Habitats Regulations Assessment of the Itchingfield Neighbourhood Plan

Horsham District Council

Project number: 60571087

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Quality information

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Revision	Revision date	Details	Authorized	Name	Position
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Executive Summary for the Habitats Regulations Assessment of the Itchingfield Neighbourhood Plan

Introduction

AECOM was appointed by Horsham District Council (HDC) to undertake a Habitats Regulations Assessment (HRA) of the Itchingfield Neighbourhood Plan (INP), one of its constituent parishes. The INP, effectively the development vision for Itchingfield Parish, covers the period between 2015 and 2031, and includes an allocation for 52 residential dwellings and seven industrial / commercial units for employment purposes. It is important to note that the INP allocates development in addition to that detailed in the overarching Horsham Local Plan, thus requiring its own separate assessment.

The objective of this assessment is to identify any aspects of the INP that result in Likely Signficant Effects (LSEs) and have the potential to cause adverse effects on the integrity of European sites (Special Areas of Conservation (SACs), Special Protection Areas (SPAs) and, as a matter of Government policy, Ramsar sites), either in isolation or in combination with other plans and projects. Where such effects are identified, the HRA is to advise on appropriate policy mechanisms for delivering mitigation.

Legislative Context

The need for an assessment of impacts on European sites is set out within Article 6 of the Habitats Directive and transposed into English law by the Conservation of Habitats and Species Regulations 2017 (as amended). The purpose of the Habitats Directive is to "*maintain or restore, at favourable conservation status, natural habitats and species of wild fauna and flora of Community interest*" (Article 2(2)). To ascertain whether the integrity of any European sites might be affected, competent authorities, in this case Itchingfield Parish Council, must therefore undertake an HRA of the plan or project in question, including an Appropriate Assessment if necessary, before approving it.

HRA tasks

Following initial evidence gathering, the first stage of any Habitats Regulations Assessment is a screening for Likely Significant Effects (LSEs), essentially an assessment of the risks for European sites, associated with a development plan. If LSEs cannot be excluded, and a mechanism for an adverse interaction between a plan and a receptor site is present, the next stage of HRA, known as Appropriate Assessment, needs to be undertaken.

The Appropriate Assessment is a more detailed analysis of the impact pathways and European sites considered at the screening stage. One of the key elements of an Appropriate Assessment is the consideration of mitigation measures, which might protect a European site from potential harmful adverse effects[1]. Furthermore, a recent ruling established that habitats or species outside a European site, which are essential for the functioning of the protected site, must be taken into account in the HRA process[2]. For this HRA, both Task 1 (Screening for Likely Significant Effects; LSEs) and Task 2 (Appropriate Assessment) were carried out.

Scope

Given an initial assessment of the relevant European sites within 10km of the Itchingfield Parish boundary and the impact pathways likely to be present, this HRA addresses the following European sites:

- The Mens SAC
- Arun Valley SPA / Ramsar / SAC
- Ashdown Forest SPA / SAC

[1] According to a decision by the European Court of Justice, these can no longer be taken into account at the screening stage of HRA. People Over Wind and Sweetman v Coillte Teoranta (C-323/17).
[2] The 2018 Holohan ruling. Case C-461/17.

LSEs Screening

The HRA shows that LSEs of the INP on the Arun Valley SPA / Ramsar regarding recreational pressure can be excluded. However, LSEs regarding several impact pathways and European sites could not be excluded. Therefore, an Appropriate Assessment of the following potential impacts and receptor sites was undertaken:

- Loss of functionally linked habitat could not be excluded for The Mens SAC, designated for barbastelle bats which forage / commute beyond designated site boundaries
- Water quality impacts on the Arun Valley SPA / Ramsar / SAC due to increased input of phosphorus from treated sewage effluent
- Water quantity, level and flow issues in the Arun Valley SPA / Ramsar / SAC as a result of increased water abstraction volumes to meet the water demand in the parish
- Atmospheric pollution effects on The Mens SAC due to the presence of nitrogen-sensitive beech forest within 200m of potential commuter routes

Findings and Recommendations from Appropriate Assessment

Regarding The Mens SAC, it was concluded that the INP has the potential to result in the loss of functionally linked commuter routes used by barbastelle bats, given it lies within the Wider Conservation Area identified as integral supporting habitat for the bats. To avoid adverse effects on site integrity, it is advised that the following wording is inserted into Policy 2 (Biodiversity Conservation) in the next iteration of the NP: '**Development proposals on greenfield sites, including any windfall development, would require a project-level Habitats Regulations Assessment that is supported by data from bat surveys**'. Further text protecting potentially existing commuting flightlines was recommended for inclusion in the supporting text to Policy 2 (see main body of text).

Regarding water quality impacts in the Arun Valley SPA / Ramsar / SAC, adverse effects on site integrity could be excluded without mitigation. This is because there is no hydrological linkage between wastewater discharged from Barns Green Wastewater Treatment Works (the works serving Itchingfield Parish) and the River Arun hydrological catchment. AECOM identified that there is no need for a phosphorus budget to be calculated or additional protective policy wording to be included in the INP.

In relation to the water quantity, level and flow in the Arun Valley SPA / Ramsar / SAC, no issues were identified based on Southern Water's Water Resources Management Plan (WRMP). However, there are concerns about the current level of abstractions from the Hardham groundwater source and its impact on the water flow in the SPA / Ramsar / SAC. As a precauionary measure, and to ensure that the Conservation Objectives in the site are protected, it is advised to add the following protective policy text under Aim 3: '**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.**'

Regarding nitrogen deposition impacts to the beech forest in The Mens SAC, the Appropriate Assessment highlighted that the A272 (a likely commuter route for Itchingfield residents) runs within 200m of sensitive SAC habitats. Therefore, there is the potential for the INP to add to the in-combination atmospheric pollution in the European site. However, an in-combination assessment of traffic and air quality effects is being undertaken at the overarching Local Plan level, which will include the growth allocated in the INP. Therefore, it is recommended that policy text linking to the Horsham Local Plan is added to the policies for Sumners Pond at the Old School. This wording should support sustainable transport within the parish and ensure that any residential planning applications coming forward in the parish are in alignment with any air quality mitigation strategy that may be developed by HDC, if this is found to be necessary.

Glossary

Appropriate Assessment	The process of assessing the effects of plans or projects on the integrity of European sites
European site	The collective term given to Special Areas of Conservation, Special Protection Areas and Ramsar sites
Functionally-linked habitat	Land outside the boundary of a European site which is nonetheless integral to the ability of the European site to achieve its conservation objectives
Habitats Regulations Assessment	The overarching process encompassing both the assessment of Likely Significant Effects and the Appropriate Assessment
In combination	The legal requirement to consider the effects of a plan on European sites not in isolation, but cumulatively with the effects of other relevant plans and projects
Integrity	The coherence of the structure and function of a European site. More simply, the ability for the site to achieve its conservation objectives
Likely Significant Effect	The first stage in the Habitats Regulations Assessment process, involving a determination of whether the realistic possiblity exists for negative effects on the interest features of a European site from a plan or project
Ramsar site	Wetland of International Importance designated under the Ramsar Convention
Special Area of Conservation	Site of international importance for habitats and non-avian species
Special Protection Area	Site of international importance for birds

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1. Introduction

Background

1.1 Under the Conservation of Habitats and Species Regulations 2017 (as amended), an Appropriate Assessment is required where a plan or project is likely to have a significant effect upon a European Site, either individually or 'in combination' with other projects.

1.2 AECOM was appointed by Horsham District Council to undertake a Habitats Regulations Assessment of the emerging Reg.15 Neighbourhood Plan (NP) for its constituent parish of Itchingfield. The objective of this assessment is to identify any aspects of the NP that may result in Likely Significant Effects (LSEs). Where LSEs may arise, the assessment considers whether an adverse effect on the integrity of European sites would arise either alone or in combination with other plans and projects, and to advise on appropriate policy mechanisms for delivering mitigation where such effects were identified. European sites are Special Areas of Conservation (SACs), Special Protection Areas (SPAs), candidate Special Areas of Conservation (cSACs), potential Special Protection Areas (pSPAs) and, as a matter of Government policy, Ramsar sites.

1.3 The Itchingfield NP covers the period between 2015 and 2031, and guides both residential and employment development in the parish over this timeframe. NPs were introduced under the 2011 Localism Act, which empowered parishes to have input in policy that would shape their future communities. Itchingfield is a rural parish in the Low Weald, approx. 5km from Horsham. The parish has its main population centre in Barns Green (at its southern extent) and the hamlet of Itchingfield in the north of its boundary. The NP sets out several key development policies with potential HRA implications, including the allocation of 52 residential dwellings and seven industrial or commercial units for employment purposes. It is important to note that this growth is additional to any growth attribution to the parish in the overarching Horsham Local Plan (HLP). Therefore, the conclusions of the HLP cannot be relied upon solely and the NP requires a complete assessment in its own right.

1.4 Itchingfield Parish lies relatively far from European sites, with the closest one being The Mens SAC in the adjoining authority of Chichester, approx. 7.4km away. In the local authority of Horsham District only one European site is located, the Arun Valley SPA / Ramsar / SAC, approx. 9.8km to the south-west of the parish. Notwithstanding these distances, all potential impact pathways require a detailed appraisal, particularly because some urban growth processes can have impacts tens of kilometres away from development sites, especially when the cumulative effect with other development plans is considered.

1.5 Growth across Horsham District was considered collectively in the HRA of the Horsham District Planning Framework incorporating the Horsham Core Strategy. This assumed a total of 1,500 dwellings to be delivered through Neighbourhood Plans across the District. To date, the overall total number of dwellings identified to be delivered through Neighbourhood Plans which have reached an advanced stage (Regulation 16 consultation), equates to a total of approximately 1508 homes. Therefore, the overall quantum of development exceeds what was assessed in the HRA of the Horsham District Planning Framework Core Strategy and growth in Itchingfield Parish will add to that additional growth.

1.6 AECOM has also been appointed by Horsham District Council to produce a report to inform their Appropriate Assessment for the Regulation 19 Local Plan. Although still in progress, the information on European sites gained for that HRA forms a useful point of reference regarding the European sites and impact pathways that are also relevant to Itchingfield. Throughout, this `HRA will therefore draw on information gathered for the emerging HRA for the HLP.

Legislative Context

1.7 The UK left the EU on 31 January 2020 under the terms set out in the European Union (Withdrawal Agreement) Act 2020 ("the Withdrawal Act"). This established a transition period,

which is currently set to end 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.

1.8 The need for Appropriate Assessment (see Figure 1) is set out within Article 6 of the EC Habitats Directive 1992, and interpreted into British law by the Conservation of Habitats and Species Regulations 2017 (as amended). The ultimate aim of the Directive is to "maintain or restore, at favourable conservation status, natural habitats and species of wild fauna and flora of Community interest" (Habitats Directive, Article 2(2)). This aim relates to habitats and species, not the European sites themselves, although the sites have a significant role in delivering favourable conservation status.

1.9 The HRA process applies the 'Precautionary Principle'[3] to European sites. Plans and projects can only be permitted having ascertained that there will be no adverse effect on the integrity of the European site(s) in question. Plans and projects with predicted adverse impacts on European sites may still be permitted if there are no alternatives to them and there are Imperative Reasons of Overriding Public Interest (IROPI) as to why they should go ahead. In such cases, compensation would be necessary to ensure the overall integrity of the site network.

1.10 In order to ascertain whether or not site integrity will be affected, an Appropriate Assessment should be undertaken of the plan or project in question:

> **Conservation of Habitats and Species Regulations 2017 (as amended)**
>
> The Regulations state that:
>
> "*A competent authority, before deciding to … give any consent for a plan or project which is likely to have a significant effect on a European site … shall make an appropriate assessment of the implications for the site in view of that sites conservation objectives… The authority shall agree to the plan or project only after having ascertained that it will not adversely affect the integrity of the European site*".

Figure 1: The legislative basis for Appropriate Assessment

1.11 Over time the phrase 'Habitats Regulations Assessment' (HRA) has come into wide currency to describe the overall process set out in the Habitats Directive from screening through to IROPI. This has arisen in order to distinguish the process from the individual stage described in the law as an 'Appropriate Assessment'.

1.12 In spring 2018 the 'Sweetman' European Court of Justice ruling[4] clarified that 'mitigation' (i.e. measures that are specifically introduced to avoid or reduce a harmful effect on a European site that would otherwise arise) 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. This HRA has been cognisant of that ruling.

Scope of the Project

1.13 There is no guidance that dictates the physical scope of an HRA of a Plan document in all circumstances. Therefore, in considering the physical scope of the assessment, we were guided primarily by the identified impact pathways (called the source-pathway-receptor model) rather than by arbitrary 'zones'. Current guidance suggests that the following European sites be included in the scope of assessment:

- All sites within the boundary of Itchingfield Parish; and,

[3] 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".*
[4] People Over Wind and Sweetman v Coillte Teoranta (C-323/17)

- Other sites shown to be linked to development within the parish boundary through a known impact 'pathway' (discussed below).

