

Wisborough Green Neighbourhood Plan

Habitat Regulations Assessment

Wisborough Green Parish Council

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Quality information

Prepared by	Checked by	Verified by	Approved by
GS Graduate Ecologist	JR Technical Director	MW Technical Director	JR Technical Director

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Prepared for:

Wisborough Green Parish Council

Prepared by:

Georgia Stephens

AECOM Infrastructure & Environment UK Limited
Midpoint, Alencon Link
Basingstoke
Hampshire RG21 7PP
United Kingdom

T: +44(0)1256 310200
aecom.com

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1. Introduction

Background to the Project

- 1.1 AECOM was appointed by Wisborough Green Parish Council to assist in undertaking a Habitats Regulations Assessment (HRA) for the emerging Wisborough Green Neighbourhood Plan (NP). This is to inform Wisborough Green Parish Council of the potential effects of new development within the parish on internationally designated wildlife sites, and how they are being addressed in the Neighbourhood Plan, for the Council to take into account in their formal HRA.
- 1.2 The objectives of the assessment are to:
 - Identify any aspects of the Neighbourhood Plan that would cause an adverse effect on the integrity of international sites (Special Areas of Conservation (SACs), Special Protection Areas (SPAs)) including, as a matter of Government policy, Ramsar sites, either in isolation or in combination with other plans and projects, and
 - To advise on appropriate policy mechanisms for delivering mitigation where such effects were identified.
- 1.3 The HRA of the Wisborough Green Neighbourhood Plan is required to determine if there are any realistic linking pathways present between an international site and the Neighbourhood Plan and where Likely Significant Effects cannot be screened out, an analysis to inform Appropriate Assessment to be undertaken to determine if adverse effects on the integrity of the international sites will occur as a result of the Neighbourhood Plan alone or in combination.

Legislation

- 1.4 The UK left the EU on 31 January 2019 under the terms set out in the European Union (Withdrawal Agreement) Act 2020 (“the Withdrawal Act”). This established a transition period, which ended on 31 December 2020. The Withdrawal Act retains the body of existing EU-derived law within our domestic law. During the transition period EU law applies to and in the UK. The most recent amendments to the Habitats Regulations – the Conservation of Habitats and Species (Amendment) (EU Exit) Regulations 2019 – make it clear that the need for HRA has continued after the end of the Transition Period.
- 1.5 Under the Regulations, an appropriate assessment is required, where a plan or project is likely to have a significant effect upon an international site, either individually or in combination with other projects. The Directive is implemented in the UK by the Conservation of Habitats and Species Regulations 2017 (as amended) (the “Habitats Regulations”).

The legislative basis for Appropriate Assessment

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:
 - a. To assist the Qualifying Body (Wisborough Green Parish Council) in preparing their plan by recommending (where necessary) any adjustments required to protect international sites, thus making it more likely their plan will be deemed compliant with the Conservation of Habitats and Species Regulations 2017 (as amended); and
 - b. 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 and the Neighbourhood Plan examiner. 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 The Habitats Regulations applies the precautionary principle¹ to international sites SAC, SPA, and Ramsar. For the purposes of this assessment candidate SACs (cSACs), proposed SPAs (pSPAs) and proposed Ramsar (pRamsar) sites are all treated as fully designated sites.
- 1.9 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 contrasts with 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.
- 1.10 In 2018, the 'People Over Wind' European Court of Justice (ECJ) ruling² determined that 'mitigation' (i.e. measures that are specifically introduced to avoid or reduce the harmful effects of a plan or project on international sites) should not be taken into account when forming a view on likely significant effects. Mitigation should instead only be considered at the appropriate assessment stage. Appropriate assessment is not a technical term: it simply means 'an assessment that is appropriate' for the plan or project in question. As such, the law purposely does not prescribe what it should consist of or how it should be presented; these are decisions to be made on a case by case basis by the competent authority. An amendment was made to the Neighbourhood Planning Regulations in late 2018 which permitted Neighbourhood Plans to be made if they required appropriate assessment.
- 1.11 Over the years the phrase 'Habitats Regulations Assessment' has come into wide currency to describe the overall process set out in the Conservation of Habitats and Species Regulations from screening through to Imperative Reasons of Overriding Public Interest (IROPI). This has arisen in order to distinguish the process from the individual stage described in the law as an 'Appropriate Assessment'. Throughout this report we use the term Habitats Regulations Assessment for the overall process.

Report Layout

- 1.12 **Chapter 2** of this report explains the process by which the HRA has been carried out. **Chapter 3** details the European Sites relevant to the parish. **Chapter 4** explores the relevant pathways of impact. **Chapter 5** summarises the Test of Likely Significant Effects of the policies and site allocations of the Plan considered 'alone' and 'in-combination'. **Chapter 6** explores the other plans that could act in combination with the Wisborough Green NP. **Chapter 7** contains the Appropriate Assessment for any linking impact pathways that could not be screened out from potentially resulting in a Likely Significant Effect. **Chapter 8** contains the conclusion and a summary of recommendations.

¹ The Precautionary Principle, which is referenced in Article 191 of the Treaty on the Functioning of the European Union, has been defined by the United Nations Educational, Scientific and Cultural Organisation (UNESCO, 2005) as: "*When human activities may lead to morally unacceptable harm [to the environment] that is scientifically plausible but uncertain, actions shall be taken to avoid or diminish that harm. The judgement of plausibility should be grounded in scientific analysis*".

People Over Wind and Sweetman v Coillte Teoranta (C-323/17)

² Case C-323/17

2. Methodology

Introduction

- 2.1 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 (GOV.UK, 2019)

HRA Task 1: Test of Likely Significant Effects (LSE)

- 2.2 Following evidence gathering, the first stage of any HRA 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:
- 2.3 *"Is the project, either alone or in combination with other relevant projects and plans, likely to result in a significant effect upon European sites?"*
- 2.4 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 5 of this report.

HRA Task 2: Appropriate Assessment (AA)

- 2.5 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.

- 2.6 During July 2019 the Ministry of Housing, Communities and Local Government published guidance for Appropriate Assessment³. Paragraph: 001 Reference ID: 65-001-20190722 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 of 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'*.
- 2.7 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 takes any policies or allocations that could not be dismissed following the high-level screening analysis and analyses 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)).
- 2.8 A decision by the European Court of Justice⁴ 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. The UK is no longer part of the European Union. However, as a precaution, it is assumed for the purposes of this HRA that EU case law regarding Habitat Regulations Assessment will still be considered informative jurisprudence by the UK courts. That ruling has therefore been considered in producing this HRA.
- 2.9 Also, in 2018 the Holohan ruling⁵ 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

- 2.10 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 Neighbourhood 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.
- 2.11 When discussing 'mitigation' for a Neighbourhood 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 Development Plan document is a high-level policy document. A Neighbourhood Plan is a lower level constituent of a Local Development Plan.

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

- 2.12 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.
- 2.13 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

³<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].

⁴ People Over Wind and Sweetman v Coillte Teoranta (C-3.23/17).

⁵ Case C-461/17.

when the plan or policy would otherwise be screened out because its individual contribution is inconsequential.

Scope of the HRA

- 2.14 There is no guidance that dictates the physical scope of an HRA of a plan. Therefore, in considering the physical scope of the assessment we were guided primarily by the identified impact pathways rather than by arbitrary “zones”, i.e. a source-pathway-receptor approach. Current guidance suggests that the following international sites be included in the scope of assessment:
- 2.15 All sites within the Neighbourhood Plan Area (the area covered by the Neighbourhood Plan); and
- 2.16 Other sites shown to be linked to development within the Neighbourhood Plan Area through a known “pathway” (discussed below). Specifically this refers to:
- **The Mens SAC**
 - **Ebernoe Common**
 - **Arun Valley SPA/Ramsar**
 - **Arun Valley SAC**
 - **Duncton to Bignor Escarpment SAC**
- 2.17 This was based upon a search within the parish boundary and a 10km zone surrounding it as well as consideration of the vulnerabilities of these sites.
- 2.18 The above sites were subjected to the initial screening exercise. It should be noted that the presence of a conceivable pathway linking the district to a European site does not mean that LSEs will occur.

3. European Sites Relevant to the Neighbourhood Plan

3.1 Appendix C shows all the European sites discussed in this HRA.

The Mens SAC

Introduction

3.2 The Mens SAC is a 204.69ha large site, comprising one of the largest ancient woodlands in West Sussex and supports a significant population of barbastelle *Barbastella barbastellus*. This site lies approx. 7.4km to the south-west of Wisborough Green Parish. Most of the SAC woodland lies on Weald Clay with some restricted areas of limestone. The site harbours a wide range of woodland communities and age structures, primarily as a result of past management regimes and underlying geology. The SAC also supports outstanding invertebrate, fungi, lichen and bryophyte assemblages.

3.3 The woodland harbours primarily high forest of sessile oak *Quercus petraea*, pedunculate oak *Quercus robur*, beech *Fagus sylvatica*, holly *Ilex aquifolium* and, locally, ash *Fraxinus excelsior*, birches *Betula* spp. and wild service tree *Sorbus torminalis*. On the heavier clay soils oak-ash woodland occurs over a shrublayer consisting of hazel *Corylus avellana*, hawthorn *Crataegus monogyna*, crab apple *Malus sylvestris* and blackthorn *Prunus spinosa*. The site is developing a near-natural high forest structure, in response to only limited silvicultural intervention over the 20th century. Barbastelles roost within the site boundary, but tend to forage outside the SAC, commuting along woodland corridors into the wider countryside⁶.

Qualifying Features⁷

3.4 Annex I habitats that are a primary reason for selection of this site:

- Atlantic acidophilous beech forests with *Ilex* and sometimes also *Taxus* in the shrublayer (*Quercion robori-petraeae* or *Ilici-Fagenion*)

3.5 Annex II species present as a qualifying feature, but not a primary reason for selection of this site:

- Barbastelle *Barbastella barbastellus*

Conservation Objectives⁸

3.6 With regard to the SAC and the natural habitats and/or species for which the site has been designated (the 'Qualifying Features' listed below), and subject to natural change;

3.7 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,

⁶ 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; 14/01/20].

⁷ Available online at: <https://sac.jncc.gov.uk/site/UK0012716> [Accessed on the 13/10/2020]

⁸ Available at: <http://publications.naturalengland.org.uk/publication/5642356338458624> [Accessed on the 13/10/2020]

- The distribution of qualifying species within the site.

Threats / Pressures to Site Integrity⁹

3.8 The following threats / pressures to the integrity of the Mens SAC have been identified in Natural England's Site Improvement Plan:

- Forestry and woodland management
- Habitat connectivity
- Invasive species
- Change in land management
- Air pollution: Risk of atmospheric nitrogen deposition
- Public access / disturbance

Arun Valley SPA / Ramsar

Introduction

3.9 The Arun Valley SPA / Ramsar comprises an area of wet meadows on the floodplain of the River Arun between Pulborough and Amberley. The grassland is neutral wet and subject to winter as well as occasional summer flooding. An extensive network of drainage ditches runs through the SPA, providing habitat for biodiverse aquatic flora and invertebrate communities. Additionally, the site is also classified as a Site of Community Importance (SCI) for little whirlpool ram's-horn snail *Anisus vorticulus*.

3.10 The plant communities present in the fields are primarily determined by the management history and water levels present. For example, the drier fields are dominated by meadow grasses, such as crested dog's-tail *Cynosurus cristatus* and perennial rye-grass *Lolium perenne*. In wetter areas rushes, sedges and tufted hair-grass *Deschampsia cespitosa* are more frequent. The ungrazed fields have developed into fen, scrub and woodland. Fen areas comprise common reed *Phragmites australis* and greater tussock-sedge *Carex paniculate*. On drier ground there is alder *Alnus glutinosa*, willow *Salix* sp. and birch *Betula* sp.

3.11 Most notably the Arun Valley SPA supports important numbers of wintering waterfowl, such as Bewick's swan *Cygnus columbianus bewickii*, shoveler *Anas clypeata*, teal *Anas crecca* and wigeon *Anas Penelope*. These feed in the wetter, low-lying fields of the floodplain adjacent to drainage ditches.

SPA Qualifying Features¹⁰

3.12 Qualifying individual species listed in Annex I of the Wild Birds Directive (Article 4.1)

- Bewick's swan *Cygnus columbianus bewickii*

3.13 Qualifying assemblage of species (Article 4.2)

During the non-breeding season, the SPA regularly supports an assemblage of waterfowl with the area regularly supporting 27,241 individual waterfowl (5 year peak mean for 1992/93 to 1996/97) including: Shoveler *Anas clypeata*, teal *Anas crecca*, wigeon *Anas penelope*, Bewick's swan *Cygnus columbianus bewickii*.

Ramsar Qualifying Features¹¹

3.14 The Arun Valley qualifies as a Ramsar site under the following Ramsar criteria:

Criterion 2

⁹ Available at: <http://publications.naturalengland.org.uk/publication/5548316158853120> [Accessed on the 13/10/2020]

¹⁰ <http://publications.naturalengland.org.uk/publication/4567444756627456> [Accessed on the 14/10/2020]

¹¹ <https://jncc.gov.uk/jncc-assets/RIS/UK11004.pdf> [Accessed on the 14/10/2020]

The site holds seven wetland invertebrate species listed in the British Red Data Book as threatened. One of these, *Pseudamnicola confusa*, is considered to be endangered. The site also supports four nationally rare and four nationally scarce plant species.

Criterion 3

In addition to the Red Data Book invertebrate and plant species, the ditches intersecting the site have a particularly diverse and rich flora. All five British duckweed *Lemna* species, all five water-cress *Rorippa* species, and all three British water milfoils (*Myriophyllum* species), all but one of the seven British water dropworts (*Oenanthe* species), and two-thirds of the British pondweeds (*Potamogeton* species) can be found on site.

Criterion 5

Assemblages of international importance

Species with peak counts in winter: 13,774 waterfowl (5 year peak mean 1998/99-2002/03)

Species / populations identified subsequent to designation for possible future consideration under criterion 6.

Species with peak counts in winter: Northern pintail, *Anas acuta*, NW Europe: 641 individuals, representing an average of 1% of the population (5-year peak mean 1998/99-2002/03)

Conservation Objectives¹²

- 3.15 With regard to the SPA and the individual species and/or assemblage of species for which the site has been classified (the 'Qualifying Features' listed below), and subject to natural change;
- 3.16 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.

Threats / Pressures to Site Integrity¹³

- 3.17 The following threats / pressures to the site integrity of the Arun Valley SPA / Ramsar have been identified in Natural England's Site Improvement Plan:
- Inappropriate water levels
 - Water pollution
 - Inappropriate ditch management

Arun Valley SAC

Introduction

- 3.18 The Arun Valley SAC, largely overlapping with the Arun Valley SPA / Ramsar, is a 487.48ha site comprising humid / mesophile grassland (95%), inland water bodies (2%) and bogs / marshes (2%). Given the overlap with the SPA / Ramsar (discussed in the previous section), the ecological characteristics are similar. However, the SAC is primarily designated for the ramshorn snail *Anisus vorticulus*. The snail

¹² <http://publications.naturalengland.org.uk/publication/4567444756627456> [Accessed on the 14/10/2020]

¹³ <http://publications.naturalengland.org.uk/publication/5353882309885952> [Accessed on the 14/10/2020]

occurs across a range of sites in southern and eastern England, with the Arun Valley being one of the three main population centres in the UK. Two of the core sites for the ramshorn snail lie in the wash lands of the Arun floodplain: the Pulborough Brooks and Amberley Wild Brooks SSSIs.

Qualifying Features¹⁴

3.19 Annex II species that are a primary reason for selection of this site:

- Ramshorn snail *Anisus vorticulus*

Conservation Objectives¹⁵

3.20 With regard to the SAC and the natural habitats and/or species for which the site has been designated (the 'Qualifying Features' listed below), and subject to natural change;

3.21 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 the habitats of qualifying species
- The structure and function of the habitats of qualifying species
- The supporting processes on which the habitats of qualifying species rely
- The populations of qualifying species, and,
- The distribution of qualifying species within the site.

Threats / Pressures to Site Integrity¹⁶

3.22 The following threats / pressures to the site integrity of the Arun Valley SAC have been identified in Natural England's Site Improvement Plan:

- Inappropriate water levels
- Water pollution
- Inappropriate ditch management

3.23 Potential loss of functionally linked habitat has also been identified as a concern, although it is not mentioned in the Site Improvement Plan.

Duncton to Bignor Escarpment SAC

Introduction

3.24 Duncton to Bignor Escarpment covers 214.47ha. Within the SAC *Asperulo-Fagetum* beech forests occur on steep scarp slopes and on more gently-sloping hillsides in mosaic with ash *Fraxinus excelsior* woodland, scrub and grassland. Much of the beech woodland is high forest but with some old pollards. Rare plants present include the white helleborine *Cephalanthera damasonium*, yellow bird's nest *Monotropa hypopitys* and green hellebore *Helleborus viridis*. The woods also have a rich mollusc fauna.

Reasons for Designation

3.25 Duncton to Bignor Escarpment qualifies as a SAC for the Habitats Directive Annex I habitat of:

- Beech forests on acid soils.

¹⁴ <https://sac.jncc.gov.uk/site/UK0030366> [Accessed on the 14/10/2020]

¹⁵ <http://publications.naturalengland.org.uk/publication/4924283725807616> [Accessed on the 14/10/2020]

¹⁶ <http://publications.naturalengland.org.uk/publication/5353882309885952> [Accessed on the 14/10/2020]

Conservation Objectives

- 3.26 The Conservation Objectives are to 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 the qualifying natural habitats rely

Historic Trends and Current Pressures

- 3.27 Historically this site has relatively few threats. The JNCC Natura 2000 data sheet documents; 'The escarpment woodland hosts a number of pheasant shoots which, in general, pose no threat to the woodland. Expansion of these shoots from current levels is undesirable. Plantations of non-native conifers are targeted for complete or partial removal. A large resident deer population is controlled by deer stalkers'.
- 3.28 In the most recent Natural England condition assessment process, 92.33% of the component SSSI of the SAC was considered to be in favourable condition.
- 3.29 The key environmental conditions that support the features of European interest have been defined as appropriate woodland management. According to the Site Improvement Plan '*No current issues affecting the Natura 2000 feature(s) have been identified on this site*'.

Ebernoe Common SAC

Introduction

- 3.30 Ebernoe Common is a 234.93ha site of international importance as an example of ancient woodland. It contains a wide range of structural and vegetation community types which have been influenced in their development by differences in the underlying soils and past management. The native trees, particularly those with old growth characteristics, support rich lichen and fungal communities, and a diverse woodland breeding bird assemblage. Nationally important maternity roosts for barbastelle bat and Bechstein's bat occur within the woodland.

Reasons for Designation

- 3.31 Ebernoe Common SAC qualifies as a SAC for both habitats and species. Firstly, the site contains the Habitats Directive Annex I habitats of:
- Atlantic acidophilous beech forests with Ilex and sometimes also Taxus in the shrublayer (*Quercion robori-petraeae* or *Ilici-Fagenion*)
- 3.32 Secondly, the site contains the Habitats Directive Annex II species:
- Barbastelle bat; and
 - Bechstein's bat

Conservation Objectives¹⁷

"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*

¹⁷ <http://publications.naturalengland.org.uk/file/5942973099671552> [accessed 16/12/2020]

- *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.”*

Historic Trends and Current Pressures

- 3.33 Ebernoe Common SAC is owned and managed by Sussex Wildlife Trust (SWT). There is evidence that the Common has contained a mixture of open pasture and high forest for centuries. Ebernoe Nature Reserve is an Open Access site and is fairly well used (SWT estimate up to 3,000 visitors per annum)¹⁸.
- 3.34 In the most recent Natural England condition assessment process, 92.81% of Ebernoe Common SSSI was considered to be in favourable condition with the remainder recovering from unfavourable status
- 3.35 Ebernoe Common is an exceptional site for both barbastelle and Bechstein bats. Most of what is known about the foraging behaviour of barbastelle bats has been derived by studies carried out over the past ten years, and the studies are able to give detailed information on flight lines surrounding Ebernoe Common of the barbastelle bat:
- Greenaway, F. (2004) Advice for the management of flightlines and foraging habitats of the barbastelle bat *Barbastellus barbastellus*. *English Nature Research Report*, Number 657.
 - Greenaway, F. (2008) Barbastelle bats in the Sussex West Weald 1997 - 2008
- 3.36 The barbastelles at Ebernoe Common SAC had flightlines that followed watercourses, particularly the River Kird, and woodland cover for distances of typically 7km. Flightlines outside the SAC are particularly to the south (the Petworth and Tillington area) but also to the west, north and east. There has been less study of the Bechstein bat populations. However, those radio-tracking projects which have been implemented for the species have established that the tracked individuals generally remained within approximately 1.5 km of their roosts¹⁹. These distances do fit with those identified from radio-tracking of Bechstein's that has been undertaken at Ebernoe Common SAC from 2001, which identified that the maximum distance travelled by a tagged Bechstein's bat to its foraging area was 1,407m, with the average 735.7m²⁰.
- 3.37 Studies have indicated that barbastelle bat flightlines from Ebernoe Common SAC cross the northern part of Chichester District. Most of this area now lies within the South Downs National Park for strategic planning purposes.
- 3.38 The key vulnerabilities to the SAC are:
- Traditional management to maintain the structural diversity and associated lichen and fungal flora, including appropriate grazing regime.
 - The retention of deadwood within the site
 - Minimal atmospheric pollution - may increase the susceptibility of beech trees to disease and alter epiphytic communities.
 - Absence of disturbance.
 - In a wider context, bats require good connectivity of landscape features to allow foraging and commuting. For barbastelle bats this is up to 7km from a known roost and up to 1.5km for Bechstein bats.
 - Both bat species have close association with woodland. Areas of undesignated woodland adjacent to SAC may be of most importance to population.

