

# Habitat Regulations Assessment: Elstead and Weyburn Neighbourhood Development Plan

Elstead Parish Council

March 2021

## Quality information

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## Table of Contents

1. Introduction.....	5
Legislation.....	5
2. Methodology.....	7
Introduction.....	7
HRA Task 1 – Likely Significant Effects (LSE).....	7
HRA Task 2 – Appropriate Assessment (AA).....	8
HRA Task 3 – Avoidance and Mitigation.....	8
Confirming Other Plans and Projects That May Act ‘In Combination’.....	9
3. Internationally Designated Sites.....	10
Thursley, Hankley and Frensham Commons SPA.....	10
Thursley, Ash, Pirbright and Chobham SAC.....	12
Thursley and Ockley Bogs Ramsar.....	13
Wealden Heaths Phase 2 SPA.....	14
Thames Basin Heaths SPA.....	15
Ebernoe Common SAC.....	16
The Mens SAC.....	18
4. Likely significant effects.....	21
Background to Elstead Parish.....	21
Physical Scope of the HRA.....	21
5. Consideration of Effect ‘in combination’.....	31
6. Appropriate assessment.....	32
Introduction.....	32
Urbanisation.....	32
Air quality.....	33
Recreational pressure.....	35
Water quality.....	38
Hydrological changes.....	39
Habitat fragmentation.....	40
7. Conclusion.....	42

## Figures

Figure 1: Four Stage Approach to Habitats Regulations Assessment. Source GOV.UK, 2019. ....	7
Figure 2. Bright et al (2007): Likelihood of a heathland patch being occupied in relation to the area of heathland. ....	41

## Tables

Table 1. How each European Site could be susceptible to the above impact pathways due to increased development within Elstead.....	23
Table 2. Screening assessment of the Elstead Neighbourhood Plan.....	26
Table 3. Roads that are within 200m of each European Sites. Red shading identifies roads located within Elstead and yellow shading identifies roads directly connected to Elstead.....	34

# 1. Introduction

- 1.1 AECOM was appointed by Elstead Parish Council to assist in undertaking a Habitats Regulation Assessment (HRA) for the Elstead and Weyburn Neighbourhood Plan (NP). This is to inform Elstead parish Council and Waverley Council of the potential effects of NP development to European Sites and how they are being addressed in the Neighbourhood Plan, for that Council to take into account in their formal HRA.
- 1.2 The Waverley Local Plan Part 1 and Part 2 (LP) were subject to HRA in 2018 and updated in 2019. The primary conclusion of those HRAs was a need to address urbanisation and recreational pressures to the Special Protected Areas (SPA), Special Areas of Conservation (SAC) and Ramsar (protected wetland) sites located within the Waverley boundary as a result of development allocations. The HRA recommended policy mechanisms for this that are reflected in the adopted Local Plan.
- 1.3 The Waverley LP HRA considered both allocations made in Local Plan Part 1 and the overall quantum of development expected across the district over the Local Plan period. This included an allowance for 160 dwellings at Elstead and Weyburn, of which approximately 100 have now been delivered, with the remainder to be allocated in the Neighbourhood Plan). The LPP1 HRA also included a windfall allowance for Waverley District. The total quantum of growth in Elstead & Weyburn has therefore already been assessed in combination with growth across Waverley and attributable to other plans and projects as part of the HRA of the Waverley LPP1. However, the specific locations of development for Elstead & Weyburn were not assessed as they are made by the Neighbourhood Plan rather than LPP1. The objective of this particular HRA is therefore to identify if any particular site allocations and/or policies in the Neighbourhood Plan that have the potential to cause an adverse effect on the integrity of Natura 2000 or European designated sites (Special Areas of Conservation, SACs, Special Protection Areas, SPAs, and Ramsar sites designated under the Ramsar convention), either in isolation or in combination with other plans and projects, and to determine whether site-specific mitigation measures are required.

## Legislation

- 1.4 The need for HRA is set out within Article 6 of the EC Habitats Directive 1992 and interpreted into British law by the Conservation of Habitats & Species Regulations 2017 (as amended). The ultimate aim of the Habitats Directive is to “maintain or restore, at favourable conservation status, natural habitats and species of wild fauna and flora of Community interest” (Habitats Directive, Article 2(2)). This aim relates primarily to habitats and species, and designated sites that have a significant role in delivering favourable conservation status. European sites (also called Natura 2000 sites) can be defined as actual or proposed/candidate Special Areas of Conservation (SAC) or Special Protection Areas (SPA). It is also Government policy for sites designated under the Convention on Wetlands of International Importance (Ramsar sites) to be treated as having equivalent status to Natura 2000 sites.
- 1.5 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. This is in contrast to the SEA Directive which does not prescribe how plan or programme proponents should respond to the findings of an environmental assessment; merely that the assessment findings (as documented in the ‘environmental report’) should be ‘taken into account’ during preparation of the plan or programme. 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.

### Box 1: The legislative basis for Appropriate Assessment

#### **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 and Species Regulations 2017 (as amended)**

With specific reference to Neighbourhood Plans, Regulation 106(1) states that:

*‘A qualifying body which submits a proposal for a neighbourhood development plan must provide such information as the competent authority [the Local Planning Authority] may reasonably require for the purposes of the assessment under regulation 105 [which sets out the formal process for determination of ‘likely significant effects’ and the ‘appropriate assessment’]...’.*

- 1.6 It is therefore important to note that this report has two purposes:
- To assist the Qualifying Body (the Neighbourhood Plan Group) in preparing their plan by recommending (where necessary) any adjustments required to protect European sites, thus making it more likely their plan will be deemed compliant with the Conservation of Habitats and Species Regulations 2017 (as amended); and
  - On behalf of the Qualifying Body, to assist the Local Planning Authority to discharge their duty under Regulation 105 (in their role as ‘plan-making authority’ within the meaning of that regulation) and Regulation 106 (in their role as ‘competent authority’).
- 1.7 As ‘competent authority’, the legal responsibility for ensuring that a decision of ‘likely significant effects’ is made, for ensuring an ‘appropriate assessment’ (where required) is undertaken, and for ensuring Natural England are consulted, falls on the local planning authority. However, they are entitled to request from the Qualifying Body the necessary information on which to base their judgment and that is a key purpose of this report.
- 1.8 Over the years, ‘Habitats Regulations Assessment’ (HRA) has come into wide currency to describe the overall process set out in the Habitats Regulations, from screening through to identification of IROPI. This has arisen in order to distinguish the overall process from the individual stage of “Appropriate Assessment”. Throughout this Report the term HRA is used for the overall process and restricts the use of Appropriate Assessment to the specific stage of that name.



## 2. Methodology

### Introduction

- 2.1 The need for Appropriate Assessment is set out within Article 6 of the EC Habitats Directive 1992 and interpreted into British law by the Conservation of Habitats and Species Regulations 2010. The ultimate aim of the Directive is to “maintain or restore, at favourable conservation status, natural habitats and species of wild fauna and flora of Community interest” (Habitats Directive, Article 2(2)). This aim relates to habitats and species, not the European sites themselves, although the sites have a significant role in delivering favourable conservation status.
- 2.2 The Habitats Directive applies the precautionary principle to European sites. Plans and projects can only be permitted having ascertained that there will be no adverse effect on the integrity of the site(s) in question. Plans and projects with predicted adverse impacts on European sites 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.
- 2.3 Figure 1 below outlines the stages of HRA according to current Ministry of Housing, Communities and Local Government 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.

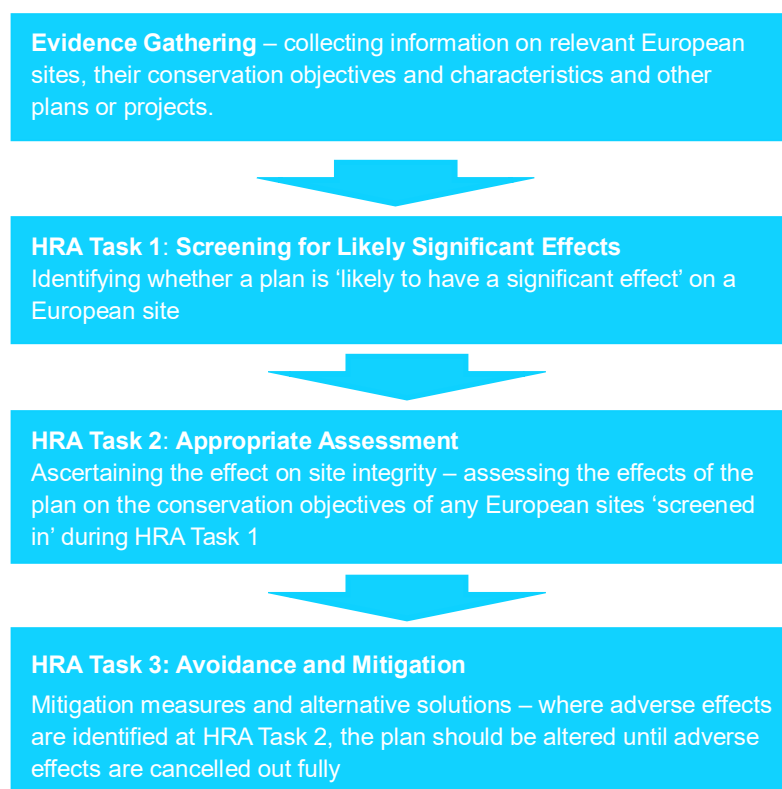


Figure 1: Four Stage Approach to Habitats Regulations Assessment. Source GOV.UK, 2019.

### HRA Task 1 – Likely Significant Effects (LSE)

- 2.4 Following evidence gathering, the first stage of any Habitats Regulations Assessment is a Likely Significant Effect (LSE) test - essentially a risk assessment to decide whether the full subsequent stage known as Appropriate Assessment is required. The essential question is:

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

- 2.5 The objective is to 'screen out' those plans and projects 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 for an adverse interaction with European sites. This stage is undertaken in Chapter 4 of this report.

## HRA Task 2 – Appropriate Assessment (AA)

- 2.6 Where it is determined that a conclusion of 'no likely significant effect' cannot be drawn, the analysis has proceeded to the next stage of HRA known as Appropriate Assessment. Case law has clarified that 'appropriate assessment' is not a technical term. In other words, there are no particular technical analyses, or level of technical analysis, that are classified by law as belonging to appropriate assessment rather than determination of likely significant effects.
- 2.7 During July 2019 the Ministry of Housing, Communities and Local Government published guidance for Appropriate assessment<sup>1</sup>. Paragraph: 001 Reference ID: 65-001-20190722m explains: *'Where the potential for likely significant effects cannot be excluded, a competent authority must make an appropriate assessment of the implications of the plan or project for that site, in view the site's conservation objectives. The competent authority may agree to the plan or project only after having ruled out adverse effects on the integrity of the habitats site. Where an adverse effect on the site's integrity cannot be ruled out, and where there are no alternative solutions, the plan or project can only proceed if there are imperative reasons of over-riding public interest and if the necessary compensatory measures can be secured'*.
- 2.8 As this analysis follows on from the screening process, there is a clear implication that the analysis will be more detailed than undertaken at the Screening stage and one of the key considerations during appropriate assessment is whether there is available mitigation that would entirely address the potential effect. In practice, the appropriate assessment would take any policies or allocations that could not be dismissed following the high-level Screening analysis and analyse the potential for an effect in more detail, with a view to concluding whether there would be an adverse effect on integrity (in other words, disruption of the coherent structure and function of the European site(s)).
- 2.9 A decision by the European Court of Justice<sup>2</sup> concluded that measures intended to avoid or reduce the harmful effects of a proposed project on a European site may no longer be taken into account by competent authorities at the Likely Significant Effects or 'screening' stage of HRA. That ruling has been considered in producing this HRA.
- 2.10 Also, in 2018 the Holohan ruling<sup>3</sup> was handed down by the European Court of Justice. Among other provisions paragraph 39 of the ruling states that *'As regards other habitat types or species, which are present on the site, but for which that site has not been listed, and with respect to habitat types and species located outside that site, ... typical habitats or species must be included in the appropriate assessment, if they are necessary to the conservation of the habitat types and species listed for the protected area'* [emphasis added]. This has been taken into account in the HRA process.

## HRA Task 3 – Avoidance and Mitigation

- 2.11 Where necessary, measures are recommended for incorporation into the Plan in order to avoid or mitigate adverse effects on European sites. There is considerable precedent concerning the level of detail that a Local Plan document needs to contain regarding mitigation for recreational impacts on European sites. The implication of this precedent is that it is not necessary for all measures that will be deployed to be fully developed prior to adoption of the Plan, but the Plan must provide an adequate policy framework within which these measures can be delivered.

<sup>1</sup> <https://www.gov.uk/guidance/appropriate-assessment#what-are-the-implications-of-the-people-over-wind-judgment-for-habitats-regulations-assessments> [Accessed: 07/01/2020].

<sup>2</sup> People Over Wind and Sweetman v Coillte Teoranta (C-323/17)

<sup>3</sup> Case C-461/17



- 2.12 In evaluating significance, AECOM has relied on professional judgement as well as the results of previous stakeholder consultation regarding development impacts on the European sites considered within this assessment.
- 2.13 When discussing 'mitigation' for a Local Plan document, one is concerned primarily with the policy framework to enable the delivery of such mitigation rather than the details of the mitigation measures themselves since the Local Plan document is a high-level policy document.

## Confirming Other Plans and Projects That May Act 'In Combination'

- 2.14 It is a requirement of the Regulations that the impacts 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.
- 2.15 In considering the potential for regional housing development on European sites the primary consideration is the impact of visitor numbers – i.e. recreational pressure and urbanisation.
- 2.16 When undertaking this part of the assessment it is essential to bear in mind the principal intention behind the legislation i.e. to ensure that those projects or plans (which in themselves may have minor impacts) are not simply dismissed on that basis but are evaluated for any cumulative contribution they may make to an overall significant effect. In practice, in combination assessment is therefore of greatest relevance when the plan would otherwise be screened out because its individual contribution is inconsequential.
- 2.17 Other plans that are likely to act in combination to Elstead NP are:
- **Waverley Local Plan Part 1** – allocates (at least) 11,210 dwellings
  - **Guildford Local Plan: strategy and sites 2015-2034** – allocates (at least) 10,678 dwellings
  - **Witley Neighbourhood Plan 2017-2032** – allocates 300 dwellings
  - **Farnham Neighbourhood Plan 2017-2032** – allocates (some with planning permission) 2,201 dwellings
  - **Chiddingfold Neighbourhood Plan (March 2019)** – allocates 130 dwellings
  - **Haslemere Neighbourhood Plan 2013-2032** – allocates (some already constructed) 990 dwellings
- 2.18 Waverley District Council are also producing a Local Plan Part 2 which will identify site allocations to deliver the quantum of development set by Local Plan Part 1 and will cover parts of the district not already covered by Neighbourhood Plans. However, LPP2 is still being drafted and cannot therefore be discussed in this HRA.