1.14 Briefly defined, impact pathways are routes by which the implementation of a policy within a Local Plan document can lead to an effect upon a European designated site. An example of this would be new residential development resulting in an increased population and thus increased recreational pressure, which could then affect European sites by, for example, disturbance of wintering or breeding birds.

1.15 Guidance from the Ministry of Housing, Communities and Local Government (MHCLG) states that the HRA should be '*proportionate to the geographical scope of the [plan policy]*' and that '*an AA need not be done in any more detail, or using more resources, than is useful for its purpose*' (MHCLG, 2006, p.6). More recently, the Court of Appeal ruled that providing the Council (competent authority) was duly satisfied that proposed mitigation could be '*achieved in practice*' to satisfy that the proposed development would have no adverse effect, then this would suffice. This ruling has since been applied to a planning permission (rather than a Core Strategy document). In this case the High Court ruled that for '*a multistage process, so long as there is sufficient information at any particular stage to enable the authority to be satisfied that the proposed mitigation can be achieved in practice it is not necessary for all matters concerning mitigation to be fully resolved before a decision maker is able to conclude that a development will satisfy the requirements of Reg 61 of the Habitats Regulations*'.

The Layout of this Report

1.16 Chapter 2 of this report explains the methodology by which this HRA has been carried out, including the three essential tasks that form part of HRA. Chapter 3 provides detailed background on the European sites located within 10km of the Itchingfield Parish boundary. Chapter 4 provides background on the key impact pathways identified in relation to the NP and the relevant European Sites. Chapter 5 undertakes the screening assessment of Likely Significant Effects (LSEs) of the Plan's policies (see Appendix B for the screening tables of NP policies). Chapter 6 carries out the Appropriate Assessment for European sites and impact pathways that could not be screened out at the LSEs stage. The main conclusions and recommendations arising from the HRA process are provided in Chapter 7.

Quality Assurance

1.17 This report was undertaken in line with AECOM's Integrated Management System (IMS). Our IMS places great emphasis on professionalism, technical excellence, quality, environmental and Health and Safety management. All staff members are committed to establishing and maintaining our certification to the international standards BS EN ISO 9001:2008 and 14001:2004 and BS OHSAS 18001:2007. In addition, our IMS requires careful selection and monitoring of the performance of all sub-consultants and contractors.

1.18 All AECOM Ecologists working on this project are members (at the appropriate level) of the Chartered Institute of Ecology and Environmental Management (CIEEM) and follow their code of professional conduct (CIEEM, 2017).

2. Methodology

Introduction

2.1 Figure 2 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.

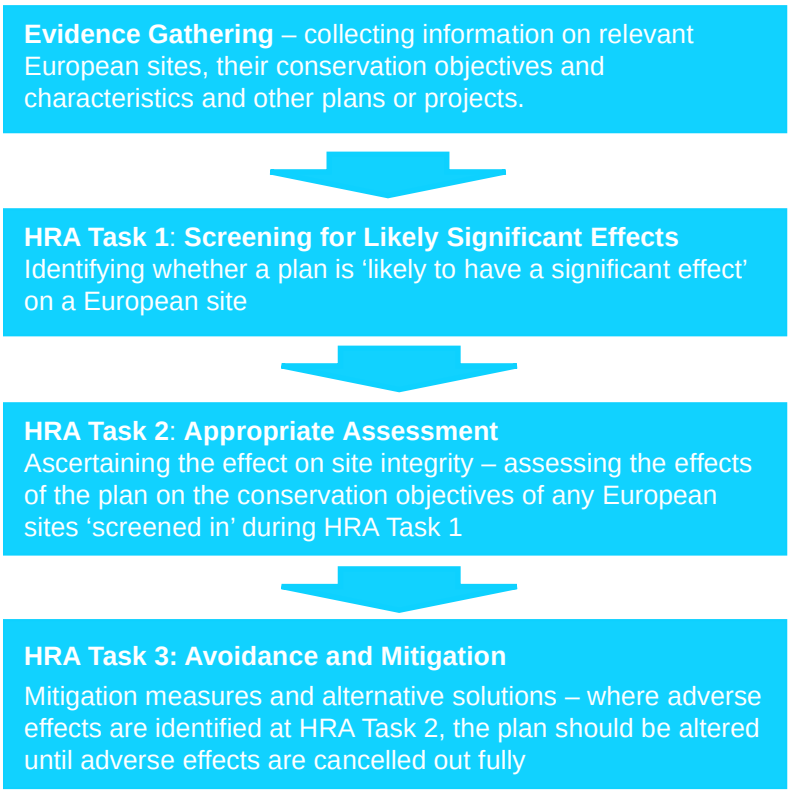

Figure 2: Four Stage Approach to Habitats Regulations Assessment. Source GOV.UK, 2019.

HRA Task 1 – Likely Significant Effects (LSE)

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

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

2.3 The objective is to 'screen out' those plans and projects that can, without any detailed appraisal, be said to be unlikely to result in significant adverse effects upon European sites, usually because there is no mechanism for an adverse interaction with European sites. This stage is undertaken in Chapter 4 of this report.

HRA Task 2 – Appropriate Assessment (AA)

2.4 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 LSEs.

2.5 During July 2019 the Ministry of Housing, Communities and Local Government published guidance for Appropriate assessment[5]. Paragraph: 001 Reference ID: 65-001-20190722m explains: '*Where the potential for likely significant effects cannot be excluded, a competent authority must make an appropriate assessment of the implications of the plan or project for that site, in view 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*'.

2.6 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)).

2.7 A decision by the European Court of Justice[6] 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.

2.8 Also, in 2018 the Holohan ruling[7] 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, specifically in relation to The Mens SAC and the Arun Valley SPA / Ramsar / SAC. Both sites are designated for mobile species (bats and bird respectively), which are likely to routinely use habitats beyond the designated site boundary.

HRA Task 3 – Avoidance and Mitigation

2.9 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.

2.10 In evaluating significance, AECOM has relied on professional judgement and the LP HRA regarding development impacts on the European sites considered within this assessment.

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

[5] 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].
[6] People Over Wind and Sweetman v Coillte Teoranta (C-323/17)
[7] Case C-461/17

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 development plans are not only considered in isolation but in-combination with other plans and projects that may also be affecting the European site(s) in question.

2.13 For example, when considering the potential for combined regional housing development across multiple local authorities to impact on European sites, a key emphasis must be on the cumulative impact of visitor numbers (i.e. recreational pressure). While one Parish might only contribute a minor portion of recreational pressure (with no negative impact on a European site), other adjacent Parishes may also each contribute minor 'amounts' of such pressure. Cumulatively, this could result in detectable effects on designated species. Evidence for in combination assessments of recreational pressure are typically available through bespoke visitor surveys commissioned by relevant stakeholders.

2.14 When undertaking this part of the assessment it is essential to bear in mind the principal intention behind the legislation i.e. to ensure that those projects or plans (which in themselves may have minor impacts) are not simply dismissed on that basis, but are evaluated for any cumulative contribution they may make to an overall significant effect. In practice, in-combination assessment is therefore of greatest relevance when the plan or policy would otherwise be screened out because its individual contribution is negligible. One of the key pieces of in-combination evidence is therefore the overarching Horsham Local Plan and its HRA, which sets out / assesses growth at a much greater scale (the in-combination level) than the individual parish level.

Geographical Scope of the HRA

2.15 There are no standard criteria for determining the ultimate physical scope of an HRA. Rather, the source-pathway-receptor model should be used to determine whether there is any potential pathway connecting development to any European sites. In the case of Itchingfield Parish, it was determined that for the initial coarse screen the following European Sites required consideration:

- Arun Valley SPA / Ramsar / SAC;
- The Mens SAC; and
- Ashdown Forest SPA / SAC.

2.16 This was based upon a search within the parish boundary and a 10km zone surrounding it (12km for the Sussex Bat SACs), as well as consideration of the vulnerabilities of these sites. Furthermore, the Ashdown Forest SPA / SAC was considered at request of Horsham District Council and the long-standing issue of atmospheric pollution in the site.

2.17 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

The Mens SAC

Introduction

3.1 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 Itchingfield 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.

3.2 The woodland harbours primarily high forest of sessile oak *Quercus petraea*, pedunculate oak Q*uercus 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 countryside[8].

Qualifying Features[9]

3.3 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*)

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

- Barbastelle *Barbastella barbastellus*

Conservation Objectives[10]

3.5 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;

3.6 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

[8] 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].
[9] Available online at*:* https://sac.jncc.gov.uk/site/UK0012716 [Accessed on the 13/10/2020]
[10] Available at: http://publications.naturalengland.org.uk/publication/5642356338458624 [Accessed on the 13/10/2020]

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

Threats / Pressures to Site Integrity[11]

3.7 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

3.8 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*.

3.9 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.

3.10 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 Features[12]

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

- Bewick's swan *Cygnus columbianus bewickii*

3.12 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*.

[11] Available at: http://publications.naturalengland.org.uk/publication/5548316158853120 [Accessed on the 13/10/2020]
[12] http://publications.naturalengland.org.uk/publication/4567444756627456 [Accessed on the 14/10/2020]

Ramsar Qualifying Features[13]

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

Criterion 2

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 Objectives[14]

3.14 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;

3.15 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 Integrity[15]

3.16 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

[13] https://jncc.gov.uk/jncc-assets/RIS/UK11004.pdf [Accessed on the 14/10/2020]
[14] http://publications.naturalengland.org.uk/publication/4567444756627456 [Accessed on the 14/10/2020]
[15] http://publications.naturalengland.org.uk/publication/5353882309885952 [Accessed on the 14/10/2020]

Arun Valley SAC

Introduction

3.17 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 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 Features[16]

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

- Ramshorn snail *Anisus vorticulus*

Conservation Objectives[17]

3.19 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;

3.20 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 Integrity[18]

3.21 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

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

Ashdown Forest SAC

Introduction

3.23 The Ashdown Forest SAC is a 2,715.88ha site comprising heath / scrub (60%) and mixed woodland (40%) in south-eastern England. It is an area of tranquil open heathland straddling the

[16] https://sac.jncc.gov.uk/site/UK0030366 [Accessed on the 14/10/2020]
[17] http://publications.naturalengland.org.uk/publication/4924283725807616 [Accessed on the 14/10/2020]
[18] http://publications.naturalengland.org.uk/publication/5353882309885952 [Accessed on the 14/10/2020]

highest sandy ridge-top of the High Weald Area of Outstanding Natural Beauty. It is situated approx. 30 miles south of London. Its underlying sandstone geology combines with a local wetter and cooler climate to produce acidic and nutrient-poor soils that produce fertile ground for heathland, valley mires and damp woodland.

3.24 Notably, the Ashdown Forest SAC contains the largest single continuous block of lowland heathland in south-east England, including dry heaths and a large proportion of wet heaths. It is particularly important in the context of the recent loss of heathland, which has shrunk by 50% in East Sussex over the past 200 years. The site supports important assemblages of beetles, dragonflies, damselflies and butterflies. Bird species of European importance are European nightjar, Dartford warbler and Eurasian hobby (see below).

3.25 Atmospheric pollution in the SAC particularly from traffic associated with Local Plans has become a significant issue over the past years. The SAC is permeated by a network of roads, many of which form major routes-to-work for local residents. A joint Air Quality Impact Assessment (AQIA) has been undertaken by Wealden District Council, Lewes District Council and other adjoining authorities. This has shown that the additional urban development will result in marginal retardation of the drop in atmospheric nitrogen deposition, but this will not affect / reduce plant species richness. Notwithstanding this, air quality remains a strategic issue in the wider geographic area around Ashdown Forest.

Qualifying Features[19]

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

- Northern Atlantic wet heaths with *Erica tetralix*
- European dry heaths

3.27 Annex II species present as a qualifying feature, but not a primary reason for site selection

- Great-crested newt *Triturus cristatus*

Conservation Objectives[20]

3.28 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;

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

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

Threats / Pressures to Site Integrity[21]

3.30 Natural England's Site Improvement Plan lists the following threats / pressures to the site integrity of the Ashdown Forest SAC (note that these are the same for the overlapping SPA):

[19] Available at: https://sac.jncc.gov.uk/site/UK0030080 [Accessed on the 14/10/2020]
[20] Available at: http://publications.naturalengland.org.uk/publication/6183967367626752 [Accessed on the 14/10/2020]
[21] Available at: http://publications.naturalengland.org.uk/publication/5793096570765312 [Accessed on the 14/10/2020]

- Change in land management
- Air pollution: Impact of atmospheric nitrogen deposition
- Public access / disturbance
- Hydrological changes

Ashdown Forest SPA

Introduction

3.31 As identified in relation to the SAC, Ashdown Forest contains one of the largest single continuous blocks of lowland heathland in south-east England (mostly wet heath and some dry heath). The survival of the forest's extensive heathlands is especially important considering the large-scale shrinkage of heathland in recent times. The Ashdown Forest SPA supports a significant assemblage of beetles, dragonflies, damselflies and butterflies, such as the nationally rare silver-studded blue. There are also important populations of Eurasian hobby and woodlark, in addition to the qualifying species of European importance (see below).