¹⁸ Monk-Terry, M and Lyons, G. Sussex Wildlife Trust Ebernoe Nature Reserve Management Plan 2010-2015.

¹⁹ Cited in: Schofield H & Morris C. 2000. 'Ranging Behaviour and Habitat Preferences of Female Bechstein's Bats in Summer'. Vincent Wildlife Trust

²⁰ Fitzsimmons P, Hill D, Greenaway F. 2002. Patterns of habitat use by female Bechstein's bats (*Myotis bechsteinii*) from a maternity colony in a British woodland

- Barbastelles require a constant humidity around their roosts; any manipulation of the shrub layer must be carefully considered.

4. Relevant Impact Pathways

Loss of Functionally Linked Habitat

- 4.1 While most European sites have been geographically defined to encompass the key features that are necessary for coherence of their structure and function, and the support of their qualifying features, this is not necessarily the case. A diverse array of qualifying species including birds, bats and amphibians are not always confined to the boundary of designated sites.
- 4.2 For example, the highly mobile nature of waterfowl necessarily means that areas of habitat of crucial importance to the maintenance of the bird populations lie outside the physical limits of European sites. Despite not being designated, these habitats are integral to the maintenance of the structure and function of European sites. Therefore, land use plans that may result in the loss of functionally linked habitat need to be subject to further assessment.
- 4.3 There is now an abundance of authoritative examples of HRA cases on plans affecting bird populations, where Natural England recognised the potential importance of functionally linked land²¹. For example, bird surveys in relation to a previous HRA established that approximately 25% of the golden plover population in the Somerset Levels and Moors SPA were affected while on functionally linked land, and this required the inclusion of mitigation measures in the relevant plan policy wording. Another important case study originates from the Mersey Estuary SPA / Ramsar, where adjacently located functionally linked land had a peak survey count of 108% of the 5 year mean peak population of golden plover. Similar to the above example, this led to considerable amendments in the planning proposal to ensure that the site integrity was not adversely affected.
- 4.4 Generally, functionally linked (but non-designated) land parcels may not be immediately obvious. An assessment of existing data sources (e.g. bird atlases showing species distributions, Environmental Record Centre data, results from bespoke bird surveys) might be required to firmly established functional linkage to European sites. In some instances, data may not be available at all, requiring further survey work.

Recreational pressure

- 4.5 There is 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 levels²², and impacts on European protected sites^{23 24}. This applies to any habitat, but recreational pressure from housing growth is of particular significance for European sites designated for their bird interest, with some species being especially sensitive 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 planning documents tend to focus on recreational sources of disturbance as a result of new residents²⁵.
- 4.6 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

²¹ Chapman C & Tyldesley D. 2016. Functional linkage: How areas that are functionally linked to European sites have been considered when they may be affected by plans and projects – A review of authoritative decisions. **Natural England Commissioned Reports** 207: 73pp.

²² Weitowitz D.C., Panter C., Hoskin R. & Liley D. 2019. The effect of urban development on visitor numbers to nearby protected nature conservation sites. *Journal of Urban Ecology* 5. <https://doi.org/10.1093/jue/juz019>

²³ 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*.

²⁴ 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*.

²⁵ 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'.

of certain areas and use of sub optimal areas etc.) and physiological changes to species (e.g. an increase in heart rate). While these are less noticeable, they might result in major population-level changes by altering the balance between immigration/birth and emigration/death²⁶.

- 4.7 Impacts of bird disturbance are 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 feeding²⁷. 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 birds²⁸. 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.
- 4.8 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 compared to hiking²⁹. Scientific evidence also suggests that key disturbance parameters, such as areas of influence and flush distance, are significantly greater for dog walkers than hikers³⁰. Furthermore, differences in route lengths and usage patterns on site is likely to imply that key spatial and temporal parameters (such as the area of a site potentially impacted and the frequency of disturbance) are also likely to differ between recreational activities. This suggests that activity type is a factor that should be taken into account in HRAs.

Non-breeding Birds (September to March)

- 4.9 The Arun Valley SPA / Ramsar is designated for overwintering waterfowl and this section summarises academic research available on these groups of birds.
- 4.10 Evans & Warrington³¹ found that on Sundays total water bird numbers (including shoveler and gadwall) were 19% higher on Stocker's Lake LNR in Hertfordshire and attributed this to observed greater recreational activity on surrounding water bodies at weekends relative to weekdays displacing birds into the LNR. However, in this study, recreational activity was not quantified in detail, nor were individual recreational activities evaluated separately.
- 4.11 Tuite et al³² used a large (379 sites), long-term (10-year) dataset (September – March species counts) to correlate seasonal changes in wildfowl abundance with the presence of various recreational activities. They determined that shoveler was one of the most sensitive species to recreational activities, such as sailing/windsurfing and rowing. Studies on recreation in the Solent have established that human leisure activities cause direct disturbance to wintering waterfowl populations^{33 34}.
- 4.12 A study on recreational disturbance in the Humber³⁵ assesses different types of noise disturbance on waterfowl referring to studies relating to aircraft (see Drewitt 1999³⁶), traffic (Reijnen, Foppen, & Veenbaas 1997)³⁷, dogs (Lord, Waas, & Innes 1997³⁸; Banks & Bryant 2007³⁹) and machinery (Delaney et al. 1999;

²⁶ Riley, J. 2003. Review of Recreational Disturbance Research on Selected Wildlife in Scotland. Scottish Natural Heritage.

²⁷ Riddington, R. et al. 1996. The impact of disturbance on the behaviour and energy budgets of Brent geese. *Bird Study* 43:269-279

²⁸ Gill, J.A., Sutherland, W.J. & Norris, K. 1998. The consequences of human disturbance for estuarine birds. *RSPB Conservation Review* 12: 67-72

²⁹ Banks P.B., Bryant J.Y. 2007. Four-legged friend or foe? Dog walking displaces native birds from natural areas. *Biology Letters* 3: 14pp.

³⁰ Miller S.G., Knight R.L., Miller C.K. 2001. Wildlife responses to pedestrians and dogs. 29: 124-132.

³¹ Evans, D.M. & Warrington, S. 1997. The effects of recreational disturbance on wintering waterbirds on a mature gravel pitlake near London. *International Journal of Environmental Studies* 53: 167-182

³² Tuite, C.H., Hanson, P.R. & Owen, M. 1984. Some ecological factors affecting winter wildfowl distribution on inland waters in England and Wales and the influence of water-based recreation. *Journal of Applied Ecology* 21: 41-62

³³ Footprint Ecology. 2010. Recreational Disturbance to Birds on the Humber Estuary

³⁴ Footprint Ecology, Jonathan Cox Associates & Bournemouth University. 2010. Solent disturbance and mitigation project – various reports.

³⁵ Helen Fearnley Durwyn Liley and Katie Cruickshanks (2012) Results of Recreational Visitor Survey across the Humber Estuary produced by Footprint Ecology

³⁶ Drewitt, A. (1999) Disturbance effects of aircraft on birds. English Nature, Peterborough.

³⁷ Reijnen, R., Foppen, R. & Veenbaas, G. (1997) Disturbance by traffic of breeding birds: evaluation of the effect and considerations in planning and managing road corridors. *Biodiversity and Conservation*, 6, 567-581.

³⁸ Lord, A., Waas, J.R. & Innes, J. (1997) Effects of human activity on the behaviour of northern New Zealand dotterel *Charadrius obscurus aquilonius* chicks. *Biological Conservation*, 82,15-20.

³⁹ Banks, P.B. & Bryant, J.V. (2007) Four-legged friend of foe? Dog-walking displaces native birds from natural areas. *Biology Letters*, 3, 611-613.

Tempel & Gutierrez 2003). These studies identified that there is still relatively little work on the effects of different types of water-based craft and the impacts from jet skis, kite surfers, windsurfers etc. (see Kirby et al. 2004⁴⁰ for a review). In very general terms, both distance from the source of disturbance and the scale of the disturbance (noise level, group size) will both influence the response (Delaney et al. 1999⁴¹; Beale & Monaghan 2005⁴²). On UK estuaries and coastal sites, a review of WeBS data showed that, among the volunteer WeBS surveyors, driving of motor vehicles and shooting were the two activities most perceived to cause disturbance (Robinson & Pollitt 2002)⁴³.

- 4.13 Disturbing activities present themselves on a continuum. Generally, activities that involve irregular, infrequent and loud noise events, movement or vibration are likely to be the most disturbing. For example, the presence of dogs around water bodies generate substantial disturbance due to the areas accessed and their impact on bird behaviour. Birds are least likely to be disturbed by activities that involve regular, frequent, predictable and quiet patterns of sound, movement or vibration. The further any activity is from the birds, the less likely it is to result in disturbance. Therefore, the factors that determine species responses to disturbance include species sensitivity, timing/duration of the recreational activity and the distance between source and receptor of disturbance.
- 4.14 The specific distance at which a species takes flight when disturbed is known as the 'tolerance distance' (also called the 'escape flight distance') and may greatly differ between species. Tolerance distances from various literature sources are summarised in **Error! Reference source not found.** It is reasonable to assume from this evidence that disturbance is unlikely to be relevant at distances of beyond 200m.

Table 1. Tolerance distances in metres of 21 species of waterfowl to various forms of recreational disturbance, as described in the literature. Where the mean is not available, distances are provided as a range.⁴⁴

Species	Type of disturbance. ¹ Tydeman (1978), ² Keller (1989), ³ Van der Meer (1985), ⁴ Wolff et al (1982), ⁵ Blankestijn et al (1986)		
	Rowing boats/kayak	Sailing boats	Walking
Little grebe		60 – 100 ¹	
Great crested grebe	50 – 100 ²	20 – 400 ¹	
Mute swan		3 – 30 ¹	
Teal		0 – 400 ¹	
Mallard		10 – 100 ¹	
Shoveler		200 – 400 ¹	
Pochard		60 – 400 ¹	
Tufted duck		60 – 400 ¹	
Goldeneye		100 – 400 ¹	
Smew		0 – 400 ¹	

⁴⁰ Kirby, J.S., Clee, C. & Seager, V. (1993) Impact and extent of recreational disturbance to wader roosts on the Dee estuary: some preliminary results. *Wader Study Group Bulletin* 68: 53-58.

⁴¹ Delaney, D.K., Grubb, T.G., Beier, P., Pater, L.L.M. & Reiser, H. (1999) Effects of Helicopter Noise on Mexican Spotted Owls. *The Journal of Wildlife Management* 63: 60-76.

⁴² Beale, C.M. & Monaghan, P. (2005) Modeling the Effects of Limiting the Number of Visitors on Failure Rates of Seabird Nests. *Conservation Biology* 19: 2015-2019.

⁴³ Robinson, J.A. & Pollitt, M.S. (2002) Sources and extent of human disturbance to waterbirds in the UK: an analysis of Wetland Bird Survey data, 1995/96 to 1998/99: Less than 32% of counters record disturbance at their site, with differences in causes between coastal and inland sites. *Bird Study* 49: 205.

⁴⁴ Tydeman, C.F. 1978. Gravel Pits as conservation areas for breeding bird communities. PhD thesis. Bedford College
Keller, V. 1989. Variations in the response of Great Crested Grebes *Podiceps cristatus* to human disturbance - a sign of adaptation? *Biological Conservation* 49: 31-45

Van der Meer, J. 1985. *De verstering van vogels op de slikken van de Oosterschelde*. Report 85.09 Deltadienst Milieu en Inrichting, Middelburg. 37 pp.

Wolf, W.J., Reijnders, P.J.H. & Smit, C.J. 1982. The effects of recreation on the Wadden Sea ecosystem: many questions but few answers. In: G. Luck & H. Michaelis (Eds.), *Schriftenreihe M.E.L.F., Reihe A: Agnew. Wissensch* 275: 85-107

Blankestijn, S. et al. 1986. Seizoensverbreding in de recreatie en verstering van Wulp en Scholkester op hoogwatervluchtplaatsen op Terschelling. Report Projectgroep Wadden, L.H. Wageningen. 261pp.

Moorhen	100 – 400 ¹	
Coot	5 – 50 ¹	
Curlew		211 ³ ; 339 ⁴ ; 213 ⁵
Shelduck		148 ³ ; 250 ⁴
Grey plover		124 ³
Ringed plover		121 ³
Bar-tailed godwit		107 ³ ; 219 ⁴
Brent goose		105 ³
Oystercatcher		85 ³ ; 136 ⁴ ; 82 ⁵
Dunlin		71 ³ ; 163 ²

- 4.15 Mitigation measures to avoid recreational pressure effects usually involve a combination of access and habitat management, and sometimes the provision of alternative recreational space. Access management (restricting access to some or all of a European site) is not typically within the remit of a Parish Council and may contravene a range of Government policies on access to open space and objectives for increasing exercise, improving health etc. However, active management of access may be possible, such as that practised on nature reserves. Habitat management also does not lie within the direct remit of Parish Councils. However, the Council can help to set a framework for improved habitat management by promoting collaboration with neighbouring parishes and Local Planning Authorities. The provision of alternative recreational space may absorb some recreational pressure, thereby reducing the recreational footfall in the more sensitive European sites. However, the location and habitat type of such alternative destinations must be carefully selected to be effective.

Bat Disturbance

- 4.16 Human presence can also lead to the disturbance of bat interest features, particularly surrounding maternity roosts and hibernacula. Disturbance of bats at critical times of the year (e.g. during hibernation) is likely to affect population viability and site usage. Due to this many roost sites are secured against unauthorised access such as through grilles at site access points. However, the roost locations of barbastelle bats are typically unknown because they are hidden in mature trees. Furthermore, barbastelle bats display significant flexibility in roost site selection within and between seasons. Therefore, these bats can generally respond to disturbance events (i.e. part of a site being subjected to high recreational pressure) by switching roost locations to less frequented areas.

Trampling / Mechanical Damage

- 4.17 Most aquatic or terrestrial sites can be affected by trampling and other mechanical damage, which in turn causes soil compaction and erosion:
- Wilson & Seney⁴⁵ examined the degree of track erosion caused by hikers, motorcycles, horses and cyclists from 108 plots along tracks in the Gallatin National Forest, Montana. Although the results proved difficult to interpret, it was concluded that horses and hikers disturbed more sediment on wet tracks, and therefore caused more erosion, than motorcycles and bicycles.
 - Cole et al⁴⁶ conducted experimental off-track trampling in 18 closed forest, dwarf scrub and meadow & grassland communities (each trampled between 0 – 500 times) over five mountain regions in the US. Vegetation cover was assessed two weeks and one year after trampling, and an inverse relationship with trampling intensity was discovered, although this relationship was weaker after one year than two weeks indicating some recovery of the vegetation. Differences in plant morphological characteristics were found to explain more variation in response between different vegetation types than soil and topographic factors. Low-growing, mat-forming grasses regained their cover best after two weeks and were considered most resistant to trampling, while tall forbs (non-woody vascular

⁴⁵ Wilson, J.P. & J.P. Seney. 1994. Erosional impact of hikers, horses, motorcycles and off road bicycles on mountain trails in Montana. Mountain Research and Development 14:77-88

⁴⁶ Cole, D.N. 1995a. Experimental trampling of vegetation. I. Relationship between trampling intensity and vegetation response. Journal of Applied Ecology 32: 203-214

Cole, D.N. 1995b. Experimental trampling of vegetation. II. Predictors of resistance and resilience. Journal of Applied Ecology 32: 215-224

plants other than grasses, sedges, rushes and ferns) were considered least resistant. The cover of hemicryptophytes and geophytes (plants with buds below the soil surface) was heavily reduced after two weeks, but had recovered well after one year and as such these were considered most resilient to trampling. Chamaephytes (plants with buds above the soil surface) were least resilient to trampling. It was concluded that these would be the least tolerant of a regular cycle of disturbance.

- Cole⁴⁷ conducted a follow-up study (in 4 vegetation types) in which shoe type (trainers or walking boots) and trampler weight were varied. Although immediate damage was greater with walking boots, there was no significant difference after one year. Heavier trampers caused a greater reduction in vegetation height than lighter trampers, but there was no difference in the effect on cover.
- Cole & Spildie⁴⁸ experimentally compared the effects of off-track trampling by hiker and horse (at two intensities – 25 and 150 passes) in two woodland vegetation types (one with an erect forb understorey and one with a low shrub understorey). Horse trampling was found to cause the largest reduction in vegetation cover. The forb-dominated vegetation suffered greatest disturbance, but recovered rapidly. Generally, it was shown that higher trampling intensities caused more disturbance.

Water Quality

4.18 An increase in the extent of residential or employment development can lead to reduced water quality of surface freshwater bodies, such as rivers and lakes. Sewage and industrial effluent discharge can result in an increased nutrient input to European sites leading to unfavourable conditions. Diffuse pollution, for example due to urban run-off, has been identified during an Environment Agency Review of Consents process and a joint Environment Agency and Natural England evidence review, as being a major contributor to pollution in aquatic ecosystems.

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

- At high levels, toxic chemicals and metals can result in immediate death of aquatic life, and can have detrimental effects even at lower levels, including increased vulnerability to disease and changes in wildlife behaviour.
- Eutrophication, the enrichment of plant nutrients in water, increases all biological activity and leads to significant changes in the composition and structure of aquatic food webs. Two of the most frequent eutrophication effects are shifts in algal species compositions and the frequency of nuisance algal blooms⁴⁹. These blooms have a multitude of consequences, including changes in vascular plant production (and biomass and species composition), reduced water clarity, increased pH, dissolved oxygen depletion and, ultimately, an increased likelihood of death of ecologically and economically important animal species⁵⁰. 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.
- Some pesticides, industrial chemicals, and components of sewage effluent are suspected to interfere with the functioning of the endocrine system, possibly having negative effects on the reproduction and development of aquatic life.
- Increased discharge of treated sewage effluent can result in high levels of macroalgal growth, smothering sandflats and mudflats, and in increased scour (as a result of greater flow volumes).

4.20 At sewage treatment works, catering for a growing population increases the risk of effluent escaping into aquatic environments in addition to consented discharges to the catchment. In many urban areas, sewage treatment and surface water drainage systems are combined, and therefore a predicted increase in flood and storm events could increase pollution risk.

⁴⁷ Cole, D.N. 1995c. Recreational trampling experiments: effects of trampler weight and shoe type. Research Note INT-RN-425. U.S. Forest Service, Intermountain Research Station, Utah.

⁴⁸ Cole, D.N., Spildie, D.R. 1998. Hiker, horse and llama trampling effects on native vegetation in Montana, USA. *Journal of Environmental Management* 53: 61-71

⁴⁹ Smith V.H., Joye S.B. & Howarth R.W. 2006. Eutrophication of freshwater and marine ecosystems. *Limnology and Oceanography* 51: 351-355.

⁵⁰ Smith V.H., Tilman G.D. & Nekola J.C. 1999. Eutrophication: Impacts of excess nutrient inputs on freshwater, marine, and terrestrial ecosystems. *Environmental Pollution* 100: 179-196.

Background information on Phosphate Impacts on the Arun Valley SPA/SAC/Ramsar

- 4.21 The characteristics of many freshwater habitats are governed by the availability of nutrients such as phosphorus (commonly assessed in the form of phosphates), which limits primary productivity and thus prevents vegetative communities from being dominated by certain species (e.g. filamentous algae, duckweed (*Lemna* sp.)). Where excessive phosphate levels accumulate a process of eutrophication can occur, whereby these species proliferate, resulting in adverse effects on the existing plant and invertebrate communities through a variety of mechanisms (e.g. shading, smothering, increased turbidity, anoxia). The result is an overall reduction of the quality of the habitats present and their ability to support priority species.
- 4.22 The River Arun is currently failing on phosphate levels. The Natural England Site Improvement Plan for the Arun Valley states “*Directly linked to this is point source pollution from a sewage treatment works upstream of the site. There may also be a risk of increased levels of nutrients entering the site through flooding, especially if the river banks are not maintained (see issue of changes in water levels). The classified bird species are also vulnerable to increased levels of nutrient enrichment as there is an increased likelihood of certain disease. Increase in growth of vegetation from sustained nutrient enrichment can make the habitat unsuitable for many bird species (Literature Review, Mott McDonald, 2006). Diffuse pollution from agricultural run off is likely to be contributing to the phosphate levels (this issue is managed via Catchment Sensitive Farming).*”
- 4.23 In contrast, agriculture contributes only a modest proportion of phosphorus, as agricultural phosphorus adsorbs to soil particles and has very limited mobility into watercourses.
- 4.24 As stated by Natural England and described by Jarvie *et al.*⁵¹, new residential units within the hydrological catchment are likely (through increased sewage production) to add phosphates to the Arun Valley SPA/SAC/Ramsar via wastewater treatment effluent.
- 4.25 As such, any developments with potential to cause a net increase in phosphate levels within the catchment (permanent or temporary) should be subject to HRA to identify any likely significant effects, and if necessary, an Appropriate Assessment.