## 3. Internationally Designated Sites

### Thursley, Hankley and Frensham Commons SPA

#### Introduction

- 3.1 The Thursley, Hankley and Frensham Commons (Wealden Heath Phase I) SPA forms a large complex of lowland heaths (otherwise referred to as The Wealden Heaths) situated in Surrey close to the Hampshire border. The complex is set in a largely rural setting with an unspoilt character despite its close proximity to large population centres such as London and Guildford. The surrounding landscape includes oak woodlands, conifer woods and small pastures intersected by narrow, sunken lanes. The underlying geology of the commons is predominantly made up by sandstones and ironstone belonging to the group known as Wealden Greensand of Cretaceous age. These form low hills and broad valleys, dissected by small streams. The deposits give rise to mostly free-draining sandy soils, but layers of less permeable deposits give rise locally to wetlands including mires, flushes and wet woodlands.
- 3.2 The complex is situated in the Surrey Hills Area of Outstanding Natural Beauty (AONB) and is in the Wealden Greensand National Character Area (NCA). Several parts of the site are used for military training and these areas have controlled public access. Part of the site is managed as a golf course. Most of the remainder has open public access and some of the sites are very popular destinations for a range of recreational activities including walking, birdwatching, horse riding, cycling and orienteering. Part of the site, Thursley Common, is declared as a National Nature Reserve managed by Natural England<sup>4</sup>.

#### Reasons for designation

- 3.3 Qualifying individual species listed in Annex I of the Wild Birds Directive (Article 4.1) that are supported by the site includes:
- Internationally important numbers of Dartford warbler *Sylvia undata*
    - When classified, the SPA supported 20 pairs (which represented 4% of the British breeding population in 1984).
      - The Thursley, Hankley and Frensham Commons SPA regularly supports internationally important numbers of Dartford warbler. The SPA is close to the northern limit of the range of this species in Europe and numbers fluctuate depending upon winter and spring weather conditions. The species does not migrate and winter survival and breeding success can be badly affected by very cold winters or prolonged periods of snow cover. Cold, damp spring weather can also have damaging effects. Dartford warblers are strongly associated with lowland heaths with extensive patches of mature gorse with an abundance of favoured invertebrate prey items such as spiders. However, they will also nest in areas of mature heather, clearings in forestry plantations and patches of bracken.
      - Dartford warblers are widely distributed across the SPA and the site provides extensive areas of suitable habitat. Particularly large numbers of birds are regularly recorded at Hankley Common and Frensham Common but they are widely distributed across the complex.
  - Internationally important numbers of Nightjar *Caprimulgus europaeus*
    - When classified, the SPA supported 20 pairs (which represented 1% of the British breeding population in 1984).
    - The Thursley, Hankley and Frensham Commons SPA regularly supports internationally important numbers of nightjar. The European population of this species is thought to have undergone a significant decline in the past as a result of loss of suitable habitat. However, data suggests that there has been a trend of increasing numbers in recent years, which may be due to better protection of core breeding areas and improved management of lowland heathland.

<sup>4</sup> Natural England (2017). *European Site Conservation Objectives: Supplementary Advice on Conserving and Restoring Site Features*. Available online from: <http://publications.naturalengland.org.uk/publication/5735025425252352> [Accessed: 07/01/2020].

- Nightjars are nocturnal birds and can often be seen hawking for food at dusk and dawn. With pointed wings and a long tails their shape is similar to a kestrel or cuckoo. Their cryptic, grey-brown, mottled, streaked and barred plumage provides ideal camouflage in the daytime.
- Nightjars are migratory, spending the winter months feeding in parts of Africa. The species is considered to be vulnerable to the effects of long-term climate change on drought-prone areas of Africa. Nightjar regularly utilise areas across the SPA for nesting and feeding. Favoured areas of habitat are areas of heath with high structural diversity including bare patches or short vegetation, but they will also utilise clearings in woods, broad rides in conifer plantations and sparsely vegetated areas. Particularly large numbers of nightjar are regularly recorded in the SPA at Thursley, Hankley, Frensham and Elstead Commons but they occur widely across the complex.
- Internationally important numbers of Woodlark *Lullula arborea*
  - When classified, the SPA supported 27 pairs (which represented 12% of the British breeding population in 1984).
    - Woodlark regularly utilise the Thursley, Hankley and Frensham Commons SPA in internationally important numbers. This species suffered a serious population decline and contraction in range in the UK up until the latter part of the 20th century. The population is now recovering and colonising new areas as a result of protection and expansion of lowland heaths. The woodlark has also benefited from rotational management of conifer plantations where it can utilise recently felled areas and areas of young re-growth for nesting. Woodlarks favour areas of short vegetation or sparsely-vegetated areas on heaths with scattered trees for use as song-posts. They feed on seeds and small invertebrates. Numbers of woodlarks tend to fluctuate over time in relation to successional development of heaths and plantations, with large numbers often present following heath fires or tree clearance.
    - Woodlarks are regularly recorded across most of the SPA with particularly large numbers often present at Thursley and Frensham Commons.

## Current threats and pressures<sup>5</sup>

3.4 Thursley, Hankley and Frensham Commons SPA also forms part of an extensive complex of lowland heathland, acid grassland, mire and commercial conifer plantations in south east England. The complex is located close to urbanization and therefore a number of pressures and threats currently impact the site, these include:

- Public access and disturbance;
- Undergrazing;
- Forestry and woodland management;
- Hydrological changes;
- Inappropriate scrub control;
- Invasive species;
- Wildlife/ arason;
- Air pollution;
- SAC feature's location/ extent/ condition unknown;
- Military; and
- Habitat fragmentation.

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<sup>5</sup> Natural England (2014). *Site improvement plan: Thames Basin*. Available online at: <http://publications.naturalengland.org.uk/publication/6249258780983296> [Accessed: 07/01/2020].

## Conservation objectives<sup>6</sup>

3.5 'Ensure that the integrity of the site is maintained or restored as appropriate, and ensure that the site contributes to achieving the aims of the Wild Birds Directive, by maintaining or restoring;

- The extent and distribution of the habitats of the qualifying features
- The structure and function of the habitats of the qualifying features
- The supporting processes on which the habitats of the qualifying features rely
- The population of each of the qualifying features, and,
- The distribution of the qualifying features within the site.'

## Thursley, Ash, Pirbright and Chobham SAC

### Introduction

3.6 Thursley, Ash, Pirbright and Chobham SAC is an extensive complex of heaths in the south east of England with extensive areas of wet and dry heath, acid mire and bog pools. The complex is situated in the Surrey Hills Area of Outstanding Natural Beauty (AONB) and is part of the Weald National Character Area. The underlying geology of the site is composed of Lower Greensand age marine deposits laid down in the Cretaceous period. This formation is made up of alternating sandstones and mudstones containing chert and ironstone, and the formation includes the distinct layers of the Folkestone Beds, Sandgate Beds and Bargate Beds.

3.7 The Folkestone Beds make up the high ground in parts of the complex. These are mostly relatively free-draining sandstones but also include occasional 'lenses' of clay which impede drainage resulting in localised surface wetness and seepages. The Folkestone Beds are a base-poor formation and so water percolating through the beds generally remains nutrient and base-poor. The underlying Sandgate Beds are mostly made up by finer-grained materials and have a higher clay content and so are generally less free-draining. It is this impeded drainage which gives rise to the formation of the mire systems. A further aspect of the geology is the influence of the Bargate Beds which are lower in the geological sequence. The Bargate Beds are fossiliferous calcareous sandstones with a high content of calcium carbonate. Water percolating through these deposits can develop a high base-status and this is thought to be the reason for a relatively high alkalinity in the water feeding the west side of the mire system on Thursley Common. Surface peat is present in the lower-lying waterlogged areas, which varies in thickness from 1-10cm over much of Ockley Common to a maximum depth of about 1.5 metres on parts of Thursley Common. The site is set in a landscape of extensive farmland, broadleaved woodland, pine woodland and small villages.

3.8 The complex includes outstanding examples of valley mire vegetation which supports very rich assemblages of wetland invertebrates, bryophytes and scarce plants, and which provide a habitat for breeding birds including curlew and snipe. Parts of the complex are managed as nature reserves with open public access. Other parts have military training ranges and have limited or no public access<sup>7</sup>.

### Reasons for designation

3.9 There are a number of qualifying habitats that are supported by the SAC, these include:

- Northern Atlantic wet heaths with *Erica tetralix*
  - This site represents lowland northern Atlantic wet heaths in south-east England. The wet heath at Thursley is NVC type M16 *Erica tetralix* – *Sphagnum compactum* and contains several rare plants, including great sundew *Drosera anglica*, bog hair-grass *Deschampsia setacea*, bog orchid *Hammarbya paludosa* and brown beak-sedge *Rhynchospora fusca*. There are transitions to valley bog and dry heath. Thursley Common is an important site for invertebrates, including the nationally rare white-faced darter *Leucorrhinia dubia*.

<sup>6</sup> Natural England (2019). European Site Conservation Objectives for Thursley, Hankley and Frensham Commons (Wealden Heaths Phase 1) Special Protection Area. Available online at: <http://publications.naturalengland.org.uk/publication/5735025425252352> [Accessed: 07/01/2020].

<sup>7</sup> Natural England (2016). European Site Conservation Objectives: Supplementary Advice on Conserving and Restoring Site Features. Available online at: <http://publications.naturalengland.org.uk/publication/5141075941392384> [Accessed: 07/01/2020].

- European dry heaths
  - This south-east England site contains a series of large fragments of once-continuous heathland. It is selected as a key representative of NVC type H2 *Calluna vulgaris* – *Ulex minor* dry heathland. This heath type has a marked south-eastern and southern distribution. There are transitions to wet heath and valley mire, scrub, woodland and acid grassland, including types rich in annual plants. The European dry heaths support an important assemblage of animal species, including numerous rare and local invertebrate species, European nightjar *Caprimulgus europaeus*, Dartford warbler *Sylvia undata*, sand lizard *Lacerta agilis* and smooth snake *Coronella austriaca*.
- Depressions on peat substrates of the *Rhynchosporion*
  - This site contains examples of Depressions on peat substrates of the *Rhynchosporion* in south-east England, where it occurs as part of a mosaic associated with valley bog and wet heath. The vegetation is found in natural bog pools of patterned valley mire and in disturbed peat of trackways and former peat-cuttings.

## Current threats and pressures<sup>8</sup>

3.10 Thursley, Ash, Pirbright and Chobham SAC forms part of an extensive complex of lowland heathland, acid grassland, mire and commercial conifer plantations in south east England. The complex is located close to urbanization and therefore a number of pressures and threats currently impact the site, these include:

- Public access and disturbance;
- Undergrazing;
- Forestry and woodland management;
- Hydrological changes;
- Inappropriate scrub control;
- Invasive species;
- Wildlife/ arason;
- Air pollution;
- SAC feature's location/ extent/ condition unknown;
- Military; and
- Habitat fragmentation.

## Conservation objectives<sup>9</sup>

3.11 'Ensure that the integrity of the site is maintained or restored as appropriate, and ensure that the site contributes to achieving the Favourable Conservation Status of its Qualifying Features, by maintaining or restoring;

- The extent and distribution of qualifying natural habitats
- The structure and function (including typical species) of qualifying natural habitats, and
- The supporting processes on which qualifying natural habitats rely.'

## Thursley and Ockley Bogs Ramsar

### Introduction

3.12 Thursley and Ockley Bogs is a valley mire complex and lies within Thursley, Hankley & Frensham Commons SSSI. The mire occurs within a matrix of heathland, where drainage is impeded, and a deep layer of peat

<sup>8</sup> Natural England (2014). *Site improvement plan: Thames Basin*. Available online at: <http://publications.naturalengland.org.uk/publication/6249258780983296> [Accessed: 07/01/2020].

<sup>9</sup> Natural England (2018). *European Site Conservation Objectives for Thursley, Ash, Pirbright and Chobham Special Area of Conservation*. Available online at: <http://publications.naturalengland.org.uk/publication/5141075941392384> [Accessed: 07/01/2020].

has built up from the remains of bog-moss *Sphagnum* spp. which forms much of the vegetation. Several areas of open water also contribute significantly to the overall diversity of the site, ranging from acidic boggy pools and ditches to large ponds.

## Reason for designation<sup>10</sup>

3.13 This site is designated under two Ramsar Criterion, these include:

- **Ramsar Criterion 2-** Supports a community of rare wetland invertebrate species including notable numbers of breeding dragonflies
- **Ramsar Criterion 3 -** 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*.

## Current threats and pressures

- Appropriate management
- Managed recreational pressure
- 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

## Conservation objectives<sup>11</sup>

3.14 *'Ensure that the integrity of the site is maintained or restored as appropriate, and ensure that the site contributes to achieving the aims of the Wild Birds Directive, by maintaining or restoring;*

- *The extent and distribution of the habitats of the qualifying features*
- *The structure and function of the habitats of the qualifying features*
- *The supporting processes on which the habitats of the qualifying features rely*
- *The population of each of the qualifying features, and,*
- *The distribution of the qualifying features within the site.'*

## Wealden Heaths Phase 2 SPA

### Introduction

3.15 The Wealden Heaths Phase II SPA is situated on an arc of hilly country on the edge of the Weald. The area runs parallel to the South Downs and is located on the borders of Hampshire, Surrey and West Sussex.

3.16 The underlying geology is composed of Cretaceous sandstones and ironstone, which give rise to predominantly acid soils. These are often sandy and free-draining but clay and silt layers produce poorly-drained areas where streams and wetland habitats can be found. The landscape is largely rural and is characterised by a prominent escarpment with broad, steep-sided valleys and low, rounded hills with a mixture of heaths, oak and birch woodland, mature conifer woodlands, pastures and wetlands.

3.17 Large parts of the SPA are used for military training, including live-firing, and so public access is restricted. However, there are also areas in the SPA which are very popular destinations for a variety of recreational uses including walking, birdwatching, orienteering and cycling. Some of the land is registered common land

<sup>10</sup> JNCC (2008) *Information Sheet on Ramsar Wetlands (RIS)*. Available online at; <http://archive.jncc.gov.uk/pdf/RIS/UK11074.pdf> [Accessed; 07/01/2020].