3.32 Large parts of Ashdown Forest are designated as a Special Protection Area (SPA) for its wild bird interest, including the breeding bird species Dartford warbler (20 pairs representing approx. 2.1% of the breeding GB population) and nightjar (35 pairs representing approx. 1.1% of the breeding GB population). Both species are sensitive to recreational disturbance, particularly from dog walkers, due to their nesting behaviour. Nightjar nest in shallow scrapes on the ground, whereas Dartford warblers tend to build their nests low in gorse.

3.33 Human disturbance in the Ashdown Forest SPA is a well thematised topic and it is documented that human activity can elicit a wide range of changes in the birds' ecology, including changes in feeding or roosting behaviour, increases in energy expenditure, abandonment of nesting sites, cooling of eggs and desertion of supporting habitat. A combination of joint Strategic Access Management and Monitoring (SAMM) and provision of Suitable Alternative Natural Greenspace (SANG) has been proposed as strategic mitigation of recreational pressure.

Qualifying Features[22]

3.34 The site is designated as a SPA for the following individual species listed in Annex I of the Wild Birds Directive (Article 4.1):

During the breeding season the SPA regularly supports:

- Dartford warbler *Sylvia undata*; 20 pairs representing at least 2.1% of the breeding population in Great Britain
- Nightjar *Caprimulgus europaeus*; 35 pairs representing at least 1.1% of the breeding population in Great Britain

Conservation Objectives[23]

3.35 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;

3.36 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

[22] Available at: https://natura2000.eea.europa.eu/Natura2000/SDF.aspx?site=UK9012181 [Accessed on the 14/10/2020]
[23] Available at: http://publications.naturalengland.org.uk/publication/6399918323269632 [Accessed on the 14/10/2020]

- 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 Integrity[24]

3.37 The following threats / pressures are identified in Natural England's Site Improvement Plan for the Ashdown Forest SPA:

- Change in land management
- Air pollution: Impact of atmospheric nitrogen deposition
- Public access / disturbance
- Hydrological changes

[24] Available at: http://publications.naturalengland.org.uk/publication/5793096570765312 [Accessed on the 14/10/2020]

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 land[25]. 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.

4.5 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 Itchingfield Parish might have the potential to result in the loss of functionally linked habitat.

4.6 The Mens SAC is 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; their Core Sustenance Zone (CSZ). For example, in a 2001 study, female adult Bechstein's bats regularly undertook commuting distances of up to 1km[26]. For Bechstein's it is reasonable to assume that the core foraging areas around The Men's SAC, for which they are designated, is likely to be within c.1km of each site boundary.

4.7 Barbastelle bats are known to travel substantial distances from their roots to feeding sites. A study on barbastelle bats determined that home range distances show considerable inter-individual differences, with bats traveling between 1 and 20km to reach their foraging areas[27]. In

[25] 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.
[26] 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.
[27] 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.

2016, the Bat Conservation Trust published guidelines on how to determine CSZs for bats and highlighted that barbastelles have a mean maximum CSZ of 6.47km[28].

4.8 The following European sites within 10km of Itchingfield Parish are sensitive to the loss of functionally linked habitat as a result of NP development (the sites in bold are taken forward into the following chapters):

- **Arun Valley SPA / Ramsar (located approx. 9.8km to the south-west of Itchingfield Parish)**
- **The Mens SAC (located approx. 7.4km to the west of Itchingfield Parish)**
- **Arun Valley SAC (located approx. 9.8km to the south-west of Itchingfield Parish)**

Recreational Pressure

4.9 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 levels[29], and impacts on European protected sites[30] [31]. 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 residents[32].

4.10 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 hiking[33]. Scientific evidence also suggests that key disturbance parameters, such as areas of influence and flush distance, are significantly greater for dog walkers than hikers[34]. 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.

Bird Disturbance

4.11 Human activity can affect birds either directly (e.g. by eliciting flight behaviour) or indirectly (e.g. by damaging their habitat or reducing their fitness in less obvious ways e.g. stress). The most obvious direct effect is that of immediate mortality such as death by shooting, but human activity can also lead to much subtler behavioural (e.g. alterations in feeding behaviour, avoidance of certain areas and use of sub optimal areas etc.) and physiological changes (e.g. an increase in

[28] Bat Conservation Trust. (2016). Coe Sustenance 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 14/10/2019].
[29] 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
[30] 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.
[31] 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.
[32] The RTPI 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'.
[33] Banks P.B., Bryant J.Y. 2007. Four-legged friend or foe? Dog walking displaces native birds from natural areas. *Biology Letters* 3: 14pp.
[34] Miller S.G., Knight R.L., Miller C.K. 2001. Wildlife responses to pedestrians and dogs. 29: 124-132.

heart rate). While these are less noticeable, they might result in major population-level changes by altering the balance between immigration/birth and emigration/death[35].

4.12 Concern regarding the effects of disturbance on birds stems from the fact that they are expending energy unnecessarily and the time they spend responding to disturbance is time that is not spent feeding[36]. Disturbance therefore risks increasing energetic expenditure of birds while reducing their energetic intake, which can adversely affect the 'condition' and ultimately survival of the birds. Additionally, displacement of birds from one feeding site to others can increase the pressure on the resources available within the remaining sites, as they then must sustain a greater number of birds[37]. Recreation disturbance in winter can be more impactful because birds are more vulnerable at this time of year due to food shortages. In contrast, there are often fewer recreational users in the winter months and some effects of disturbance may be reduced because birds are not breeding.

Non-breeding Birds (September to March)

4.13 The Arun Valley SPA / Ramsar is designated for overwintering waterfowl and this section summarises academic research available on these groups of birds.

4.14 Evans & Warrington[38] 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.

4.15 Tuite et al[39] 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[40] [41].

4.16 A study on recreational disturbance in the Humber[42] assesses different types of noise disturbance on waterfowl referring to studies relating to aircraft (see Drewitt 1999[43]), traffic (Reijnen, Foppen, & Veenbaas 1997)[44], dogs (Lord, Waas, & Innes 1997[45]; Banks & Bryant 2007[46]) and machinery (Delaney et al. 1999; 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. 2004[47] for a review). In very general terms, both distance from the source of disturbance and the scale of the disturbance (noise level, group

[35] Riley, J. 2003. Review of Recreational Disturbance Research on Selected Wildlife in Scotland. Scottish Natural Heritage.
[36] Riddington, R. *et al*. 1996. The impact of disturbance on the behaviour and energy budgets of Brent geese. *Bird Study* 43:269-279
[37] Gill, J.A., Sutherland, W.J. & Norris, K. 1998. The consequences of human disturbance for estuarine birds. *RSPB Conservation Review* 12: 67-72
[38] 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
[39] 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
[40] Footprint Ecology. 2010. Recreational Disturbance to Birds on the Humber Estuary
[41] Footprint Ecology, Jonathan Cox Associates & Bournemouth University. 2010. Solent disturbance and mitigation project – various reports.
[42] Helen Fearnley Durwyn Liley and Katie Cruickshanks (2012) Results of Recreational Visitor Survey across the Humber Estuary produced by Footprint Ecology
[43] Drewitt, A. (1999) Disturbance effects of aircraft on birds. English Nature, Peterborough.
[44] 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.
[45] 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.
[46] 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.
[47] 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.

size) will both influence the response (Delaney et al. 1999[48]; Beale & Monaghan 2005[49]). 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)[50].

4.17 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 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.

4.18 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 Table 1. 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.[51]

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]	
Moorhen		100 – 400 [1]	
Coot		5 – 50 [1]	
Curlew			211 [3]; 339 [4]; 213 [5]

[48] 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.
[49] 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.
[50] 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.
[51] Tydeman, C.F. 1978. Gravel Pits as conservation areas for breeding bird communities. PhD thesis. Bedford College
Keller, V. 1989. Variations in the response of Great Crested Grebes *Podiceps cristatus* to human disturbance - a sign of adaptation? *Biological Conservation* 49: 31-45
Van der Meer, J. 1985. *De verstoring van vogels op de slikken van de Oosterschelde*. Report 85.09 Deltadienst Milieu en Inrichting, Middelburg. 37 pp.
Wolf, W.J., Reijenders, P.J.H. & Smit, C.J. 1982. The effects of recreation on the Wadden Sea ecosystem: many questions but few answers. In: G. Luck & H. Michaelis (Eds.), *Schriftenreihe M.E.L.F., Reihe A: Agnew. Wissensch* 275: 85-107
Blankestijn, S. et al. 1986. Seizoensverbreding in de recreatie en verstoring van Wulp en Scholkester op hoogwatervluchplaatsen op Terschelling. Report Projectgroep Wadden, L.H. Wageningen. 261pp.

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]

4.19 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.

4.20 The available baseline information suggests that the Arun Valley SPA / Ramsar is vulnerable to recreational pressure because of the risk of disturbance to its overwintering waterfowl, such as the Bewick's swans, shoveler and teal. While the SPA / Ramsar lies approx. 9.8km to the south-west of Itchingfield Parish, this impact pathway is considered further as a precautionary measure.

Bat Disturbance

4.21 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.

4.22 Notwithstanding this, Natural England's Supplementary Conservation Advice Note states that the management of human disturbance should primarily centre around maintaining some sections of woodland with little to no recreational disturbance. A study has shown that barbastelle bats preferentially roost in quieter areas of woodland. However, The Mens SAC is not currently identified as being subject to high levels of recreational footfall and it is therefore concluded that recreational disturbance is not currently restricting roost sites for barbastelle bats. Therefore, recreational pressure is not considered further in relation to qualifying barbastelle bats in The Mens SAC.

Trampling / Mechanical Damage

4.23 Most aquatic or terrestrial sites can be affected by trampling and other mechanical damage, which in turn causes soil compaction and erosion:

- Wilson & Seney)[52] 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

[52] 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

disturbed more sediment on wet tracks, and therefore caused more erosion, than motorcycles and bicycles.

- Cole et al[53] conducted experimental off-track trampling in 18 closed forest, dwarf scrub and meadow & grassland communities (each tramped between 0 – 500 times) over five mountain regions in the US. Vegetation cover was assessed two weeks and one year after trampling, and an inverse relationship with trampling intensity was discovered, although this relationship was weaker after one year than two weeks indicating some recovery of the vegetation. Differences in plant morphological characteristics were found to explain more variation in response between different vegetation types than soil and topographic factors. Low-growing, mat-forming grasses regained their cover best after two weeks and were considered most resistant to trampling, while tall forbs (non-woody vascular plants other than grasses, sedges, rushes and ferns) were considered least resistant. 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.
- Cole [54] conducted a follow-up study (in 4 vegetation types) in which shoe type (trainers or walking boots) and trampler weight were varied. Although immediate damage was greater with walking boots, there was no significant difference after one year. Heavier tramplers caused a greater reduction in vegetation height than lighter tramplers, but there was no difference in the effect on cover.
- Cole & Spildie[55] 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.

4.24 The Mens SAC is mainly 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. Given this evidence, recreational pressure is not considered further in relation to the qualifying mature beech forest in The Mens SAC.

4.25 Overall, the following European sites within 10km of Itchingfield Parish are sensitive to recreational pressure arising from development in the Parish (the site in bold is taken forward into the following chapters):

- **Arun Valley SPA / Ramsar (located approx. 9.8km to the south-west of Itchingfield Parish)**
- The Mens SAC (located approx. 7.4km to the west of Itchingfield Parish)

[53] 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
[54] 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.
[55] 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

Water Quality

4.26 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.

4.27 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 blooms[56]. 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 species[57]. 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).

4.28 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.

4.29 The most likely problem arising from the Itchingfield NP is the discharge of treated sewage effluent, which is likely to increase the input of phosphorus into the Arun Valley SPA / Ramsar / SAC. Water pollution is listed as one of the main threats to the integrity of Arun Valley in Natural England's Site Improvement Plan. Given the relatively long distance 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 Itchingfield NP.

4.30 Overall, the following European sites within 10km of Itchingfield Parish are considered to be potentially susceptible to water quality impacts arising from development in the Parish (sites in bold are taken forward into the following chapters):

- **Arun Valley SPA / Ramsar (located approx. 9.8km to the south-west of Itchingfield Parish)**
- **Arun Valley SAC (located approx. 9.8km to the south-west of Itchingfield Parish)**

[56] Smith V.H., Joye S.B. & Howarth R.W. 2006. Eutrophication of freshwater and marine ecosystems. Limnology and Oceanography 51: 351-355.
[57] 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.

Water Quantity, Level and Flow

4.31 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.

4.32 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.

4.33 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:

- 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.

4.34 Specifically, the Conservation Objectives Supplementary Advice Note for the Arun Valley SPA / Ramsar highlights the importance of a naturally fluctuating water flow and specific water depth to the qualifying species of the SPA / Ramsar, particularly the Bewick's swans. 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.

4.35 The Ramshorn snail, qualifying feature of the Arun Valley SAC, inhabits ditches with unpolluted, calcareous waters. 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.