Water Quantity, Level and Flow

- 4.26 The unique nature of wetlands combines shallow water, high levels of nutrients and high primary productivity. These conditions are ideal for the growth of organisms at the basal level of food webs, which feed many species of birds, mammals, fish and amphibians. Overwintering and migrating wetland bird species are particularly reliant on these food sources, as they need to build up enough nutritional reserves to sustain their long migration routes.
- 4.27 Winter flooding is integral to the function of most wetlands and essential in maintaining a variety of foraging habitats for SPA birds. Maintaining a steady water supply during key stages of their life cycle will be critical for survival. However, different species vary in their requirements of water levels. Splash and / or shallow flooding is required to provide suitable feeding areas and roosting sites for ducks and waders. In contrast, deeper flooding is essential to provide these habitats for Bewick’s swans and some duck species. For aquatic species, such as the Arun Valley SAC’s ramshorn snail, the extent of freshwater directly determines the amount of habitat available and is therefore critical to the species’ survival.
- 4.28 Wetland habitats rely on hydrological connections with other surface waters, such as rivers, streams and lakes. A constant supply of water is fundamental to maintaining the ecological integrity of sites. However, while the natural fluctuation of water levels within narrow limits is desirable, excess or too little water supply might cause the water level to be outside of the required range for SPA birds, their prey items or key plant species. This might lead to the loss of the structure and functioning of wetland habitats. There are two mechanisms through which urban development might negatively affect the water level in aquatic SPAs / Ramsars / SACs:

⁵¹ 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.

- The supply of new housing with potable water will require an increase in the abstraction of water from surface water and groundwater bodies. Depending on the level of water stress in the geographic region, this is likely to reduce the water level in SPAs that share the same catchment.
- The expansion of impermeable surfaces in urban areas increases the volume and speed of surface water runoff. As traditional drainage systems often cannot cope with the volume of stormwater, sewer overflows are designed to discharge excess water directly into watercourses. Often this pluvial flooding results in downstream inundation of watercourses and the potential flooding of wetland habitats.

4.29 The Arun Valley SAC has a relatively narrow hydrological catchment and its water level is primarily maintained by a few key rivers that traverse the plain. Notably, Natural England have told Chichester District Council, the overarching Local Planning Authority, that they are very concerned about the Hardham groundwater abstraction (a key part of the Southern Water supply strategy for this part of Chichester under certain conditions) and its effect on water levels / flows in the Arun Valley. As such, they have advised Chichester and adjacent Horsham District that ‘*The Environment Agency and Natural England are working with Southern Water to try to identify a long term more sustainable water supply. In the meantime, whilst the adverse effect remains or is uncertain, development in Horsham must be certain not to add to this adverse effect.*’ They then refer the Councils to ‘*...studies such as the Gatwick Sub Regional water cycle study regarding this issue. For example, the study cites the requirement to demonstrate water neutrality in order for sufficient water to be available to the district.*’

Atmospheric Pollution

4.30 The main pollutants of concern for European sites are oxides of nitrogen (NOx), ammonia (NH₃) and sulphur dioxide (SO₂) and are summarised in **Error! Reference source not found.** Ammonia can have a directly toxic effect upon vegetation, particularly at close distances to the source such as near road verges⁵². NOx can also be toxic at very high concentrations (far above the annual average critical level). However, in particular, high levels of NOx and NH₃ are likely to increase the total N deposition to soils, potentially leading to deleterious knock-on effects in resident ecosystems. Increases in nitrogen deposition from the atmosphere is widely known to enhance soil fertility and to lead to eutrophication. This often has adverse effects on the community composition and quality of semi-natural, nitrogen-limited terrestrial and aquatic habitats^{53 54}.

Table 2. Main sources and effects of air pollutants on habitats and species⁵⁵

Pollutant	Source	Effects on habitats and species
Sulphur Dioxide (SO ₂)	<p>The main sources of SO₂ are electricity generation, and industrial and domestic fuel combustion. However, total SO₂ emissions in the UK have decreased substantially since the 1980’s.</p> <p>Another origin of sulphur dioxide is the shipping industry and high atmospheric concentrations of SO₂ have been documented in busy ports. In future years shipping is likely to become one of the most important contributors to SO₂ emissions in the UK.</p>	<p>Wet and dry deposition of SO₂ acidifies soils and freshwater, and may alter the composition of plant and animal communities.</p> <p>The magnitude of effects depends on levels of deposition, the buffering capacity of soils and the sensitivity of impacted species.</p> <p>However, SO₂ background levels have fallen considerably since the 1970’s and are now not regarded a threat to plant communities. For example, decreases in Sulphur dioxide concentrations have been linked to returning lichen species and improved tree health in London.</p>
Acid deposition	Leads to acidification of soils and freshwater via atmospheric deposition of SO ₂ , NOx, ammonia	Gaseous precursors (e.g. SO ₂) can cause direct damage to sensitive vegetation, such as

⁵² http://www.apis.ac.uk/overview/pollutants/overview_NOx.htm.

⁵³ Wolseley, P. A.; James, P. W.; Theobald, M. R.; Sutton, M. A. **2006**. Detecting changes in epiphytic lichen communities at sites affected by atmospheric ammonia from agricultural sources. *Lichenologist* 38: 161-176

⁵⁴ Dijk, N. **2011**. Dry deposition of ammonia gas drives species change faster than wet deposition of ammonium ions: evidence from a long-term field manipulation *Global Change Biology* 17: 3589-3607

⁵⁵ Information summarised from the Air Pollution Information System (<http://www.apis.ac.uk/>)

Pollutant	Source	Effects on habitats and species
	<p>and hydrochloric acid. Acid deposition from rain has declined by 85% in the last 20 years, which most of this contributed by lower sulphate levels.</p> <p>Although future trends in S emissions and subsequent deposition to terrestrial and aquatic ecosystems will continue to decline, increased N emissions may cancel out any gains produced by reduced S levels.</p>	<p>lichen, upon deposition.</p> <p>Can affect habitats and species through both wet (acid rain) and dry deposition. The effects of acidification include lowering of soil pH, leaf chlorosis, reduced decomposition rates, and compromised reproduction in birds / plants.</p> <p>Not all sites are equally susceptible to acidification. This varies depending on soil type, bed rock geology, weathering rate and buffering capacity. For example, sites with an underlying geology of granite, gneiss and quartz rich rocks tend to be more susceptible.</p>
Ammonia (NH ₃)	<p>Ammonia is a reactive, soluble alkaline gas that is released following decomposition and volatilisation of animal wastes. It is a naturally occurring trace gas, but ammonia concentrations are directly related to the distribution of livestock.</p> <p>Ammonia reacts with acid pollutants such as the products of SO₂ and NO_x emissions to produce fine ammonium (NH₄⁺) - containing aerosol. Due to its significantly longer lifetime, NH₄⁺ may be transferred much longer distances (and can therefore be a significant trans-boundary issue).</p> <p>While ammonia deposition may be estimated from its atmospheric concentration, the deposition rates are strongly influenced by meteorology and ecosystem type.</p>	<p>The negative effect of NH₄⁺ may occur via direct toxicity, when uptake exceeds detoxification capacity and via N accumulation.</p> <p>Its main adverse effect is eutrophication, leading to species assemblages that are dominated by fast-growing and tall species. For example, a shift in dominance from heath species (lichens, mosses) to grasses is often seen.</p> <p>As emissions mostly occur at ground level in the rural environment and NH₃ is rapidly deposited, some of the most acute problems of NH₃ deposition are for small relict nature reserves located in intensive agricultural landscapes.</p>
Nitrogen oxides (NO _x)	<p>Nitrogen oxides are mostly produced in combustion processes. Half of NO_x emissions in the UK derive from motor vehicles, one quarter from power stations and the rest from other industrial and domestic combustion processes.</p> <p>In contrast to the steep decline in Sulphur dioxide emissions, nitrogen oxides are falling slowly due to control strategies being offset by increasing numbers of vehicles.</p>	<p>Direct toxicity effects of gaseous nitrates are likely to be important in areas close to the source (e.g. roadside verges). A critical level of NO_x for all vegetation types has been set to 30 ug/m³.</p> <p>Deposition of nitrogen compounds (nitrates (NO₃), nitrogen dioxide (NO₂) and nitric acid (HNO₃)) contributes to the total nitrogen deposition and may lead to both soil and freshwater acidification.</p> <p>In addition, NO_x contributes to the eutrophication of soils and water, altering the species composition of plant communities at the expense of sensitive species.</p>
Nitrogen deposition	<p>The pollutants that contribute to the total nitrogen deposition derive mainly from oxidized (e.g. NO_x) or reduced (e.g. NH₃) nitrogen emissions (described separately above). While oxidized nitrogen mainly originates from major conurbations or highways, reduced nitrogen mostly derives from farming practices.</p> <p>The N pollutants together are a large contributor to acidification (see above).</p>	<p>All plants require nitrogen compounds to grow, but too much overall N is regarded as the major driver of biodiversity change globally.</p> <p>Species-rich plant communities with high proportions of slow-growing perennial species and bryophytes are most at risk from N eutrophication. This is because many semi-natural plants cannot assimilate the surplus N as well as many graminoid (grass) species.</p>

Pollutant	Source	Effects on habitats and species
Ozone (O ₃)	<p>A secondary pollutant generated by photochemical reactions involving NO_x, volatile organic compounds (VOCs) and sunlight. These precursors are mainly released by the combustion of fossil fuels (as discussed above).</p> <p>Increasing anthropogenic emissions of ozone precursors in the UK have led to an increased number of days when ozone levels rise above 40ppb ('episodes' or 'smog'). Reducing ozone pollution is believed to require action at international level to reduce levels of the precursors that form ozone.</p>	<p>N deposition can also increase the risk of damage from abiotic factors, e.g. drought and frost.</p> <p>Concentrations of O₃ above 40 ppb can be toxic to both humans and wildlife, and can affect buildings.</p> <p>High O₃ concentrations are widely documented to cause damage to vegetation, including visible leaf damage, reduction in floral biomass, reduction in crop yield (e.g. cereal grains, tomato, potato), reduction in the number of flowers, decrease in forest production and altered species composition in semi-natural plant communities.</p>
4.31	<p>Sulphur dioxide emissions overwhelmingly derive from power stations and industrial processes that require the combustion of coal and oil, as well as (particularly on a local scale) shipping⁵⁶. Ammonia emissions originate from agricultural practices⁵⁷, with some chemical processes also making notable contributions. As such, it is unlikely that material increases in SO₂ or NH₃ emissions will be associated with the neighbourhood planning document.</p>	
4.32	<p>NO_x emissions, however, are dominated by the output of vehicle exhausts (more than half of all emissions). A 'typical' housing development will contribute by far the largest portion to its overall NO_x footprint (92%) through the associated road traffic. Other sources, although relevant, are of minor importance (8%) in comparison⁵⁸. Emissions of NO_x could therefore be reasonably expected to increase because of a higher number of vehicles due to implementation of the Neighbourhood Plan.</p>	
4.33	<p>According to the World Health Organisation, the critical NO_x concentration (critical threshold) for the protection of vegetation is 30 µgm⁻³; the threshold for sulphur dioxide is 20 µgm⁻³. In addition, ecological studies have determined 'critical loads'⁵⁹ of atmospheric nitrogen deposition (that is, NO_x combined with ammonia NH₃).</p>	
4.34	<p>The Department of Transport's Transport Analysis Guidance stipulates that, beyond 200m, the contribution of vehicle emissions from the roadside to local pollution levels is not significant⁶⁰ (Figure 2). This is therefore the distance that has been used throughout this HRA in order to determine whether European sites are likely to be significantly affected by development outlined in the Wisborough Green Neighbourhood Plan.</p>	

⁵⁶ http://www.apis.ac.uk/overview/pollutants/overview_SO2.htm.

⁵⁷ Pain, B.F.; Weerden, T.J.; Chambers, B.J.; Phillips, V.R.; Jarvis, S.C. 1998. A new inventory for ammonia emissions from U.K. agriculture. *Atmospheric Environment* 32: 309-313

⁵⁸ Proportions calculated based upon data presented in Dore CJ et al. 2005. UK Emissions of Air Pollutants 1970 – 2003. UK National Atmospheric Emissions Inventory. <http://www.airquality.co.uk/archive/index.php>

⁵⁹ The critical load is the rate of deposition beyond which research indicates that adverse effects can reasonably be expected to occur

⁶⁰ <http://www.dft.gov.uk/webtag/documents/expert/unit3.3.3.php#013> [Accessed on the 08/10/2019]

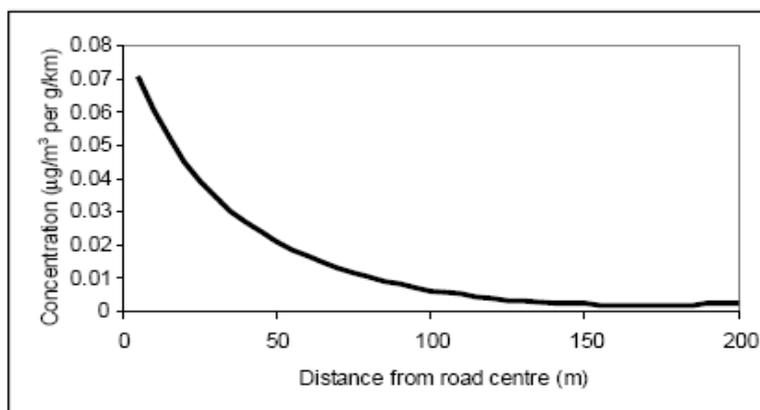


Figure 2: Traffic contribution to concentrations of pollutants at different distances from a road (Source: DfT⁶¹)

- 4.35 Exhaust emissions from increased vehicle usage linked to residential and employment development are capable of adversely affecting most plants and potentially altering community composition. Considering this, an increase in the net population and potential employment growth allocated in the Wisborough Green NP could result in increased traffic adjacent to European sites that are sensitive to atmospheric pollution.

⁶¹ <http://www.dft.gov.uk/ha/standards/dmrb/vol11/section3/ha20707.pdf> [Accessed on the 08/10/2019]

5. Test of Likely Significant Effects (LSEs)

Background to Wisborough Green Parish

- 5.1 The NP states “*The Parish of Wisborough Green is an area of approximately 1756 hectares which lies in the north western corner of West Sussex, 3 miles from the border with Surrey. It has a population of 1414 with a density of 1.4 persons per hectare (the average for the South East being 4.5).*”
- 5.2 *It is a typical rural English Village with a picturesque central village green, pond, church and shop located in the historic and Conservation Area of the village. The south western part of the Parish lies within the South Downs National Park.*
- 5.3 *Together with Loxwood, Kirdford, Plaistow and Ifold, and a small part of Lynchmere Parish, the Parish of Wisborough Green forms the northern part of the Plan Area in the Chichester District Council (CDC) Local Plan which is separated from the southern district Parishes by the South Downs National Park. The South Downs National Park Authority is the Local Planning Authority for the area within the National Park Boundary”*

Physical scope of the HRA

- 5.4 There are five European Sites which are described in the previous section that lie within 10km of Wisborough Green Parish. These are The Mens SAC, Ebernoe Common SAC, Duncton to Bignor Escarpment SAC, Arun Valley SAC and Arun Valley SPA/ Ramsar.
- 5.5 Duncton to Bignor Escarpment SAC is located approximately 7.5km from the southern boundary of Wisborough Green Parish, although the allocations proposed by Wisborough Green Parish Council are all located in the northern half of the Parish which is closer to 13km from the SAC. The Natural England Site Improvement Plan for this SAC also states that there are no current threats or pressures that may impact the integrity of this European Site⁶². However, the A272 which extends through the Parish connects to the A285 at Petworth and leads directly past Duncton to Bignor Escarpment SAC towards the popular employment hub of Chichester. Therefore, this site is screened in for further consideration of air quality impacts as a result of increased residential development in the Parish.
- 5.6 The Arun Valley SAC/SPA and Ramsar is located south of the Parish and from initial inspections of aerial imagery, there are no connecting major roads from the Parish to within 200m of these European Sites. Therefore, air quality is screened out in relation to these sites. Additionally, these European Sites are the only sites out of those considered in this assessment that are sensitive to water quality and hydrological changes as specified in the Natural England Site Improvement Plan⁶³. This impact pathway is considered in relation to these Sites below. The SPA/Ramsar and the SAC are designated for their populations of wintering birds, notably the Bewick’s swan, and the little ramshorn snail respectively. The Ramsar site is also designated for a number of other rare aquatic plants and invertebrates. These qualifying species are sensitive to development. Therefore, recreational pressure and loss of functionally linked land are also considered further in relation to these sites.
- 5.7 Although The Mens SAC is located directly west of the Parish and partially within the Parish in the southern section, and therefore lies within the accepted catchment to be screened in for likely significant effects of water quality and hydrological changes to level and flow, this site is upstream of the Parish on the River Kird. Therefore, surface run off from impermeable surfaces created within the six allocations proposed in the NP would travel east within the River Kird away from this European Site. Additionally, the closest site allocation (Ansell’s Yard) to The Mens SAC is located approximately 500m from the edge of the SAC and connects to the River Kird outside of the SAC. Ansell’s Yard is a partially brownfield site. Therefore, the development of this site will only result in a minimal increase in hardstanding. Run-off is therefore deemed unlikely to materially impact the water quality or flow levels of The Mens SAC. Ebernoe

⁶² Natural England Site Improvement Plan – Duncton to Bignor Escarpment, Available at: <http://publications.naturalengland.org.uk/publication/5623422855938048> [accessed 20/01/2021]

⁶³ Natural England Site Improvement Plan – Arun Valley, available at: <http://publications.naturalengland.org.uk/publication/5353882309885952> [accessed 20/01/2021]

Common is also located upstream of Wisborough Green along the River Kird. Therefore, this site is screened out of further assessment with regard to water quality and water quantity, level and flow.

- 5.8 However, both The Mens SAC and Ebernoe Common SAC are designated for their populations of rare UK bat species and have been screened in for further consideration regarding recreational pressure, air quality and loss of functionally linked land.
- 5.9 Based on conclusions drawn from Natural England Site Improvement Plans and previous HRA work undertaken for surrounding parishes, a summary of the impact pathways that require consideration regarding increased development within the Wisborough Green Parish and the aforementioned European Sites. These are:
- Loss of functionally linked land
 - Recreational pressure
 - Air quality
 - Water Quality
 - Hydrological changes, including water abstraction
- 5.10 Table 3 describes these environmental impact pathways. The consideration of Neighbourhood Plan policies (the Test of Likely Significant Effects) is then documented in Table 4.
- 5.11 For the Screening assessment (Table 4) green shading in the final column indicates that the proposed development site or policy has been determined 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. Note that where European Site boundaries overlap, the closest distance to the SAC, SPA or Ramsar is taken.