<sup>11</sup> Natural England (2014). *Site Improvement Plan Thames Basin*. Available online at: <http://publications.naturalengland.org.uk/publication/5735025425252352> [Accessed: 07/01/2020].



but traditional common land management practices, including grazing, have largely died out in the area. Nevertheless, there are strong cultural and historical links to the past reflected in the landscape.

## Reasons for Designation<sup>12</sup>

3.18 The SPA supports three Annex I species:

- Dartford warbler *Sylvia undata* - when classified, the SPA supported 16 pairs (5 year peak mean 1989-1993) which represented 1.7% of the GB population.
- Nightjar *Caprimulgus europaeus* - when classified, the SPA supported 43 pairs (5 year peak mean 1989-1993) which represented 1.4% of the GB population.
- Woodlark *Lullula arborea* - when classified, the SPA supported 15 pairs (5 year peak mean 1989-1993) which represented 4.3% of the GB population.

## Current threats and pressures

3.19 The habitats and features that are supported by Wealden Heaths Phase 2 SPA are sensitive to changes in air quality. Exceeding critical values for air pollutants may result in changes to the chemical status of a supporting habitat's substrate, accelerating or damaging plant growth, altering vegetation structure and composition and thereby affecting the quality and availability of nesting, feeding or roosting habitats. Some of the effects that might be attributable to aerial pollution could include accelerated and more vigorous growth of bramble, birch and coarse grasses and consequent loss of bare ground and/or heather which offer nest sites. In addition, to air quality pressures the site is also susceptible to disturbance caused by recreational pressure. The nature, scale, timing and duration of some human activities can result in the disturbance of birds at a level that may substantially affect their behaviour, and consequently affect the long-term viability of the population.

## Conservation objectives<sup>13</sup>

*'Ensure that the integrity of the site is maintained or restored as appropriate, and ensure that the site contributes to achieving the aims of the Wild Birds Directive, by maintaining or restoring;*

- *The extent and distribution of the habitats of the qualifying features*
- *The structure and function of the habitats of the qualifying features*
- *The supporting processes on which the habitats of the qualifying features rely*
- *The population of each of the qualifying features, and,*
- *The distribution of the qualifying features within the site.'*

## Thames Basin Heaths SPA

### Introduction

3.20 Thames Basin Heaths Special Protection Area (SPA) consists of a number of fragments of lowland heathland scattered across Surrey, Hampshire and Berkshire. It is predominantly dry and wet heath but also includes areas of deciduous woodland, gorse scrub, acid grassland and mire, as well as associated conifer plantations. Around 75% of the SPA has open public access being either common land or designated as open country under the Countryside and Rights of Way Act 2000. The SPA consists of 13 Sites of Special Scientific Interest. Three of the SSSIs are also designated as part of the Thursley, Ash, Pirbright and Chobham Special Area of Conservation (which is located more than 5km from Hart District boundary).

3.21 Bramshill SSSI and Hazeley Heath SSSI both lie within Hart District, along with the majority of Castle Bottom to Yateley and Hawley Commons SSSI and the western part of Bourley and Long Valley SSSI.

<sup>12</sup> Natural England (2019) *Designated Sites View*. Available online at: <https://designatedsites.naturalengland.org.uk/SiteGeneralDetail.aspx?SiteCode=UK9012132&SiteName=DEVIL>, accessed 02/12/19

<sup>13</sup> Natural England (2019). *European Site Conservation Objectives for Wealden Heaths Phase II SPA*. Available online at: <http://publications.naturalengland.org.uk/publication/5729030657540096>, accessed 02/12/19.

3.22 The location of the Thames Basin Heaths has resulted in the designated site being subject to high development pressure. English Nature (now Natural England) published a Draft Delivery Plan for the Thames Basin Heaths SPA in May 2006, partly in response to the European Court of Justice ruling of October 2005. This is updated by the 'Thames Basin Heaths Special Protection Delivery Framework' published by the Thames Basin Heaths Joint Strategic Partnership Board in January 2009. These documents aim to allow a strategic approach to accommodating development by providing a method through which local authorities can meet the requirements of the Habitats Regulations through avoidance and mitigation measures.

## Reasons for designation<sup>14</sup>

3.23 Thames Basin Heaths SPA qualifies under Article 4.1 of the Birds Directive (79/409/EEC) by supporting populations of European importance of the following species listed on Annex I of the Directive:

3.24 During the breeding season:

- Nightjar *Caprimulgus europaeus*
- Woodlark *Lullula arborea*
- Dartford Warbler *Sylvia undata*

## Current treats and pressures<sup>15</sup>

3.25 The Thames Basin Heaths SPA are an extensive complex of lowland heathland, acid grassland, mire and commercial conifer plantations in south east England. Features supported by this rare habitat are Dartford warbler, woodlark, nightjar that are susceptible to disturbance generate by human activity. Current threats and pressures that are experienced by the site are:

- Appropriate Management;
- Management of disturbance during the breeding season (March to July);
- Air pollution;
- Urbanisation;
- Maintenance of appropriate water levels; and
- Maintenance of water quality.

## Ebernoe Common SAC

### Introduction

3.26 Ebernoe Common is an extensive complex of ancient woodland and former wood pasture in West Sussex, five miles south-east of Haslemere. The site lies on the Cretaceous Weald Clay and falls within the Low Weald National Character Area (NCA 121). The central core of the site, approximately a third of the total area, forms Ebernoe Common National Nature Reserve.

3.27 It is a varied site with a range of woodland communities and age structures which have developed due to differences in underlying soils and past management. This range of conditions together with a long continuity of woodland cover has in turn resulted in the site supporting an outstanding diversity of species: Barbastelle and Bechstein's bats, which favour ancient woodland, breed in the site because it provides suitable roosting and feeding habitats. While Bechstein's feed exclusively in the woodland, Barbastelles commute into the surrounding countryside using the woodland corridors which branch out from the site. In addition, the native trees, particularly those with old growth characteristics, support rich lichen and fungal

<sup>14</sup> JNCC (2005). *SPA Description: Thames Basin Heaths*. Available online at: <http://archive.incc.gov.uk/default.aspx?page=2050>, accessed 02/12/19.

<sup>15</sup> Natural England (2014). *Site improvement plan: Thames Basin Heaths SPA*. Available online at: <http://publications.naturalengland.org.uk/publication/6249258780983296>, accessed 02/12/19.

communities, including a number of rare and scarce species, and the woodland complex as a whole supports a diverse breeding bird assemblage<sup>16</sup>.

## Reason for designation<sup>17</sup>

3.28 Annex I habitats that are a primary reason for site selection include:

- Atlantic acidophilous beech forests with Ilex and sometimes also Taxus in the shrublayer (Quercion robori-petraeae or Ilici-Fagenion); Beech forests on acid soils
  - This Annex I type comprises beech *Fagus sylvatica* forests with holly Ilex, growing on acid soils, in a humid Atlantic climate. Sites of this habitat type often are, or were, managed as wood-pasture systems, in which pollarding of beech and oak *Quercus* spp. was common. This is known to prolong the life of these trees.

3.29 Annex II species that are supported by the site that are primary reason for site selection include:

- Barbastelle *Barbastella barbastellus*
  - The barbastelle is a medium-sized bat unlike any other in Europe. The fur is almost black, usually with very pale or golden-brown tips to the hairs. The ears are very broad with the inner edges joined together across the forehead.
  - Barbastelle ecology is relatively poorly-known. In Europe it is believed to be mainly an upland and forest species; in the UK it seems to prefer wooded river valleys. The species forages in mixed habitats, usually over water. Barbastelles appear to select cracks and crevices in wood for breeding, mostly in old or damaged trees, but cracks and crevices in the timbers of old buildings may also be used. Maternity colonies may move between suitable crevices within a small area, such as a piece of woodland or a complex of buildings. Caves and underground structures may be used for hibernation. The species is very sensitive to disturbance, together with the loss of roost-sites and food resources.
  - The barbastelle is one of the UK's rarest mammals. Few maternity roost sites are known in the UK. The great majority of other records come from caves or abandoned mines, which are important hibernation sites for a range of bat species. The barbastelle is widely distributed across southern England and across Wales but is likely to have been significantly under-recorded within its range. Individual bats are sometimes discovered in buildings during summer.
- Bechstein's bat *Myotis bechsteinii*
  - Bechstein's bat is a medium-sized species, with very long ears and a long, pointed, bare, pink face. It has shaggy light-to reddish-brown fur on its back and contrasting greyish white-tipped fur on its underside. The species is closely associated with mature deciduous woodland and appears to select old woodpecker holes or rot holes in trees for breeding. It also occurs in coniferous woodland in some areas.
  - Maternity colonies may move between suitable crevices within a small area, such as a piece of woodland. It is believed to hibernate in hollow trees and sometimes in underground localities. It is one of the UK's rarest mammals, recorded from only a small number of sites in southern England and Wales. Very few maternity roosts are currently known, one of which is in a bat-box. The great majority of other records come from caves or abandoned mines, which are important hibernation sites for a range of bat species.
  - It is also one of the rarest bats in western Europe and is regarded as endangered in several countries. A population decrease has been reported over most of its European range. The species occurs from the Iberian Peninsula east to the Ukraine and Moldova. Local populations in southern England, Wales, southern Sweden and Bornholm mark the northern border of the range. A maternity colony of Bechstein's bat is associated with the site. Roosts are mainly in old woodpecker holes in the stems of live mature oak *Quercus petraea* trees.

<sup>16</sup> Natural England (2019). European Site Conservation Objectives: Supplementary advice on conserving and restoring site features. Available online from: <http://publications.naturalengland.org.uk/publication/6255629165395968> [Accessed: 20/11/19].

<sup>17</sup> JNCC (2019). *Ebernoe Common SAC*. Available online at: <https://sac.jncc.gov.uk/site/UK0012715> [Accessed: 20/11/2019]

## Current threats and pressures<sup>18</sup>

3.30 Ebernoe Common is an extensive block of mature woodland and former wood pasture which has been under continuous woodland cover for at least the last 500 years. The range of woodland types within the site and their longstanding history allows it to support an outstanding diversity of species. In particular, Barbastelle and Bechstein's bats - who favour ancient woodland - breed in the site because it provides suitable roosting and feeding habitats. While Bechstein's feed exclusively in the woodland, Barbastelles commute into the surrounding countryside using the woodland corridors which branch out from the site. Therefore, current threats and pressures occur from direct pressure the SAC and those outside the SAC. The include:

- Forestry and woodland management;
- Offsite habitat availability/ management;
- Habitat fragmentation;
- Change in land management;
- Hydrological changes;
- Air pollution; and
- Public access/ disturbance.

## Conservation objectives<sup>19</sup>

3.31 'Ensure that the integrity of the site is maintained or restored as appropriate, and ensure that the site contributes to achieving the Favourable Conservation Status of its Qualifying Features, by maintaining or restoring;

- The extent and distribution of qualifying natural habitats and habitats of qualifying species
- The structure and function (including typical species) of qualifying natural habitats
- The structure and function of the habitats of qualifying species
- The supporting processes on which qualifying natural habitats and the habitats of qualifying species rely
- The populations of qualifying species, and,
- The distribution of qualifying species within the site.'

## The Mens SAC

### Introduction

3.32 The Mens is one of the largest ancient woodlands in West Sussex and supports a significant population of barbastelle *Barbastella barbastellus*. It is eight miles south-west of Horsham and falls within the Low Weald National Character Area (NCA 121). Most of the woodland lies on Weald Clay although in some places Paludina limestone outcrops at the surface. It is a varied site with a range of woodland communities and age structures which have developed due to differences in underlying soils and past management. The site also supports outstanding invertebrate, fungi, lichen and bryophyte assemblages.

3.33 The woodland is predominantly high forest of sessile oak *Quercus petraea* and pedunculate oak *Quercus robur*, beech *Fagus sylvatica*, holly *Ilex aquifolium* and locally, ash *Fraxinus excelsior*, birches *Betula* spp. and wild service tree *Sorbus torminalis*. Beech dominates the lighter soils over an understorey of holly and yew *Taxus baccata*. On the heavier clay soils oak-ash woodland occurs over a mixed shrub layer which includes hazel *Corylus avellana*, hawthorn *Crataegus monogyna*, crab apple *Malus sylvestris* and blackthorn *Prunus spinosa*. It is developing a near-natural high forest structure, in response to only limited silvicultural intervention over the 20th century, combined with the effects of natural events such as the 1987

<sup>18</sup> Natural England (2015). *Site improvement plan Ebernoe Common*. Available online at: <http://publications.naturalengland.org.uk/publication/6364242571689984> [Accessed: 20/11/19].

<sup>19</sup> Natural England (2018). *European Site Conservation Objectives for Ebernoe Common Special Area of Conservation*. <http://publications.naturalengland.org.uk/publication/6255629165395968> [Accessed: 20/11/19].

great storm. Barbastelles roost within the woodland but tend to forage outside of the site, commuting along woodland corridors into the wider countryside<sup>20</sup>.

## Reason for designation<sup>21</sup>

3.34 Annex I habitats that are a primary reason for site selection include:

- Atlantic acidophilous beech forests with *Ilex* and sometimes also *Taxus* in the shrublayer (*Quercion robori-petraeae* or *Ilici-Fagenion*); Beech forests on acid soils
  - This Annex I type comprises beech *Fagus sylvatica* forests with holly *Ilex*, growing on acid soils, in a humid Atlantic climate. Sites of this habitat type often are, or were, managed as wood-pasture systems, in which pollarding of beech and oak *Quercus* spp. was common. This is known to prolong the life of these trees.

3.35 Annex II species that are supported by the site that are primary reason for site selection include:

- Barbastelle *Barbastella barbastellus*
  - The Mens SAC has been selected for classification as an example of a maternity colony of barbastelles *Barbastella barbastellus* which utilise a range of tree roosts in The Mens; usually in dead tree stumps. However, the species appears to be present throughout the year; but it is not clear how many bats hibernate at the site.

## Current threats and pressures<sup>22</sup>

3.36 The Mens is an extensive and structurally diverse woodland site. Like Ebernoe Common, the woodland site adjacent to it, it is ancient woodland, having been under continuous woodland cover for the last 500 years. Its diversity supports a range of species including lichen, fungi and invertebrates. Barbastelle bats *Barbastella barbastellus* - who favour ancient woodland - breed in the site because it provides the nesting and feeding habitats they require. Barbastelles commute into the surrounding countryside using the woodland corridors which branch out from the site. Current threats and pressures experienced by the site include:

- Forestry and woodland management;
- Habitat connectivity;
- Invasive species;
- Change in land management;
- Air pollution; and
- Public access and disturbance.