4.36 Overall, the following European sites within 10km of Itchingfield Parish are sensitive to changes in the water level, quantity and flow arising from development in the Parish (sites in bold are taken forward into the following chapters):

- **Arun Valley SPA / Ramsar (located approx. 9.8km to the south-west of Itchingfield Parish)**
- **Arun Valley SAC (located approx. 9.8km to the south-west of Itchingfield Parish)**

Atmospheric Pollution

4.37 The main pollutants of concern for European sites are oxides of nitrogen (NOx), ammonia (NH_3) and sulphur dioxide (SO_2) and are summarised in Table 2. Ammonia can have a directly toxic effect upon vegetation, particularly at close distances to the source such as near road verges[58]. NOx can also be toxic at very high concentrations (far above the annual average critical level). However, in particular, high levels of NOx and NH_3 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[59] [60].

Table 2: Main sources and effects of air pollutants on habitats and species[61]

Pollutant	Source	Effects on habitats and species
Sulphur Dioxide (SO_2)	The main sources of SO_2 are electricity generation, and industrial and domestic fuel combustion. However, total SO_2 emissions in the UK have decreased substantially since the 1980's. Another origin of sulphur dioxide is the shipping industry and high atmospheric concentrations of SO_2 have been documented in busy ports. In future years shipping is likely to become one of the most important contributors to SO_2 emissions in the UK.	Wet and dry deposition of SO_2 acidifies soils and freshwater, and may alter the composition of plant and animal communities. The magnitude of effects depends on levels of deposition, the buffering capacity of soils and the sensitivity of impacted species. However, SO_2 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.
Acid deposition	Leads to acidification of soils and freshwater via atmospheric deposition of SO_2, NOx, ammonia 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. 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.	Gaseous precursors (e.g. SO_2) can cause direct damage to sensitive vegetation, such as lichen, upon deposition. 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. 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.
Ammonia (NH_3)	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. Ammonia reacts with acid pollutants such as the products of SO_2 and NO_X emissions to produce	The negative effect of NH_4+ may occur via direct toxicity, when uptake exceeds detoxification capacity and via N accumulation. 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

[58] http://www.apis.ac.uk/overview/pollutants/overview_NOx.htm.
[59] 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
[60] 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
[61] Information summarised from the Air Pollution Information System (http://www.apis.ac.uk/)

Pollutant	Source	Effects on habitats and species
	fine ammonium (NH_4+) - containing aerosol. Due to its significantly longer lifetime, NH_4+ may be transferred much longer distances (and can therefore be a significant trans-boundary issue). While ammonia deposition may be estimated from its atmospheric concentration, the deposition rates are strongly influenced by meteorology and ecosystem type.	species (lichens, mosses) to grasses is often seen. As emissions mostly occur at ground level in the rural environment and NH_3 is rapidly deposited, some of the most acute problems of NH_3 deposition are for small relict nature reserves located in intensive agricultural landscapes.
Nitrogen oxides (NO_x)	Nitrogen oxides are mostly produced in combustion processes. 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. 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.	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 NOx for all vegetation types has been set to 30 ug/m3. Deposition of nitrogen compounds (nitrates (NO_3), nitrogen dioxide (NO_2) and nitric acid (HNO_3)) contributes to the total nitrogen deposition and may lead to both soil and freshwater acidification. 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.
Nitrogen deposition	The pollutants that contribute to the total nitrogen deposition derive mainly from oxidized (e.g. NO_X) or reduced (e.g. NH_3) nitrogen emissions (described separately above). While oxidized nitrogen mainly originates from major conurbations or highways, reduced nitrogen mostly derives from farming practices. The N pollutants together are a large contributor to acidification (see above).	All plants require nitrogen compounds to grow, but too much overall N is regarded as the major driver of biodiversity change globally. 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. N deposition can also increase the risk of damage from abiotic factors, e.g. drought and frost.
Ozone (O_3)	A secondary pollutant generated by photochemical reactions involving NOx, volatile organic compounds (VOCs) and sunlight. These precursors are mainly released by the combustion of fossil fuels (as discussed above). 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.	Concentrations of O_3 above 40 ppb can be toxic to both humans and wildlife, and can affect buildings. High O_3 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.

4.38 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) shipping[62].

[62] http://www.apis.ac.uk/overview/pollutants/overview_SO2.htm.

Ammonia emissions originate from agricultural practices[63], with some chemical processes also making notable contributions. As such, it is unlikely that material increases in SO_2 or NH_3 emissions will be associated with the neighbourhood planning document.

4.39 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 comparison[64]. 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.

4.40 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'[65] of atmospheric nitrogen deposition (that is, NOx combined with ammonia NH_3).

4.41 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 significant[66] (Figure 3). 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 Itchingfield Neighbourhood Plan.

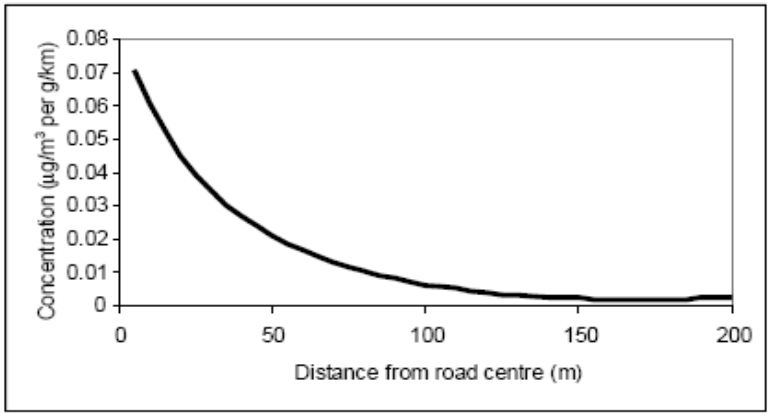

Figure 3: Traffic contribution to concentrations of pollutants at different distances from a road (Source: DfT[67])

4.42 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 Itchingfield NP could result in increased traffic adjacent to European sites that are sensitive to atmospheric pollution.

Reason for excluding the Ashdown Forest SAC

4.43 Ordinarily, a zone of 10km is used to screen in European sites vulnerable to reductions in air quality. This is based on the average UK car journey being approximately 10.6km[68]. Ashdown Forest SAC lies almost 15km from Horsham District and nearly 20km from the closest significant population centre within that district (Horsham itself). Moreover, there are no direct road links between Itchingfield Parish and the Ashdown Forest SAC such that the journey by road is

[63] 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
[64] 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
[65] The critical load is the rate of deposition beyond which research indicates that adverse effects can reasonably be expected to occur
[66] http://www.dft.gov.uk/webtag/documents/expert/unit3.3.3.php#013 [Accessed on the 08/10/2019]
[67] http://www.dft.gov.uk/ha/standards/dmrb/vol11/section3/ha20707.pdf [Accessed on the 08/10/2019]
[68] 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

considerably more than 20km. This is clearly well outside the typical travel distance for a Horsham resident.

4.44 Given the distance involved is considered very likely that any change in Annual Average Daily Traffic on roads through the SAC from growth across the whole of Horsham District would be in the low single figures at most. When translated into air quality results (NOx concentrations and nitrogen deposition rates) this would be inconsequential even in-combination with other projects and plans for the following reasons:

- Daily traffic flows are not fixed numerals but fluctuate from day to day. The AADT for a given road is an annual average (specifically, the total volume of traffic for a year, divided by 365 days). It is this average number that is used in air quality modelling, but the 'true' flows on a given day will vary around this average figure. Very small changes in average flow lie well within the normal variation (known as the standard deviation or variance) and would not result in a statistically significant difference in the total AADT; and

- When converted into NOx concentrations, ammonia concentrations or nitrogen deposition rates, the experience of AECOM's air quality modelling team is that very small changes in AADT would only affect the third decimal place. The third decimal place is not normally reported in air quality modelling to avoid false precision. For this reason, pollution is generally not reported to more than 2 decimal places (0.01). Anything smaller is simply reported as less than 0.01 (< 0.01) i.e. probably more than zero but too small to model with precision.

4.45 In reaching this conclusion we are mindful of paragraph 48 of Advocate-General Sharpston's Opinion in European Court of Justice Case C-258/11 where she stated that: '*the requirement for an effect to be 'significant' exists in order to lay down a de minimis threshold. Plans and projects that have no appreciable effect on the site can therefore be excluded. If all plans and projects capable of having any effect whatsoever on the site were to be caught by Article 6(3), activities on or near the site would risk being impossible by reason of legislative overkill'*.

4.46 We are also mindful that, Mr Justice Jay, when ruling in Wealden v SSCLG [2017] EWHC 351 (Admin) (2017), did accept that if the contribution of an individual plan or project was 'very small indeed' (he quoted a notional 50 AADT in making this illustration) it could be legitimately and legally excluded from 'in combination' assessment. This is consistent with Advocate-General Sharpston's position. The Ashdown Forest SPA / SAC is therefore not taken forward into the following chapters.

4.47 Overall, the following European sites identified in relation to the Itchingfield Parish are sensitive to atmospheric pollution in the form of nitrogen deposition arising from development in the Neighbourhood Plan (the site in bold is taken forward into the following chapters):

- **The Mens SAC (located approx. 7.4km to the west of Itchingfield Parish)**

- Ashdown Forest SPA / SAC (located approx. 25.1km to the east of Itchingfield Parish)

5. Screening for Likely Significant Effects (LSEs)

Loss of Functionally Linked Habitat

Arun Valley SPA / Ramsar

5.1 The Arun Valley SPA / Ramsar is designated for its overwintering population of Bewick's swans, which regularly forage in habitats beyond the site boundary, including wet grassland and arable parcels of land. Bewick's swans have a maximum foraging range of 10km, but most individuals will focus within a 5km radius from their roost site. As stated in the previous section, 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.

5.2 Itchingfield Parish lies approx. 9.8km to the north-east of the Arun Valley SPA / Ramsar, which is close to the maximum foraging distance recorded and far beyond the core foraging ranges identified for Bewick's swans. As such it is concluded that the emerging Itchingfield NP will not lead to Likely Significant Effects (LSEs) on the Arun Valley SPA / Ramsar regarding the impact pathway loss of significant parcels of functionally linked habitat. The site is screened out from Appropriate Assessment in relation to this impact pathway.

Arun Valley SAC

5.3 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. Given that Itchingfield Parish lies approx. 9.8km to the north-east of the Arun Valley SAC, it is concluded that there will be no LSEs of the emerging Itchingfield 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.

The Mens SAC

5.4 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.

5.5 Itchingfield Parish lies approx. 7.4km to the east of The Mens SAC, which is within the foraging ranges observed for barbastelle bats. Therefore, greenfield development in Itchingfield could result in the loss of linear commuting features and foraging habitats (e.g. wet meadows and waterbodies[69]) that are functionally linked to The Mens SAC. Even if development did not lead to direct loss of such features, it could impact the SAC by failing to provide an adequate physical

[69] http://www.bats.org.uk/data/files/Species_Info_sheets/barbastelle_11.02.13.pdf [accessed 08/02/2018]

buffer zone against construction and operational lighting that in turn could reduce the functionality of these features for barbastelle bat**. Overall, LSEs of the emerging Itchingfield 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.**

5.6 In particular, the following policies are screened in because they may increase the amount of (potentially functionally linked) greenfield development in Itchingfield Parish:

- Policy 9 – Sumners Ponds Site (provides for 32 residential units and 7 light industrial / commercial units)
- Policy 10 – Old School site, Itchingfield (provides for 20 residential units)
- Policy 11 – Windfall Development (defined as the shortfall between sites allocated in the NP and the indicative housing number for the whole Parish, provided by HDC; to be delivered within the Built-Up Area)
- Aim 5 – Traveller Sites (provide for up to 21 traveller pitches at different sites in the parish; touring 4 caravans)
- Policy 16 – Small-scale businesses (supports business developments of up to 1000m^2 in floorspace)

Recreational Pressure

Arun Valley SPA / 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 Itchingfield NP will only allocate approx. 52 residential dwellings at a distance of 9.8km from the SPA / Ramsar. This is well beyond the typical core recreational catchments for inland European sites, which are usually around 5-7km. Notwithstanding this, 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. In contrast, 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'. However, this part of the SPA is almost 16km from Itchingfield Parish.

5.5 The in-combination aspect of recreational pressure was also assessed in the HRA of the overarching Horsham Local Plan, which would have covered the growth identified in the Itchingfield NP and that allocated in the surrounding parishes. This is in line with the HRA for the adopted Horsham District Planning Framework (HDPF) HRA which scoped out recreational pressure as an impact pathway for the Arun Valley SPA / Ramsar. It is noted that the overall quantum of residential dwellings provided in Horsham's Neighbourhood Plans exceeds the

quantum provided in the adopted HDPF. However, given that the exceedance is relatively small and considering the existing management of recreation in the SPA / Ramsar, it is concluded that the HDPF HRA can continue to be relied upon.

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.

Water Quality

Arun Valley SPA / Ramsar / SAC

5.7 The Arun Valley SPA / Ramsar / SAC is sensitive to changes in water quality, such as from siltation and high phosphate concentrations. Nitrogen input (primarily from agricultural sources) is not a main concern for freshwater habitats. According to Natural England's Site Improvement Plan[70] for the Arun Valley, the rivers Arun and Stor are currently failing on phosphate concentrations. High concentrations of phosphorus are the consequence of point-source pollution from a Wastewater Treatment Works (Marehill WwTW) upstream from the SPA / Ramsar / SAC. Notwithstanding this, other WwTWs also contribute to the nutrient load in the site, albeit to a lesser extent. Siltation is primarily a consequence of agricultural run-off rather than point sources.