Table 3. Description of potential impact pathways from increased development to European Sites

Impact pathway	Discussion
Loss of functionally linked land	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 ⁶⁴ . Increased residential development within Wisborough Green could lead to a loss of suitable habitat used by highly mobile species for which European Sites are designated. This habitat loss would restrict the movement of protected species which could lead to a decline in numbers. This impact pathway is relevant to the Arun Valley SPA which is designated for populations of wintering birds such as Bewick's swan. It is also relevant to the Mens SAC and Ebernoe Common SAC which are designated for their populations of barbastelle and Bechstein's bats.
Recreational Pressure	Increased development within Wisborough Green could lead to higher numbers of visitors to European Sites, particularly those within relatively easy recreational access. 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. Increased visitors can have direct and indirect for a European Site that could prevent said site achieving its conservation objectives. European Sites which could be impacted by recreational pressure are The Mens SAC, Ebernoe Common SAC, Arun Valley SPA/SAC/Ramsar. Duncton to Bignor Escarpment SAC falls outside the accepted recreational zone of inland European designations (5km) and does not list recreational pressure as a current threat to the integrity of this SAC.
Air quality	Increased residential development within Wisborough Green Parish would likely lead to a greater number of vehicles within the parish. As such, increased air pollution could arise relative to a situation of no growth. Pollutants released from vehicles may be carried directly by wind currents and deposited to European Sites or pollutants may become soluble and taken up during evaporation and deposited to said sites during precipitation. Guidance from the Institute of Air Quality Management and Highways England both set an impact zone of 200m from the roadside for potential significant air quality effects to vegetation from main road traffic. European Sites located within 200m of a major road from the parish towards a major employment hub are: The Mens SAC and Duncton to Bignor Escarpment SAC.
Water quality (surface water runoff)	Increased residential development within Wisborough Green Parish could lead to the loss of previously undeveloped land and increased surface water runoff to nearby European Sites. There is a risk that inappropriate drainage design may lead to increased surface water runoff from new development. The Mens SAC is located approximately 600m from the closest site allocation within Wisborough Green Parish. Ebernoe Common is located 4.8km from the Parish, the Arun Valley SPA/SAC/Ramsar is located 3.7km from the Parish and Duncton to Bignor Escarpment is located 7.5km from the Parish. These distances are considered too great a distance to be impacted by issues of polluted surface water runoff from increased development in the Parish.
Water quality (discharge of treated sewage effluent)	Increased housing development at Wisborough Green Parish will be served by Wisborough Green WWTW which drains into the hydrological catchment of the Arun Valley SPA/ SAC/ Ramsar. The Riven Arun is already failing on phosphate levels therefore phosphate neutrality is a key requirement of new development within the Parish. Therefore, it is necessary to consider any risk that increased sewage output could degrade the water quality (i.e. through increased phosphorus discharge) of European Sites, in the absence of environmental mitigation and adequate wastewater treatment works.
Water Quantity, level	The qualifying species of the Arun Valley SPA/ SAC/ Ramsar are dependent upon the freshwater habitats provided at these European Sites. Significant changes in water levels

⁶⁴ Wilcove, D.S., McLellan, C.H. and Dobson, A.P., 1986. Habitat fragmentation in the temperate zone. *Conservation biology*, 6, pp.237-256.

and flow including due to development within the same hydrological catchment could impact the survival of these species.
water abstraction

Table 4. Screening assessment (Likely Significant Effects) of the Wisborough Green NP

Policy	European Sites and Proximity to Allocation Area	Brief summary	Screening outcome
OA1: Development Allocation	N/A	The NP allocates 21 dwellings carried forward from the previous plan period which have planning permission and a further 40 dwellings allocated in the emerging NP.	Likely Significant Effects. Screened In. This policy allocates specific quanta of dwellings for the Plan Area which detailed further in subsequent policies. However, this policy, generally speaking may have likely significant effects on surrounding European Sites via the following impact pathways: <ul style="list-style-type: none"> • Loss of functionally linked land • Recreational pressure • Air quality • Water quality • Water quantity level & flow Therefore, this policy is screened in for further assessment.
OA2: Spatial Strategy	N/A	Appropriate sustainable development within the parish will be permitted if it fulfils criteria relating to the nature of the village, Local Gap retention, Conservation Ares, village character and the South Downs National Park	No Likely Significant Effects. Screened out. This is a development management policy relating to sustainable development that sets out key development criteria and does not specifically allocate sites for development. Therefore, no impact pathways exist to European Sites.
OA3: Settlement Boundary	N/A	Specifies that development within the settlement boundary must comply with the Chichester Local Plan Key Policies Pre-Submission 2014-2029	No Likely Significant Effects. Screened out. This is a development management policy that sets out key development criteria and does not specifically allocate sites for development. Therefore, no impact pathways exist to European Sites.
OA4: Small Scale Housing Sites	N/A	The NP supports small housing development upon a number of conditions including: <ul style="list-style-type: none"> • The total of dwellings and site coverage o not cause overdevelopment of the plot in comparison with the characteristics of neighbouring plots • The scheme will not adversely affect any heritage assets • The scheme will not result in the loss of valuable trees, hedges or other natural features that form part of the character of the Parish 	No Likely Significant Effects. Screened out. This is a development management policy that sets out key development criteria and does not specifically allocate sites for development. Therefore, no impact pathways exist to European Sites.

		<p>and the biodiversity is maintained or enhanced</p> <ul style="list-style-type: none"> The development is well integrated within the existing village and maintains the residential amenity of neighbours. 	
OA5: Local Gaps	N/A	Proposals must ensure the retention of Local Gaps specified in the NP and should be accompanied by mitigation showing how the Local Gap can be enhanced and ameliorated. Important trees and hedges within local gaps must be retained as part of any development proposal.	No Likely Significant Effects. Screened out. This is a development management policy that sets out key development criteria and does not specifically allocate sites for development. Therefore, no impact pathways exist to European Sites.
OA6: Development in the Neighbourhood Plan Area within the South Downs National Park (SDNP)	N/A	Any development in the Neighbourhood Plan Area within the SDNP must align with the National Park Purposes and enhance the qualities the National Park values most relating to tranquillity and dark skies	No Likely Significant Effects. Screened out. This is a development management policy that sets out key development criteria and does not specifically allocate sites for development. Therefore, no impact pathways exist to European Sites.
OA7: Land adjoining the South Downs National Park (SDNP)	N/A	Development within the land adjoining the SDNP must not detract from the visual qualities and characteristics of the SDNP and should affect the views into and of the Park.	No Likely Significant Effects. Screened out. This is a development management policy that sets out key development criteria and does not specifically allocate sites for development. Therefore, no impact pathways exist to European Sites.
OA8: Flood Risk	N/A	Development in areas of Flood Risk Zones 2 and 3 will only be permitted in accordance with the NPPF. New development outside Flood Risk Zones 2 and 3 should be subject to a site specific flood risk assessment in accordance with the NPPF	No Likely Significant Effects. Screened out. This policy specifically relates to the flood risk in the Parish and how this impacts where new development will be permitted. It does not specifically allocate sites for development. Therefore, no impact pathways exist to European Sites.
EN1: Ecological Sites	N/A	Development must avoid strategic and local biodiversity or habitat sites that could harm existing ecological assets, Wisborough Green's wildlife network and habitat connectivity within the national and internationally important sites. All new development must retain existing hedgerows except where no other alternative is available and satisfactory mitigation can be achieved.	No Likely Significant Effects. Screened out. This is a development management policy relating to the protection of natural features that support protected species and that sets out key development criteria and does not specifically allocate sites for development. Therefore, no impact pathways exist to European Sites.
EN2: Landscape Character and Open Views	N/A	Any Development should maintain the local character of the landscape and should not cause unacceptable loss or diminution of significant views that currently provide open field aspects or views from the village centre or other open spaces.	No Likely Significant Effects. Screened out. This is a development management policy that sets out key development criteria and does not specifically allocate sites for development. Therefore, no impact pathways exist to European Sites.
EN3: Public Rights of Way	N/A	Existing PROWs will be protected and enhanced where possible. Proposals will not be supported if they bisect a PROW unless it can be shown that either the current course can be retained or that any diversion would not result in any	No Likely Significant Effects. Screened out. This is a development management policy relating to public rights of way that sets out key development criteria that ensures the retention of the PROWs network and does not specifically allocate sites for development. Therefore, no

		adverse impact on residential amenity or safety of the general public.	impact pathways exist to European Sites.
EN4: Conserving and Enhancing the Heritage Environment	N/A	This policy ensures new development adheres to the local distinctive and character of the area to maintain the individual identity of the settlements.	No Likely Significant Effects. Screened out. This is a development management policy that sets out key development criteria and does not specifically allocate sites for development. Therefore, no impact pathways exist to European Sites.
EN5: Local Green Space	N/A	Figure 11 in the NP shows the designated Local Green Space where development will not be permitted except under very specific circumstances	No Likely Significant Effects. Screened out. This is a development management policy that sets out key development criteria and does not specifically allocate sites for development. Therefore, no impact pathways exist to European Sites.
EN6: Local Open Space	N/A	Figure 11 in the NP should be designated Local Open Space where proposals for new development will be expected to enhance existing use and community value. Development that does not do this will not be permitted unless an equivalent area of open space is provided of the same size, suitability and accessibility as the existing open space.	No Likely Significant Effects. Screened out. This is a development management policy that sets out key development criteria and does not specifically allocate sites for development. Therefore, no impact pathways exist to European Sites.
NEW: Biodiversity	N/A	All proposals should protect and enhance biodiversity in accordance with the NPPF and comply with criteria specified in the NP. Where adverse impacts cannot be avoided, appropriate measure should be implemented.	No Likely Significant Effects. Screened out. This is a development management policy that sets out key development criteria and does not specifically allocate sites for development. Therefore, no impact pathways exist to European Sites.
CD1: Retention of Assets of Community Value	N/A	Development proposals that will enhance the viability and community value of registered Assets of Community Value will be supported. However in circumstance where it can be demonstrated that the operation of an asset is no longer economically viable, new proposals may be considered.	No Likely Significant Effects. Screened out. This is a development management policy that sets out key development criteria and does not specifically allocate sites for development. Therefore, no impact pathways exist to European Sites.
HO1: Housing Need	N/A	New housing development should favour smaller dwellings to address the imbalance of a high proportion of larger dwellings. This should achieve the recommended housing mix of 35% 1 and 2 bed dwellings, 50% 3 bed dwellings and 15% 4 bed dwellings.	No Likely Significant Effects. Screened out. This is a development management policy that sets out key development criteria and does not specifically allocate sites for development. Therefore, no impact pathways exist to European Sites.
HO2: Agricultural Occupancy	N/A	Applications seeking the removal of agricultural occupancy conditions in the Plan Area will only be permitted where the unit has been marketed unsuccessfully in its current use. The marketing period should be for at least 12 months.	No Likely Significant Effects. Screened out. This is a development management policy that sets out key development criteria and does not specifically allocate sites for development. Therefore, no impact pathways exist to European Sites.
DS1: Housing Density	N/A	The density of new or replacement housing should reflect the immediate character of the street or area within which it is situated. The built coverage of all sites should allow sufficient space for significant planting to mature on and between plots to allow new developments to assimilate well within the rural mature of the village and its setting. Uniform plots and house types should be	No Likely Significant Effects. Screened out. This is a development management policy that sets out key development criteria and does not specifically allocate sites for development. Therefore, no impact pathways exist to European Sites.

		avoided to reflect the wide variety found within the characteristic streets of the village. Short terraces and semidetached dwellings will be acceptable if interspersed with a greater variety of plot size and form.	
DS2: Vernacular for New Developments	N/A	All new developments of one or more houses should reflect the character and context of existing developments however contemporary and innovative materials and design will be supported where improvement can be robustly demonstrated without detracting from the historic context. Conditions regarding this can be found in the NP.	No Likely Significant Effects. Screened out. This is a development management policy that sets out key development criteria and does not specifically allocate sites for development. Therefore, no impact pathways exist to European Sites.
DS3: Housing Extensions – Style and Vernacular	N/A	New extensions will follow criteria set out in the NP to follow the style and vernacular of the original building focussing on details like size and shape of windows, roof shapes and pitch angles, tiling materials, brickwork colour and texture.	No Likely Significant Effects. Screened out. This is a development management policy that sets out key development criteria and does not specifically allocate sites for development. Therefore, no impact pathways exist to European Sites.
DS4: Parking Provision and Standards	N/A	This policy designates the number of parking spaces for new developments based on the number of beds for each dwelling and details assets such as: Provision of Garages, Visitor Parking, Non-residential Parking and Electric vehicles	No Likely Significant Effects. Screened out. This is a development management policy that sets out key development criteria and does not specifically allocate sites for development. Therefore, no impact pathways exist to European Sites.
ED1: Development of New and Existing Businesses	N/A	This policy details the conditions by which expanding businesses must following to gain support from the Council including: environmental effects, impacts to nearby residents, impacts on the local highway network, conservation of the Conservation Area and Heritage assets.	No Likely Significant Effects. Screened out. This is a development management policy that sets out key development criteria and does not specifically allocate sites for development. Therefore, no impact pathways exist to European Sites.
ED2: Encourage and Support Home Working	N/A	Live/work units or retail/commercial units in new development will be supported where economically sustainable in accordance with the NP policies and where they will be retained in perpetuity through a S106 agreement. Development must give broad support to the local economy through flexible and progressive planning in order to encourage business innovation.	No Likely Significant Effects. Screened out. This is a development management policy that sets out key development criteria and does not specifically allocate sites for development. Therefore, no impact pathways exist to European Sites.
Site Specific Policy – Commercial Areas	N/A	The council supports commercial redevelopment of the Newpound commercial area and Wharf Farm commercial site on the current footprints, not exceeding the measurements of the existing buildings. Proposals must maintain existing or offer new opportunities for business and employment.	Likely Significant Effects. Screened in. This policy specifically relates to development within a certain area of the Parish designed to fulfil a particular role relating to business and employment. Although this policy does not quantify the development, it is necessary to consider the impact pathways that could arise.
IN1: Waste water management	N/A	Any new connection to the Wisborough Green primary sewer network of new developments and/or expansion to existing developments of greater than 5 houses will not be supported unless it can be shown that there is either capacity in the network or by rigorous analysis such that a new connection and/or expansion of the network will not increase the risk of system backup/flooding	No Likely Significant Effects. Screened out. This policy relates to the capacity of the waste water treatment works that will be associated with the site allocations proposed in the NP. Measures will need to be taken to ensure that the increased sewage effluent from the site allocations does not adversely impact the integrity of surrounding European Sites. However this policy does not

		and that the network can accommodate the additional demand for sewage disposal either in its existing form or through planned improvements to the system.	allocate new development within the parish. Therefore no impact pathways exist to European Sites.
IN2: Pedestrian Access	N/A	Development proposals are required to demonstrate that they include provision for safe pedestrian access within the site, connect to the current pedestrian network to access village facilities and accommodate access and linkages to the network of local Public Right of Way.	No Likely Significant Effects. Screened out. This is a development management policy that sets out key development criteria and does not specifically allocate sites for development. Therefore, no impact pathways exist to European Sites.
IN3: Street Lighting and Dark Night Skies	N/A	This policy implements conditions for new development proposals to follow with regard to lighting in order to minimise the effect on the tranquillity and dark skies valued by the SDNP.	No Likely Significant Effects. Screened out. This is a development management policy that sets out key development criteria and does not specifically allocate sites for development. Therefore, no impact pathways exist to European Sites.
IN4: Climate Change, Energy Conservation and Renewable Energy Schemes	N/A	Subject to conditions specified in the NP, energy generating schemes and infrastructure using renewable energy sources and insulating materials will be supported for existing individual properties and new development within the Plan Area.	No Likely Significant Effects. Screened out. This is a development management policy that sets out key development criteria and does not specifically allocate sites for development. Therefore, no impact pathways exist to European Sites.
IN5: Communications Connectivity	N/A	This policy supports new proposals to improve telecommunications in the Parish provided it does not impact the character in the Local Area. Applications for new residential development will only be approved if they are accompanied by a communication statement that demonstrates that the development will be able to connect to the best available broadband network and to take advantage of future improvements to it.	No Likely Significant Effects. Screened out. This is a development management policy that sets out key development criteria and does not specifically allocate sites for development. Therefore, no impact pathways exist to European Sites.
Policy SS8: Land known as Ansells Yard Nursery is allocated for up to 18 dwellings including affordable housing and 3 no. class B/E(g) class units for the period 2019 2035	The Mens SAC: 0.5km SW Ebernoe Common SAC: 5.5km Duncton to Bignor Escarpment SAC: 13km SW Arun Valley SAC: 8.9km S Arun Valley SPA/Ramsar: 8.9km S	The proposal must demonstrate that the exiting employment use on the site is satisfactorily accommodated with no net loss of floorspace unless redeployed or it is satisfactorily demonstrated that an improved and more efficient level of employment space is being provided that meets the needs of the existing employment use. Vehicular access to the site is to be provided from a single point on the Kirdford Road with visibility splays secured appropriate to the speed of traffic. The site will require detailed invasive surveys to determine contaminants present and any planning application for the site will be accompanied by details of the survey results and a scheme of remediation The site will be developed with high quality and sensitively designed properties,	Likely Significant Effects. Screened in This allocates up to 18 residential dwellings. Therefore, the following impacts pathways could arise alone and in combination with surrounding growth: <ul style="list-style-type: none"> • The Mens SAC – Loss of functionally linked land, recreational pressure, air quality, water quality, hydrology • Ebernoe Common SAC - Loss of functionally linked land, recreational pressure, air quality • Duncton to Bignor Escarpment – Air quality • Arun Valley SPA/Ramsar – Loss of functionally linked land, recreational pressure, water quality, hydrology • Arun Valley SAC - Loss of functionally linked land, recreational pressure, water quality, hydrology

no more than two storeys with pitched roofs.

A minimum 30% affordable housing to be provided

The design and style of dwellings will adhere to the Village Design Statement which provides advice on detailing and appropriate materials and integrate sensitively with the provide a sensitive integration of the commercial units

Off street vehicular parking should be provided on –site in accordance with the requirements set in Neighbourhood Plan Policy DS4.

The site layout shall include surface water drainage features as part of the overall design scheme.

Existing mature tree lines or hedges on boundaries to be retained. Any additional planting shall be of native species appropriate to the rural environment.

Development of the site shall provide biodiversity net gain where possible.

Where external lighting is demonstrated as being necessary for safety purposes, an external lighting scheme shall be submitted to demonstrate that the scheme is designed to minimise light pollution in accordance with Neighbourhood Plan Policy IN3.

The provision of a footpath access from the site to the village centre, linking to existing or planned footways where possible.

The provision of on-site amenity space in the area hatched on map x.



<p>Policy SS8: Land known as Tanglewood Nursery is allocated for up to 12 dwellings including affordable housing, for the</p>	<p>The Mens SAC: 0.68km SW Ebernoe Common SAC: 5.9km W Duncton to Bignor Escarpment SAC: 12.9km SW Arun Valley SAC: 8.6km S Arun Valley SPA/Ramsar:</p>	<p>Proposals for the site shall include: Vehicular access to the site is to be provided from a single point on the Kirdford Road with visibility splays secured appropriate to the speed of traffic. The site will be developed with high quality and sensitively designed properties, no more than two storeys with pitched roofs.</p>
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Likely Significant Effects. Screened in
This allocates up to 12 residential dwellings. Therefore, the following impacts pathways could arise alone and in combination with surrounding growth:

- The Mens SAC – Loss of functionally linked land, recreational pressure, air quality, water quality, hydrology
- Ebernoe Common SAC - Loss of functionally linked land, recreational pressure, air quality

period 2019 – 2035 8.6km S

The site layout should broadly accord with the sketch diagram

A minimum 30% affordable housing to be provided

The design and style of dwellings will adhere to the Village Design Statement which provides advice on detailing and appropriate materials

Off street vehicular parking should be provided on –site in accordance with the requirements set in Neighbourhood Plan Policy DS4.

The site layout shall include surface water drainage features as part of the overall design scheme.

Existing mature tree lines or hedges on boundaries to be retained. Any additional planting shall be of native species appropriate to the rural environment.

Development of the site shall provide biodiversity net gain where possible.

Where external lighting is demonstrated as being necessary for safety purposes, an external lighting scheme shall be submitted to demonstrate that the scheme is designed to minimise light pollution in accordance with Neighbourhood Plan Policy IN3.

The provision of a footpath access from the site to the village centre, linking to existing or planned footways where possible.

The provision of on-site amenity space in the area hatched on map x.

- Duncton to Bignor Escarpment – Air quality
- Arun Valley SPA/Ramsar – Loss of functionally linked land, recreational pressure, water quality, hydrology
- Arun Valley SAC - Loss of functionally linked land, recreational pressure, water quality, hydrology

Policy SS6: Land known as Stable Field is allocated for 7 dwellings for the period 2019 - 2035

The Mens SAC: 0.75km SW
 Ebernoe Common SAC: 5.9km W
 Duncton to Bignor Escarpment SAC: 12.9km SW
 Arun Valley SAC: 8.5km S
 Arun Valley SPA/Ramsar: 8.5km S

Proposals for the site shall include:
 Vehicular access to the site is to be provided from a single point on the Kirdford Road with visibility splays secured appropriate to the speed of traffic.
 The Site will be developed with high quality and sensitively designed properties, no more than two storeys with pitched roofs.
 The site layout should broadly accord with the sketch diagram.

- Likely Significant Effects. Screened in**
 This allocates up to 7 residential dwellings. Therefore, the following impacts pathways could arise alone and in combination with surrounding growth:
- The Mens SAC – Loss of functionally linked land, recreational pressure, air quality, water quality, hydrology
 - Ebernoe Common SAC - Loss of functionally linked land, recreational pressure, air quality
 - Duncton to Bignor Escarpment – Air quality

A heritage statement shall be submitted and the design and style of dwellings will take into account the proximity to the Conservation Area, neighbouring Listed buildings, and the highly sensitive open nature of the Local Gap in which it is situated. The design must also adhere to the Village Design Statement which provides advice on detailing and appropriate materials.

Off street vehicular parking should be provided on –site in accordance with the requirements set in Neighbourhood Plan Policy DS4.

The site layout shall include surface water drainage features as part of the overall design scheme.

The existing tree belt along Kirdford Road (excluding the proposed access) and Green lane boundaries, shall be retained. Other good quality trees on the site boundaries shall be retained. Any additional planting shall be of native species appropriate to the rural environment.

Development of the site shall provide biodiversity net gain, where possible.

Where external lighting is demonstrated as being necessary for safety purposes, an external lighting scheme shall be submitted to demonstrate that the scheme is designed to minimise light pollution in accordance with Neighbourhood Plan Policy IN3.

The provision of a footpath access from the site to the village centre, linking to existing or planned footways.

Provision of an area of public open space for recreation and biodiversity (including provision for the protection of protected species) in the area shown hatched pink and green on Figure XX. Details, including the transfer of land to the Parish Council are to be agreed as part of a legal agreement in consultation with the Parish Council prior to planning permission being granted.