## Conservation objectives<sup>23</sup>

3.37 'Ensure that the integrity of the site is maintained or restored as appropriate, and ensure that the site contributes to achieving the Favourable Conservation Status of its Qualifying Features, by maintaining or restoring;

- The extent and distribution of qualifying natural habitats and habitats of qualifying species
- The structure and function (including typical species) of qualifying natural habitats
- The structure and function of the habitats of qualifying species
- The supporting processes on which qualifying natural habitats and the habitats of qualifying species rely

<sup>20</sup> Natural England (2019). *European Site Conservation Objectives: Supplementary advice on conserving and restoring site features*. Available online from: <http://publications.naturalengland.org.uk/publication/5642356338458624> [Accessed: 20/11/19].

<sup>21</sup> JNCC (2019) *The Mens SAC*. Available online at: <https://sac.jncc.gov.uk/site/UK0012716> [Accessed: 20/11/19].

<sup>22</sup> Natural England (2015). *Site improvement plan The Mens*. Available online at: <http://publications.naturalengland.org.uk/publication/5548316158853120> [Accessed: 20/11/19].

<sup>23</sup> Natural England (2018). *European Site Conservation Objectives for The Mens Special Area of Conservation*. Available online at: <http://publications.naturalengland.org.uk/publication/5642356338458624> [Accessed: 20/11/19].

- *The populations of qualifying species, and,*
- *The distribution of qualifying species within the site.'*



## 4. Likely significant effects

### Background to Elstead Parish

- 4.1 Elstead village is in the Borough of Waverley; Elstead Parish covers approximately 11 square kilometres and has a perimeter of about 16km. The civil parish of Elstead is located to the south west of Guilford and south east of Farnham, Surrey. Elstead is a small village with approximately 2,500 residents residing in 1,100 properties: current residential development is concentrated along Thursley Road and Milford Road that meet at Elstead Green. The parish supports numerous green spaces and the River Wey passes through the north of the village. Evidence of early human residence at Elstead dates to the early medieval period; Elstead Bridge that crosses the River Wey, which is considered the work of the Cistercian Monks of Waverley Abbey, is estimated to have been built around the same time, possibly after the floods of 1233<sup>24</sup>.

### Physical Scope of the HRA

- 4.2 Three of the European Sites that are described in Section 3 lie within the boundary of Elstead Parish. These are Thursley, Hankley and Frencham Commons SPA, Thursley, Ash. Pirbright and Chobham SAC and Thursley and Ockley Bogs Ramsar. The Wealden Heaths Phase 2 SPA is located only 2km south of the boundary and the Thames Basin Heaths SPA is located 6.7km north. Based upon previous HRA work undertaken for Waverley District there are several impact pathways of impact that require analysis regarding increased development within the Elstead Parish and said European Sites. These are:

- Air quality;
- Recreational pressure;
- Hydrological changes and water quality;
- Habitat fragmentation; and
- Urbanization.

- 4.3 Elbernoe Common SAC and The Mens SAC are designated for their populations of rare bats; Bechstein's and barbastelle. Bats are not expected to be confined to the boundaries of European Sites and are anticipated to forage within the wider vicinity of their Core Sustainance Zone (CSZ). For example, in a 2001 study, female adult Bechstein's bats regularly undertook commuting distances of up to 1km<sup>25</sup>. A second radio-tracking study in 2002 of Ebernoe Common SAC, showed that the maximum distance travelled by tagged individuals was 1,407m, with an average of 735.7m<sup>26</sup>. For Bechstein's it is reasonable to assume that the core foraging areas around the Ebernoe Common SAC and The Men's SAC, for which they are designated, is likely to be within c.1km of each site boundary.

- 4.4 Barbastelle bats are known to travel substantial distances from their roots to feeding sites. A study on barbastelle bats determined that home range distances show considerable inter-individual differences, with bats traveling between 1 and 20km to reach their foraging areas<sup>27</sup>. In 2016, the Bat Conservation Trust published guidelines on how to determine CSZs for bats and highlighted that barbastelles have a mean maximum CSZ of 6.47km<sup>28</sup>. As a precaution, Natural England and South Downs National Park Authority have since agreed a Sussex Bat Protocol<sup>29</sup>, which identifies a maximum 12km zone around the Sussex bat SACs (Ebernoe Common SAC, The Mens SAC and Singleton & Cocking Tunnels SAC) in which HRAs investigating habitat fragmentation are required.

<sup>24</sup> Historic England (2019). *Elstead Bridge*. Available online at: <https://historicengland.org.uk/listing/the-list/list-entry/1005921>, accessed 02/12/19.

<sup>25</sup> Kerth G., Wagner M. & Koenig B. 2001. Roosting together, foraging apart: Information transfer about food is unlikely to explain sociality in female Bechstein's bats (*Myotis bechsteini*). *Behavioural Ecology and Sociobiology* 50: 283-291.

<sup>26</sup> Fitzsimmons P., Hill D., Greenaway F. (2002). Patterns of habitat use by female Bechstein's bats (*Myotis bechsteini*) from a maternity colony in a British woodland.

<sup>27</sup> Zeale M.R.K., Davidson-Watts I. & Jones G. (2012). Home range use and habitat selection by barbastelle bats (*Barbastella barbastellus*): Implications for conservation. *Journal of Mammalogy* 93: 1110-1118.

<sup>28</sup> Bat Conservation Trust. (2016). Core Sustainance Zones: Determining zone size. Available at [https://cdn.bats.org.uk/pdf/Resources/Core\\_Sustainance\\_Zones\\_Explained\\_04.02.16.pdf?mtime=20190219173135](https://cdn.bats.org.uk/pdf/Resources/Core_Sustainance_Zones_Explained_04.02.16.pdf?mtime=20190219173135) [Accessed on the 14/10/2019].

<sup>29</sup> South Downs National Park Authority/ Natural England (2017). Sussex Bat Special Area of Conservation Planning and Landscape Scale Enhancement Protocol. Final Draft

- 4.5 Given the closest distance to the Elstead Parish boundary for Ebernoe Common SAC is 14km, and the Mens SAC is 20km these distances are more than double each species' CSZ and beyond the zone identified in the Sussex Bat Protocol.
- 4.6 Recreational pressure on these sites was investigated for the South Downs Local Plan HRA (all these sites being located within the National Park). That HRA concluded that the majority of visitors to the South Downs National Park who visit Ebernoe Common and The Mens do so during daylight hours. Therefore, there is limited potential for conflicts between Park users and bats. In addition, it was noted that recreational pressure is not identified as a threat or pressure on the Natural England Site Improvement Plan for either SAC. Finally, Elstead is well beyond the typical core recreational catchment of inland European sites that have been identified in a range of visitor surveys.
- 4.7 Therefore, likely significant effects due to increased development at Elstead is not expected to impact the SACs. Ebernoe Common SAC and The Mens SAC is scoped out form further discussion within this report.
- 4.8 Mole Gap to Reigate Escarpment SAC was covered by the 'likely significant effects' assessment of the Waverley Local Plan Part 1. However, Natural England's advice given to other authorities regarding the recreational impact on the Mole Gap to Reigate Escarpment SAC, was that this impact pathway could be screened out<sup>30</sup>. Primarily this advice was based on the fact that there is currently no evidence of significant off-track recreational damage in the different management units of the SAC and that there is an adequate management plan for the site. Given the SAC is 25km from Elstead at its closest, it is also well beyond the core local recreational catchment of the SAC. Therefore, this SAC is also scoped out of further assessment.
- 4.9 Table 1 identifies the environmental impact pathways to the European Sites that are likely to be impacted by increased residential development at Elstead.

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<sup>30</sup> Appendix 3 of the HRA for the Tandridge Local Plan. Tandridge District Council. (2019).

**Table 1. How each European Site could be susceptible to the above impact pathways due to increased development within Elstead.**

Impact pathway	Discussion
Recreational pressure	Increased development within Elstead could lead to higher numbers of visitors to European Sites. For example, the nature, scale, timing and duration of some human activities can result in the disturbance of birds at a level that may substantially affect their behaviour, and consequently affect the long-term viability of the population. This is highly likely for Thursley, Hankley and Frensham Common SPA, Thursley, Ash, Pirbright and Chobham SAC and Thursley and Ockly Bogs Ramsar that lie within the Elstead boundary and the Wealden Heaths Phase 2 SPA that is situated only 2km south of the boundary.
Air quality	Increased residential development within Elstead will lead to a greater number of vehicles within the parish. As such, increased air pollution is expected from vehicles emission. Pollutants realised form vehicles may be carried directly by wind currents and deposited to at European Sites or pollutants may become soluble and taken up during evaporation and deposited to European Sites at precipitation.
Hydrological changes	Thursley, Hankley and Frensham Common SPA, Thursley and Ockley Bogs Ramsar, Thames Basin Heaths and Ebernoe Common SAC all support lowland bog that is susceptible to changes in fluctuations in water table depth. Increased development, generated from the Elstead NP, could impact the water table of lowland bog. Impacts could occur from poor drainage design, increased water abstraction and bog erosion <sup>31</sup> .
Habitat fragmentation	Simply described, habitat fragmentation is the division of an expanse of habitat into smaller, individual patches that are isolated from each other by the removal of the original habitat <sup>32</sup> . Heathland is arguably one of the most severely fragmented habitats in the world with heathland cover decreased by 85% over the past 150 years as a result of agriculture and development <sup>33</sup> . The loss of heathland has had population consequences to the species that are supported by this habitat (including nightjar and woodlark) <sup>34</sup> . Given, that Thursley, Hankley and Frensham Commons SPA, Thursley, Ash, Pirbright and Chobham SAC and Thursley and Ockley Bogs Ramsar lie within the boundary of Elstead. There is a risk that increased development could, in combination, fragment these habitats, either through direct loss or providing barriers to movement; thus, impacting on the species.
Water quality (surface water runoff)	Increased residential development within Elstead village could lead to the loss of previously undeveloped land and therefore increased surface water runoff to nearby European Sites.

<sup>31</sup> Labadz, J., Allott, T., Evans, M., Butcher, D., Billett, M., Stainer, S., Yallop, A., Jones, P., Innerdale, M., Harmon, N. and Maher, K., 2010. Peatland Hydrology: Draft Scientific Review to IUCN Peatland Programme Commission of Inquiry on Peatlands.

<sup>32</sup> Wilcove, D.S., McLellan, C.H. and Dobson, A.P., 1986. Habitat fragmentation in the temperate zone. *Conservation biology*, 6, pp.237-256.

<sup>33</sup> English Nature (2002). *Lowland heathland a cultural and endangered landscape*. Northminster House: Peterborough

<sup>34</sup> Liley, D. and 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(2), pp.219-230.

Water quality (discharge of treated sewage effluent)

Increased housing development within the Elstead village would lead to increased sewage production. Therefore, it is necessary to consider any risk that increased sewage could degrade the water quality (i.e. through increased phosphorus discharge) of European Sites when in the absence of environmental mitigation and adequate wastewater treatment works<sup>35</sup>. Currently, the overall Water Framework Directive (WFD) classification status of Elstead is categorised as *poor*. The Waverley Borough Council Water Cycle Study 2016<sup>36</sup> recorded that ‘waste water is the most frequently stated reason for an element failure [within the Waverley District], being attributed for 80% of the water bodies. This directly links with the most often failing elements, phosphate and macrophytes and phytobenthos, which are heavily influenced by STW discharge.’ The report also described that the overall water body class for Frensham Great Pond (supported by Thursley, Ash, Pirbright and Chobham SAC) is *poor* as a result of ‘continuous sewage discharge from waste water, diffuse sewage discharge from towns, cities and transport, and drainage from road runoff’.

Research into water quality issues and waste water treatment works has previously been commissioned by Waverley Borough. The WCS (2016) undertaken by Capita report findings that Elstead Sewage Treatment Works (STW) remaining capacity is estimated to be at 240 dwellings or 5% remaining capacity. The report goes on to describe that the Elstead ‘appears to have area for expansion if required’. In addition, Waverley’s Water Quality Assessment report (2017)<sup>37</sup> concludes that ‘Elstead WwTW is located on the main River Wey with several other major WwTW upstream (e.g. Haslemere and Farnham). However...no significant changes in water quality were predicted over the lifetime of the Local Plan. As such housing growth at sites higher up in the catchment is not expected to impact on the growth areas served by Elstead WwTW.’

In any case, sewage effluent is the responsibility of water companies this also means to ensure there is no environmental consequences of WwTW. Capita report that ‘future objectives from both Thames Water and Southern Water seek to improve their treatment and disposal of waste water into receiving watercourses. A review of the water companies’ Strategic Direction Statements shows that they both aim to reduce the number of pollution incidents from wastewater treatment and disposal to zero within the next 25 years, with a minimum aim of 100% compliance by their STW within required standards.’

Given the evidence described above, it is considered that sewage production as a result of growth at Elstead has already been extensively assessed by Waverley Borough Council. As such, the conclusion of the cited reports above are decided and no further assessment of discharge of treated sewage effluent effecting water quality of European Sites is required.

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Urbanization

Increased urbanisation could lead to likely significant effects to European Sites<sup>38</sup>. In particular, increased residential development within 400m of the Thursley, Hankley and Frensham Common SPA. For example, development adjacent the SPA could increase cat predation to ground nesting birds and chicks reducing breeding success<sup>39</sup> of Annex II species, increase the occurrence of wildfire and have profound edge effects and habitat fragmentation. For the Waverley LP HRA, a zone of 400m was used to identify development sites that may particularly contribute to this pathway; the same buffer is used for Elstead NP.

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<sup>35</sup> Jarvie, H. P., Neal, C., & Withers, P. J. (2006). Sewage-effluent phosphorus: a greater risk to river eutrophication than agricultural phosphorus?. *Science of the total environment*, 360(1-3), 246-253.

<sup>36</sup> Capita (2016). Waverley Borough Council High Level Water Cycle Study. Available online: [https://www.waverley.gov.uk/downloads/file/5293/waverley\\_borough\\_council\\_high\\_level\\_water\\_cycle\\_study](https://www.waverley.gov.uk/downloads/file/5293/waverley_borough_council_high_level_water_cycle_study) [Accessed: 07/01/2020].

<sup>37</sup> Amec Foster Wheeler (2017). Waverley Water Quality Assessment. Available online: [https://www.waverley.gov.uk/downloads/file/5787/waverley\\_water\\_quality\\_assessment\\_-\\_june\\_2017](https://www.waverley.gov.uk/downloads/file/5787/waverley_water_quality_assessment_-_june_2017) [Accessed: 07/01/2020].