5.8 The potential for an effect from an increased volume of treated sewage effluent was considered in the HRA of the Southern Water Water Resources Management Plan (WRMP), which states that: '*Detailed water quality assessment previously undertaken identified that the River Rother had the best water quality of the major tributaries entering the tidal Arun, with the River Stor having relatively poor water quality; treated effluent from Horsham WwTW also results in lower water quality entering from the Upper Arun*.'

5.9 **Given this evidence, LSEs of the emerging Itchingfield NP on the Arun Valley SPA / Ramsar / SAC regarding water quality cannot be excluded. This European site is screened in for Appropriate Assessment in relation to this impact pathway.** In particular, the following policies are screened in because they will increase the volume of wastewater produced in the parish:

- Policy 9 – Sumners Ponds Site (provides for 32 residential units and 7 light industrial / commercial units)
- Policy 10 – Old School site, Itchingfield (provides for 20 residential units)
- Policy 11 – Windfall Development (defined as the shortfall between sites allocated in the NP and the indicative housing number for the whole Parish, provided by HDC; to be delivered within the Built-Up Area)
- Aim 5 – Traveller Sites (provide for up to 21 traveller pitches at different sites in the parish; touring 4 caravans)
- Policy 16 – Small-scale businesses (supports business developments of up to 1000m^2 in floorspace)

Water Quantity, Level and Flow

Arun Valley SPA / Ramsar / SAC

5.10 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. 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. In contrast, Natural England specifies that at least 30% of ditches should not exceed 1m in depth. 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

[70] Natural England Site Improvement Plan Arun Valley (2014) http://publications.naturalengland.org.uk/file/5185212862431232

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. The SAC has a relatively narrow hydrological catchment and its water level is primarily maintained by a few key rivers that traverse the plain.

5.11 By allocating 52 new residential dwellings and seven industrial / commercial units, the emerging Itchingfield 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 SPA / Ramsar / SAC are most likely to occur as a result of increased water abstraction for public water supply and surface water run-off from impermeable urban surfaces. Due to the relatively long distance between the site and Itchingfield Parish (approx. 9.8km) surface water run-off is not considered to be an issue resulting from the NP. Instead, the main pressure is likely to occur through water demand.

5.12 Notably, Natural England have told Horsham 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 Horsham under certain conditions) and its effect on water levels / flows in the Arun Valley. As such, they have advised Horsham 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 Council 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*'.

5.13 **Overall, LSEs of the Itchingfield 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.** In particular, the following policies are screened in because they will increase the demand for clean drinking water in Itchingfield Parish:

- Policy 9 – Sumners Ponds Site (provides for 32 residential units and 7 light industrial / commercial units)
- Policy 10 – Old School site, Itchingfield (provides for 20 residential units)
- Policy 11 – Windfall Development (defined as the shortfall between sites allocated in the NP and the indicative housing number for the whole Parish, provided by HDC; to be delivered within the Built-Up Area)
- Aim 5 – Traveller Sites (provide for up to 21 traveller pitches at different sites in the parish; touring 4 caravans)
- Policy 16 – Small-scale businesses (supports business developments of up to 1000m^2 in floorspace)

Atmospheric Pollution

The Mens SAC

5.14 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.

5.15 The Mens SAC lies 7.4km to the west of Itchingfield Parish, directly adjacent to a major A road (the A272). For any Itchingfield residents working in the north of Chichester District (e.g. Petworth, Midhurst) or East Hampshire District, the A272 would provide the fastest commuter route (according to Google Maps). While it is noted that this part of Chichester District is very rural in nature, atmospheric pollution effects of the Itchingfield NP in-combination with growth across Horsham 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 52 residential dwellings or working in the seven new industrial / commercial units could have a material effect on nitrogen deposition to the SAC, particularly in-combination with other plans and projects.

5.16 **Overall, LSEs of the Itchingfield NP on The Mens SAC regarding atmospheric pollution cannot be excluded. The site is screened in for Appropriate Assessment regarding this impact pathway.** In particular, the following policies are screened in because they may increase the number of two-way commuter journeys within 200m of sensitive woodland:

- Policy 9 – Sumners Ponds Site (provides for 32 residential units and 7 light industrial / commercial units)
- Policy 10 – Old School site, Itchingfield (provides for 20 residential units)
- Policy 11 – Windfall Development (defined as the shortfall between sites allocated in the NP and the indicative housing number for the whole Parish, provided by HDC; to be delivered within the Built-Up Area)
- Aim 5 – Traveller Sites (provide for up to 21 traveller pitches at different sites in the parish; touring 4 caravans)
- Policy 16 – Small-scale businesses (supports business developments of up to 1000m^2 in floorspace)

6. Appropriate Assessment

Loss of Functionally Linked Habitat

The Mens SAC

6.1 The SAC's barbastelle bat population is dependent on habitat connectivity and foraging areas beyond the designated site boundary. The protected site itself is limited to the woodland core area where breeding colonies exist. Natural England's Site Improvement Plan identifies the need for further research on available, restored or created habitat that the bats use for foraging, swarming and commuting.

6.2 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 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).

6.3 An Appropriate Assessment of this impact pathway requires an appraisal of the following key aspects:

- The distance between The Mens SAC and Itchingfield (i.e. does the parish lie within the bats' commuting distance);
- The flightlines and habitats located between The Mens SAC and Itchingfield Parish (i.e. are bats likely to actually reach the parish along linear landscape features); and
- The habitat type in potential site allocations (i.e. would potential foraging areas, such as semi-natural wet grassland and riparian habitat be lost).

6.4 The Mens SAC lies approx. 7.4km to the west of Itchingfield Parish, which is well within the expected ranging zone of barbastelle bats. Radio-tracking data has shown that foraging areas can lie between 10-15km from roost sites, meaning that barbastelle can cover relatively large areas on a regular basis. Based on published data, Natural England has established the following impact zones surrounding bat sites in Sussex[71]:

- Key Conservation Area – a core sustenance zone of 6.5km in which all impacts must be assessed
- Wider Conservation Area – a 12km wider support area in which significant impacts (e.g. disruption or severance) on flightlines must be considered; **this is also the zone in which Itchingfield lies**

6.5 In a scoping study for the West Sussex Bat Project, the flightlines of radio-tracked individuals were assessed. While most bats foraged in the first few kilometres surrounding the core woodland area of The Mens SAC, some individuals commuted much longer distances. Map 1 of the scoping study shows that an individual commuted several kilometres north of Billingshurst, which is a similar distance that Itchingfield Parish lies from this settlement. The existing data clearly highlights that the parish lies within a regular commuter corridor from the SAC, highlighting that adverse effects on site integrity cannot be dismissed.

6.6 Generally, both The Mens SAC and Itchingfield Parish lie in a relatively rural area of southern England, which comprises extensive tracts of arable land bounded by hedgerows. Therefore, it

[71] South Downs National Park Authority, Natural England. (2018). Sussex Bat Special Area of Conservation – Planning and Landscape Scale Enhancement Protocol. 17pp. Available at: https://www.southdowns.gov.uk/wp-content/uploads/2018/04/TLL-15-Draft-Sussex-Bat-SAC-Protocol.pdf

is considered that there are ample linear landscape features, providing for good connectivity with off-site foraging habitats. To the north-west, The Mens SAC is bordered by the A272, which is likely to limit north-ward connectivity. Instead, no such commuting restrictions exist to the east of the SAC towards Billingshurst and, ultimately, Itchingfield Parish. Furthermore, the River Arun runs past the SAC on a north-south axis, providing for a suitable riparian commuting corridor with plentiful bat forage. It is considered that the rural nature of the relevant parts of Chichester and Horsham Districts would enable barbastelle bats to use the wider area around Itchingfield Parish, and flightlines and foraging habitats within the parish itself.

6.7 The Itchingfield NP allocates two development sites, but it is considered that the overall risk regarding the loss of flightlines and / or foraging areas for barbastelle bats associated with these allocations is limited. An in-depth discussion of the allocations is provided in the following:

- Sumners Pond: The site (allocated for 32 residential units and seven industrial / commercial units) lies in Barns Green. The housing is allocated in the northern part of the site, which is currently an undeveloped field adjacent to a campsite. The employment development is allocated in the southern part of the site, which comprises existing industrial development. The allocation itself does not include any flightlines or mature trees of any kind, and it is considered unlikely that barbastelle bats forage in the undeveloped field. The biggest risk associated with this allocation is light pollution (during or post-construction) affecting the bats' use of a small section of woodland to the north of the allocation.

- Old School site, Itchingfield: The site (allocated for 20 dwellings) lies in the southern part of Itchingfield village. The site boundary comprises some brownfield development (an old school) and a large playing field adjacent a treeline. While to the north of Barns Green (and therefore further from The Mens SAC), it is possible that SAC bats use the treeline or grassy field for navigation and / or foraging. Therefore, it is advisable that further precautions regarding the development of this site are taken.

Existing Policy Protection

6.8 The Itchingfield NP currently contains no direct mention of the need to protect European sites or their qualifying features. Notwithstanding this, several policies in the plan will indirectly benefit barbastelle bats by protecting their habitats. Policy 1 (Green Infrastructure Conservation) stipulates that developments shall provide for measures that '*conserve, maintain and/or enhance the green infrastructure of the parish*'. Proposals that result in the loss of green infrastructure (GI) will be rejected unless they provide for mitigation or compensation of GI loss. GI encompasses features that are critical to bats, including hedgerows, mature trees and streams. It is considered that biodiversity net gain will also extend some protection to features utilised by bats.

6.9 Policy 2 (Biodiversity Conservation) of the NP also provides protective policy wording important to the Mens SAC. It specifies that proposals will be supported where they '*seek to ensure and enable the protection, conservation and enhancement of the parish's biodiversity… including its hedgerows, ponds, orchards, roadside verges and woodland*'. Again, this statement provides for high-level protection biodiversity, including the habitat features that will be important to barbastelle bats.

6.10 Important context for the protection of The Mens SAC is also provided in the emerging Horsham Local Plan, which provides the overarching planning document for Itchingfield Parish. Policy 31 (Strategic Policy: Green Infrastructure and Biodiversity) of the Local Plan states that particular consideration in the planning application process will be given to Special Areas of Conservation. Development that undermines the Conservation Objectives or does not provide adequate mitigation or compensation measures, will be refused. Importantly, the policy concludes by stating that '*any development with the potential to impact… The Mens SAC will be subject to a Habitats Regulations Assessment*'. By definition, carrying out an HRA will ensure that projects for which adverse effects on site integrity cannot be excluded, will not receive planning consent.

Recommendations for the Itchingfield NP

6.11 While broad protective policy wording regarding the protection of GI is already included in the NP, it is recommended that additional wording is included to ensure adverse effects on The Mens SAC are specifically considered at the application stage and thus avoided. As a first step,

additional policy wording should take the form of cross-referencing to requirements specified in the emerging Horsham Local Plan. For example, the following policy wording could be inserted into Policy 2 (Biodiversity Conservation) or another appropriate policy in the next iteration of the NP: '***Development proposals on greenfield sites, including any windfall development, would require a planning application Habitats Regulations Assessment that is supported by data from bat surveys***'. Importantly, this would also explicitly extend the requirements to unpredictable windfall sites, which could come forward in the Wider Conservation Area for the barbastelle.

6.1 It is difficult to judge whether a site (or components thereof) is / are used as foraging habitat or commuting routes, solely from satellite imaging. Given that Itchingfield falls within the 12km Wider Conservation Area surrounding The Mens SAC and to be precautionary regarding the potential severance of commuting lines of barbastelle bats, the following further text (or similar) could be inserted into the supporting text for Policy 2 in the next iteration of the NP: '***In order to be fully compliant with the Habitats Directive regarding The Mens SAC qualifying features, proposals for the development of greenfield sites within the Parish must evaluate whether there is a potential for the loss of suitable foraging habitat and / or the severance of commuting flightlines, such as in the form of mature treelines, hedgerows and watercourses. If so, such features must be preserved or compensated for, unless bat surveys demonstrate that they are not used by barbastelle bats. Care must also be taken through development design to ensure that such features are not subject to unacceptable levels of artificial lighting.***'

6.2 Provided that the above policy wording (or similar) is inserted into the Itchingfield NP, it is concluded that the plan would not result in adverse effects on the integrity of The Mens SAC regarding the impact pathway loss of functionally linked habitat.

Water Quality

Arun Valley SPA / Ramsar / SAC

6.3 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. Water quality in the SPA / Ramsar is a known issue and a review of the Environment Agency's Catchment Data Explorer highlights that the River Arun upstream of Pallingham (which is the area encompassing the northern part of the SPA / Ramsar) was classified as having 'moderate' water quality in 2019. Notably, this section of the R. Arun has been classified as 'poor' in relation to phosphate. The shortfall in water quality is also reflected in the river's macrobenthos, phytobenthos and fish, which are all classified as in 'moderate' condition. The site specifies that the reasons for not achieving good status (RNAG) include point-source sewage discharge (i.e. discharge of treated sewage effluent from Wastewater Treatment Works; WwTWs) and agriculture. As such, the waterbody is currently not compliant with the Water Framework Directive (WFD) and further input of phosphorus should be avoided.