Before planning permission is granted a scheme shall be prepared in consultation with the Parish Council (the Scheme) showing how the public open space is to be laid out. The Scheme shall include:-

- Arun Valley SPA/Ramsar – Loss of functionally linked land, recreational pressure, water quality, hydrology
- Arun Valley SAC - Loss of functionally linked land, recreational pressure, water quality, hydrology

- i. Provision for access and parking (to County Council standards);
- ii. Provision for active uses (located so as not to give excessive noise or disturbance to new or existing residents);
- iii. An area for biodiversity (including provision for the protection of protected species).

Any planning permission for residential development shall ensure that provision is made to secure:-

- i. The implementation of the Scheme in full by the development
- ii. The transfer of all the land comprising the Scheme to an appropriate public body (which may be the Parish Council) to secure its provision as public open space in perpetuity; and
- iii. The payment of an appropriate commuted sum to secure the long term maintenance of the Scheme.

Policy SS5: Land known as Winterfold Garden is allocated for 8 dwellings for the period 2019 – 2035.
 The Mens SAC: 1km W
 Ebernoe Common SAC: 6.3km W
 Duncton to Bignor Escarpment SAC: 13.1km SW
 Arun Valley SAC: 8.2km S
 Arun Valley SPA/Ramsar: 8.2km S

Proposals for the site shall include:

Vehicular access to the site is to be provide from a single point on the Durbans Road with visibility splays secured appropriate to the speed f traffic

The site will be developed with high quality and sensitively designed properties, no more than two storeys, with pitched roofs.

The site layout should broadly accord with the sketch diagram.

A heritage statement shall be submitted and the design and style of dwellings will take into account the proximity to the Conservation Area, neighbouring Listed buildings and non-designated heritage assets (as identified in the Conservation Area Character Appraisal Statement.)

The design must adhere to the Village Design Statement which provides advice on detailing and appropriate materials.

Off street vehicular parking should be provided on –site in accordance with the requirements set in Neighbourhood Plan Policy DS4.

A Flood Risk Assessment shall be submitted to demonstrate how flood risk to

Likely Significant Effects. Screened in

This allocates up to 8 residential dwellings. Therefore, the following impacts pathways could arise alone and in combination with surrounding growth:

- The Mens SAC – Loss of functionally linked land, recreational pressure, air quality, water quality, hydrology
- Ebernoe Common SAC - Loss of functionally linked land, recreational pressure, air quality
- Duncton to Bignor Escarpment – Air quality
- Arun Valley SPA/Ramsar – Loss of functionally linked land, recreational pressure, water quality, hydrology
- Arun Valley SAC - Loss of functionally linked land, recreational pressure, water quality, hydrology

the site will be managed including drainage features as part of the overall design scheme.

The existing tree belt along the Songhurst Meadow boundary (eastern) and other good quality trees on the site boundaries shall be retained. Any additional planting shall be of native species appropriate to the rural environment.

The proposal shall detail biodiversity enhancements (including adjacent to the retained tree belt on the eastern boundary) and shall provide overall biodiversity net gain where possible.

Where external lighting is demonstrated as being necessary for safety purposes, an external lighting scheme shall be submitted to demonstrate that the scheme is designed to minimise light pollution in accordance with Neighbourhood Plan Policy IN3.



Results of the Test of Likely Significant Effects

Loss of functionally linked habitat

The Mens SAC

- 5.12 The Mens SAC is designated for its population of barbastelle bats, which comprises more than 80 breeding females. Barbastelle bats are sensitive to the loss of functionally linked habitat for several reasons. Firstly, they are dependent on flightlines from the SAC into surrounding foraging areas. It is known that the bats forage up to 5km from their maternity roosts, with some individuals flying much longer distances to traverse sub-optimal habitat to reach suitable feeding grounds. Flightlines used by this species include linear hedgerows, waterways, blocks of scrubs, wooded rides and walking tracks. Secondly, barbastelles rely on foraging areas outside the SAC boundary, most notably wet grassland and riparian habitats. Such foraging areas may lie 10-15km away from their roost sites.
- 5.13 Wisborough Green Parish lies directly east adjacent to the boundary of the Mens SAC and therefore lies within the foraging ranges observed for barbastelle bats. Additionally the Parish contains suitable foraging and navigational features such as the River Kird and a network of hedgerows and woodland which provide functionally linked habitat to the SAC. Therefore development within Wisborough Parish boundary could result in the loss of linear commuting features and foraging habitats (e.g. wet meadows and waterbodies⁶⁵) that are functionally linked to the Mens SAC. Even if development did not lead to direct loss of features, it could impact the SAC by failing to provide an adequate physical buffer zone against construction and operational lighting that in turn could reduce the functionality of these features for barbastelle bat.
- 5.14 **Overall LSEs of the emerging Wisborough Green NP on The Mens SAC regarding the impact pathway loss of functionally linked habitat cannot be excluded. Therefore the site is screened in for appropriate assessment in relation to this impact pathway.**

Ebernoe Common SAC

- 5.15 Ebernoe Common lies 4.8km northwest of Wisborough Green Parish at its closest point and like the Mens SAC, is designated for its populations of rare UK bat species.
- 5.16 For Ebernoe Common, radio tracking of barbastelle bats in August 2008 by the Sussex Wildlife Trust showed that some bats travelled up to 10.46km from their roosts within the SAC however the average distanced travelled by barbastelles in this study was 5.1km which is a marked decrease on the same study conducted 10 years previously. Bats were particularly noted using established flight lines such as the River Kird which extends east from the SAC towards Kirdford and Wisborough Green.⁶⁶
- 5.17 Barbastelle bats are known to travel substantial distances from their roots to feeding sites. Another 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 areas⁶⁷. 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 6.47km⁶⁸.
- 5.18 Given the findings of the Sussex Wildlife Trust and the Bat Conservation Trust, an increase in residential development within Wisborough Green, particularly within the vicinity of the River Kird could result in adverse impacts on bats using the River Kird as a foraging feature. This particularly refers to the WG19 – 2: Ansell's Yard site allocation which is located approximately 300m and 115m from the River Kird respectively.

⁶⁵ https://cdn.bats.org.uk/pdf/About%20Bats/barbastelle_11.02.13.pdf?mtime=20181101151250&focal=none [accessed 20/01/2021]

⁶⁶ Greenaway (2008), Barbastelle bats in the Sussex West Weald, available at: <https://assets.sussexwildlifetrust.org.uk/barbastelle-bats-in-the-sussex-west-weald-1997-2008-1.pdf> [accessed 20/01/2021]

⁶⁷ 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.

⁶⁸ Bat Conservation Trust. (2016). Core Sustainance Zones: Determining zone size. Available at https://cdn.bats.org.uk/pdf/Resources/Core_Sustenance_Zones_Explained_04.02.16.pdf?mtime=20190219173135 [Accessed on the 20/01/2021].

- 5.19 Even if development did not lead to direct loss of features, it could impact the SAC by failing to provide an adequate physical buffer zone against construction and operational lighting that in turn could reduce the functionality of these features for barbastelle bat.
- 5.20 **Overall LSEs of the emerging Wisborough Green NP on Ebernoe Common SAC regarding the impact pathway loss of functionally linked habitat cannot be excluded. Therefore the site is screened in for appropriate assessment.**

Arun Valley SPA/Ramsar

- 5.21 The Arun Valley SPA / Ramsar is designated for several mobile waterfowl and wader species, which are known to depend on habitats beyond the designated site boundary (known as functionally linked habitat). This particularly applies to Bewick's swans *Cygnus columbianus bewickii*, which routinely forage in agricultural land parcels up to 5km from their core wetlands and can do so up to 10km from European Sites. Natural England's Supplementary Conservation Advice Note specifies that maintaining the extent and distribution of supporting habitat for the non-breeding season does also '*apply to supporting habitat which also lies outside the site boundary*'. Therefore, the remainder of this section assesses potential functionally linked site allocations proposed in the emerging Wisborough Green NP.
- 5.22 Generally, development plans may lead to the loss of functionally linked habitat (mainly winter foraging resources) through the allocation of greenfield sites (e.g. grassland, agricultural stubble / cereals), meaning that qualifying species have to compete for dwindling forage. Development within built-up areas would not affect the availability of functionally-linked land, but greenfield development beyond the boundaries could do so if it resulted in the loss of farmland areas large enough to support a significant proportion (i.e. 1% of more) of the SPA/Ramsar population of Bewick's swan (i.e. generally 2ha in size and upwards) and with suitably clear sightlines.
- 5.23 The Arun Local Plan HRA identified that Natural England has specified two Impact Risk Zones for the Arun Valley SPA / Ramsar, the latter extending 6.5km from the designated site boundary. Within this radius residential developments are defined as resulting in the potential loss of functionally linked habitat.
- 5.24 Wisborough Green Parish lies approximately 3.7km to the northwest of the Arun Valley SPA/Ramsar, which is well within the maximum foraging distance recorded and far beyond the core foraging ranges identified for Bewick's swans.
- 5.25 **As such LSEs of the emerging Wisborough Green NP on the Arun Valley SPA/Ramsar regarding the impact pathway loss of functionally linked habitat cannot be excluded. Therefore, the site is screened in for appropriate assessment.**

Arun Valley SAC

- 5.26 Ramshorn snails are a species with limited mobility, which lives within the ditch system of the SAC. These snails move between streams and water ditches with the help of winter flooding events. The colonisation of new foraging and breeding areas is considered to be critical to the long-term viability of the species. Given that newly colonised ditches may lie within or outside the designated site boundary, there is a potential risk of urban development to result in the loss of functionally linked habitat for this species. However, it is considered extremely unlikely that ramshorn snails from the Arun Valley SAC would colonise new habitats beyond a few hundred metres from the site boundary.
- 5.27 Given that Wisborough Green Parish lies approx. 3.7km to the north-west of the Arun Valley SAC, it is concluded that there will be no LSEs of the emerging Wisborough Green NP on the Arun Valley SAC regarding the impact pathway loss of functionally linked habitat. The site is screened out from Appropriate Assessment in relation to this impact pathway.

Recreational Pressure

The Mens SAC & Ebernoe Common SAC

- 5.28 Public access/disturbance has been cited in the Natural England Site Improvement Plans for The Mens SAC and Ebernoe Common SAC due to concern over the existing light levels at each site and the

potential impact of increased light levels on the resident bat populations. However, site allocation at Wisborough Green are too far from either SAC to affect light levels.

- 5.29 Ebernoe Common SAC and The Mens SAC mainly receive visitors during daylight hours which provides little opportunity for overlap between visitors and bat activity although recently it has been noted that there has been an increase in cyclists using high powered headlamps at night in order to enjoy off-road cycling. However given the quanta of the allocations proposed and the low levels of overlap between human activity and bat foraging it is possible to conclude no likely significant effects of recreational pressure on Ebernoe Common and The Mens SAC as a result of development within Wisborough Green Parish. Light levels from human sources is cited in the Natural England Site Improvement Plans for both sites as a potential issue however given the low quanta of the allocations proposed for Wisborough Green Parish, the associated increase in visitors is not predicted to significantly impact the foraging behaviour of bats using these SACs.
- 5.30 The Mens SAC is also designated for its mature beech forests. Veteran and mature trees within the SAC are potentially vulnerable to trampling and soil compaction. It is well known that the soil conditions surrounding mature trees affect their roots, mycorrhizal fungi, nutrient uptake and growth rate. Recreational activities undertaken around the base of such trees are likely to lead to compacted soil with less space for air and water, both essential for plant growth. Over time this may negatively impact trees in the SAC. However, Natural England's Site Improvement Plan does not specify recreational pressure as a threat or pressure to the SAC's beech forest, indicating that the overall recreational use of the site is limited. This is supported by a review of published walking routes in the ViewRanger application, which does not show any routes traversing the SAC.
- 5.31 Given this evidence, recreational pressure is not considered further in relation to the qualifying mature beech forest or the qualifying populations of Bechstein's and barbastelles in The Mens SAC and/or Ebernoe Common SAC. These sites are screened out from Appropriate Assessment in relation to this impact pathway.

Arun Valley SPA/ SAC/ Ramsar

- 5.1 The component parts of the SPA / Ramsar are the following SSSIs: Pulborough Brooks SSSI, Waltham Brooks SSSI and Amberley Wild Brooks SSSI. These subcomponents all lie within the South Downs National Park and the Wisborough Green NP will only allocate a maximum of 48 residential dwellings at a distance of 3.7km from the SPA / Ramsar. This is within typical core recreational catchments for inland European sites, which are usually around 5-7km. Further detail on the nature and the management of the component SSSIs is discussed here.
- 5.2 While disturbance is a potential impact pathway for the SPA / Ramsar, it is not listed as a threat or pressure in Natural England's Site Improvement Plan. This is most likely because the two most sensitive parts of the SPA / Ramsar (Amberley Wild Brooks SSSI and Pulborough Brooks SSSI) are under appropriate management regimes from the RSPB.
- 5.3 For example, the Amberley Wild Brooks reserve is not actively promoted as a visitor attraction. The RSPB website explicitly highlights that the reserve is not capable of accommodating a large number of visitors due to its conservation sensitivity. The reserve does not provide any specific facilities or cater for group bookings, reducing the number of visitors likely to visit. Access within the site is restricted to the Wey South Path in order to minimise bird disturbance. Pulborough Brooks SSSI is usually open to the public but access is managed through a network of hides. The most sensitive parts of the site are also designated as dog exclusion zones. Moreover, a per visit charge for non-RSPB members is in place, which will limit the number of casual walkers.
- 5.4 Regarding the Waltham Brooks SSSI there is some concern regarding recreational pressure, which is documented in consultation comments from the Coldwaltham Meadows Conservation Trust and the Sussex Wildlife Trust on the South Downs Local Plan. The primary risk here would be an increase in visitor pressure (particularly involving dog walkers) disturbing grazing livestock which are used to manage the Waltham Brooks SSSI, the condition of which is 'Recovering'.
- 5.5 The NP allocates 40 new dwellings that have not been covered by the overarching Local Plans. Given that recreational pressure is not identified as a specific issue in the Site Improvement Plan such a small number of dwellings will not result in a material change in recreational activity at the site even in combination with the small amounts of housing planned around the site in the Horsham Local Plan and

South Downs Local Plan. Additionally, whilst the edge of the parish is located approximately 3.7km from the European Site, the allocations proposed in the emerging neighbourhood plan are located approximately 7.9km from the European Sites which is beyond a realistic recreational distance for these sites.

- 5.6 Overall, a conclusion of no LSE is therefore drawn regarding recreational pressure in the Arun Valley SPA / Ramsar. This site is screened out from Appropriate Assessment in relation to this impact pathway.

Atmospheric Pollution

The Mens SAC

- 5.7 The Mens SAC lies directly adjacent to the western Parish border; the SAC is also directly adjacent to the A272 which connects Wisborough Green to various employment hubs such as Petworth, Midhurst or Billingshurst. Billingshurst, according to the NP, is the location of the nearest secondary school to Wisborough Green Parish, further magnifying the importance of the A272. While it is noted that this part of Chichester District is very rural in nature, atmospheric pollution effects of the Wisborough NP in combination with growth across Chichester District and the South Downs National Park are not excluded, particularly considering that the maximum nitrogen deposition in the SAC already exceeds the critical nitrogen load. Commuters resulting from the dwellings proposed in the Wisborough Green NP could have a material effect on nitrogen deposition to the SAC, particularly in combination with other plans and projects across the district.
- 5.8 As identified on APIS, The Mens SAC is sensitive to nitrogen deposition from the atmosphere. The Atlantic acidophilous beech forests have a critical nitrogen load of 10-20 kg N/ha/yr, an exceedance of which would result in changes of ground vegetation and mycorrhiza, nutrient imbalances and soil fauna. Review of further information on the website shows that the current maximum nitrogen deposition rate is at 26.9 kg N/ha/yr (although a significant portion of that deriving from agriculture), therefore already considerably exceeding the critical load.
- 5.9 **Overall, LSEs of the Wisborough Green NP on The Mens SAC regarding atmospheric pollution cannot be excluded. The site is screened in for Appropriate Assessment regarding this impact pathway.**

Ebernoe Common SAC

- 5.10 The woodland of Ebernoe Common SAC is sensitive to nitrogen deposition which could affect the ground flora and epiphytic communities of the beech forest, although it is unlikely to affect tree survival. According to the UK Air Pollution Information System nitrogen deposition is not believed to have a direct, major effect on tree growth in the UK.⁶⁹
- 5.11 This European site is adjacent to an A road (the A283), although work undertaken for the South Downs Local Plan indicated that the road has relatively low traffic flows such that modelled baseline NOx concentrations did not exceed the critical level for that pollutant even at the roadside and are forecast to fall further over the plan period due to the improvements in vehicle emissions technology (i.e. people replacing older vehicles with those compliant with the most recent emissions standard, Euro6) outstripping the forecast increase in vehicle flows.
- 5.12 The designated habitat for the SAC is beech woodland. This habitat has a minimum Critical Load of 10 kg/N/ha/yr, and as such the background nitrogen deposition is above this Critical Load (being approximately 22 kg/N/ha/yr) according to APIS. Relatively high nitrogen deposition rates compared to relatively low NOx concentrations suggests that much of the nitrogen deposition at this SAC derives from surrounding agriculture rather than road traffic.
- 5.13 Additionally, the A283 past this SAC is not a major route from Wisborough Green to likely employment locations such as Guildford. This is demonstrated by investigation using Google maps which recommends other routes as shorter journey times.

⁶⁹ <http://www.apis.ac.uk/node/965>

- 5.14 Given this, it is considered that likely significant effects regarding air quality can be reasonably dismissed. Therefore this site screened out for appropriate assessment in relation to this impact pathway.

Duncton to Bignor Escarpment SAC

- 5.15 The acidic beech forests of Duncton to Bignor Escarpment SAC are potentially sensitive to nitrogen deposition which could affect the ground flora and epiphytic communities of the beech forest, although it is unlikely to affect tree survival. According to the UK Air Pollution Information System nitrogen deposition is not believed to have a direct, major effect on tree growth in the UK.
- 5.16 This habitat has a minimum Critical Load of 10 kg/N/ha/yr, and as such the background nitrogen deposition is above this Critical Load (being approximately 22 kg/N/ha/yr) according to APIS. Relatively high nitrogen deposition rates compared to relatively low NO_x concentrations suggests that much of the nitrogen deposition at this SAC derives from surrounding agriculture rather than road traffic.
- 5.17 However this European Site is directly adjacent to the A285 which connects to the A272 which extends through the Wisborough Green Parish Boundary. This route is the recommended route on Google Maps from Wisborough Green to the common employment hub of Chichester therefore an increase in dwellings within Wisborough Green Parish is likely to result in an increase in cars along the A285 leading to higher levels of nitrogen deposition.
- 5.18 **Given that the current background nitrogen deposition already exceeds the critical load, LSEs of the emerging Wisborough Green NP on Duncton to Bignor Escarpment SAC regarding air quality cannot be excluded. The site is screened in for Appropriate Assessment regarding this impact pathway.**

Water quality

Arun Valley SPA/SAC/Ramsar

- 5.19 Given the relatively long distance (approximately 3.7km) between the parish and Arun Valley, direct surface runoff from impermeable surfaces and overflowing septic tanks is not considered to be an issue for the Wisborough Green NP despite being located within the Upper Arun catchment area. However the most likely problem arising from the Wisborough Green NP is the discharge of treated sewage effluent, which is likely to increase the input of phosphorus into the Arun Valley SPA / Ramsar / SAC through input to the River Kird which directly feeds into the Upper Arun.
- 5.20 According to the Natural England Site Improvement Plan for the The Arun Valley SPA / Ramsar / SAC, these sites are sensitive to changes in water quality, such as from siltation and high phosphate concentrations. Natural England's Site Improvement Plan for the Arun Valley SAC/SPA and Ramsar also states "*The classified bird species are also vulnerable to increased levels of nutrient enrichment as there is an increased likelihood of certain disease. Increase in growth of vegetation from sustained nutrient enrichment can make the habitat unsuitable for many bird species (Literature Review, Mott McDonald, 2006).*"
- 5.21 Nitrogen input (primarily from agricultural sources) is not a main concern for freshwater habitats. According to Natural England's Site Improvement Plan for the Arun Valley, the rivers Arun and Storr are currently failing on phosphate concentrations. High concentrations of phosphorus are the consequence of point-source pollution from a Wastewater Treatment Works upstream from the SPA / Ramsar / SAC. Siltation is primarily a consequence of agricultural run-off rather than point sources.
- 5.22 The main contribution to phosphorus release into surface water is provided by the effluent discharge, and as such increased residential development should not be ignored. In comparison, diffuse pollution from agricultural runoff is likely to provide a small contribution to phosphate levels and this issue is managed via Catchment Sensitive Farming). As described by Jarvie *et al.*⁷⁰, new residential units within the hydrological catchment for the Arun Valley are likely (through increased sewage production) to add phosphates to a site via wastewater treatment effluent.

⁷⁰ 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.

