the UK
- Bullhead: High densities occur along much of the river's length
- White-clawed crayfish (though not a primary reason for site selection)
- Otter (though not a primary reason for site selection)
- Atlantic salmon (though not a primary reason for site selection)
- Brook lamprey (though not a primary reason for site selection)

11.3 Historic Trends and Current Pressures

11.3.1 A principal threat to the habitats within this SAC has been decreases in flow velocities and increases in siltation, in turn affecting macrophyte cover. Surveys during the 1990s showed declines in *Ranunculus* cover since 1990, attributable to increased abstractions in the upper catchment, coupled with a series of years with below-average rainfall. Low flows interact with nutrient inputs from point sources to produce localised increases in filamentous algae and nutrient-tolerant macrophytes at the expense of *Ranunculus*. The Environment Agency has undertaken assessments to inform licensed water abstraction at critical times. Efforts are currently being made to increase the viability of the southern damselfly population through population studies and a Species Action Plan.

11.3.2 Recent Condition Assessment process reviews indicated that large sections of the river are suffering from inappropriate water levels, with siltation and abstraction cited as problems in places. In some areas, discharges were causing reduced water quality.

11.3.3 The key environmental conditions needed to maintain site integrity include:

- Maintenance of flow velocities - low flows interact with nutrient inputs from point sources to produce localised increases in filamentous algae and nutrient-tolerant macrophytes at the expense of *Ranunculus*.
- Low levels of siltation,
- Unpolluted water and low nutrient inputs.
- Maintenance of grazing pressure is essential for Southern damselfly habitat.

11.4 Effects of the Joint Core Strategy

11.4.1 These are described below, against each potential impact.

Water Resources

11.4.2 Water supplies to the southern part of East Hampshire district are supplied by Portsmouth Water. This area is supplied by the WRZ1 of the company, where the River Itchen source at Gater's Mill supplies 30-40% of the current yields (45.5Ml/d). The River Itchen is covered by the EA's Test and Itchen CAMS. As part of its Review of Consents process, the EA has decided to modify licences to meet the Environment Agency target flow regime for the river by imposing a hands off flow condition (i.e. a condition which stipulates that the abstraction must cease when the river flow drops to a certain point) and by applying monthly totals for June to September (inclusive) (i.e. a maximum volume of water that can be abstracted).

11.4.3 Portsmouth Water calculate that this will result in a loss during critical demand periods of around 10Ml/d from supplies, which they propose to compensate by including a winter storage reservoir (Havant Thicket), completion expected by 2035 and in the shorter term, increased efficiency measures, metering, and water recovery facilities. Given the EA's conditions for abstraction licensing stipulate a threshold flow below which abstraction will not be permitted, there is therefore no mechanism by which increased public demand in East Hampshire can directly impact upon the SAC through Portsmouth Water supplies. The remainder of Portsmouth Water's supply sources for East Hampshire are not within the catchment of the Itchen.

11.4.4 The groundwater underlying the headwaters of the Itchen does supply public drinking water at Lasham in the north-west of East Hampshire district. The current and future predicted status of this source is at 'no water available' in order to protect the over-abstracted downstream Itchen. This WRMU is responsible for the supply to Four Marks, where 330 new dwellings are proposed.

11.4.5 In addition, the Council has a number of measures within its policies that will help to reduce demand on water resources:

- **CP22 - Sustainable Construction:** "*Planning permission will only be granted for development … which on completion meets the following minimum Code for Sustainable Homes threshold level … 3 until end of 2012, 4 from 2013 and 5 from 2016*."
- **CP24 - Water Resources and Quality:** "*Development will be required to protect the quality and quantity of water, and make efficient use of water. Development will only be permitted where: a) it protects and enhances the quality and quantity*

of groundwater, surface water features and controls aquatic pollution to help to achieve the requirements of the European Water Framework Directive … b) it has an adequate means of water supply (even in a drought), sufficient foul and surface water drainage and adequate sewage treatment capacity. Development must be phased to take into account the timing of any water and/or sewerage infrastructure required which should be in place prior to the occupation of development'.

11.4.6 Given the confidence of the water suppliers in being able to maintain supplies, the security provided by the EA licencing process, and the water conservation and supply policies to be adopted by the Council and the National Park Authority, it is possible to conclude that the Joint Core Strategy draft policies do not present a likely significant hydrological impact on the River Itchen SAC.