6.4 Natural England's Site Improvement Plan links the threat to water quality in the SPA / Ramsar / SAC directly to point-source pollution from WwTWs, such as the Horsham WwTW. This sewage works lies a significant distance upstream from the European site (over 28km in flowpath) and it is considered that the phosphate load from this plant would have been subjected to natural attenuation and dilution processes. In Habitats Regulations Assessments of Water Cycle Studies, nature conservation sites beyond 20km are rarely considered, because it is deemed that at such distances any impacts on nutrient loads in waterbodies would be inconsequential. However, despite the long distance to the Arun Valley SPA / Ramsar / SAC, the HRA of Southern Water's WRMP 2015-40 specifically mentions that Horsham WwTW contributes to the low water quality entering the site from the Upper Arun[72]. In line with this, Natural England now also requires that a phosphate budget is calculated for developments that contribute a net increase in nutrients to

[72] Southern Water. Water Resources Management Plan 2015-40 – Habitats Regulations Assessment (Summary). 7pp. Available at: https://www.southernwater.co.uk/Media/Default/PDFs/HRA-summary.pdf

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.

6.5 A consultation with Southern Water, the water company for wastewater treatment in Horsham District, indicated that large parts of Itchingfield Parish are served by Barns Green WwTW, which lies to the south of Barns Green village. While Southern Water confirmed that the WwTW would have sufficient headroom to accommodate 52 new dwellings, it is also noted that these works discharge to Par Brook. Consultation of the EA's Catchment Data Explorer highlights that the Brook lies within the Adur and Ouse surface water management catchment[73]. Therefore, there is no hydrological connectivity with the R. Arun and Western Streams, which feed into the Arun Valley SPA / Ramsar / SAC.

6.6 Given that there is no hydrological linkage between wastewater discharged from Barns Green WwTW and the River Arun hydrological catchment, it is concluded that the Itchingfield NP will not result in adverse effects on the water quality in the Arun Valley SPA / Ramsar / SAC. There is no need for a nutrient budget to be calculated or additional protective policy wording.

Water Quantity, Level and Flow

Arun Valley SPA / Ramsar / SAC

6.7 As identified in the previous chapter, the most likely way in which the Itchingfield NP will affect the water quantity, level and flow in European sites is through an increased abstraction of water resources for the potable water supply. This could materially reduce the volume of freshwater that enters the floodplain around the Arun Valley SPA / Ramsar / SAC with potential cascading effects on its qualifying species. For example, reduced water levels in the SAC may lead to the disappearance of ditch habitat for the ramshorn snail.

6.8 The potable water in the wider area around Itchingfield Parish is supplied by Southern Water and the company's future plans for water use are outlined in the Water Resources Management Plan (WRMP). The 2019 WRMP published by Southern Water identifies that Itchingfield Parish lies in the company's Central Water Resource Zone (WRZ). According to the document, potable water in north Sussex will be supplied by a mix of water from rivers, groundwater sources, a water reservoir and additional water supply from Portsmouth Water. The WRMP also provides a forecast of the supply-demand balance in all of its WRZs during a 1 in 200-year drought, a precautionary approach to model the worst-case scenario of water availability. It is estimated that the Central WRZ (in which Itchingfield Parish is located) would go into deficit (i.e. demand outpacing supply) early in the planning period, with a potential for a deepening deficit as sustainability reductions are accounted for in 2027/28.

6.9 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 new water resources or increases to existing abstractions are considered primary means through which adverse effects on European sites might occur.

6.10 The list of potential options then undergoes several rounds of screening from an 'unconstrained', a 'constrained' to a 'feasible' options list. The feasible options then undergo detailed environmental assessments following statutory requirements, including HRA and Water Frameworks Directive Assessment (WFDA). The assessment results of the most recent HRA of Southern Water's WRMP are considered in the following.

6.11 The HRA of the preferred programme and strategic alternative options for the Central WRZ (the WRZ relevant to Itchingfield) documented that there were no LSEs on the Arun Valley SPA /

[73] This data can be accessed at: https://environment.data.gov.uk/catchment-planning/ManagementCatchment/3000 [Accessed on the 04/11/2020].

Ramsar / SAC arising from any of the options included in the preferred strategy. 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.

6.12 The available evidence indicates that the Itchingfield 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.

6.13 It is noted, however, that Natural England have told Horsham Council that they are concerned about the Hardham groundwater abstraction (a key part of the Southern Water supply strategy for Horsham 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.

6.14 This is clearly not an issue that a Neighbourhood Plan can resolve and the delivery of 52 dwellings in Itchingfield 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.

6.15 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 under Aim 3, which relates to the infrastructure provision in Itchingfield Parish. The following text could be added to Aim 3 or its supporting text: '***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.***'

6.16 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.

Atmospheric Pollution

The Mens SAC

6.17 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 Itchingfield residents. An assessment of detailed habitat mapping on MAGIC indicates that qualifying woodland occurs throughout the entire SAC boundary along the A272.

6.18 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 Itchingfield NP.

6.19 An initial analysis of the likelihood that the A272 is a major commuter route can be undertaken by assessing journey-to-work data. This provides commuter data for Local Planning Authorities rather than parishes, but it provides some evidence on whether commuter traffic from / to Itchingfield Parish might occur. Census 2011 data show that there are 13,879 commutes into and 20,846 commutes out from Horsham District on a daily basis. Chichester District (the LPA that encompasses The Mens SAC and which would most likely require a drive along the A272)

contributes a relatively small portion of Horsham's overall commuter load, accounting for 952 daily inflows (6.9%) and 951 daily outflows (4.6%) for the authority. This is most likely due to the rural nature of Chichester District with few employment centres and relatively scarce housing). The most likely source of and destination for Horsham commuters is Crawley, which would not involve a drive past The Mens SAC. Overall, it is considered relatively unlikely that the Itchingfield NP alone will contribute significantly to atmospheric nitrogen deposition in the SAC. Notwithstanding this, an in-combination atmospheric pollution effect, particularly considering the existing high nitrogen deposition rates in the SAC, is deemed possible.

6.20 An in-combination assessment of atmospheric pollution (including any policy, traffic and air quality recommendations) is being planned to be undertaken at the Local Plan level to inform the Horsham Local Plan Review, as the small amount of growth allocated in NPs does not make this appropriate to be undertaken at the individual parish level. If a need for further assessment is identified at the Local Plan level, any traffic or air quality modelling undertaken for the Local Plan Review will account for Horsham District's in-combination growth including that in Itchingfield Parish.

6.21 Horsham District Council has become a signatory to the Sussex Air Quality Partnership, which provides for air quality and emissions mitigation guidance in Sussex. While this strategy is principally concerned with air quality impact on human health, some of its mitigation measures, including provision of electric vehicle charging points, the setting up of car clubs or car-sharing schemes and improvements to cycling paths, may benefit European sites by encouraging alternative travel modes.

6.22 Horsham's Local Plan also contains a strong commitment to integrated communities and sustainable transport. Specifically, **Policy 42 (Sustainable Transport)** states that: '*Development will be supported if it: 3. Prioritises and provides safe and accessible walking and cycling routes and is integrated with the wider network of routes, including public rights of way and cycle paths. 6. Develops innovative and adaptable approaches to public transport in the rural areas of the District.*' As such, it is considered that a policy framework for minimising atmospheric pollution in the district, including its effects on European sites, is present in the guiding planning framework. A reference to sustainable transport modes is also made in **Policy 39 (Sustainable Design and Construction)** of the HLP, which specifies that development should provide sustainable infrastructure wherever possible. The policy states that '*Development should be designed to encourage walking, cycling, cycle storage and accessibility to sustainable forms of transport including the provision of electric vehicle charging points.*'

6.23 **Since the Neighbourhood Plan must ultimately be in conformity with the adopted Horsham District Planning Framework, it should include additional wording (for example as text in the policies for the Summers Ponds or Old School Sites) 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 Horsham 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 Itchingfield NP: '*To conform with the overarching Horsham District Planning Framework and help reduce atmospheric pollution within the District, Itchingfield 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 Horsham Local Plan will be supported*.'**

6.24 With such wording included it is considered that no adverse effects on integrity will arise from the Neighbourhood Plan.

7. Conclusions & Recommendations

7.1 This HRA considered the development outlined in the emerging Itchingfield NP in the context of the sensitivities of and impact pathways linking to the following European sites:

- Ashdown Forest SAC;
- The Mens SAC; and
- Arun Valley SPA / Ramsar / SAC

7.2 While potential impacts on the Ashdown Forest SAC were screened out, both the The Mens SAC and the Arun Valley SPA / Ramsar / SAC were taken forward to Appropriate Assessment. The main conclusions and recommendations regarding these sites are summarised in the following paragraphs.

The Mens SAC

Loss of Functionally Linked Habitat

7.3 Regarding The Mens SAC, it was concluded that the Itchingfield NP has the potential to result in the loss of functionally linked commuter routes used by barbastelle bats. For this species w Wider Conservation Area of 12km has been established, in which Itchingfield Parish lies. To avoid adverse effects on the integrity of the SAC, it is recommended to provide a stronger cross-reference to the emerging Horsham Local Plan. It is advised that the following wording is inserted into Policy 2 (Biodiversity Conservation) or another appropriate policy in the next iteration of the NP: '***Development proposals on greenfield sites, including any windfall development, would require a project-level Habitats Regulations Assessment that is supported by data from bat surveys***'.

7.4 Furthermore, to be precautionary regarding the potential severance of commuting lines of barbastelle bats, the following additional text (or similar) should be inserted into the supporting text of Policy 2 in the next iteration of the NP: '***In order to be fully compliant with the Habitats Directive regarding The Mens SAC qualifying features, proposals for the development of greenfield sites within the Parish must evaluate whether there is a potential for the loss of suitable foraging habitat and / or the severance of commuting flightlines, such as in the form of mature treelines, hedgerows and watercourses. If so, such features must be preserved or compensated for, unless bat surveys demonstrate that they are not used by barbastelle bats. Care must also be taken through development design to ensure that such features are not subject to unacceptable levels of artificial lighting.***'

7.5 Provided that the above policy recommendations (or similar) are inserted into the Itchingfield NP, it is concluded that the plan would not result in adverse effects on the integrity of The Mens SAC regarding the impact pathway loss of functionally linked habitat.

Atmospheric Pollution

7.6 An initial assessment of the road network adjacent to the SAC, highlighted that the A272 (a potential commuter route for Itchingfield residents) runs within 200m of sensitive SAC habitats. There clearly is a potential for residents resulting from the NP to be adding to the in-combination nitrogen deposition to designated woodland.

7.7 An in-combination assessment of atmospheric pollution (including any policy, traffic and air quality recommendations) is being planned to be undertaken at the Local Plan level to inform the Horsham Local Plan Review, as the small amount of growth allocated in NPs does not make this appropriate to be undertaken at the individual parish level. If a need for further assessment is identified at the Local Plan level, any traffic or air quality modelling undertaken for the Local Plan

Review will account for Horsham District's in-combination growth including that in Itchingfield Parish.

7.8 **Since the Neighbourhood Plan must ultimately be in conformity with the adopted Horsham District Planning Framework, it should include additional wording (for example as text in the policies for the Summers Ponds or Old School Sites) 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 Horsham District Council, if the Local Plan HRA identifies one is required, before they are consented. The following text is recommended for inclusion as supporting text in the next iteration of the Itchingfield NP: '*To conform with the overarching Horsham District Planning Framework and help reduce atmospheric pollution within the District, Itchingfield 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 Horsham Local Plan will be supported*.'** With such wording included it is considered that no adverse effects on integrity will arise from the Neighbourhood Plan, both alone and in-combination.

Arun Valley SPA / Ramsar / SAC

Water Quantity, Level and Flow

7.9 While adverse effects of the Itchingfield NP on the water quality in the Arun Valley SPA / Ramsar / SAC were excluded, further policy wording is recommended to protect the water quantity, level and flow in this designated site. Natural England advised that there are concerns about the impact of the Hardham groundwater abstraction on water flows in the SPA / Ramsar / SAC, an issue post-dating Southern Water's WRMP. While this is not an issue that a Neighbourhood Plan can resolve (which also would be inappropriate given the small quantum of growth it allocates), appropriate recognition of this issue should be given in the NP.

7.10 Therefore, in order to draw a conclusion of no adverse effect on site integrity 'in-combination' with other projects and plans, text should be added to the NP regarding this. A suitable location would be under Aim 3, which relates to the infrastructure provision in Itchingfield 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.***' 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.

Appendix A

Figure 4: Map of European sites relevant to the Itchingfield Neighbourhood Plan. The map also shows the two development sites allocated in the NP, namely the Sumners Ponds site and The Old School site.