- 5.23 The site allocations in the emerging NP would be serviced by Wisborough Green WwTW which discharges into the River Kird, which as previously mentioned, flows into the river Arun and through the Arun Valley. Currently, it is unclear whether there is sufficient headroom within the WwTW to accommodate the quanta set out in the NP.
- 5.24 **Given this evidence, LSEs of the emerging Wisborough Green NP on the Arun Valley SPA / Ramsar / SAC regarding water quality cannot be excluded. These European sites are screened in for Appropriate Assessment in relation to this impact pathway.**

Water Quantity, Level and Flow

Arun Valley SPA/SAC/Ramsar

- 5.25 The qualifying species of the Arun Valley SPA / Ramsar / SAC are all sensitive to hydrological changes, potentially resulting from changes in the hydrological regime in the wider catchment of the Arun Valley.
- 5.26 The ramshorn snail, the SAC's qualifying feature, ideally requires minimum summer water depths of 0.5-1m. Ramshorn snails are unable to survive periods of ditch drying. Winter flooding within natural limits is likely to be important for this species to colonise new ditches, an essential prerequisite for maintaining a healthy population. Natural England specifies that at least 30% of ditches should not exceed 1m in depth.
- 5.27 As highlighted in the previous section, the qualifying waterfowl species of the Arun Valley SPA / Ramsar require naturally fluctuating water levels within set limits for loafing, roosting and foraging. Furthermore, the Ramsar is designated for its outstanding assemblage of wetland plants and invertebrates, all of which depend on appropriate water levels throughout at least parts of their life cycle.
- 5.28 Increases to the quantity and rate of water delivery can result in summer flooding and prolonged / deeper winter flooding. This in turn results in the reduction of suitable feeding and roosting sites for birds. For example, in areas where water is too deep, most waders will be unable to reach their food sources close to the ground. Generally, wetlands within and downstream of urban areas are likely to have some limited capacity to absorb some of the surface water runoff from pavement and buildings, thereby providing flood control and preventing water logging of crops. However, if this capacity is exceeded, there might be adverse effects on the integrity of such sites.
- 5.29 The River Kird runs through Wisborough Green and feeds the Upper Arun which in turn, flows into the Arun floodplain. Although the quanta of the site allocations proposed in the NP are insufficient to produce a notable difference in surface water run off and are located at sufficient distance from the River Kird for this to be reasonably dismissed as an issue, problems from water abstraction due to increased development in the Parish could occur.
- 5.30 By allocating 61 new residential dwellings, the emerging NP would inevitably increase the water demand in the parish. Resulting excessive changes to the hydrological integrity, such as through effects on water flow and volume, in the Arun Valley Ramsar / SAC are most likely to occur as a result of increased water abstraction for public water supply.
- 5.31 **Overall, LSEs of the Wisborough Green NP on the Arun Valley SPA/ Ramsar / SAC regarding water quantity, level and flow cannot be excluded. The site is screened in for Appropriate Assessment regarding this impact pathway.**

6. The in-combination scope

- 6.1 It is a requirement of the Regulations that the impacts and effects of any land use plan being assessed are not considered in isolation but in combination with other plans and projects that may also be affecting the internationally designated site(s) in question.
- 6.2 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 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. The overall approach is to exclude the risk of there being unassessed likely significant effects in accordance with the precautionary principle. This was first established in the seminal Waddensee⁷¹ case.
- 6.3 For the purposes of this assessment, we have determined that, due to the nature of the identified impacts, the key other plans and projects with potential for in combination likely significant effects are those schemes that have the following impact pathways: Loss of functionally linked land, recreational pressure, air quality impacts, water quality impacts and water quantity level and flow. The following plans have been assessed for their in-combination impact to interact with the Wisborough Green Neighbourhood Plan:
- Chichester Local Plan 2014-2029 (7,388 dwellings over the plan period 2012 – 2029. This was superseded by the CDC Local Plan Review to 2035)⁷²
 - Chichester Local Plan Review 2035 (12,350 dwellings over the plan period 2016 – 2035)
 - South Downs National Park Authority Local Plan (4,750 dwellings over the plan period 2014 – 2033)
 - Horsham District Local Plan
 - Southern Water, Water Resources Management Plan
 - Chichester District Council Water Quality Assessment
 - Chichester District Council Transport Study
 - Horsham District Council Local Plan (16,000 dwellings over the plan period)
 - Arun Local Plan (20,000 dwellings over the plan period 2011 - 2031)⁷³

⁷¹ Waddensee case (Case C-127/02, [2004] ECR-I 7405)

⁷² <https://www.chichester.gov.uk/newlocalplan>

⁷³ <https://www.arun.gov.uk/download.cfm?doc=docm93ijim4n12844.pdf&ver=12984>

7. Appropriate Assessment

Introduction

- 7.1 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.
- 7.2 By virtue of the small amount of growth the NP specifies for Wisborough Green, the main impact pathways of concern to this HRA (loss of functionally linked land, water quality, air quality, recreational pressure, and hydrological changes including water abstraction) are inherently 'in combination' with neighbouring plans and projects. However, for completeness, potential impacts of the maximum 40 net residential dwellings allocated within Wisborough Green Parish in isolation are also assessed.
- 7.3 The Chichester District Council Local Plan allocated up to 60 residential dwellings within Wisborough Green Parish over the plan period 2014 – 2029. However, the Local Plan Review to 2035 allocates only 25 dwellings to Wisborough Green. Further consultation between Wisborough Green Parish Council and CDC in November 2020 has yielded an allocation of 40 dwellings to Wisborough Green. The NP allocates these dwellings between four sites which will be appropriately assessed below. However, when taken in the context of 12,350 dwellings to be delivered in the plan period 2016-2035 by Chichester District Council, the growth allocated in the Wisborough Green NP is unlikely to change the in-combination conclusions of the Local Plan Review HRA.
- 7.4 The HRA screening exercise undertaken in Chapter 5, Table 4 indicates potential site allocations that may have likely significant effects on the European Sites due to loss of functionally linked land, recreational pressure, air quality, water quality and hydrological changes including water abstraction. At the screening stage, the following policies were screened in requiring further assessment:
- OA1: Development Allocation: allocates 21 dwellings carried forward from the previous plan period which have planning permission and a further 40 dwellings allocated in the emerging NP;
 - Site Specific Policy: Commercial redevelopment of the Newpound commercial area and Wharf Farm commercial site on the current footprints;
 - WG19-2: Ansell's Yard (up to 18 dwellings and 3 business units);
 - WG19-3: Tanglewood Nursery (up to 12 dwellings);
 - WG19-4: Stable Field (up to 7 dwellings);
 - WG19-5: Winterfold Garden (up to 8 dwellings).

Loss of functionally linked habitat

The Mens SAC & Ebernoe Common SAC

- 7.5 The Mens SAC and Ebernoe Common 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; In 2016, the Bat Conservation Trust published guidelines on how to determine Core Sustenance Zones (CSZs) for bats and highlighted that barbastelles have a mean maximum CSZ of 6.47km. However, data collated by the Bat Conservation trust to determine the CSZ for different bats suggests a CSZ of 3km for Bechstein's bats due to their rarity and specialised habitat requirements. However, in a 2001 study, female adult Bechstein's bats regularly undertook commuting distances of up to 1km⁷⁴.
- 7.6 Radio-tracking studies have been undertaken to identify core foraging areas. These reports have identified that the barbastelles of The Mens SAC forage to the east of the SAC, principally on the floodplain of the River Arun from close to Horsham in the north to Parham in the south. They also cross to the Adur floodplain. In some cases, the bats travelled up to 12.2km to visit foraging areas. The currently available radio-tracking evidence indicates that 75% of the bat population forage within 9km of the SAC although it is conceivable for barbastelle bats of the SAC to use a wider area for activities such as migrating between hibernation roosts and summer roosts.
- 7.7 For Ebernoe Common, radio tracking of barbastelle bats in August 2008 by the Sussex Wildlife Trust showed that some bats travelled up to 10.46km from their roosts within the SAC however the average distanced travelled by barbastelles in this study was 5.1km which is a marked decrease on the same study conducted 10 years previously. Bats were particularly noted using established flight lines such as the River Kird which extends east from the SAC towards Kirdford and Wisborough Green.
- 7.8 Barbastelle bats generally forage in woodland canopy and forest margins, although they may also forage in more open areas. In order to get to suitable foraging areas, they use linear features in the landscape, such as hedgerows, waterways, blocks of scrub, wooded rides, roads and tracks, and can traverse extensive areas of unsuitable habitats. Both commuting features and foraging areas can lie far beyond the designated site boundary. Natural England's Site Conservation Objectives Supplementary Advice Note for this European Site states that the target in relation to flightlines is set as 'restore', because many flightlines are now fragmented (e.g. by breaks in hedgerows, road infrastructure or light pollution).
- 7.9 Natural England advice to South Downs National Park Authority related to the HRA of their Local Plan proposed the following zone-based approach when assessing potential impact pathways for these SACs:
- A '**key conservation area**' – for any development proposed within 6.5km of the SAC, all impacts will be considered; and
 - A '**wider conservation area**' – for any development proposed 6.5 - 12km from the SAC, significant impacts or severance of flightlines will be considered. This area encompasses the full extent from the SAC in which bats may forage.
- 7.10 The Wisborough Green NP Site allocations all fall within the 'key conservation area' zone for both The Mens SAC and Ebernoe Common SAC, and within the aforementioned CSZ for both species from both sites. Additionally they all contain instances of what can be considered functionally linked habitat for bats:
- **WG19-2: Anells' Yard** – (This site is allocated for up to 18 dwellings and at least 3 business units). This site is located in the north western part of the parish and is currently used as a vintage market. The site includes both grassland and hedgerows with trees and connects to Boxall brook, all of which could act as foraging habitat for barbastelle bats. The main concerns for this allocation are the loss of foraging habitat as well as operational light pollution (during or post-construction) affecting the bat's use of the surrounding hedgerows and Boxall Brook or the River Kird as foraging habitat. **Therefore, it is advisable that further precautions regarding the development of this site are taken.**

⁷⁴ 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 bechsteinii*). *Behavioural Ecology and Sociobiology* **50**: 283-291.

- **WG19-3: Tanglewood Nursery** (This site allocates up to 12 dwellings). This is located in the north western part of the parish and is currently used as a horticultural nursery. The site is predominantly covered in hardstanding and green houses. However, the north of the Site borders optimal bat foraging habitat including intact hedgerows, small woodland copses, open fields and several ponds. Development of this site would incur operational light pollution onto this habitat which could affect the foraging activity of bats using this land from the Mens SAC or Ebernoe Common SAC. **Therefore, it is advisable that further precautions regarding the development of this site are taken.**
- **WG19-4: Stable Field** (with pavement to village centre) (This site allocates up to 7 dwellings). This site is located in the north western part of the Parish and is currently open space. Although the site itself appears to comprise low quality grassland, it is possible that bats may utilise the hedgerow along the northwestern border of the site leading north to areas of more suitable bat foraging habitat. **Therefore, it is advisable that further precautions regarding the development of this site are taken.**
- **WG19-5: Winterfold Garden** (This site allocates up to 8 dwellings). This site is located in the north western part of the parish and currently forms open garden space to the residential developments adjacent. Currently the site includes hedgerows with trees bordering a small grassland space which could provide suitable foraging habitat for bats from The Mens SAC or Ebernoe Common SAC. The site connects to more hedgerows leading north east that could be used as navigational or foraging features of barbastelle bats. **Therefore, it is advisable that further precautions regarding the development of this site are taken.**

7.11 This conclusion is reflected in the Chichester District Council Local Plan Review HRA which states *“The Local Plan Review does not allocate any new residential development north of the South Downs National Park Authority boundary within either the key conservation area or wider conservation area. However, it does allocate a quantum of growth to both Loxwood and Wisborough Green parishes (125 dwellings to Loxford and 25 to Wisborough Green). Actual sites will be identified in the respective Neighbourhood Plan Reviews. As such it is not known on which (or how many) development sites these housing requirements will be met. Clearly, however, the entirety of both parishes lies within the 12km zone and much lies within the 6.5km zone. Therefore they could impact upon the supporting habitat of bats associated with Ebernoe Common SAC. The same applies to any windfall development that could feasibly occur within the north of the District.”*⁷⁵

7.12 It should be noted that further consultation between Wisborough Green Parish Council and CDC in November 2020 has yielded an amended allocation of 40 dwellings to Wisborough Green by CDC.

Existing Policy Protection

7.13 Linear features and suitable foraging habitat within the Parish is indirectly protected under **Policy 49: Natural Environment** of the CDC Local Plan 2014 - 2029 which states:

7.14 *“Biodiversity Planning permission will be granted for development where it can be demonstrated that all the following criteria have been met:*

1. *The biodiversity value of the site is safeguarded;*
2. *Demonstrable harm to habitats or species which are protected or which are of importance to biodiversity is avoided or mitigated;*
3. *The proposal has incorporated features that enhance biodiversity as part of good design and sustainable development;*
4. *The proposal protects, manages and enhances the District’s network of ecology, biodiversity and geological sites, including the international, national and local designated sites (statutory and non-statutory), priority habitats, wildlife corridors and stepping stones that connect them;*
5. *Any individual or cumulative adverse impacts on sites are avoided;*

⁷⁵ AECOM (2018) Available at: [https://www.chichester.gov.uk/media/30918/Habitat-Regulations-Assessment-Chichester-Local-Plan-Review/pdf/Chichester_Local_Plan_Review_HRA_Issue_V2_9_Nov_2018_\(2\).pdf](https://www.chichester.gov.uk/media/30918/Habitat-Regulations-Assessment-Chichester-Local-Plan-Review/pdf/Chichester_Local_Plan_Review_HRA_Issue_V2_9_Nov_2018_(2).pdf) [accessed 20/01/2021]

6. *The benefits of development outweigh any adverse impact on the biodiversity on the site. Exceptions will only be made where no reasonable alternatives are available; and planning conditions and/or planning obligations may be imposed to mitigate or compensate for the harmful effects of the development.*"

7.15 Linear features and suitable foraging habitat within the Parish are also protected under **Policy EN1: Ecological Sites** of the NP which states:

7.16 *"Development must avoid strategic and local biodiversity or habitat sites, local sites and stepping stones or corridors (including those identified in the Green Infrastructure/Ecology Network Map available on the Village website) that would or could harm existing ecological assets, Wisborough Green's wildlife network and ecological/habitat connectivity between the national and internationally important sites.*

All new development within the Plan Area must retain existing hedgerows in order to ensure that protected species and habitats are not harmed by the proposal.

An exception to the policy would be for the provision of services by statutory undertakers where no other alternative is available and satisfactory mitigation can be achieved."

7.17 Biodiversity as a general factor is also addressed in the NP policy framework under the **Biodiversity policy** which states:

7.18 *"All proposals for development should protect and enhance biodiversity and geodiversity to reflect the requirements of the NPPF (paragraphs 170 to 177) and comply with all of the following criteria:*

1. *Protecting and enhancing internationally, nationally and locally designated sites, protected species and ancient of species rich hedgerows grasslands and woodlands.*
2. *Preserving ecological networks and the migration or transit of flora and fauna*
3. *Protecting ancient trees and woodland and trees of arboriculture value*
4. *Promoting the preservation restoration and re-creation of wildlife priority habitats and the protection and recovery of species.*
5. *Where reasonable and proportionate to do so, providing a net gain in biodiversity*
6. *Avoiding potential impacts on the Arun contributory sites and other sites of value and interest. Proposals should demonstrate that ecological considerations have been properly asses*

Where adverse impacts on biodiversity cannot be avoided, necessary appropriate measures should be implemented or, as a last resort, compensation measures should e carried out as described in paragraph 175 of the NPPF.

Where reasonable and proportionate to do so, biodiversity features should be incorporated in and around all new developments and biodiversity enhancements added wherever possible."

7.19 **The existing policy wording in the Wisborough Green NP is deemed sufficient to ensure that there is no loss of functionally linked land as a result of development within the Parish. Therefore a conclusion can be made of no adverse effects on the integrity of the Mens SAC or Ebernoe Common SAC as a result of development within the Parish.**

Arun Valley SPA/SAC/Ramsar

7.20 The Arun Valley SPA / Ramsar is designated for its population of Bewick's swans and an assemblage of overwintering waterfowl, including shoveler, teal and wigeon. Of the species, Bewick's swans are most dependent on functionally linked grassland and arable land for foraging. The importance of functionally linked habitat outside the Arun Valley SPA / Ramsar resulted in Natural England establishing two Impact Risk Zones surrounding the SPA, in which residential developments (or other forms of urbanisation) have a high probability of resulting in the loss of functionally linked habitat. The dependence of Bewick's swans on land beyond the designated site boundary means that residential and employment development within Wisborough Green Parish might have the potential to result in the loss of functionally linked habitat.

7.21 Natural England's Conservation Objective Supplementary Advice states *"Supporting habitat includes improved pasture, autumn-sown crops, over-wintered stubbles and oil seed rape outside the SPA.*

Bewick's swan is an overwintering species on the Arun Valley and regularly occur in nationally and internationally important numbers in the area, and whilst not restricted to using this habitat, they will feed on species-poor wet grassland, probably to maximise their intake of the most productive grasses and their associated invertebrates, to maintain their food reserves during the cold winter months. Principle habitats within and surrounding the site include; Grazing marsh, water fen and reedbeds, mesotrophic – species rich and poor grasslands, surrounding arable land, open water, rivers and ditches.”

- 7.22 Whilst all of the site allocations proposed in the Wisborough Green NP include instances of grassland (most likely species poor), none come close to exceeding the accepted 2ha area that, if lost could significantly impact populations of wintering Bewick's swan. Additionally, the majority of the site allocations are completely enclosed by hedgerows which block the sight lines to the wider landscape rendering these allocations less suitable. The most suitable allocations to support passing Bewick's swans are those located closest to the River Kird, or containing ponds. These are discussed below.
- **WG19-2: Ansell's Yard** – This site, whilst being the largest of those proposed in the Wisborough Green NP (1.6ha which still does not exceed the accepted 2ha), is majority hardstanding and completely enclosed by hedgerow which blocks sight lines to the wider landscape. Additionally, the grassland present within this land parcel appears to be managed making this unsuitable habitat for Bewick's swan
- 7.23 The Chichester District Council Local Plan Review HRA states that “*research to the location of the area of functionally linked supporting habitat identifies no areas within Chichester District Council authority boundary and outside the South Downs National Park Authority that serve as functionally linked supporting habitat for the SPA. As such, there is no realistic impact pathway linking this site to the Local Plan Review.*”
- 7.24 The South Downs Local Plan states “*Development proposals on greenfield sites within 5km of the Arun Valley SPA, as shown on the Policies Map, will undertake an appraisal as to whether the land is suitable for wintering Bewick's Swan. If it is suitable then surveys will be undertaken to determine whether the fields are of importance to the swan population. If so, appropriate alternative habitat would be required before development could proceed.*”⁷⁶
- 7.25 However given that the site allocations for Wisborough Green are all located further than 5km from the SPA, this considered unnecessary.
- 7.26 **Given that none of the site allocations proposed in the Wisborough Green NP are suitable to provide functionally linked habitat to Bewick's swan, it can be concluded that there will be no adverse effects on the integrity of this European site as a result of increased residential development in Wisborough Green Parish.**

Water Quality (discharge of treated sewage effluent)

Arun Valley SPA/Ramsar/SAC

- 7.27 The section on impact pathways and the test of LSEs section established that the Arun Valley SPA / Ramsar / SAC is sensitive to negative impacts on water quality, because all its qualifying species either directly or indirectly depend on good water quality.
- 7.28 New housing within the Parish detailed within the emerging NP would result in increased sewage production. The growth area of Wisborough Green is served by Wisborough Green WwTWs that discharges into the water body the River Kird which is upstream of the Upper Arun SSSI and the Arun Valley SPA/SAC/Ramsar within the same hydrological catchment.
- 7.29 Whilst the quantity of new housing detailed within the emerging NP is modest in itself (40 dwellings), impacts could potentially arise ‘in combination’ with other existing and future development connected to Wisborough Green WwTW and with other developments contributing to phosphate discharge into the hydrological catchment of the Arun Valley SPA/SAC and Ramsar.

⁷⁶ South Downs Local Plan (2019), Available at: https://www.southdowns.gov.uk/wp-content/uploads/2019/07/SD_LocalPlan_2019_17Wb.pdf [accessed 20/01/2021]

- 7.30 Natural England's Site Improvement Plan links the threat to water quality in the SPA / Ramsar / SAC directly to point-source pollution from WwTWs. Natural England now also requires that a phosphate budget is calculated for developments that contribute a net increase in nutrients to the SPA / Ramsar / SAC. To determine whether there is a need for nutrient neutrality calculations, the relevant WwTWs and their discharge locations need to be identified.