<sup>38</sup> Chace, J.F. and Walsh, J.J., 2006. Urban effects on native avifauna: a review. *Landscape and urban planning*, 74(1), pp.46-69.

<sup>39</sup> Marzluff, J.M., 2001. Worldwide urbanization and its effects on birds. In *Avian ecology and conservation in an urbanizing world* (pp. 19-47). Springer, Boston, MA.

- 4.10 For the Screening assessment (Table 2) green shading in the final column indicates that the proposed development site or policy has been deemed not to lead to a likely significant effect on any European sites due to the absence of any mechanism for an adverse effect. Orange shading indicates that a pathway of impact exists and further discussion is therefore required. For the purposes of this assessment a 5km influence zone is chosen because a) this is the zone within which a series of HRAs have identified that all net new housing will have an adverse effect on the integrity of Thames Basin Heaths SPA without mitigation and b) the HRA of Waverley Local Plan Part 1 records that Natural England recommended during preparation of that HRA that the Council undertake a project-level HRA on all larger developments located within 5km of Wealden Heaths Phase I SPA and Wealden Heaths Phase 2 SPA.

**Table 2. Screening assessment of the Elstead Neighbourhood Plan.**

Policy	European Sites	Brief summary	Screening outcome
Policy PP1: Settlement boundary	<ul style="list-style-type: none"> <li>Thursley, Hankley and Frensham Commons SPA: 95m, S</li> <li>Thursley, Ash, Pirbright and Chobham SAC: 95m, S</li> <li>Thursley and Ockley Bogs Ramsar: 317m, S</li> <li>Wealden Heaths Phase 2 SPA: 4.2km, S</li> <li>Thames Basin Heaths SPA: 7.8km, N</li> </ul>	Policy defines the settlement boundary of Elstead.	<p><b>Likely significant effects. Screened in.</b></p> <p>This policy has involved changes to the previous Elstead settlement boundary to accommodate new development allocations. Part of this has included the removal of land from green belt. Therefore, considering the close distance to European Sites likely significant effects cannot be dismissed in the absence of further discussion/ mitigation.</p>
Policy PP2: Core Planning Principles	N/A	Policy requires development to be innkeeping with the local character of Elstead.	<p><b>No likely Significant Effect. Screened out.</b></p> <p>This is a development management policy and does not specifically allocate sites for development. Therefore, no impact pathways exist.</p>
Policy H1: Housing Allocations	N/A	Describes policy requirements for the development of three site allocations.	<p><b>No likely Significant Effect. Screened out.</b></p> <p>This is a development management policy and requires allocated sites to following policy requirements. Therefore, no impact pathways exist for this policy.</p>
Policy H2: Sunray Farm	<ul style="list-style-type: none"> <li>Thursley, Hankley and Frensham Commons SPA: 573m, S</li> <li>Thursley, Ash, Pirbright and Chobham SAC: 573m, S</li> <li>Thursley and Ockley Bogs Ramsar: 827m, S</li> <li>Wealden Heaths Phase 2 SPA: 4.7km, S</li> <li>Thames Basin Heaths SPA: 8.2km, N</li> </ul>	Policy allocates a total of 40 net dwellings.	<p><b>European Sites with likely significant effects. Screened in.</b></p> <p>This policy allocates a total of 40 residential dwellings that are within close proximity to European Sites (namely Thursley, Ash, Pirbright and Chobham SAC, Thursley, Hankley and Frensham Commons SPA and Thursley and Ockley Bogs Ramsar) and consideration of accumulative development with surrounding authorities (i.e. in combination). As such, impacts to water quality, air quality, recreational pressure, habitat fragmentation and urbanization are considered likely to European Sites in the absence of further discussion and mitigation.</p> <p><b>Screened out European Sites.</b></p> <p>Alternatively, that Thames Basin Heaths SPA is located over 8km from the site. Considering the significantly closer distances of the Wealden Heaths the Thames Basin heaths SPA is consider too far to lead to likely significant effects as a result of residential development at Sunray Farm.</p>
Policy H3: Springfield	<ul style="list-style-type: none"> <li>Thursley, Hankley and Frensham Commons SPA: 1.13km, E</li> <li>Thursley, Ash, Pirbright and Chobham SAC: 1.13km, E</li> <li>Thursley and Ockley Bogs Ramsar: 1.23m, S</li> <li>Wealden Heaths Phase 2 SPA: 4.8km, S</li> <li>Thames Basin Heaths SPA: 8.2km, N</li> </ul>	Policy allocates a total of 16 net dwellings.	<p><b>European Sites with likely significant effects. Screened in.</b></p> <p>This policy allocates a total of 16 residential dwellings that are within close proximity to European Sites (namely Thursley, Ash, Pirbright and Chobham SAC and Thursley, Hankley and Frensham Commons SPA) and consideration of accumulative development with surrounding authorities (i.e. in combination). As such, impacts to water quality, air quality, recreational pressure, habitat fragmentation and urbanization are considered likely to European Sites in the absence of further discussion and mitigation.</p> <p><b>Screened out European Sites.</b></p> <p>Alternatively, that Thames Basin Heaths SPA is located over 8km from the site. Considering the significantly closer distances of the Wealden Heaths the Thames Basin heaths SPA is consider too far to lead to likely significant effects as a result of residential development at Springfield.</p>



Policy H4: Four Trees	<ul style="list-style-type: none"> <li>• Thursley, Hankley and Frensham Commons SPA: 550m, E</li> <li>• Thursley, Ash, Pirbright and Chobham SAC: 550m, E</li> <li>• Thursley and Ockley Bogs Ramsar: 993m, S</li> <li>• Wealden Heaths Phase 2 SPA: 4.98km, S</li> <li>• Thames Basin Heaths SPA: 8.3km, N</li> </ul>	Policy allocated a total of 11 net dwellings.	<p><b>European Sites with likely significant effects. Screened in.</b></p> <p>This policy allocates a total of 11 residential dwellings that are within close proximity to European Sites (namely Thursley, Ash, Pirbright and Chobham SAC and Thursley, Hankley and Frensham Commons SPA) and consideration of accumulative development with surrounding authorities (i.e. in combination). As such, impacts to water quality, air quality, recreational pressure, habitat fragmentation and urbanization are considered likely to European Sites in the absence of further discussion and mitigation.</p>	<p><b>Screened out European Sites.</b></p> <p>Alternatively, that Thames Basin Heaths SPA is located over 8km from the site. Considering the significantly closer distances of the Wealden Heaths the Thames Basin Heaths SPA is consider too far to lead to likely significant effects as a result of residential development at Four trees.</p>
Policy H5: Windfall	<p>Within settlement boundary. Closest distance to European Sites to said boundary is used.</p> <ul style="list-style-type: none"> <li>• Thursley, Hankley and Frensham Commons SPA: 95m, S</li> <li>• Thursley, Ash, Pirbright and Chobham SAC: 95m, S</li> <li>• Thursley and Ockley Bogs Ramsar: 317m, S</li> <li>• Wealden Heaths Phase 2 SPA: 4.2km, S</li> <li>• Thames Basin Heaths SPA: 7.8km, N</li> </ul>	Policy describes allocation and design requirements for windfall developments.	<p><b>No likely Significant Effect. Screened out.</b></p> <p>This is a development management policy and does not specifically allocate sites for development. Moreover, the HRA of the Waverley LPP1 specifically included an allowance for windfall over the plan period in its analyses. Therefore, no impact pathways exist.</p>	
Policy H6: Housing Choices	N/A	Policy requires residential development to provide a mix of housing types and bedroom numbers.	<p><b>No likely Significant Effect. Screened out.</b></p> <p>This is a development management policy and does not specifically allocate sites for development. Therefore, no impact pathways exist.</p>	
Policy H7: Affordable housing provision	N/A	Policy requires development to provide affordable housing.	<p><b>No likely Significant Effect. Screened out.</b></p> <p>This is a development management policy and does not specifically allocate sites for development. Therefore, no impact pathways exist.</p>	
Policy ESDQ1: Character and design	N/A	Policy describes building design to keep in line with the character and landscape of Elstead.	<p><b>No likely Significant Effect. Screened out.</b></p> <p>This is a development management policy and does not allocate sites for development. Therefore, no impact pathways exist.</p>	
Policy ESDQ2: Conversions and Subdivisions	N/A	Policy provides strict requirements for the conversation of existing properties or the subdivision of existing plots.	<p><b>No likely Significant Effect. Screened out.</b></p> <p>This is a development management policy and does not allocate sites for development. Therefore, no impact pathways exist.</p>	
Policy ESDQ3: Design and Development Briefs	N/A	Policy requires that development over a certain threshold size must provide a detail design and development brief.	<p><b>No likely Significant Effect. Screened out.</b></p> <p>This is a development management policy and does not allocate sites for development. Therefore, no impact pathways exist.</p>	
Policy ESDQ4: Local Green Spaces	N/A	Policy affords protection to local green spaces within Elstead.	<p><b>No likely Significant Effect. Screened out.</b></p> <p>This is a positive environmental policy. Therefore, no impact pathway exists.</p>	

Policy ESDQ5: Landscape and Visual Impact	N/A	Policy ensures that development located adjacent the rural landscape is sensitive in design.	<b>No likely Significant Effect. Screened out.</b> This is a positive environmental policy. Therefore, no impact pathway exists.
Policy ESDQ6: Bonfire Hill	N/A	Policy requires that development must have no unacceptable impact on the views from and of Bonfire Hill.	<b>No likely Significant Effect. Screened out.</b> This is a positive environmental policy. Therefore, no impact pathway exists.
Policy ESDQ7: Tanshire and Weyburn Green Gap	N/A	Policy affords protection to green belt between Elstead village and Tanshire Park and Weyburn developments located at the eastern boundary,	<b>No likely Significant Effect. Screened out.</b> This is a positive environmental policy. Therefore, no impact pathway exists.
Policy ESDQ8: Biodiversity and Trees	N/A	Policy requires development to have biodiversity net gain, provide mitigation for protected species and designated sites where applicable.	<b>No likely Significant Effect. Screened out.</b> This is a positive environmental policy. Therefore, no impact pathway exists.
Policy ESDQ9: Historic Environment	N/A	Policy requires development to be innkeeping with local distinctiveness, character and sense of place and affords protection to Listed Buildings, Scheduled Ancient Monuments and Conservation Areas.	<b>No likely Significant Effect. Screened out.</b> This is a development management policy and does not allocate sites for development. Therefore, no impact pathways exist.
Policy ESDQ10: Sustainable Design	N/A	Policy supports innovative approaches to construction of low carbon development and increasing water efficiency.	<b>No likely Significant Effect. Screened out.</b> This is a development management policy and does not allocate sites for development. Therefore, no impact pathways exist.
Policy EBS1: Retention and Expansion of Local Employment Space	<p>Within parish boundary. Closest distance to European Sites to said boundary is used.</p> <ul style="list-style-type: none"> <li>Thursley, Hankley and Frensham Commons SPA: within boundary</li> <li>Thursley, Ash, Pirbright and Chobham SAC: within boundary</li> <li>Thursley and Ockley Bogs Ramsar: within boundary</li> <li>Wealden Heaths Phase 2 SPA: 2km, S</li> <li>Thames Basin Heaths SPA: 6.7km, N</li> </ul>	Policy supports the retention and, subject to policy constraints, expansion of employment space.	<b>Likely significant effects. Screened in.</b> While this policy does not specifically allocate sites for employment development the NP does support increases in employment space. As such, there is a risk that likely significant effects could occur to European Sites since this policy provides limited spatial detail of development placement. There is particular concern for designated sites that are within the southern boundary of the parish as inappropriate placement could lead to employment space directly adjacent European Sites (i.e. urbanisation impacts).
Policy EBS2: Working from Home	<p>Within parish boundary. Closest distance to European Sites to said boundary is used.</p> <ul style="list-style-type: none"> <li>Thursley, Hankley and Frensham Commons SPA: within boundary</li> <li>Thursley, Ash, Pirbright and Chobham SAC: within boundary</li> </ul>	Policy describes the Council support to work from home. This includes applications for home offices on garden land, subject to satisfactory compliance to all other relevant policies within	<b>No likely Significant Effect. Screened out.</b> This is a development management policy and does not allocate sites for development. Rather this policy aims to encourage working from home that could reduce the need to travel by car. Therefore, no impact pathways exist.