Revision: 01 Drawn: CN Checked: TD Approved: DW Date: 05/11/2020

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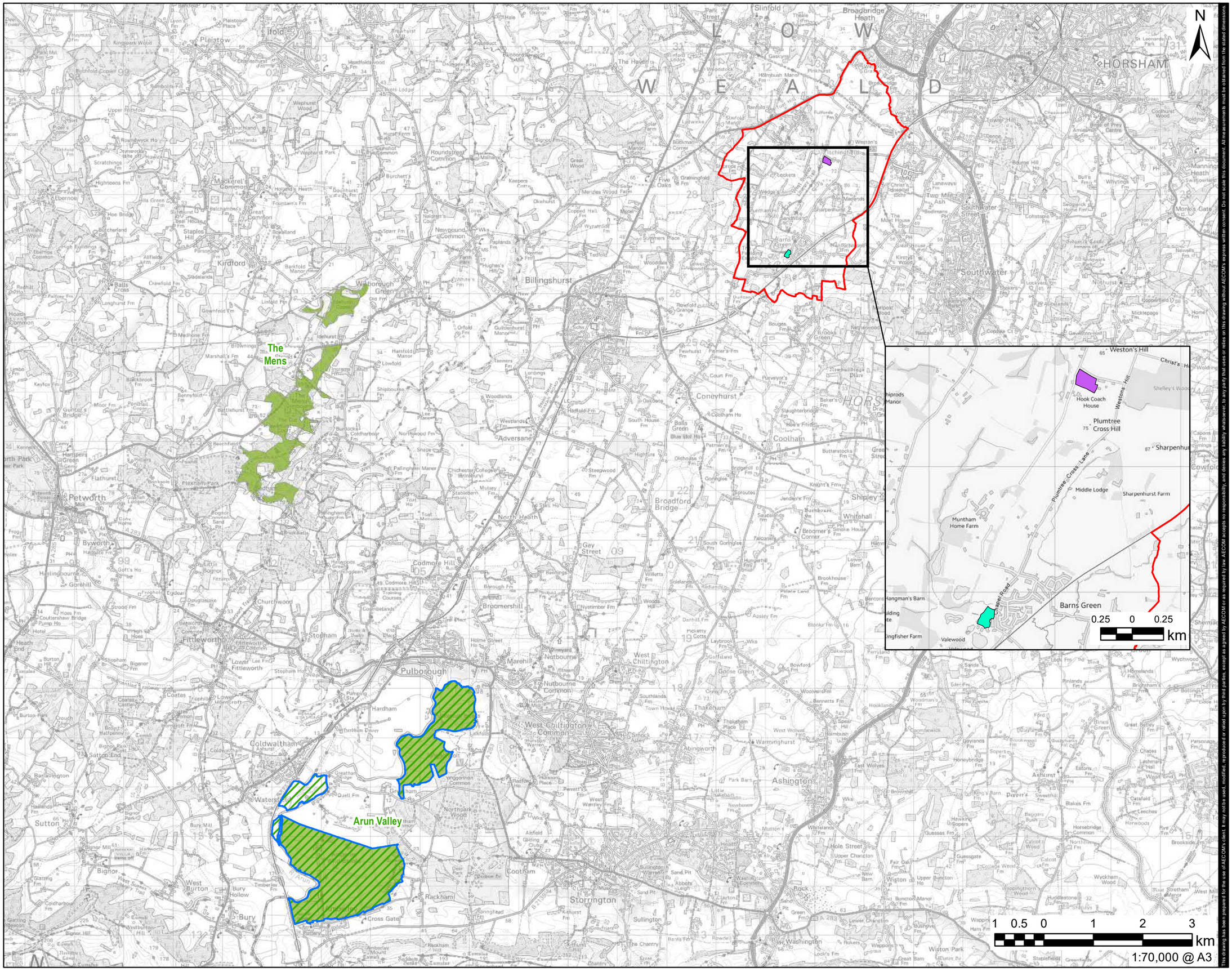

AECOM

PROJECT

HABITATS REGULATIONS ASSESSMENT OF THE ITCHINGFIELD NEIGHBOURHOOD PLAN

CLIENT

HORSHAM DISTRICT COUNCIL

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LEGEND

- Itchingfield Parish Boundary
- Arun Valley Ramsar
- Special Area of Conservation (SAC)
- Arun Valley Special Protection Area (SPA)

Site Allocation

- Old School Site
- Sumners Pond

NOTES

ISSUE PURPOSE

DRAFT

PROJECT NUMBER

60640455

SHEET TITLE

EUROPEAN SITES RELEVANT TO THE SITES ALLOCATED IN THE ITCHINGFIELD NEIGHBOURHOOD PLAN

SHEET NUMBER

FIGURE 1

Appendix B

Table 3: Likely Significant Effects (LSEs) screening table of the Itchingfield Neighbourhood Plan policies and aims.

Policy Number / Name	Text	Test of Likely Significant Effect
Chapter 4 – Environment and Heritage		
Aim 1 – Prevention of Coalescence	IPC will not support development in areas which would undermine, individually or cumulatively, physical separation between this parish and the parishes that surround it (Billingshurst, Southwater, Broadbridge Heath, Slinfold and Shipley). It is considered vitally important, to ensure the openness and rural character of the parish, that these open areas are protected and maintained. This will be done by offering full support to HDC in implementing HDPF Policy 27 and the relevant Policy in the Local Plan Review.	The are no Likely Significant Effects of this aim on European Sites. This aim stipulates that the coalescence of Itchingfield Parish with other parishes will be avoided. It is considered that this aim is positive because it will help prevent extensive loss of green infrastructure, including habitats such as hedgerows, trees and waterways, which may be important to barbastelle bats and that may be functionally linked to The Mens SAC. Overall, this is considered to be a positive aim and there are no impact pathways linking to European Sites. Therefore, Aim 1 is screened out from Appropriate Assessment.
Policy 1 – Green Infrastructure Provision	Development proposals shall, where possible and consistent with other policies in this Plan, incorporate the following measures: (a) measures that will conserve, maintain and/or enhance the green infrastructure of the parish. (b) provisions to produce additional green infrastructure.	The are no Likely Significant Effects of this policy on European Sites. This policy supports green infrastructure provision and increased accessibility for pedestrians / cyclists in the parish. It further stipulates that developments will have to

	(c) proposals which seek to improve access for pedestrians and cyclists through green infrastructure linkages will be supported. Proposals which would result in the loss of existing green infrastructure will be rejected unless it can be demonstrated that the development proposals bring new opportunities which mitigates or compensates land loss, whilst ensuring the protection of the existing ecosystem. Developers will be required to demonstrate how they intend to achieve a net gain in biodiversity.	mitigate or compensate for any green infrastructure loss. Overall, this is considered to be a positive policy and there are no impact pathways linking to European Sites. Therefore, Policy 1 is screened out from Appropriate Assessment.
Aim 2 – Managing Surface Water	Development proposals, which seek to reduce the risk of surface water flooding will be supported. Development proposals should seek to reduce existing run-off rates in the first instance. Development proposals which incorporate sustainable urban drainage techniques to manage surface water will be supported. Where technically feasible sustainable drainage techniques should include infiltration measures that reflect natural drainage patterns and manage water as close to its source as possible. Development proposals which seek to incorporate local measures to manage surface water will be supported.	The are no Likely Significant Effects of this aim on European Sites. This aim reduces the risk of surface water run-off from new developments in the parish, such as through sustainable urban drainage techniques (e.g. SuDS). New developments should achieve greenfield run-off rates wherever possible. While the European sites relevant to Itchingfield Parish lie too far from the parish for there to be realistic impacts through surface water run-off, this is considered to be a positive aim. There are no impact pathways linking to European Sites. Therefore, Aim 2 is screened out from Appropriate Assessment.
Policy 2: Biodiversity Conservation	Development proposals shall, where possible and consistent with other policies in this Plan, incorporate the following measures: (a) proposals that seek to ensure and enable the protection, conservation and enhancement of the parish's biodiversity and ecology including its hedgerows, ponds, orchards, roadside verges and woodland, including shaws and ancient and veteran trees This policy can be shown to be achieved by:	The are no Likely Significant Effects of this policy on European Sites. This policy seeks to protect, conserve and enhance the parish's biodiversity and ecology, including hedgerow, ponds, orchards, roadside verges and woodland. For example, detailed, cumulative impact assessments will

	(a) Informed and up-to-date ecological and biodiversity information, including the site surveys; (b) The identification and explanation of the impact that the proposed schemes would have on the biodiversity and ecology of the site and its environs; (c) The identification and explanation of cumulative impacts; (d) Avoiding harm, and where unavoidable, mitigating harm; (e) Maximise opportunities to enhance, manage and restore habitats, so that there is a net gain to biodiversity on the site, where practicable; where this is not practicable on site, then off-site within the parish; (f) Following best practice in Sustainable Drainage techniques.	be required, and biodiversity net gain will be required. The protection of habitat features in the parish is likely to be particularly important for barbastelle bats from The Mens SAC, which depend on functionally linked flightlines outside the SAC boundary. A preservation of these features will help mitigate any potential functionally linked habitat loss. Overall, this is a positive policy and there are no impact pathways linking to European Sites. Therefore, Policy 2 is screened out from Appropriate Assessment.
Policy 3: Heritage Assets and Itchingfield Conservation Area	Development proposals shall, where possible and consistent with other policies in this Plan, incorporate measures which seek to conserve heritage assets in a manner appropriate to their significance. Special regard shall be given to the desirability of preserving any heritage building, or its setting, and/or any features of special architectural interest which the building possesses. Development proposals for development within the Itchingfield Conservation Area and the setting within which it lies shall include measures which seek to conserve and enhance the Area.	The are no Likely Significant Effects of this policy on European Sites. This is a development management policy that seeks to protect heritage assets in the parish, such as heritage buildings of architectural interest (in the Itchingfield Conservation Area) and their wider setting in the landscape. However, heritage assets generally have no bearing on European sites. There are no impact pathways that link this policy to European sites. Therefore, the policy is screened out from Appropriate Assessment.
Policy 4: Protection of Open Spaces	Development proposals shall, where possible and consistent with other policies in this Plan, include measures which provide a mix of formal and informal open space to meet the needs generated by the development. Open space is to be of high quality and serve local need. The attached Map identifies the following areas of public open space:	The are no Likely Significant Effects of this policy on European Sites. This policy protects existing open spaces in the parish, including the Village Green,

	a) the Village Green and playing field; b) the Arboretum adjoining the village green; c) the Community Orchard at the rear of the Ashmiles development; d) Ancient Woodland at the rear of the Ashmiles development; 36 e) Play area in Two Mile Ash Road adjacent to the Ashmiles development; and f) Jubilee Field Development proposals which involve the replacement of existing open space, including the identified areas of public open space, shall include the following measures: 1. Equivalent (in qualitative and quantitate terms) or enhanced open space is provided to serve the current or existing needs of the residents of the parish; and 2. Proposals for the replacement of open space ensure the replacement is made available before the loss of the existing. Development proposals which result in the loss of existing open space, including the identified areas of public open space, shall comply with the following conditions: 1. An assessment has been undertaken which has clearly shown the facility to be surplus to requirements; or 2. The loss resulting from the proposed development would be replaced by equivalent or better provision in terms of quantity and quality in a suitable location; or 3. The development is for alternative sports and recreational provision, the needs for which clearly outweigh the loss.	ancient woodland, Jubilee Field and others. Development proposals that result in the replacement or loss of existing open space, must provide adequate replacements of such space. For European sites sensitive to recreational pressure, the provision or protection of outdoor space adjacent to new residential development is generally regarded as key to absorbing some of the emerging recreational pressure locally. However, the Arun Valley SPA / Ramsar and The Mens SAC are not considered to be especially sensitive to recreation (see main body of text). Overall, this is a positive policy and there are no impact pathways linking to European sites. Therefore, Policy 4 is screened out from Appropriate Assessment.
Policy 5: Protection of Green Infrastructure	Development proposals shall, where possible and consistent with other policies in this Plan, incorporate measures that will protect and enhance the green infrastructure and valued landscape features of the parish, such as:	The are no Likely Significant Effects of this policy on European Sites.