Existing Policy Protection

- 7.31 Headroom capacity of the relevant WwTW is protected by **Policy IN1: Waste Water Management** in the emerging NP which states:
- 7.32 *"Any new connection to the Wisborough Green primary sewer network of new developments and/or expansion to existing developments of greater than 5 houses will not be supported unless it can be shown that there is either capacity in the network or by rigorous analysis that such a new connection and/or expansion of the network will not increase the risk of system back up/flooding and that the network can accommodate the additional demand for sewage disposal either in its existing form or through planned improvements to the system"*
- 7.33 The Chichester District Council Water Quality Assessment published in 2018 by AMEC Foster Wheeler states *"The modelling indicates that although there will be some deterioration downstream of Wisborough Green WwTW, it will be less than the Environment Agency's aspirational 10% threshold. This indicates that water quality should not be a constraint to future housing development. However, the discharge of the Wisborough Green WwTWs acts in combination with the discharge from the Kirdford WwTWs which is further upstream. These WwTWs are located on the River Kird and as such there is potential for cumulative impacts to occur. The nitrogen loading from Kirdford WwTW is predicted to increase from baseline conditions by 75% by 2036 and that from Wisborough Green is predicted to increase by 44%, equating to a total increase of about 8 kgN/day from both works combined. Although this does not directly correlate to nitrate concentrations, it does indicate an increased risk to the Arun Upper catchment, and measures will be required to reduce the future potential loading of nitrate. Modelling suggests that there will be no significant increase in phosphate concentrations downstream of either Kirdford (based on implementation of the mitigation highlighted in Section 4) or Wisborough Green WwTW."*⁷⁷
- 7.34 The water quality assessment states that as of February 2018, the remaining headroom for the Wisborough Green is 143 households which covers the new development proposed in the Wisborough Green NP. Additionally, the modelling shown in this document accounts for a worst case scenario of 250 new households that would be served by the Wisborough Green Water Treatment Works. However the assessment only covers the period to 2035 whereas the NP covers the period to 2037 leaving two years unaccounted for in terms of development. In addition to this, when the WQA was published in 2018, phosphate was at Poor Status downstream of the Wisborough Green WwTW. It is likely that development since 2018 has negatively contributed to this status. Therefore, taking steps to ensure that development within Wisborough Green achieves Phosphorus neutrality is imperative to ensure that no further adverse effects on the integrity of the Arun SPA, SAC and Ramsar are generated by new development within the parish. This topic is not addressed in the overarching local plans for either Chichester District or the South Downs National Park given that the European Sites in question are located within the South Downs National Park and the proposed site allocations are located within the north of the Parish which falls with the Chichester District boundary.
- 7.35 An assessment of the predicted phosphate output from the proposed new development within the parish is detailed in Appendix A. Recommendations from the conclusions drawn from this assessment are detailed in the Chapter 8 of this document.

Air Quality

The Mens SAC

- 7.36 The Mens SAC sensitivity to atmospheric nitrogen deposition was established in the LSEs section. Furthermore, it was also documented that the site directly adjoins the A272, a potential commuter route for Wisborough Green residents given that the A272 passes directly through Wisborough Green. An

⁷⁷ Chichester District Council Water Quality Assessment (2018), Available at: <http://www.chichester.gov.uk/CHttpHandler.ashx?id=30900> [accessed 20/01/2021]

- assessment of detailed habitat mapping on MAGIC indicates that qualifying woodland occurs throughout the entire SAC boundary along the A272.
- 7.37 The A272 is an A road that connects the districts of Horsham and Chichester on a west-east trajectory. The Department for Transport's road traffic statistics showed an Annual Average Daily Traffic (AADT) flow of 4,245 cars, 89 Light Goods Vehicles and 193 Heavy Goods Vehicles at manual count point 6848 (towards the centre of the SAC) in 2019. While clearly not as busy as many dual A roads, it is possible that this road link would need to accommodate further traffic under future development scenarios, including the Wisborough Green NP.
- 7.38 The designated habitat for this SAC is beech woodland. According to APIS, the minimum Critical Load of nitrogen for beech woodland is 10 kg/N/ha/yr. APIS also identifies that the existing nitrogen deposition rate at the transect location is approximately 24.8 kg/N/ha/yr. Therefore, nitrogen deposition rates are already in exceedance of the critical load. The Critical Level for ammonia for beech woodlands is 3 µg NH₃/m³. However, the site is also partially designated for its rich lichen and bryophyte populations which have a Critical Level of 1 µg NH₃/m³. As such, it is this lower Level for ammonia that will be used in this assessment. APIS also identifies that the existing average ammonia concentrations are 1.26 µg NH₃/m³, and thus already in exceedance for the SACs lichen and bryophyte populations.
- 7.39 The nitrogen deposition rate is 26.9kg/N/ha/yr for The Men's SAC which is above the maximum critical load of 20 kgN/ha/yr and well above the lower critical load of 10 kgN/ha/yr.
- 7.40 With regards to NO_x the critical level is set at 30 ug/m³ and the average NO_x concentration is 10.64 µg/m³ which is well below this. Due to improvements in vehicle emissions technology (as reflected in the Defra Emission Factor Toolkit) NO_x concentrations are forecast to continue to fall notwithstanding the expected increase in traffic due to development across West Sussex. As both baseline and all future concentrations are forecast to be below the Critical Level of 30 ug/m³ it can be concluded that NO_x itself will not have an adverse impact upon the SAC and will only be considered further within the assessment as a source of nitrogen deposition.
- 7.41 An in-combination assessment of atmospheric pollution (including any policy, traffic and air quality recommendations) was published in 2018. However the CDC Local plan - Transport Study of Strategic Development Options and Sustainable Transport Measures considers the air quality impacts based on the growth allocated by the Local Plan which is 25 dwellings in the case of Wisborough Green according to the Local Plan Review 2035. It should be noted that further consultation between Wisborough Green Parish Council and CDC in November 2020 has yielded an amended allocation of 40 dwellings to Wisborough Green by CDC.
- 7.42 The traffic modelling undertaken for the Local Plan Review HRA in 2018 is in the process of being updated and will cover all growth planned in Chichester District alone and in combination with growth elsewhere. It is not available at the time of writing this HRA. However, the contribution of growth within Wisborough Green will be very small and the issue is therefore most appropriately dealt with at the Local Plan level.
- 7.43 **Since the Neighbourhood Plan must ultimately be in conformity with the Chichester District Local Plan Review, it should include additional wording to support sustainable transport within the parish and ensure that any planning applications that come forward for housing in the parish are in alignment with, and contribute to, any air quality mitigation strategy that may be developed by Chichester District Council, if the Local Plan HRA identifies one is required, before they are consented. The following supporting text is recommended for inclusion in the next iteration of the Wisborough Green NP: *'To help reduce atmospheric pollution within the District, Wisborough Green Parish Council will support developments that facilitate the use of sustainable transport modes, including walking, cycling, public transport and the use of electric vehicles. Developments could achieve this by improving connectivity with wider Public Right of Ways, enhancing accessibility of local green and blue infrastructure and providing electric vehicle charging points. Any emerging air quality mitigation approaches provided in the Chichester Local Plan Review will be supported.'***

Duncton to Bignor Escarpment

- 7.44 The critical load for nitrogen deposition for this European Site is 10-20 kg/N/ha/yr. APIS states that exceedance of this range would cause "...changes in ground vegetation and mycorrhiza, nutrient

imbalance and changes in soil fauna." Currently, nitrogen deposition is 22.9 kg/N/ha/yr on average, with the minimum (22.3) still above the maximum range given by APIS as acceptable.

- 7.45 The Critical Level for ammonia for beech woodlands is 3 µg NH₃/m³. However, the site is also partially designated for its rich lichen and bryophyte populations which have a Critical Level of 1 µg NH₃/m³. As such, it is this lower Level for ammonia that will be used in this assessment. APIS also identifies that the existing average ammonia concentrations are 0.96 µg NH₃/m³, which comes in below the Critical Level given by APIS.
- 7.46 With regards to NO_x the critical level is set at 30 ug/m³ and the average NO_x concentration is 10.98 µg/m³ which is well below this. Due to improvements in vehicle emissions technology (as reflected in the Defra Emission Factor Toolkit) NO_x concentrations are forecast to continue to fall notwithstanding the expected increase in traffic due to development across West Sussex. As both baseline and all future concentrations are forecast to be below the Critical Level of 30 ug/m³ it can be concluded that NO_x itself will not have an adverse impact upon the SAC and will only be considered further within the assessment as a source of nitrogen deposition.
- 7.47 The Air Quality Assessment which supports the CDC Local Plan Review states *"The predicted increase in traffic at the A285 south of Duncton, which passes through northwest corner of Duncton to Bignor Escarpment SAC, is above 1000 AADT. However, Duncton to Bignor Escarpment SAC lies wholly within South Downs National Park Authority area, who is preparing a single local plan for the entire National Park and has commissioned a separate evidence base."*⁷⁸
- 7.48 The HRA of the South Downs Local Plan concluded that no adverse effect on the integrity of the SAC would arise from traffic-related nitrogen deposition, either alone or in combination with other projects and plans, including growth expected across Chichester District at the time of the assessment. Moreover, this SAC is located almost 13km from the settlement of Wisborough Green (further by road), which is where all the allocations are made. A zone of 10km is typically used to screen in European sites vulnerable to reductions in air quality. This is based on the average UK car journey being approximately 10.6km⁷⁹. It is therefore considered that a conclusion of no adverse effect on integrity can be drawn for this SAC.

Water Quantity Level and Flow

Arun Valley SPA/SAC/Ramsar

Abstraction

- 7.49 The proposed NP could result in increased abstraction of water resources for the potable water supply which could materially reduce the volume of fresh water that enters the floodplain around the Arun Valley SPA / SAC / Ramsar with potential cascading effects on its qualifying species and habitats. In this case, this refers to the ditch system within this European Site which supports the little Ramshorn snail in particular.
- 7.50 The potable water in Wisborough Green Parish is supplied by Southern Water who published a Water Resource Management Plan in December 2019 outlined the resourcing for the water supply areas until 2070. In this WRMP, Wisborough Green is included within the Central area specifically within the Sussex North Water Resource Zone. The breakdown of water resourcing for this area as specified by the WRMP is as follows: 51% rivers, 35% groundwater, 8% reservoirs and 6% transfers⁸⁰.
- 7.51 Water companies respond to supply-demand deficits by considering development options required to meet the growing water demand in the WRMP period. These options may involve a combination of demand management (e.g. investments to reduce leakage reduction, install smart meters, etc.) and supply-side (e.g. bulk water transfer, desalination, water reuse schemes and new groundwater / river abstractions). Typically, demand management is regarded as less 'invasive' and preferable regarding the environment, but it is often not sufficient to meet the growing water demand. In contrast, the exploitation of

⁷⁸ Transport Study of Strategic Development Options and Sustainable Transport Measures (2018) Available at: <http://www.chichester.gov.uk/CHttpHandler.ashx?id=31013> [accessed 20/01/2021]

⁷⁹ GOV.UK (2019). *Average number of trips made and distance travelled.* <https://www.gov.uk/government/statistical-data-sets/nts01-average-number-of-trips-made-and-distance-travelled>, accessed 13/03/2020

⁸⁰ Southern Water (2019) Water Resources Management Plan, Available at: https://www.southernwater.co.uk/media/3656/5025_wrmp_-_v11.pdf [accessed 20/01/2021]

- new water resources or increases to existing abstractions are considered primary means through which adverse effects on European sites might occur.
- 7.52 The HRA of the preferred programme and strategic alternative options for the Central WRZ (the WRZ relevant to Wisborough Green) documented that there were no LSEs on the Arun Valley SPA / Ramsar / SAC arising from any of the options included in the preferred strategy⁸¹. While one option includes an increased abstraction from the Pulborough groundwater license, this was determined not to have material effects on the Arun Valley due to there being no hydrological connectivity between the abstraction and the European site. Given that none of the preferred options have been determined to result in LSEs on the Arun Valley SPA / Ramsar / SAC, Southern Water's WRMP is concluded not to reduce the amount of water in the Arun Valley floodplain.
- 7.53 The available evidence indicates that the Wisborough Green NP will not result in adverse effects on the integrity of the Arun Valley SPA / Ramsar / SAC regarding the impact pathway water quantity, level and flow. This is because the water supply options identified in Southern Water's WRMP do not have hydrological interactions with this European site.
- 7.54 It is noted, however, that Natural England have told Horsham Council and Chichester Council that they are concerned about the Hardham groundwater abstraction (a key part of the Southern Water supply strategy for this part of Chichester District under certain conditions) and the effect this might have on water levels / flows in the Arun Valley SPA / Ramsar / SAC. They are currently working with the Environment Agency and Southern Water to investigate and deliver infrastructure enhancements such that reliance on the Hardham abstraction, even at times of high demand is reduced or eliminated. Horsham District Council is a participant in the Gatwick Sub-Region Water Cycle Study and JBA Consulting have just issued an updated Water Cycle Study. However, the scope of that Water Cycle Study specifically excludes consideration of the implications of changes to the Hardham groundwater abstraction.
- 7.55 This is clearly not an issue that a Neighbourhood Plan can resolve and the delivery of 61 dwellings in Wisborough Green Parish will not make any difference in the use of the Hardham source by Southern Water given the enormous size of the Gatwick Sub-Region that the Hardham abstraction serves.
- 7.56 However, it is considered that in order to draw a conclusion of no adverse effect on site integrity 'in-combination' with other projects and plans, text should be added into the Neighbourhood Plan. A suitable location would be in sections relating to the infrastructure provision in Wisborough Green Parish. The following text could be added: ***'Developers are advised to engage in pre-application discussions with Southern Water to evaluate whether changes to the Hardham abstraction would have any impacts for the timing of delivery of their developments in order to keep pace with infrastructure investment.'***
- 7.57 With such text being included, it is considered that the Neighbourhood Plan would have no adverse effect either alone or in-combination with other plans and projects.

⁸¹ Southern Water (2019) Annex 15: Habitat regulations Assessment Main Report, Available at: <https://www.southernwater.co.uk/media/1329/annex-15-hra-main-report.pdf> accessed 20/01/2021]

8. Conclusions

- 8.1 This assessment undertook both Screening and Appropriate Assessment of the policies and any allocations within the emerging Wisborough Green Neighbourhood Plan.
- 8.2 The international designated sites considered within the Appropriate Assessment for impact pathways that could not be screened out at the screening stage were:
- The Mens SAC
 - Ebernoe Common SAC
 - Arun Valley SAC
 - Arun Valley SPA/Ramsar
 - Duncton to Bignor Escarpment SAC
- 8.3 Impact pathways considered during the screening were: loss of functionally linked land, recreational pressure, water quality, water quantity, level and flow and air pollution. Recreational pressure was screened out at the Screening stage due to a lack of linking impact pathways. Recreational pressure and air quality could not be screened out at the Screening stage and were therefore further discussed within the Appropriate Assessment.
- 8.4 Six policies which proposed new development were subject to Appropriate Assessment as they were located within the accepted zones of influence of the aforementioned international sites and could result in adverse effects on the integrity of an international site in combination with other projects and plans. These were:
- OA1: Development Allocation: allocates 21 dwellings carried forward from the previous plan period which have planning permission and a further 40 dwellings allocated in the emerging NP;
 - Site Specific Policy: Commercial redevelopment of the Newpound commercial area and Wharf Farm commercial site on the current footprints;
 - WG19-2: Ansell's Yard (up to 18 dwellings and 3 business units);
 - WG19-3: Tanglewood Nursery (up to 12 dwellings);
 - WG19-4: Stable Field (up to 7 dwellings);
 - WG19-5: Winterfold Garden (up to 8 dwellings).
- 8.5 Following Appropriate Assessment, a number of recommendations were made to improve the policy framework provided in the Standish Neighbourhood plan. These are as follows:
- **It is recommended that the Neighbourhood Plan should include additional wording to support sustainable transport within the parish and ensure that any planning applications that come forward for housing in the parish are in alignment with, and contribute to, any air quality mitigation strategy that may be developed by Chichester District Council, if the Local Plan HRA identifies one is required, before they are consented. The following supporting text is recommended for inclusion in the next iteration of the Wisborough Green NP: ‘*To help reduce atmospheric pollution within the District, Wisborough Green Parish Council will support developments that facilitate the use of sustainable transport modes, including walking, cycling, public transport and the use of electric vehicles. Developments could achieve this by improving connectivity with wider Public Right of Ways, enhancing accessibility of local green and blue infrastructure and providing electric vehicle charging points. Any emerging air quality mitigation approaches provided in the Chichester Local Plan Review will be supported.*’**
 - **It is recommended that the NP recognises in its text that phosphate neutrality may become a requirement for development in the parish depending on the outcome of Natural England’s latest review of water quality in the Arun Valley SAC and Ramsar site. Developers should therefore be aware that they may need to demonstrate how they are to achieve phosphate neutrality to ensure no adverse effects on the integrity of the Arun Valley SAC/SPA and**

Ramsar in order to secure planning consent. Details of potential mitigation options and an initial future-proofing phosphate neutrality calculation can be found in Appendix A.

- **it is considered that in order to draw a conclusion of no adverse effect on site integrity ‘in-combination’ with other projects and plans regarding abstraction effects on the Arun Valley SPA/Ramsar/SAC, text should be added into the Neighbourhood Plan. A suitable location would be in sections relating to the infrastructure provision in Wisborough Green Parish. The following text could be added: ‘Developers are advised to engage in pre-application discussions with Southern Water to evaluate whether changes to the Hardham abstraction would have any impacts for the timing of delivery of their developments in order to keep pace with infrastructure investment.’**

8.6 It is concluded that subject to recommendations made in this assessment, combined with the overarching Chichester District Council Local Plan Review 2035 and the South Downs National Park Authority Local Plan, the Wisborough Green Neighbourhood Plan will contain sufficient policy framework to ensure no adverse effects on the integrity of international designated site will occur in isolation or in combination with other projects and plans.

Appendix A Future proofing the Wisborough Green NP HRA – achieving phosphate neutrality

Introduction

- 8.7 Considering the potential for impacts from increased phosphate discharge, and in view of the planning policy described above, it is necessary for this HRA examine the potential need for mitigation for phosphate discharge from the proposed maximum of 40 new dwellings in Wisborough Green Parish. This needs to be assessed alone and in combination with other development.
- 8.8 Achieving nutrient neutrality is one way to address the existing uncertainty surrounding the impact of new development on designated sites. Natural England advises that a phosphate budget (referred to as Total Phosphorus (TP)) can be calculated for new developments and has provided a guidance document to enable this to be calculated⁸². That document was specifically prepared for the Stour catchment in Kent. However, the basic phosphate calculation methodology is transferable to other European sites. Such a calculation has been undertaken for the draft NP (summarised in Table 5 below).
- 8.9 This calculation indicates whether development avoids harm to protected sites from phosphate discharge, or whether mitigation will be required to ensure that there is no adverse effect from phosphate discharge. It will then be for the applicant to ensure that such mitigation is identified before their planning application is submitted.
- 8.10 Note that the calculations make a series of broad assumptions about a) the existing habitats on site (and thus the amount of phosphate they currently release into the catchment) and b) how each site is to be developed and thus the future balance between areas of housing and areas of retained greenspace. Therefore, the calculations undertaken for this report would need to be re-run for each housing scheme and planning application as each scheme is developed.
- 8.11 These calculations are based on a worst-case assumption that all phosphorus discharged from these sites will reach the Arun Valley SPA/ SAC/ Ramsar.

Background to the Arun catchment

- 8.12 The River Arun's geological and habitat diversity sustains some of the most important floral and faunal assemblages in England, many of which have adapted to the abiotic conditions of the river system. However, as identified in Natural England's Site Improvement Plan (SIP)⁸³, features of the SPA and SAC are under growing threat from water pollution, stemming from point source pollution from water treatment works upstream of the international site and diffuse water pollution (from agricultural runoff) entering the water course. Vulnerable species identified in the SIP are Bewick's swan, and the little ramshorn whirlpool snail *Anisus vorticulus*. The SIP identifies that the little ramshorn whirlpool snail requires good water quality, and that *Potamogeton ssp* (pond weed), an important food source for the Bewick's swan, also requires good water quality. In addition to those vulnerable features identified in the SIP for the SAC and SPA, many of the aquatic plants species for which the Ramsar site is designated (*Lemna* species, *Rorippa* species, *Myriophyllum* species, *Oenanthe* species, and *Potamogeton* species) and also the swollen spire snail *Pseudamnicola confusa* are likely to be vulnerable to reductions in water quality. All aquatic plant species present will provide essential supporting habitat for the little ramshorn whirlpool snail and swollen spire snail. Additionally, phosphate enrichment can lead to an increased likelihood of certain diseases and sustained nutrient enrichment can result in changes to plant communities that both the snail, other invertebrates and Bewick's swan may depend upon.

⁸² Natural England (2019). *Advice on Nutrient Neutrality for New Development in the Stour Valley Catchment in Relation to Stodmarsh Designated Sites - For Local Planning Authorities*. Available online: <https://www.havant.gov.uk/sites/default/files/documents/SolentNutrientAdviceV2June2019.pdf>, accessed 05/02/2021.

⁸³ <http://publications.naturalengland.org.uk/file/5185212862431232> [accessed 05/02/2021]

Background to the Phosphorous Nutrient Neutrality Calculations

- 8.13 The main contribution to phosphorus release into surface water is provided by the effluent discharge, and as such increased residential development should not be ignored. In comparison, diffuse pollution from agricultural runoff is likely to provide a small contribution to phosphate levels and this issue is managed via Catchment Sensitive Farming). As described by Jarvie *et al.*⁸⁴, new residential units within the hydrological catchment for the Arun Valley are likely (through increased sewage production) to add phosphates to a site via wastewater treatment effluent.
- 8.14 Since the issue remains under investigation at this stage, Natural England has not yet devised a nutrient neutrality calculation methodology for the Arun Valley European sites. However, a methodology for calculating the phosphate release of new development (through both changes in land use and, particularly, release of treated sewage effluent) has been developed for Stodmarsh SAC, SPA and Ramsar site in Kent and the calculation methodology would be essentially identical if Natural England did determine that development in the Arun catchment also needed to achieve nutrient neutrality. Nutrient neutrality calculations have therefore been undertaken for the residential site allocations provided within the Local Plan using the phosphorus calculation method developed for Stodmarsh.