	<ul style="list-style-type: none"> <li>• Thursley and Ockley Bogs Ramsar: within boundary</li> <li>• Wealden Heaths Phase 2 SPA: 2km, S</li> <li>• Thames Basin Heaths SPA: 6.7km, N</li> </ul>		
Policy EBS3 Local Community Co-Working Space	<p>Within parish boundary. Closest distance to European Sites to said boundary is used.</p> <ul style="list-style-type: none"> <li>• Thursley, Hankley and Frensham Commons SPA: within boundary</li> <li>• Thursley, Ash, Pirbright and Chobham SAC: within boundary</li> <li>• Thursley and Ockley Bogs Ramsar: within boundary</li> <li>• Wealden Heaths Phase 2 SPA: 2km, S</li> <li>• Thames Basin Heaths SPA: 6.7km, N</li> </ul>	Policy describes requirements for local community co-working and business meeting space developments.	<p><b>Likely significant effects. Screened in.</b></p> <p>While this policy does not specifically allocate sites for employment development the NP does support the development of co-working and business meeting space. In addition, there is lack of spatial detail for this policy. Therefore, inappropriate placement could lead to employment space directly adjacent European Sites and urbanisation impacts could occur.</p>
Policy EBS4: Equestrian Related Development		Policy describes the requirements of equestrian development.	<p><b>No likely Significant Effect. Screened out.</b></p> <p>This is a development management policy and does not allocate sites for new development. Therefore, no impact pathways exist.</p>
Policy TGA1: Pedestrian and Cycle Movement	Within parish boundary.	Policy describes the requirement of developments to provide/ enhance pedestrian and cycle routes.	<p><b>No likely Significant Effect. Screened out.</b></p> <p>This is a development management policy aimed to increase walking and cycling within the parish. Therefore, no impact pathways exist.</p>
Policy TGA2: Design Code: Rural character of streets and public spaces	Within parish boundary.	Policy supports development that improves rural character, public highway and use of natural materials.	<p><b>No likely Significant Effect. Screened out.</b></p> <p>This is a development management policy and does not allocate sites for new development. Therefore, no impact pathways exist.</p>
Policy TGA3: Car and Cycle Parking	<p>Within settlement boundary. Closest distance to European Sites to said boundary is used.</p> <ul style="list-style-type: none"> <li>• Thursley, Hankley and Frensham Commons SPA: 95m, S</li> <li>• Thursley, Ash, Pirbright and Chobham SAC: 95m, S</li> <li>• Thursley and Ockley Bogs Ramsar: 317m, S</li> <li>• Wealden Heaths Phase 2 SPA: 4.2km, S</li> <li>• Thames Basin Heaths SPA: 7.8km, N</li> </ul>	Policy supports the development of cycling and car parking facilitates with associated residential and commercial development.	<p><b>Likely significant effects. Screened in.</b></p> <p>While this policy does not specifically allocate sites for parking facilities the NP does support the development of said facilities. Therefore, inappropriate placement and lack of drainage design could lead to likely significant effects to European Sites due to surface water runoff.</p>
Policy TGA4: Improved Bus Services	Within parish boundary.	Policy supports proposals that improve or provide coordinated bus services.	<p><b>No likely Significant Effect. Screened out.</b></p> <p>This is a development management policy and does not allocate sites for new development. Therefore, no impact pathways exist.</p>
Policy RLW1: Recreation and Leisure Facilities	Within parish boundary.	Policy supports the retention of existing public recreational and leisure facilities.	<p><b>No likely Significant Effect. Screened out.</b></p> <p>This is a development management policy and does not allocate sites for new development. Therefore, no impact pathways exist.</p>
Policy RLW2: Community Facilities	Within parish boundary.	Policy supports the retention of existing community facilities.	<p><b>No likely Significant Effect. Screened out.</b></p>

		<p>This is a development management policy and does not allocate sites for new development. Therefore, no impact pathways exist.</p>
<p>Policy RLW3: Retention of Assets of Community Value    Within parish boundary.</p>	<p>Policy affords protection of Assets of Community Value from inappropriate development.</p>	<p><b>No likely Significant Effect. Screened out.</b>                  This is a development management policy and does not allocate sites for new development. Therefore, no impact pathways exist.</p>
<p>Policy ID1: Infrastructure Delivery    Within parish boundary.</p>	<p>Policy describes the requirement of new development to provide suitable on-site and off-site infrastructure.</p>	<p><b>No likely Significant Effect. Screened out.</b>                  This is a development management policy and does not allocate sites for new development. Therefore, no impact pathways exist.</p>

## 5. Consideration of Effect ‘in combination’

- 5.1 The Waverley LPP1 was subject to HRA in 2018 and later updated in 2019 for the post- Examination Local Plan. That HRA included a strategic assessment of air quality, recreational pressure and urbanisation ‘in combination’ with growth in other authority areas and included an allowance for 160 dwellings at Elstead plus windfall, with which this Neighbourhood Plan is compliant. Therefore, key in combination issues such as air quality have already been assessed in LPP1.

## 6. Appropriate assessment

### Introduction

- 6.1 The law does not prescribe how an appropriate assessment should be undertaken or presented but the appropriate assessment must consider all impact pathways that have been screened in, whether they are due to policies alone or to impact pathways that arise in combination with other projects and plans. That analysis is the purpose of this section. The law does not require the 'alone' and 'in combination' effects to be examined separately provided all effects are discussed.
- 6.2 By virtue of the small amount of growth planned in Elstead, the main impacts pathways of concern to this HRA (water quality, air quality, recreational pressure, urbanization, habitat fragmentation and hydrological changes) are inherently 'in combination' with neighbouring plans and projects. However, for completeness, potential impacts of c. 61 net residential developments within Elstead village in isolation are also assessed.
- 6.3 The HRA screening exercise undertaken in Chapter 4, Table 2 indicated a total of seven policies that were expected to have likely significant effects to the European Sites due to air quality, water quality, hydrological changes, recreational pressures, and urbanisation issues. At the screening stage the following policies were screened in, requiring further assessment:
- Policy PP1: Settlement boundary
  - Policy H2: Sunray Farm – 40 dwellings
  - Policy H3: Springfield – 16 dwellings
  - Policy H4: Four Trees – 11 dwellings
  - Policy EBS1: Retention and Expansion of Local Employment Space
  - Policy EBS3 Local Community Co-Working Space
  - Policy TGA3: Car and Cycle Parking

### Urbanisation

- 6.4 At the screening stage a buffer of 400m was used to screen for potential urbanisation impacts to the Thursley, Hankley and Frensham Commons SPA, Thursley, Ash, Pirbright and Chobham SAC and Thursley and Ockley Bogs Ramsar. Urbanisation is essentially the encroaching of settlements onto open space to such an extent that there is a regular background level of impact (whether recreational activity, cat predation, fly tipping or garden waste and other activities) due to close proximity of large amounts of housing. This can have a negative effect on wildlife causing them to retreat further into the body of a site and abandon the edge habitats or impacting breeding success and result in habitat fragmentation and changes in plant communities<sup>40</sup>.
- 6.5 Policy H2: Sunray Farm, Policy H3: Springfield and Policy H4: Four Trees are all allocated over 400m from the Wealden Heaths. These sites allocations are at distances too great to lead to site integrity impacts and are not discussed further.
- 6.6 However, windfall under Policy PP1: Settlement boundary, as well as developments under Policy EBS1: Retention and Expansion of Local Employment Space, Policy EBS3 Local Community Co-Working Space and Policy TGA3: Car and Cycle Parking could all come forward within 400m of the Wealden Heaths and may lead to impact. Although, these policies do not specifically allocate sites for development, it is **strongly recommended that a policy in the plan makes it explicit that housing development within 400m of the Wealden Heaths Phase 1 SPA will not be supported and that any other development proposed within the 400m zone will require HRA.**

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<sup>40</sup> Vallet, J., Beaujouan, V., Pithon, J., Rozé, F. and Daniel, H., 2010. The effects of urban or rural landscape context and distance from the edge on native woodland plant communities. *Biodiversity and Conservation*, 19(12), pp.3375-3392.



# Air quality

## Introduction

- 6.7 Increased residential development within Elstead village could decrease air quality through increased emissions from vehicle exhausts. There are two measures of relevance regarding air quality impacts from vehicle exhausts. The first is the concentration of oxides of nitrogen (known as NO<sub>x</sub>) in the atmosphere. In extreme cases NO<sub>x</sub> can be directly toxic to vegetation but its main importance is as a source of nitrogen, which is then deposited on adjacent habitats. The guideline atmospheric concentration advocated by Government for the protection of vegetation is 30 micrograms per cubic metre (µg<sub>m</sub><sup>-3</sup>), known as the Critical Level, as this concentration relates to the growth effects of nitrogen derived from NO<sub>x</sub> on vegetation.
- 6.8 The second important metric is a measure of the rate of the resulting nitrogen deposition. The addition of nitrogen is a form of fertilization, which can have a negative effect on woodlands and other habitats over time by encouraging more competitive plant species that can force out the less competitive species that are more characteristic. Unlike NO<sub>x</sub> in atmosphere, the nitrogen deposition rate below which we are confident effects would not arise is different for each habitat. The rate (known as the Critical Load) is provided on the UK Air Pollution Information System (APIS) website ([www.apis.ac.uk](http://www.apis.ac.uk)) and is expressed as a quantity (kilograms) of nitrogen over a given area (hectare) per year (kgNha<sup>-1</sup>yr<sup>-1</sup>).
- 6.9 Emissions of NO<sub>x</sub> and resulting deposition can have community level impacts to habitats and European Sites. Habitats that are particularly sensitive to elevated nitrogen levels include heathlands and lowland bog. Supported communities within bogs are particularly sensitive to nitrogen deposition. Bryophytes (mosses and liverworts) lack a well-developed cuticle and therefore more easily absorb pollutants across their cell surface. Their abundance decreases when a certain threshold of nitrogen is exceeded. *Sphagnum* bogs are incredibly important organisms as they store large quantities of carbon and, to an extent, filter pollutants from the environment<sup>41</sup>. The protection of this habitat from nitrogen degradation is therefore incredibly important.
- 6.10 The routes that nitrogen deposition impacts habitats and vegetation described above are through toxicity and the movement of nitrogen through varying trophic levels. Another route of affect is through nitrogen acidification. A study undertaken by Maskell et al (2010)<sup>42</sup> observed that with increasing acid deposition from NO<sub>x</sub> there was a decrease in species richness within heathland. Acid deposition can have serious impacts to the health of soil structure and the microbial communities found here. These species carryout a natural decaying process known as nitrification (converting ammonium to nitrate) that generates acidity. However, when in combination with acid deposition from NO<sub>x</sub> pollution the soil pH may become too acidic for specialised plant communities to survive and result in a net decrease in biodiversity<sup>43</sup>. Acidification tends to be more of an issue for acid substrates, which have poor buffering capacity (i.e. heathland), than neutral or calcareous substrates.
- 6.11 Air quality impacts of development plans are most appropriately tackled at the Local Plan level. Impacts of air quality to European Sites within the district of Waverley were assessed in 2016 during the Waverley Local Plan Part 1 HRA. A summary of these findings are described below.
- 6.12 To support the 2016 HRA an Air Quality Impact Assessment was undertaken comparing the predicted change in vehicle flows on roads within 200m of the Thames Basin Heaths SPA, Thursley, Ash, Pirbright and Chobham SAC, Wealden Heaths Phase I (Thursley, Hankley and Frensham Commons) SPA, and Wealden Heaths Phase II SPA as a result of the LP, that was predicted to occur over time due to background population growth and delivery of existing consents.
- 6.13 Since vehicle exhausts are situated very close to the ground the emissions only have a local effect within a narrow band along the roadside, well within 200m of the centreline of the road. Beyond 200m emissions will have dispersed sufficiently that atmospheric concentrations are essentially background levels. The rate of decline is steeply curved rather than linear. In other words concentrations will decline rapidly as one begins

<sup>41</sup> Phoenix, G., Emmett, B., Britton, A., Caporn, S., Dise, N., Helliwell, R., Jones, L., Leake, J., Leith, I., Sheppard, L., Sowerby, A., Pilkington, M., Rowe, E., Ashmore, M. and Power, S. (2011). Impacts of atmospheric nitrogen deposition: responses of multiple plant and soil parameters across contrasting ecosystems in long-term field experiments. *Global Change Biology*, 18(4), pp.1197-1215.

<sup>42</sup> Maskell, L.C., Smart, S.M., Bullock, J.M., Thompson, K.E.N. and Stevens, C.J., (2010). Nitrogen deposition causes widespread loss of species richness in British habitats. *Global Change Biology*, 16(2), pp.671-679.

<sup>43</sup> Defra (2007) Acid Deposition Processes. Nobel House: London.

to move away from the roadside, slackening to a more gradual decline over the rest of the distance up to 200m. Air Quality Technical Advisory Group guidance advises that where the concentration within the emission footprint (i.e. the Process Contribution (PC), the contribution of the scheme in question) in any part of the European site(s) is 1% of the relevant long-term benchmark (Critical Level or Critical Load) or less, the emission is not likely to have a significant effect alone or in combination irrespective of the background levels.

- 6.14 A series of road links within 200m of the Thames Basin Heaths SPA, Thursley, Ash, Pirbright and Chobham SAC, Wealden Heaths Phase I (Thursley, Hankley and Frensham Commons SPA), and Wealden Heaths Phase II SPA were identified for further investigation. These are described in Table 3.

**Table 3. Roads that are within 200m of each European Sites. Red shading identifies roads located within Elstead and yellow shading identifies roads directly connected to Elstead.**

Link	Ecological Site	Grid reference
A287 (Odiham Road)	Thames Basin Heaths SPA	SU827491
A287	Thursley, Ash, Pirbright and Chobham SAC, and Wealden Heaths Phase I (Thursley, Hankley and Frensham Commons) SPA	SU849406
A3 (Portsmouth Road)	Thursley, Ash, Pirbright and Chobham SAC, and Wealden Heaths Phase I (Thursley, Hankley and Frensham Commons) SPA	SU927409
A286 (Haslemere Road)	Thursley, Ash, Pirbright and Chobham SAC, and Wealden Heaths Phase I (Thursley, Hankley and Frensham Commons) SPA	SU933403
B3001	Thursley, Ash, Pirbright and Chobham SAC, and Wealden Heaths Phase I (Thursley, Hankley and Frensham Commons) SPA	SU922432
A3	Wealden Heaths Phase II SPA	SU899376
A287 (Hindhead Road)	Wealden Heaths Phase II SPA	SU889353

- 6.15 The HRA identified that all modelled Road Links were predicted to result in a reduction of traffic flows over the Plan period as a result of the LP and its transport improvements, with the exception of the B3001.
- 6.16 AECOM air quality specialists calculated expected NO<sub>x</sub> concentrations, nitrogen deposition rates and acid deposition rates for the B3001. The B3001 passes immediately adjacent to the Thursley, Ash, Pirbright and Chobham SAC, and Wealden Heaths Phase I (Thursley, Hankley and Frensham Commons) SPA. Two locations on the B3001 Road Link within 200m of the SPA were subject to air quality modelling as a result of the Plan. For NO<sub>x</sub>, if the numbers in the Change column fall on or below 0.3 µgm<sup>-3</sup> (i.e. 1% of the generic Critical Level for vegetation of 30 µgm<sup>-3</sup>) then impacts can be screened out without further discussion. For nitrogen deposition, if the numbers in this column fall on or below 0.1 kgNha<sup>-1</sup>yr<sup>-1</sup> (1% of the lowest point in the Critical Load range) then it can also be screened out.
- 6.17 There were several occasions where NO<sub>x</sub> change increased by 1% or more of the generic Critical Level; however, none of the modelled transects on the B3001 are currently in exceedance of the generic Critical Level of NO<sub>x</sub> for vegetation of 30 µgm<sup>-3</sup>, nor are they expected to be in exceedance when Local Plan growth is taken into account.

## Discussion

- 6.18 The HRA undertaken for Waverley Borough Council LPP1 undertook a strategic assessment of air quality changes as a result of growth within the borough (including Elstead) over the plan period 2016-2032. That HRA included an assessment of increased vehicle uses within Waverley (i.e. growth at Elstead in combination with surrounding parishes that make up the borough and surrounding Local Plans). As such these findings can be directly applied to the assessment of residential and employment growth within Elstead (Polices: PP1, H2, H3, H4 and EBS1). The development of 61 dwellings within Elstead is to be concentrated at Milford Road (B3001), these developments are therefore expected to contribute to the

overall increase in forecast traffic at Thursley, Ash, Pirbright and Chobham SAC, and Thursley, Hankley and Frensham Commons SPA over the NP period. However, this level of growth was modelled for LPP1.