11.5 Conclusions

11.5.1 It is possible to conclude that significant effects of the Joint Core Strategy on the interest features of the River Itchen SAC are unlikely to occur.

Appendix 1 - Monitoring of EC Birds Directive Annex 1 species on the lowland heaths within East Hampshire DC

The table below summarises the data for 2006-10 provided by 2Js Ecology to EHDC. Comments on each species follow.

Site with conservation status	Sub-sites		2006	2007	2008	2009	2010
Wealden Heaths SPA: Woolmer Forest SSSI	Longmoor Inclosure	NJ	(13)	**19**	(13)	(13)	16
		WL	**16**	**16**	**16**	**16**	15
		DW	34	49	**56**	11	2
	Woolmer Forest	NJ	(15)	(16)	(15)	(15)	**21**
		WL	20	**22**	20	19	15
		DW	43	50	**54**	13	0
Wealden Heaths SPA: Broxhead & Kingsley Commons SSSI	Broxhead Common	NJ	(1)	X	(1)	**4**	**4**
		WL	**9**	8	5	6	5
		DW	13	**14**	8	1	0
	Kingsley Common	NJ	X	**1**	X	0	0
		WL	1	1	**3**	2	1
		DW	0	0	0	0	0
Wealden Heaths SPA: Ludshott & Bramshott Commons SSSI	Ludshott Common	NJ	15	X	X	13	**17**
		WL	4	4	X	2	**5**
		DW	32	**50**	X	7	7
	Bramshott Common	NJ	X	X	X	X	**1**
		WL	1	X	**3**	2	1
		DW	1	X	**2**	0	0
Shortheath Common SSSI	Shortheath Common	NJ	X	X	X	X	**1**
		WL	**3**	2	**3**	2	2
		DW	0	0	0	0	0
Hammer Common (SINC?)	Hammer Common	NJ	X	X	X	X	**1**
		WL	**3**	X	0	0	0
		DW	**1**	X	0	0	0
The Warren, Oakhanger (SINC?)	The Warren, Oakhanger	NJ	(1)	X	X	4	**5**
		WL	2	3	3	**6**	2
		DW	0	**1**	**1**	0	0

Figures in bold font **19** = maximum count recorded in 5 year monitoring period
Figures in normal font 19 = other complete counts recorded in 5 year monitoring period
Figures in parentheses (4) = counts recorded in 5 year monitoring period which may be underestimates.
X = count not made

Comments on each species

Nightjar. Overall status: Stable. Full coverage was achieved in 2010 but, due largely to the nocturnal habits of the species, coverage of some sub-sites was variable in earlier years. Taking the maximum count recorded at each sub-site within the five year monitoring period gives a total of 80 territories. This total is a probably a good estimate of the annual population in EHDC since the species has the most stable population of the three species due to its ability to nest in a variety of heathland habitats.

Woodlark. Overall status: Stable. Full coverage of the prime sub-sites was achieved in all five years but one or two less important locations were not covered in 2007 and 2008. Taking the maximum count recorded at each sub-site within the five year monitoring period gives a total of 70 territories. This species is sensitive to changes in the habitat; it prefers to nest in areas with short vegetation and bare patches (often created by fire, tree-felling or other intervention by man), and if these become overgrown they become less suitable. On the large sub-sites at Longmoor Inclosure and Woolmer Forest numbers have remained remarkably stable over the five year period which can be attributed to the rotational availability of new habitat. However, on smaller sub-sites fluctuations probably represent changes in the amount of suitable habitat available. Thus the five year total of 70 territories probably slightly overestimates the annual population in EHDC, which is probably in the range 60-65 territories.

Dartford Warbler. Overall status: currently at very low ebb but with potential to increase rapidly given mild winters and lack of fires. All suitable habitat was fully covered in every year except that Ludshott Common, a prime site, was not covered in 2008 and Bramshott and Hammer Commons, which probably held no more than three territories, were not covered in 2007. Numbers reached an all time peak since modern bird recording began in 2007/08 with a total of around 170 territories. Two successive winters with heavy snowfall reduced the total to 32 in 2009 and seven in 2010. This species requires mature heather with scattered brakes of gorse. Gorse is important not only as nesting habitat but also for providing food and shelter during severe winter weather. There is plenty of suitable habitat in the area and the species should recover in future years.

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