Appropriate Assessment

- 8.15 New residential development provided by Wisborough Green Local Plan will most likely be serviced by Wisborough Green Waste Water Treatment Works (WwTW) that discharges into the River Kird which ultimately feeds the Upper Arun Catchment (and the Arun Valley designated sites). At this stage it is assumed that all of the site allocations will be serviced by the above WwTW because for the purposes of this assessment, the WwTW closest to the allocations has been selected. This decision will generally not occur until a water company has a planning application to consider. A more detailed and accurate Nutrient Neutrality calculation may therefore need to be provided by the applicant at the individual planning application stage.

Phosphorus Balance within the Wisborough Green Neighbourhood Plan

- 8.16 The phosphorus nutrient neutrality calculation undertaken for the Wisborough Green Neighbourhood Plan indicates whether development would avoid harm to protected sites (The Arun Valley) from phosphate discharge (generally by resulting in a net reduction in phosphorus entering the catchment), or whether mitigation would be required (in the event that a formal nutrient neutrality requirement was introduced by Natural England) to ensure that there is no adverse effect from phosphorus discharge.
- 8.17 The nutrient budget calculation for the Wisborough Green Neighbourhood Plan residential site allocations involved four stages:
- Stage 1: Future phosphorus load in treated wastewater effluent
 - Stage 2: Phosphorus loss due to conversion of existing land uses
 - Stage 3: Phosphorus leachate from future land uses
 - Stage 4: Overall phosphorus budget for the site
- 8.18 Existing land use was determined at this high-level by assessing satellite imagery on Google Maps. Where data was inconclusive as to the exact crop used, the 'Mixed Agriculture' category was used. Future land uses (e.g. the extent of the urban fabric and any open space) were identified either by using masterplans where available, or by calculating the broad area that would be taken up by residential development using a standard housing density of 40 dwellings per hectare and defining the resulting area as the 'urban' land on the developed site. All collected information fed into the nutrient calculation described below. Each type of broad land use (urban, park/SANG, cereal, lowland grazing etc.) has a P load assigned to it in the nutrient neutrality calculation methodology. Therefore, converting land from (for

⁸⁴ 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.

example) cereal cropping to urban land considerably reduces the P load. However, whether this is enough to offset the increased P load due to treated sewage effluent is dependent on the types of habitat involved and the area of land involved.

- 8.19 Note that the calculations make a series of broad assumptions about a) the existing habitats on site (and thus the amount of phosphorus they currently release into the catchment) and b) how each site is to be developed (the areas to be altered) and thus the future balance between areas of housing and areas of retained greenspace. Therefore, the calculations undertaken for this report would need to be re-run by the applicants for each housing scheme and planning application as each scheme is developed and a detailed masterplan became available.
- 8.20 The below table (Table 5) identifies the Wisborough Green Neighbourhood Plan site allocations that are likely to discharge to the Wisborough Green WwTW that ultimately discharges to the Arun Valley international site and the amount of phosphorus each allocation is predicted to produce as a result of the changed land use and residential development. Those site allocations identified in red in the final column (Allocation P Budget with 20% buffer) are calculated to result in a Phosphorous surplus and would thus require mitigation if phosphorus neutrality becomes a requirement during the life of the Neighbourhood Plan. Full details of the neutrality calculations are given in Appendix B.

Table 5. Site Allocations that are likely to ultimately discharge to the Arun Valley Designated Sites

Site Allocation	Number of proposed dwellings	proposed WwTW	Allocation P Budget with 20% buffer
WG19-2: Ansell's Yard	18 & 3 Business Units	Wisborough Green	14.8
WG19-3: Tanglewood	Up to 12 dwellings	Wisborough Green	10.17
WG19-4: Stable Field	7 dwellings	Wisborough Green	5.98
WG19-5: Winterfold Garden	8 dwellings	Wisborough Green	6.47

- 8.21 The plan level nutrient neutrality assessment of the above site allocations (provided in Table 5) identified that all of the site allocations are likely to result in a net increase in phosphate levels within the River Arun in comparison to current land use.
- 8.22 As such, these are the development allocations for which phosphorus offsetting may need to be identified before planning consent could be granted if Natural England does introduce a nutrient neutrality requirement for the Arun catchment.
- 8.23 In the long-term it is acknowledged that the issue of nutrient neutrality is difficult if not impossible to address purely at the Neighbourhood Plan level and will likely require cross work with the wastewater company and the Environment Agency and their permitting teams, as well as the local planning authorities. Nonetheless, potential solutions are discussed below.

Potential Avoidance Strategies / Solutions to Explore

- 8.24 Assuming the developer's nutrient neutrality calculation confirms that mitigation is required, and this is agreed with the competent authority, it is likely that some or all of the following may need to be undertaken.
- 8.25 If mitigation is required, the following should be explored:
- Removing additional land from agricultural production – While agriculture does not contribute as much phosphorus to watercourses as treated sewage effluent, it does contribute some phosphorus. For example, each hectare of cereal cropping generally contributes approximately 0.36 kilograms of phosphorus per year. Therefore, removing additional land from agricultural production and putting it down to parkland (which has a relatively low phosphorus loss rate) instead would offset the phosphorus released in treated wastewater from the new housing. Initial calculations for this HRA indicate that approximately 3,756ha of farmed land (similar to the land use being lost) would need to be removed from agricultural production (over and above that which would be lost to the

development footprints themselves) within the Arun catchment to offset the phosphorus produced by the new housing.

- Securing further improvement to Wastewater Treatment Works (WwTW) Infrastructure – Current Environment Agency (EA) guidance suggests that the use of conventional on-site treatment methods can produce effluent with phosphorus concentrations as low as 0.25mg/l. Many WwTW have treatment thresholds above this level. However, any further improvements to the infrastructure at WwTW would need to be secured through a formal agreement with the water company. As there is currently no EA requirement for reducing to a 0.25 mg/l phosphorus consent for works that are not already doing so, any request to improve effluent quality would require external investment in a new Tertiary treatment plant (at a likely cost of £1 million+). Moreover, Wisborough Green WwTW is already committed to a treatment standard of 0.25 mg/l which can't be further tightened;
- Identifying an alternative wastewater discharge location - Discharging to ground would 'bypass' surface waterbodies, ultimately contributing to groundwater. It is considered that this would reduce the phosphorus loading in surface water and help in protecting the Arun Valley Sites. This is because adsorption and metal complex formation retain most of the potentially mobile phosphorus and thus reduce mobilisation from groundwater into surface waters;
- Utilising local packaged WwTW - A local packaged WwTW associated specifically with the development could be used to provide a removal route for the additional phosphorus. However, treatment would require the use of a chemical dosing system which would still only achieve a 1mg/l phosphorus concentration. The only method to achieve a lower concentration through packaged treatment would be to include a further tertiary treatment method such as reedbeds and similar. However, this requires increased operational effort and eventually will require a Water Authority to adopt and operate it for its asset life;
- Utilising downstream wetlands - A wetland/reedbed filtration system that was not linked to a WwTW would be unlikely to be effective in removing phosphorus from sewage effluent (although it would contribute to removal of phosphorus from surface runoff). The UKWIR Chemical Investigations Programme (CIP)⁸⁵ identified a relatively poor phosphate (as opposed to nitrogen) removal performance. In the UK, such wetlands are rarely used for wastewater treatment because on their own they are not expected to achieve a lower phosphate concentration than 2mg/l. Therefore, they are most suitable as a tertiary sewage treatment method following initial treatment stages at a WwTW or packaged treatment plans.

⁸⁵ Available at: <https://ukwir.org/the-chemicals-investigation-programme-phase-2,-2015-2020> [Accessed 13/10/2020].

Appendix B Full Phosphate Neutrality Calculations

8.26 Phosphorus discharge calculations for the four draft NP housing allocations are detailed below. These calculations follow the method described by Natural England.

8.27 When measuring the area of land covered by housing post-development, a housing density of 40 dwellings per hectare has been assumed. Existing land use types and areas have been judged based on freely available online mapping and aerial imaging. The methodology is that derived for the Stodmarsh SAC as it relates to phosphorus neutrality. The water company has confirmed that Wisborough Green WwTW does not currently have a phosphorus permit limit. Therefore the default figure of 8 mg/l has been used as is done in the Stodmarsh area where a WwTW lacks a permit.

WG19 – 2: Ansell's Yard

STAGE 1 - WORKED EXAMPLE TO CALCULATE TOTAL PHOSPHATE LOAD FROM DEVELOPMENT WASTEWATER	
Site Allocation	WG19-2
Site Name	Ansell's Yard
Number of Residential Dwellings	18
Number of new residents	43.2
Water consumption person / day	110
Total wastewater generated by development (litres / day)	4752
Likely Wastewater Treatment Works (WwTW)	Wisborough Green
TP Environmental permit for WwTW (mg/l TP)	8
90% of consent limit	7.2
TP Discharge after WwTW treatment (mg/TP/day)	34214.4
TP Discharge after WwTW treatment (kg/TP/day)	0.0342144
TP Discharge after WwTW treatment (kg/TP/year)	12.488256
STAGE 2 - WORKED EXAMPLE TO CALCULATE PHOSPHOROUS LOAD FROM CURRENT LAND USE	
Area of existing developed land	0.6693
Phosphate load from existing developed land	0.555519
Area of existing lowland grazing land	0
Phosphate load from existing lowland grazing land	0
Area of existing greenspace	0.4578
Phosphate load from existing greenspace	0.064092
Existing phosphate load	0.619611
STAGE 3 - WORKED EXAMPLE TO CALCULATE PHOSPHOROUS LOAD FROM FUTURE LAND USES	
Number of Residential Dwellings	18
Number of new residents	43.2
New urban area (hectares)	0.45

Phosphate leaching rate from new urban area	0.83
Phosphate Load from future urban area	0.3735
New SANG/ open space (ha)	0.6771
Phosphate load from SANG / open space	0.094794
Combine Phosphate load from future land uses	0.468294
STAGE 4 - WORKED EXAMPLE TO CALCULATE THE NET CHANGE IN PHOSPHATE LOAD FROM THE DEVELOPMENT	
Phosphate Load from future urban area	0.468294
Phosphate net change	-0.151317
Add loading due to new housing wastewater	12.488256
Phosphate budget (no buffer)	12.336939
Divide by 5	2.4673878
20% buffer	14.8043268

WG19 – 3: Tanglewood Nursery

STAGE 1 - WORKED EXAMPLE TO CALCULATE TOTAL PHOSPHATE LOAD FROM DEVELOPMENT WASTEWATER	
Site Allocation	WG19-3
Site Name	Tanglewood Nursery
Number of Residential Dwellings	12
Number of new residents	28.8
Water consumption person / day	110
Total wastewater generated by development (litres / day)	3168
Likely Wastewater Treatment Works (WwTW)	Wisborough Green
TP Environmental permit for WwTW (mg/l TP)	8
90% of consent limit	7.2
TP Discharge after WwTW treatment (mg/TP/day)	22809.6
TP Discharge after WwTW treatment (kg/TP/day)	0.0228096
TP Discharge after WwTW treatment (kg/TP/year)	8.325504
STAGE 2 - WORKED EXAMPLE TO CALCULATE PHOSPHOROUS LOAD FROM CURRENT LAND USE	
Area of existing developed land	0.0508
Phosphate load from existing developed land	0.042164
Area of existing horticulture	0.5028
Phosphate load from existing horticulture	0.090504
Area of existing greenspace	0
Phosphate load from existing greenspace	0
Existing phosphate load	0.132668
STAGE 3 - WORKED EXAMPLE TO CALCULATE PHOSPHOROUS LOAD FROM FUTURE LAND USES	
Number of Residential Dwellings	12
Number of new residents	28.8
New urban area (hectares)	0.3

Phosphate leaching rate from new urban area	0.83
Phosphate Load from future urban area	0.249
New SANG/ open space (ha)	0.2536
Phosphate load from SANG / open space	0.035504
Combine Phosphate load from future land uses	0.284504
STAGE 4 - WORKED EXAMPLE TO CALCULATE THE NET CHANGE IN PHOSPHATE LOAD FROM THE DEVELOPMENT	
Phosphate Load from future urban area	0.284504
Phosphate net change	0.151836
Add loading due to new housing wastewater	8.325504
Phosphate budget (no buffer)	8.47734
Divide by 5	1.695468
20% buffer	10.172808

WG19 – 4: Stable Field

STAGE 1 - WORKED EXAMPLE TO CALCULATE TOTAL PHOSPHATE LOAD FROM DEVELOPMENT WASTEWATER	
Site Allocation	WG19-4
Site Name	Stable field
Number of Residential Dwellings	7
Number of new residents	16.8
Water consumption person / day	110
Total wastewater generated by development (litres / day)	1848
Likely Wastewater Treatment Works (WwTW)	Wisborough Green
TP Environmental permit for WwTW (mg/l TP)	8
90% of consent limit	7.2
TP Discharge after WwTW treatment (mg/TP/day)	13305.6
TP Discharge after WwTW treatment (kg/TP/day)	0.0133056
TP Discharge after WwTW treatment (kg/TP/year)	4.856544
STAGE 2 - WORKED EXAMPLE TO CALCULATE PHOSPHOROUS LOAD FROM CURRENT LAND USE	
Area of existing developed land	0
Phosphate load from existing developed land	0
Area of existing mixed agricultural use land	0.4
Phosphate load from existing mixed agricultural use land	0.108
Area of existing greenspace	0
Phosphate load from existing greenspace	0
Existing phosphate load	0.108
STAGE 3 - WORKED EXAMPLE TO CALCULATE PHOSPHOROUS LOAD FROM FUTURE LAND USES	
Number of Residential Dwellings	7
Number of new residents	16.8
New urban area (hectares)	0.25

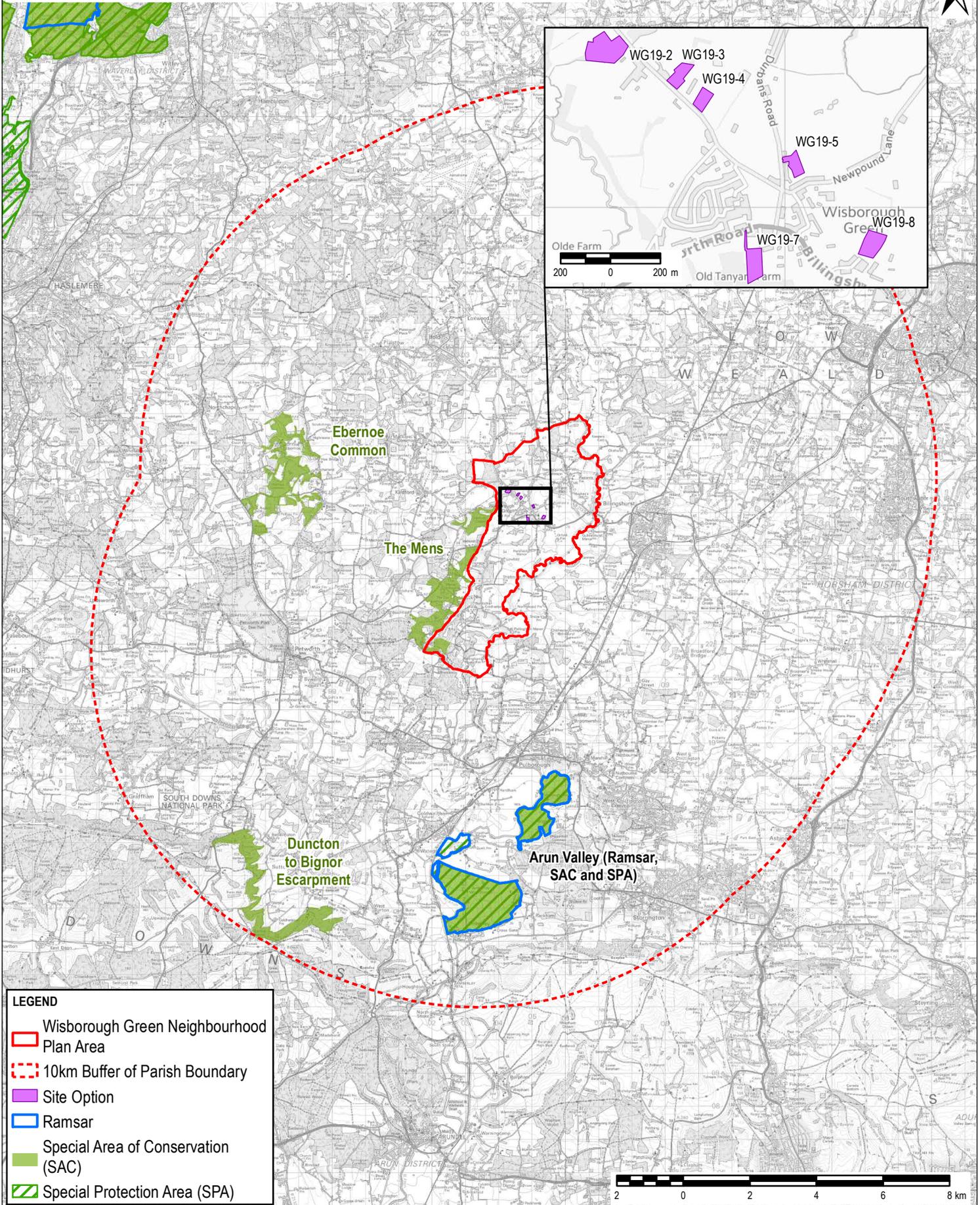
Phosphate leaching rate from new urban area	0.83
Phosphate Load from future urban area	0.2075
New SANG/ open space (ha)	0.1979
Phosphate load from SANG / open space	0.027706
Combine Phosphate load from future land uses	0.235206
STAGE 4 - WORKED EXAMPLE TO CALCULATE THE NET CHANGE IN PHOSPHATE LOAD FROM THE DEVELOPMENT	
Phosphate Load from future urban area	0.235206
Phosphate net change	0.127206
Add loading due to new housing wastewater	4.856544
Phosphate budget (no buffer)	4.98375
Divide by 5	0.99675
20% buffer	5.9805

WG19 – 5: Winterfold Garden

STAGE 1 - WORKED EXAMPLE TO CALCULATE TOTAL PHOSPHATE LOAD FROM DEVELOPMENT WASTEWATER	
Site Allocation	WG19-5
Site Name	Winterfold Garden
Number of Residential Dwellings	8
Number of new residents	19.2
Water consumption person / day	110
Total wastewater generated by development (litres / day)	2112
Likely Wastewater Treatment Works (WwTW)	Wisborough Green
TP Environmental permit for WwTW (mg/l TP)	8
90% of consent limit	7.2
TP Discharge after WwTW treatment (mg/TP/day)	15206.4
TP Discharge after WwTW treatment (kg/TP/day)	0.0152064
TP Discharge after WwTW treatment (kg/TP/year)	5.550336
STAGE 2 - WORKED EXAMPLE TO CALCULATE PHOSPHOROUS LOAD FROM CURRENT LAND USE	
Area of existing developed land	0.4181
Phosphate load from existing developed land	0.347023
Area of existing lowland grazing land	0
Phosphate load from existing lowland grazing land	0
Area of existing greenspace	0.0386
Phosphate load from existing greenspace	0.005404
Existing phosphate load	0.352427
STAGE 3 - WORKED EXAMPLE TO CALCULATE PHOSPHOROUS LOAD FROM FUTURE LAND USES	
Number of Residential Dwellings	8
Number of new residents	19.2
New urban area (hectares)	0.2

Phosphate leaching rate from new urban area	0.83
Phosphate Load from future urban area	0.166
New SANG/ open space (ha)	0.2181
Phosphate load from SANG / open space	0.030534
Combine Phosphate load from future land uses	0.196534
STAGE 4 - WORKED EXAMPLE TO CALCULATE THE NET CHANGE IN PHOSPHATE LOAD FROM THE DEVELOPMENT	
Phosphate Load from future urban area	0.196534
Phosphate net change	-0.155893
Add loading due to new housing wastewater	5.550336
Phosphate budget (no buffer)	5.394443
Divide by 5	1.0788886
20% buffer	6.4733316

Appendix C Map of European Sites



LEGEND	
	Wisborough Green Neighbourhood Plan Area
	10km Buffer of Parish Boundary
	Site Option
	Ramsar
	Special Area of Conservation (SAC)
	Special Protection Area (SPA)

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Drawing Number FIGURE 1		Rev 01	THIS DOCUMENT HAS BEEN PREPARED PURSUANT TO AND SUBJECT TO THE TERMS OF AECOM'S APPOINTMENT BY ITS CLIENT. AECOM ACCEPTS NO LIABILITY FOR ANY USE OF THIS DOCUMENT OTHER THAN BY ITS ORIGINAL CLIENT OR FOLLOWING AECOM'S EXPRESS AGREEMENT TO SUCH USE, AND ONLY FOR THE PURPOSES FOR WHICH IT WAS PREPARED AND PROVIDED.		