- 6.19 In addition, the Waverley LPP1 provides transport policies that aim to increase resident use of sustainable transport options:
- 6.20 Waverley LPP1: '*ST1: Sustainable transport - The Council will work in partnership with Surrey County Council, neighbouring authorities, transport providers and other key stakeholders to ensure that development schemes: 1. are located where opportunities for sustainable transport modes can be maximised, reflecting the amount of movement generated, the nature and location of the site and recognising that solutions and measures will vary from urban to rural locations; 2. make the necessary contributions to the improvement of existing, and provision of new, transport schemes that lead to improvements in accessibility and give priority to the needs of pedestrians, cyclists, users of public transport, car sharers and users of low and ultra-low emission vehicles; 3. include measures to encourage non-car use such as on-site cycle parking;...7. are consistent with the objectives and actions within the Air Quality Action Plan... 8. encourage the provision of new and improved footpaths, bridleways and cycleways, provided there would be no significant effect on SPAs and other areas of importance for nature conservation (Policies NE1 and NE3)*'.
- 6.21 Waverley LPP1: '*Para 16.27...a framework to undertake air quality monitoring would need to be set up with other relevant local authorities. The Council will work with partners to consider the best way to monitor changes in air quality across the Borough, and on European sites likely to be affected by new development in the Borough. This would include long term monitoring of the main roads that fall within 200m of the Thames Basin Heaths, Wealden Heaths Phase I and Wealden Heaths Phase II SPAs and the introduction of any mitigation measures. If air quality was found not to improve then further protective measures would need to be devised*'.
- 6.22 It is concluded that air quality assessments previously completed for the Waverley LPP1 provides detailed analysis with regards to NOx increases within Elstead and the Waverley Borough. In addition, there are two LP policies that provide strict policy requirement of road design within the borough to promote sustainable modes of transport and ensure road schemes have an Air Quality Action Plan. These measures are considered sufficient to mitigate any adverse in combination effect on air quality at the European Sites as a result of the Elstead NP and growth across Waverley and beyond.

## Recreational pressure

- 1.1 There is growing concern over the cumulative impacts of recreation on key nature conservation sites in the UK, as most sites must fulfill conservation objectives while also providing recreational opportunity. Various research reports have provided compelling links between changes in housing and access levels and impacts on European protected sites<sup>44 45</sup>. This applies to any habitat, but the additional recreational pressure from housing growth on destinations with water features is likely to be especially strong and some of the qualifying waterfowl are known to be susceptible to disturbance. Different European sites are subject to different types of recreational pressures and have different vulnerabilities. Studies across a range of species have shown that the effects from recreation can be complex. HRAs of Plans tend to focus on recreational sources of disturbance as a result of new residents<sup>46</sup>.
- 1.2 Human activity can affect organisms directly (e.g. loss of habitat or by causing species to flee) and indirectly (e.g. by damaging their habitat or reducing their fitness in less obvious ways e.g. stress). The most obvious direct effect is the loss of habitat as a result of increased visitors to a site (i.e. trampling). But human activity can also lead to much subtler behavioural (e.g. alterations in feeding behaviour, avoidance of certain areas and use of sub optimal areas etc.) and physiological changes to species (e.g. an increase in heart rate).

<sup>44</sup> Liley D, Clarke R.T., Mallord J.W., Bullock J.M. 2006a. The effect of urban development and human disturbance on the distribution and abundance of nightjars on the Thames Basin and Dorset Heaths. Natural England / Footprint Ecology.

<sup>45</sup> Liley D., Clarke R.T., Underhill-Day J., Tyldesley D.T. 2006b. Evidence to support the appropriate Assessment of development plans and projects in south-east Dorset. Footprint Ecology / Dorset County Council.

<sup>46</sup> The RTP1 report 'Planning for an Ageing Population' (2004) which states that 'From being a marginalised group in society, the elderly are now a force to be reckoned with and increasingly seen as a market to be wooed by the leisure and tourist industries. There are more of them and generally they have more time and more money.' It also states that 'Participation in most physical activities shows a significant decline after the age of 50. The exceptions to this are walking, golf, bowls and sailing, where participation rates hold up well into the 70s'.

While these are less noticeable, they might result in major population-level changes by altering the balance between immigration/birth and emigration/death<sup>47</sup>.

- 1.3 Impacts of bird disturbance is particularly well studied. Much research concern stem from the fact that birds expend energy unnecessarily when disturbed and the time they spend responding to humans is time that is not spent feeding<sup>48</sup>. Disturbance therefore risks increasing energetic expenditure of birds while reducing their energetic intake, which can adversely affect the 'condition' and ultimately survival of the birds. Additionally, displacement of birds from one feeding site to others can increase the pressure on the resources available within the remaining sites, as they then must sustain a greater number of birds<sup>49</sup>. Moreover, the more time a breeding bird spends disturbed from its nest, the more its eggs are likely to cool and the more vulnerable they, or any nestlings, are to predators. Recreational effects on ground-nesting birds are particularly severe, with many studies concluding that urban sites support lower densities of key species, such as nightjar<sup>50 51</sup>.
- 1.4 Evidence in the literature suggests that the magnitude of disturbance clearly differs between different types of recreational activities. For example, dog walking leads to a significantly higher reduction in bird diversity and abundance than hiking<sup>52</sup>. Scientific evidence also suggests that key disturbance parameters, such as areas of influence and flush distance, are significantly greater for dog walkers than hikers<sup>53</sup>. A UK meta-analysis suggests that important spatial (e.g. the area of a site potentially influenced) and temporal (e.g. how often or long an activity is carried out) parameters differ between recreational activities, suggesting that activity type is a factor that should be taken into account in HRAs<sup>54</sup>.
- 6.23 Around Thames Basin Heaths SPA the scale of existing residential development within 5km is already high and there have been long-standing concerns about the impact of new residential development on the SPA. However, the same pattern of historic development intensity does not apply to Thursley, Hankley and Frensham Commons SPA. The number of dwellings within 5km is an order of magnitude smaller around Thursley, Hankley and Frensham Commons SPA. Moreover, the scale of new housing expected within 5km the SPA is much smaller than that expected around the Thames Basin Heaths SPA. Current adopted Core Strategies and Local Plans propose to deliver approximately 35,000 dwellings (including windfalls) within 5km of the Thames Basin Heaths over the period to 2030; this compares to c.1,500 within 5km of Thursley, Hankley and Frensham Commons SPA to 2032.
- 6.24 This means that a) Thursley, Hankley and Frensham Commons SPA is currently under much lower pressure from residential development than the Thames Basin Heaths SPA and b) the expected future change in development density is also much lower.
- 6.25 The LPP1 HRA<sup>55</sup> identified that the Wealden Heaths Phase I (Thursley, Hankley and Frensham Commons SPA) site has a core recreational catchment (i.e. 70% of visitors) of 9km. However the LPP1 HRA also concluded that due to the large amount of existing semi-natural green infrastructure located within 9km of the SPA, and the relatively low number of new dwellings to be provided within 9km of the SPA over the Plan period, increased recreational pressure was unlikely to adversely affect the integrity of the SPA and thus there was no need for a strategic district-wide mitigation solution.
- 6.26 During the preparation of the Waverley LPP1, Natural England recommended that the Council undertake HRA on all larger developments located within 5km of Wealden Heaths Phase I SPA. This is to confirm the continuing validity of the assessment contained within the Local Plan HRA with regard to the zone closest

<sup>47</sup> Riley, J. 2003. Review of Recreational Disturbance Research on Selected Wildlife in Scotland. Scottish Natural Heritage.

<sup>48</sup> Riddington, R. *et al.* 1996. The impact of disturbance on the behaviour and energy budgets of Brent geese. *Bird Study* 43:269-279

<sup>49</sup> Gill, J.A., Sutherland, W.J. & Norris, K. 1998. The consequences of human disturbance for estuarine birds. *RSPB Conservation Review* 12: 67-72

<sup>50</sup> Clarke R.T., Liley D., Sharp J.M., Green R.E. 2013. Building development and roads: Implications for the distribution of stone curlews across the Brecks. PLOS ONE. doi:10.1371/journal.pone.0072984.

<sup>51</sup> 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.

<sup>52</sup> Banks P.B., Bryant J.Y. 2007. Four-legged friend or foe? Dog walking displaces native birds from natural areas. *Biology Letters* 3: 14pp.

<sup>53</sup> Miller S.G., Knight R.L., Miller C.K. 2001. Wildlife responses to pedestrians and dogs. 29: 124-132.

<sup>54</sup> Weitowitz D., Panter C., Hoskin R., Liley D. The spatio-temporal footprint of key recreation activities in European protected sites. Manuscript in preparation.

<sup>55</sup> AECOM (2016) Local Plan Part 1: Strategic Policies and Sites. Pre-Submission Draft (July 2016) Habitats Regulations Assessment

AECOM (2017) Waverley Borough Council Local Plan Part 1: Strategic Policies and Sites: Additional Housing Habitats Regulations Assessment Addendum

to the SPA since that analysis was not informed by particular site allocations beyond strategic sites. This requirement is accommodated within Waverley LPP1:

- 6.27 Policy NE1: Biodiversity and Geological Conservation– *‘Where new development is proposed that would result in a net increase in residential accommodation within 400m of the boundary of Thursley, Hankley and Frensham Commons (Wealden Heaths Phase I) SPA and Wealden Heaths Phase II SPA, the Council will need to be satisfied that there will be no significant adverse effects on the ecological integrity of the SPA through a project level Habitats Regulations Assessment (HRA).’*
- 6.28 Text in paragraph 16.28 - *‘... if a housing proposal is capable of affecting the Wealden Heaths Phase I and II SPA, beyond 400 metres from the site, it will be considered on a case-by-case basis as to whether a project-specific Habitats Regulations Assessment (HRA) is required (this should be accessed at the HRA Screening Assessment stage). The requirement is likely to vary dependent on the size of site, the ‘in-combination’ effects and its distance from the SPA. Advice on this should be sought from Natural England at the earliest opportunity’.*

## Wealden Heaths European Sites

- 6.29 Given that all housing allocations are over 4km of the Wealden Heaths Phase 2 SPA residential development promoted by Elstead NP is unlikely to lead to site integrity impacts and recreational activity from Elstead residents is most likely to focus on Wealden Heaths Phase 1 SPA, which is much closer.
- 6.30 Three sites for housing allocation lie within 700m (i.e. within 5km influence zone) of Thursley, Hankley and Frensham Commons SPA: Sunray Farm, Springfield and Four Trees in total these sites aim to deliver 61 net dwellings to Elstead. Even though individual plans may only result in a small impact, when combined with a large number of other plans which propose to deliver housing within 5km of the SPA over the same time period, larger ‘in combination’ effects are likely to arise.
- 6.31 Given that Thursley, Hankley and Frensham Commons SPA, Thursley, Ash, Pirbright and Chobham SAC and Thursley and Ockley Bogs Ramsar lie within the parish boundary of Elstead it is recommended that European Site policy protection is provided as follows, to reflect the latest advice from Natural England to Waverley Council:
- 6.32 The mitigation solution agreed between Waverley Council and Natural England regarding the Wealden Heaths Phases 1 and 2 is as follows:**
- A. Development sites of less than 20 dwellings would not need mitigation;**
  - B. Development sites of 20 - 50 dwellings would require some form of mitigation such as Heathland Infrastructure Projects (HIPs)<sup>56</sup> and an associated project-level appropriate assessment for any planning application); and**
  - C. Development sites of more than 50 dwellings would require a Suitable Alternative Green Space (SANG) to be identified by the developer before permission could be granted (and appropriate assessment).**
- 6.33 **Policy H2: Sunray Farm allocates a total of 40 net residential dwellings thereby HIPs will need to be identified by the applicant in agreement with Waverley Council and Natural England. It is recommended that specific policy wording relating requirement B above (sites of 20 - 50 dwellings) is added to Policy H2.**
- 6.34 In addition to the provisions outlined above, Elstead supports a range of green space that are already utilized by local residents for recreational means. These are:
- **Village greens** - the main green at the junction of the Milford Road and Thursley Road and the Church Green opposite St James’ Church and Burford Lodge Recreation Ground. These greens have football and cricket pitches.

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<sup>56</sup> Heathland Infrastructure Projects (HIPs) are a concept developed around the Dorset Heaths. The idea is to make areas of existing countryside or parkland more desirable for informal recreation and better functional from a recreational point of view for local residents. They are delivered by either the local authorities, from contributions collected through Community Infrastructure Levy payments, and/or directly by developers through on-site provision. Third parties may bring forward proposals through the planning system for consideration by the local authorities and Natural England. Projects are likely to be bespoke to local areas and for example may consist of creating linkages between open green spaces, recreational facilities such as non-motorised bike tracks or fire access measures.



- **Bonfire Hill** – green belt, AONB at the centre of the village with a footpath connecting the east and west of the village running along the top of the site and is popular with walkers.
- **Thundry Meadows/ Charleshill SSSI** – owned by the Surrey Wildlife Trust site consists of a complex of wet and dry pastures interspersed with wet woodland, in the valley of the upper Wey north-west of Elstead.

6.35 It is considered that if the above recommendations are completed that, in conjunction with Waverley LPP1 policy wording, current safeguarding to Thursley, Hankley and Frensham Commons SPA, Thursley, Ash, Pirbright and Chobham SAC and Thursley and Ockley Bogs Ramsar is appropriate to mitigate the recreational pressures caused by residential development. In addition, it is considered that Elstead supports alternative green spaces within the parish that may already act to divert residents from European Sites.

## Water quality

6.36 Considering the fact that Thursley, Hankley and Frensham Commons SPA, Thursley, Ash, Pirbright and Chobham SAC and Thursley and Ockley Bogs Ramsar overlap a large proportion of the southern boundary of Elstead there is a risk that inappropriate drainage design could result in water quality contamination.

6.37 The quality of the water that feeds European Sites is an important determinant of the nature of their habitats and the species they support<sup>57</sup>. Rivers, streams and aquatic environments supported/that are fed by these sites can be affected by pollution from road run-off such as oil/ vehicle chemicals, and in the winter increased salt from de-icing the roads and pollution incident(s).

6.38 Within areas of excavation (i.e. construction activities) there is a potential for increased risk to groundwater resources from any spills/ leaks of fuel, oil and/or sediment.

6.39 Poor water quality can have a range of environmental impacts. At high levels, toxic chemicals and metals can result in the immediate death of aquatic life. At lower levels, detrimental effects can also be experienced, including increased vulnerability to disease and changes in wildlife behaviour<sup>58</sup>.

6.40 The impacts of poor water quality entering European Sites can have far-reaching consequences similar to air quality. For example:

- 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<sup>59 60</sup>.
- 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.

6.41 Allocated housing development at Elstead is located either within 600m or 700m of the that Thursley, Hankley and Frensham Commons SPA, Thursley, Ash, Pirbright and Chobham SAC and Thursley and Ockley Bogs Ramsar. Development under Policy TGA3: Car and Cycle Parking could be located within 100m of these European Sites. As such, a risk of water quality contamination to these sites could arise in the event of inappropriate drainage design.

6.42 At this stage it is important to note that, as groundwater migrates, natural filtration occurs; this has a positive correlation with increased distance travelled from the point source<sup>61</sup>. However, the distances of 600m and 700m, although not directly adjacent the SPA/SAC/Ramsar, could threaten site integrity if pollution contaminates surface water. This is because Thursley and Ockley Bogs Ramsar is hydrologically connected

<sup>57</sup> Johnson, W.W. and Finley, M.T., 1980. *Handbook of acute toxicity of chemicals to fish and aquatic invertebrates: Summaries of toxicity tests conducted at Columbia National Fisheries Research Laboratory, 1965-78* (No. 137). US Fish and Wildlife Service.

<sup>58</sup> Poulin, R., 1992. Toxic pollution and parasitism in freshwater fish. *Parasitology Today*, 8(2), pp.58-61.

<sup>59</sup> Rabalais, N.N., 2002. Nitrogen in aquatic ecosystems. *AMBIO: A Journal of the Human Environment*, 31(2), pp.102-113.

<sup>60</sup> Howarth, R.W. and Marino, R., 2006. Nitrogen as the limiting nutrient for eutrophication in coastal marine ecosystems: evolving views over three decades. *Limnology and Oceanography*, 51(1 part2), pp.364-376.

<sup>61</sup> Cheremisinoff, N.P., 1998. *Groundwater remediation and treatment technologies*. Elsevier.

to Elstead as the River Wey passes through the north of the village and connects to the Ramsar via the Royal Brook<sup>62</sup>. Historically, Elstead has experienced groundwater flooding<sup>63</sup>; the Waverley Strategic Flood Risk Assessment (SFRA) report<sup>64</sup> identifies that the B3001 at Elstead lies within the functional floodplain of the River Wey. This road has been identified previously, refer to section: Air Quality, to have the highest concentration of NOx concentration in Waverley. Again, it is important to reiterate that air quality modelling findings did not suggest LP growth within Waverley would result in significant NOx depositions at this road. However, in the event of flooding, nitrogen and other volatile organic compounds released from vehicles could easily pollute water. This in turn, may enter Thursley and Ockley Bogs Ramsar when flood level decrease to normal levels. Further still, Thursley and Ockley Bogs Ramsar Information Sheet: Current scientific research and facilities states that ‘*research into suspected nutrient influenced sphagnum die back*’ was undertaken at this site, further indicating *Sphagnum* susceptibility to water pollution.

- 6.43 Current mitigation to prevent such event of occurring are describes in the overarching Waverly LPP1 provide policy wording to ensure that all development borough provides suitable drainage design and flood risk management.
- 6.44 Policy CC1: Climate change – ‘*Development will be supported where it contributes to mitigating and adapting to the impacts of climate change, including measures that -... 5. use green infrastructure and SuDS to help absorb heat, reduce surface water runoff and support habitat networks.*’
- 6.45 Policy CC4: Flood Risk Management – ‘*1. Development must be located, designed and laid out to ensure that it is safe; that the risk from flooding is minimised whilst not increasing the risk of flooding elsewhere; and that residual risks are safely managed... 2. Sustainable drainage systems (SuDS) will be required on major developments (10 or more dwellings or equivalent) and encouraged for smaller schemes. A site-specific Flood Risk Assessment will be required for sites within or adjacent to areas at risk of surface water flooding as identified in the SFRA. There should be no increase in either the volume or rate of surface water runoff leaving the site. Proposed development on brownfield sites should aim to reduce run off rates to those on greenfield sites where feasible. There should be no property or highway flooding, off site, for up to the 1 in 100 year storm return period, including an allowance for climate change.*’
- 6.46 It is considered that these policies provided in the Waverley LPP1 do provide mitigation against surface water runoff. However, it is **recommended wording is included in the Elstead NP that states any new development will not be supported unless it contains details of the measures that will be taken to ensure polluted runoff (including suspended sediment) does not leave the site and enter the surrounding waterbodies during construction and operation.**

## Hydrological changes

- 6.47 One of the key requirements for maintaining site integrity of Thursley, Ash, Pirbright and Chobham SAC, Thursley, Hankley and Frensham Commons SPA and Thursley and Ockley Bog Ramsar is the maintenance of appropriate water levels.
- 6.48 Increased residential development arising from Policy PP1: Settlement boundary, Policy H2: Sunray Farm, Policy H3: Springfield and Policy H4: Four Trees will likely lead to increases in water uses and this has the potential to increase the volume of water abstracted for new residents. The Environment Agency has investigated whether parts of Thursley, Hankley and Frensham Commons SSSI are being adversely affected by current levels of water abstraction in addition to studying the hydrological continuity between the major aquifer (Hythe Beds) and the minor aquifer (Folkestone Beds)<sup>65</sup>.
- 6.49 AECOM understands that the Environment Agency considers that it will be possible for water companies to meet the future water resource requirements for the Waverley area (and indeed the entire South East of England) without increased abstractions from watercourses and groundwaters that are of importance to

<sup>62</sup> River Levels (2019). River Wey at Elstead and Eashing. Available online: <https://riverlevels.uk/flood-warning-river-wey-at-elstead-and-eashing#.XhSF-fX7S70> [Accessed: 07/01/2020].

<sup>63</sup> Capita (2016). *Waverley Borough Council Level 2 Strategic Flood Risk Assessment*. Gresham Street: London.

<sup>64</sup> Capita (2010). Waverley Strategic Flood Risk Assessment. Volume 2: Technical Report. Available online: [https://www.waverley.gov.uk/downloads/download/909/strategic\\_flood\\_risk\\_assessment\\_sfra](https://www.waverley.gov.uk/downloads/download/909/strategic_flood_risk_assessment_sfra) [Accessed: 07/01/2019].

<sup>65</sup> “I can confirm that the Environment Agency’s Review of Existing abstraction licence consents appropriate assessment (undertaken in line with the requirements of Regulation 50 if the Habitats Regs) has been able to ascertain no adverse affect on the integrity of the Thursley, Ash, Pirbright and Chobham Common SAC from all identified EA regulated Licenses to Abstract Groundwater when assessed alone and in-combination with other potential impacts on water resources.” Heather Lewis, Environment Agency, pers. comm. 2007

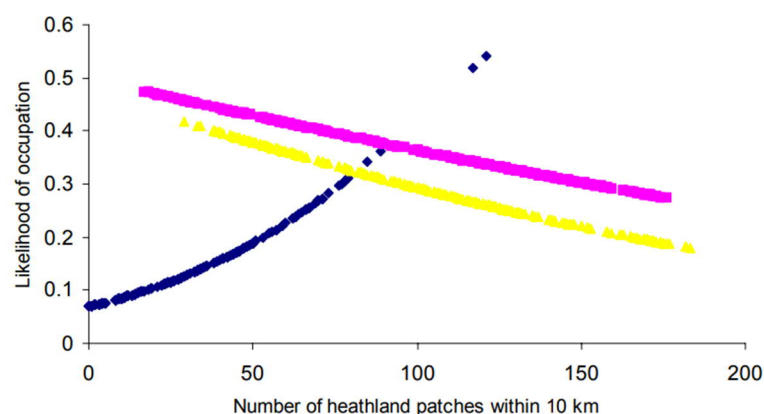


Thursley, Ash, Pirbright and Chobham SAC. This conclusion is based on modelling work that assumes new strategic water resource options, ongoing leakage control and increasing water efficiencies.

- 6.50 The impacts of excessive water abstraction to European Sites is best discussed at higher spatial scales (i.e. borough/ district level with the Environment Agency and Thames Water). The HRA of the Waverley LPP1 concluded it has already been noted that the security of water supply is beyond the scope of Waverley Borough to influence, and it is considered that the Council has taken all appropriate measures to minimise any contribution to the overall pressures on water resources in the Guildford Water Resource Zone. This same conclusion applies to Elstead NP.

## Habitat fragmentation

- 6.51 As briefly described in Table 2, habitat fragmentation is the division of larger habitats into smaller patches as a consequence of development<sup>66 67 68</sup>.
- 6.52 The decline in heathland habitat and increased fragmentation has contributed to a decline in nightjar and woodlark numbers throughout the UK<sup>69</sup>. Populations of each species are now largely confined to fragmented heathland habitat and from this, issues of: population bottlenecks<sup>70</sup>, reduced reproductive success<sup>71</sup> and high mortality rate, due to lack of available resources, can all contribute to a decline or, in severe cases, extinction of populations within a particular habitat patch. Nightjar<sup>72</sup> are insectivores and woodlark<sup>73</sup> feed on seeds and insects of a variety of species. As such, their foraging habitat can extend beyond heathland when in search of food. However, these species' nesting preferences are specifically adapted to heathland. For example, Bright et al (2007)<sup>74</sup> observed that nightjar occupied patches, were significantly larger in size when compared to unoccupied patches. They also observed a positive correlation between nightjar occupation with heathland patches that were within closer proximity (i.e. less fragmented), Figure 2 shows these findings.



<sup>66</sup> Bright, P.W., 1993. Habitat fragmentation-problems and predictions for British mammals. *Mammal Review*, 23(3-4), pp.101-111.

<sup>67</sup> Mullu, D., (2016) A Review on the Effect of Habitat Fragmentation on Ecosystem. *Journal of Natural Sciences Research*, 6.

<sup>68</sup> Natural England (2012). Improvement programme for England's Natura 2000 sites (IPENS). Available online: <https://www.gov.uk/government/publications/improvement-programme-for-englands-natura-2000-sites-ipens> [Accessed: 16/01/20]

<sup>69</sup> Langston, R.H.W., Wotton, S.R., Conway, G.J., Wright, L.J., Mallord, J.W., Currie, F.A., Drewitt, A.L., Grice, P.V., Hoccom, D.G. and Symes, N., 2007. Nightjar *Caprimulgus europaeus* and Woodlark *Lullula arborea*—recovering species in Britain?. *Ibis*, 149, pp.250-260.

<sup>70</sup> Broquet, T., Angelone, S., Jaquiere, J., Joly, P., LENA, J.P., Lengagne, T., Plenet, S., Luquet, E. and Perrin, N., 2010. Genetic bottlenecks driven by population disconnection. *Conservation Biology*, 24(6), pp.1596-1605.

<sup>71</sup> Bright, J.A., Langston, R. and Bierman, S., 2007. *Habitat associations of nightjar *Caprimulgus europaeus* breeding on heathland in England*. RSPB.

<sup>72</sup> RSPB (2019). *Nightjar*. Available online: <https://www.rspb.org.uk/birds-and-wildlife/wildlife-guides/bird-a-z/nightjar/> [Accessed: 17/01/20]

<sup>73</sup> RSPB (2019). *Woodland*. Available online: <https://www.rspb.org.uk/birds-and-wildlife/wildlife-guides/bird-a-z/woodlark/> [Accessed: 17/01/20]

<sup>74</sup> Bright, J.A., Langston, R. and Bierman, S., 2007. *Habitat associations of nightjar *Caprimulgus europaeus* breeding on heathland in England*. RSPB.

- ◆ : heathland patches with 0-10 km<sup>2</sup> of other heathland within 10 km.
- ▲ : heathland patches with 10-20 km<sup>2</sup> of other heathland within 10 km.
- : heathland patches with over 20 km<sup>2</sup> of other heathland within 10 km.

**Figure 2. Bright et al (2007): Likelihood of a heathland patch being occupied in relation to the area of heathland.**

- 6.53 The presence of Dartford Warblers at the Thames Basin and Wealden Heaths SPAs has been well recorded since the late 1960s. Records show that the number of species territories increased markedly from zero in 1968 to almost 1000 territories in 2008. These figures suggested a larger population size than the New Forest and Dorset Heaths SPA; largely considered the UK strong hold for the species. However, severe winters during 2008/09 and 2009/10 resulted in a massive decrease in population to just 50 remaining territories<sup>75</sup>. Considering their rarity and the susceptibility to variable conditions<sup>76</sup> there are potential risks to population health due to fragmentation of suitable habitat from increased development.
- 6.54 Dartford warblers also feed upon invertebrates; however, this species tend are strongly associated with gorse and heather<sup>77</sup>. For example, it is believed that although close to 95% of the Dartford warbler population was lost between 2008-2010; those birds that did survive were located in heathland patches with higher proportion of gorse scrub than those without. This suggests that gorse is an essential component of Dartford warbler survival<sup>78</sup> throughout the year.
- 6.55 Although Elstead Parish supports Thursley, Hankley and Frensham Commons SPA, Thursley, Ash, Pirbright and Chobham SAC and Thursley and Ockley Bogs Ramsar (and that all allocated sites lie within 600m of the SPA boundary) none of the allocated development sites support the key habitats of importance to nesting nightjar, woodlark and Dartford warbler: acid grassland, rotationally-managed plantation or heathland. Therefore a conclusion of no adverse effect on integrity can be drawn.

<sup>75</sup> Clark, J.M. and Eyre, J., 2012. Dartford warblers on the Thames Basin and Wealden heaths. *British Birds*, 105(6), p.308.

<sup>76</sup> Bradbury, R. B., Pearce-Higgins, J.W., Wotton, S. R., Conway, G. J., & Grice, P.V. 2011. The influence of climate and topography in patterns of territory establishment in a range-expanding bird. *Ibis* 153: 336–344.

<sup>77</sup> RSPB (2019). *Dartford Warbler*. Available online: <https://www.rspb.org.uk/birds-and-wildlife/wildlife-guides/bird-a-z/dartford-warbler/> [Accessed: 17/01/20]

<sup>78</sup> Bibby, C. J. 1977. Ecology of the Dartford Warbler *Sylvia undata* (Boddaert) in relation to its conservation in Britain. Unpublished PhD thesis, Council for National Academic Awards

## 7. Conclusion

- 7.1 For those policies brought forward for appropriate assessment the appropriate safeguarding policy wording should be added. With the above recommendations incorporated it is concluded that no adverse effect would occur on the integrity of European Sites within catchment of Elstead Parish.