	1. The Downs Link; 2. Public Rights of Way and their settings; 3. Hedgerows; 4. Copses and woods, ancient woodlands and veteran trees; 5. Orchards; particularly the Asmiles Community Orchard; 6. River corridors (such as, but not limited to: River Arun; River Adur; Parsons' Brook).	This policy stipulates the protection and enhancement of green infrastructure and landscape features in the parish, including hedgerows, copses and woods, orchards and river corridors. From an HRA perspective, the protection of these habitat features is important to barbastelle bats from The Mens SAC, which will use linear landscape features for navigation. The preservation of the River Arun corridor is also important as this might be used as a commuting route from the SAC towards the wider area around Itchingfield Parish (see main body of text). This policy augments Policy 2, which also benefits the habitat requirements of barbastelle. Overall, this is considered to be a positive policy and there are no impact pathways linking to European Sites. Therefore, Policy 5 is screened out from Appropriate Assessment.
Aim 3 – Infrastructure Provision	Development proposals which confirm that adequate infrastructure will be provided will be supported.	The are no Likely Significant Effects of this aim on European Sites. This aim has a development management purpose and stipulates that new development proposals must confirm adequate infrastructure is in place for their support. While it is a very broad aim, effectively encompassing all types of infrastructure, it also implies that new developments would have to be served by adequate sewerage and WwTW infrastructure. This is important for

		protecting the water quality in the Arun Valley SPA / Ramsar / SAC (see main body of the text). Overall, this is a positive aim and there are no impact pathways linking this aim to European sites. Therefore, Aim 3 is screened out from Appropriate Assessment.
Policy 6: Community Facilities Protection	Development proposals shall, where possible and consistent with other policies in this Plan, incorporate measures that: (a) avoid the loss of community facilities (unless the facility in question is no longer viable, in which case the developer will be required to undertake a viability assessment and marketing strategy before a change of use is allowed); (b) avoid the substantial alteration and/or replacement of community facilities except where: 1. Equivalent (in qualitative and quantitative terms) or enhanced facilities are provided to serve local needs; and 2. Proposals for the replacement of a community facility ensure the replacement facility is made available before the closure of the existing facility. 39 (c) IPC will support development proposals which provide for new community facilities or which provide for expansion of existing facilities to support the needs of the community.	The are no Likely Significant Effects of this policy on European Sites. This policy protects community facilities, unless a facility is no longer viable. However, community facilities have no bearing on European sites. There are no impact pathways that link this policy to European sites. Therefore, Policy 6 is screened out from Appropriate Assessment.
Policy 7: Education Facilities Development	Development proposals for additional buildings and/or facilities at Barns Green Primary School shall, where possible and consistent with other policies in this Plan, incorporate the following measures: a) Built form is contained (where possible) within the current BUAB; b) Proposals protect any heritage assets and their setting; and c) Impact on local amenity is acceptable.	The are no Likely Significant Effects of this policy on European Sites. This policy sets out development guidelines for additional buildings / facilities at Barns Green primary School. However, this particular development has no bearing on European sites, particularly because it does

		not involve developments of residential or employment nature. There are no impact pathways that link this policy to European sites. Therefore, Policy 7 is screened out from Appropriate Assessment.
Policy 8: Broadband Provision	Proposals to provide access to a super-fast broadband network (that is to say, broadband connections of at least 30Mbpm) and mobile phone connectivity of 5G, to serve the Parish will need to demonstrate that the opportunity to expand the broadband connections of at least 30Mbpm, and 5G connectivity, has been explored and, where possible, achieved. The location and design of any above-ground network installations shall be sympathetically chosen and designed not adversely to affect the character of the local area nor the amenity of local residents.	The are no Likely Significant Effects of this policy on European Sites. This policy sets out the broadband provision in Itchingfield Parish. However, such facilities have no potential impacts on European sites. There are no impact pathways linking this policy to European sites. Therefore, Policy 8 is screened out from Appropriate Assessment.
Policy 9: Sumners Ponds Site	Development proposals for around 32 residential units and 7 light industrial/commercial units, on land at Sumners Ponds shall include the following measures: 1. Proposals provide a mix of dwelling type and size to meet the needs of current and future households; 2. The design positively responds to the prevailing character of the surrounding area; 3. Proposals include “affordable housing” dwellings pursuant to HDC Policies; 4. Where possible, proposals allow for the retention and enhancement of existing mature tree belts and hedgerows on the northern and eastern boundaries; 5. Proposals must demonstrate special regard for the listed building “Little Slaughterford” (on the northern boundary of the site) and its setting and/or any features or special architectural or historic interest which it possesses through sensitive design and boundary treatment, and measures must be taken to ensure that there is no contamination from any part of the site onto or into “Little Slaughterford”, or any neighbouring property, from existing substances or	Likely Significant Effects (LSEs) of this policy on European Sites cannot be excluded. This policy allocates 32 residential units and seven light industrial / commercial units on land at Sumners Ponds. It also sets out specific development criteria, including safe vehicle access routes, adequate sewerage infrastructure, sufficient parking spaces and floorspace size. **The following impact pathways are generally associated with an increase in population size and employment provision:** • **Loss of functionally linked habitat** • **Water quantity, level and flow**

	substances emanating from the new development or the continuing occupation and use thereof; 6. Proposals ensure safe vehicle access and egress to and from Chapel Road, including adequate sightlines for emerging vehicles; 7. The layout is planned to ensure proper and adequate access to existing sewerage infrastructure for maintenance and upsizing purposes; 8. Proposals ensure adequate parking for residents and visitors; that is to say, that parking spaces will be provided to prevent (as far as is practicable) car parking on the roads of the development. 9. Any light industrial/commercial units shall not exceed 2000 square metres of ground space. The units shall not exceed eaves height of 4.5 metres and ridge height of 6.5 metres. The units shall be clad in natural material and shall have a pitched roof. The design and appearance of the units shall be in sympathy with the rural surroundings of the village. The units shall be no less than 25 metres from Chapel Road and 20 metres from any house.	• **Water quality** • **Atmospheric pollution** • **Recreational pressure** Because LSEs in relation to some of these linking impact pathways cannot be excluded, Policy 9 is screened in for Appropriate Assessment.
Policy 10: Old School Site, Itchingfield	Development proposals around 20 residential units on land at the site of the old School, Itchingfield Road, Itchingfield shall include the following measures: 1. Proposals provide a mix of dwelling type and size to meet the needs of current and future households; 2. The design positively responds to the prevailing character of the surrounding area, having particular regard to the setting of Itchingfield Conservation Area to the north of the site, and Itchingfield House to the south-west of the site; 3. Proposals include “affordable housing” dwellings pursuant to the HDC policies; 4. Proposals allow for the retention of existing mature trees and hedgerows on the southern boundary; 5. Proposals ensure safe vehicle access and egress to and from Itchingfield Road, including adequate sightlines for emerging vehicles; 6. The layout is planned to ensure proper and adequate access to existing sewerage infrastructure for maintenance and upsizing purposes;	Likely Significant Effects (LSEs) of this policy on European Sites cannot be excluded. This policy allocates 20 residential units at the Old School site in Itchingfield village. It also sets out specific development criteria, including the retention of existing mature trees and hedgerows, safe vehicle access routes, adequate sewerage infrastructure and sufficient parking spaces. **The following impact pathways are generally associated with an increase in population size:** • **Loss of functionally linked habitat** • **Water quantity, level and flow** • **Water quality**

	7. Proposals ensure adequate parking for residents and visitors; that is to say, that parking spaces will be provided to prevent (as far as is practicable) car parking on the roads of the development.	• **Atmospheric pollution** • **Recreational pressure** Because LSEs in relation to some of these linking impact pathways cannot be excluded, Policy 10 is screened in for Appropriate Assessment.
Policy 11: Windfall Development	Development proposals for residential development on unidentified sites within the Built-Up Area Boundary will be supported where proposals: (a) are proportionate in scale; (b) relate positively in design terms to the character of the area; and (c) avoid unacceptable harm to the amenity of any existing dwelling on the site and to nearby properties.	Likely Significant Effects (LSEs) of this policy on European Sites cannot be excluded. This policy supports windfall development within the Built-Up Area Boundary, which by definition cannot be quantified as it represents 'unexpected' development opportunities. The policy also sets out specific criteria that windfall proposals must satisfy, including proportionality in scale and the avoidance on unacceptable harm to existing properties. **The following impact pathways are generally associated with an increase in population size:** • **Loss of functionally linked habitat** • **Water quantity, level and flow** • **Water quality** • **Atmospheric pollution** • **Recreational pressure** Because LSEs in relation to some of these linking impact pathways cannot be excluded, Policy 11 is screened in for Appropriate Assessment.

Policy 12: Design Parameters	Development proposals shall, where possible and consistent with other policies in this Plan, incorporate the following measures in relation to character and design. Any development will not be supported unless the character and design of the development meet the following criteria: that the development shall: 1. Be of high quality design and layout; 2. Contribute positively to the private and public realm to create a sense of place; 3. Respect the character and scale of the surrounding buildings and landscape; 4. Protect open spaces and gardens that contribute to the character of the area; 5. Protect the identity and character of Barns Green and Itchingfield; 6. Does not cause unacceptable harm to the amenities of existing nearby residents and future occupants of new dwellings, including taking account of the impact on privacy, outlook, daylight, sunlight and security; 7. Create safe, accessible and well connected environments 8. Protect existing landscape features and contributes to the parish's Green Infrastructure network; 9. Incorporate the use of local materials which are appropriate to the existing housing stock; 10 .Positively respond to the local vernacular character of the parish.	The are no Likely Significant Effects of this policy on European Sites. This policy sets out essential design parameters for new development proposals, including the provision of a sense of place, protection of the identity of Barns Green and Itchingfield, providing accessible and well-connected environments and protecting existing Green Infrastructure landscape features. There are no impact pathways that link this policy to European sites. Therefore, Policy 12 is screened out from Appropriate Assessment.
Policy 13: Sustainable Design	Development proposals shall seek to improve the sustainability of development. Development proposals will, where possible and subject to other policies in this Plan, incorporate the following measures: (a) Electric car charging points (b) Solar panels of appropriate and unobstructive design. (c) Solar heating panels, ground- and air-source heat systems	The are no Likely Significant Effects of this policy on European Sites. This policy stipulates that new development proposals shall provide sustainability measures, including electric vehicle charging points and solar panels. However, sustainable technologies are not considered to be relevant to European sites.

		There are no impact pathways linking this policy to European sites. Therefore, Policy 13 is screened out from Appropriate Assessment.
Policy 14: Housing Mix	Development proposals shall provide a mix of predominantly one, two, three, bedroom houses will be supported, subject to the development needs of the particular sites and any Policy in relation to that site.	The are no Likely Significant Effects of this policy on European Sites. This policy sets out the housing mix (in relation to the number of bedrooms to be provided in developments) for Itchingfield Parish. However, the nature of the housing mix is not considered to affect European sites. There are no impact pathways linking this policy to European sites. Therefore, Policy 14 is screened out from Appropriate Assessment.
Aim 4 – Housing Mix (Apartments)	IPC will support the provision of one or two-storey detached, semi-detached flatted development or terraced houses in the parish, subject to compliance with other Policies and Aims in this Plan. Where development proposes flatted development accommodation, IPC will support the provision of such flats, subject to compliance with other Policies and Aims in this Plan.	The are no Likely Significant Effects of this aim on European Sites. This aim identifies that the Parish Council will support the provision of one- or two-storey housing, as well as the provision of flats. However, the housing type provided is not considered to materially affect European sites. There are no impact pathways linking this aim to European sites. Therefore, Aim 4 is screened out from Appropriate Assessment.
Policy 15: Parking Provision	Development shall include provision of off-road parking for residents of, and visitors to, the development in compliance with West Sussex County Council requirements.	The are no Likely Significant Effects of this policy on European Sites. This policy identifies that new developments will have to provide off-road parking for new

		residents (in compliance with West Sussex County Council requirements). However, the provision of car parking space has material effect on European sites. There are no impact pathways linking this policy to European sites. Therefore, Policy 15 is screened out from Appropriate Assessment.
Aim 5 – Traveller Sites	Save as for 10 pitches (together with touring 4 caravans) at Greenfield Farm, West Chiltington Lane, Barns Green, Itchingfield, and 11 pitches at Kingfisher Farm, West Chiltington Lane, Barns Green; any suggested need for further, or fewer, pitches or additional caravans within the parish will be looked at again when the review of the draft Horsham District Council Gypsy, Traveller and Travelling Showpeople Draft Site Allocations Development Plan Document (DPD) (December 2017) is available.	Likely Significant Effects (LSEs) of this aim on European Sites cannot be excluded. This aim safeguards a total of 21 traveller pitches and 4 touring caravans throughout Itchingfield Parish. This quantum will be reviewed when the relevant supporting DPD is available. The provision of additional traveller sites effectively represents an increase in the local population similar to that which occurs through new residential dwellings. **The following impact pathways are generally associated with an increase in population size:** • **Loss of functionally linked habitat** • **Water quantity, level and flow** • **Water quality** • **Atmospheric pollution** • **Recreational pressure** Because LSEs in relation to some of these linking impact pathways cannot be excluded, Aim 5 is screened in for Appropriate Assessment.

Policy 16: Small-scale Businesses	Development proposals which enable the development of, or expansion of, small-scale businesses will be supported where: a) they are located within the BUAB; OR b) contained within existing buildings; OR c) are on previously-developed land. Such business development must be shown to be viable, sustainable and likely to benefit the local economy and/or the wellbeing of the parish. The provision of viable small business premises or retail properties within new developments will also be supported where economically sustainable and in accordance with this policy. In addition, development proposals will be supported where development: d) does not involve the loss of dwellings unless the benefit outweighs the loss; e) proposals are in keeping with the character and vitality of the local area; c) proposals respect local residential amenity; and d) proposals would not have an unacceptable impact on the local road network. In this Policy, “small-scale” means a business operated by, or employing, less than 5 persons and which business can operate from a space up to 1000 sq m	Likely Significant Effects (LSEs) of this policy on European Sites cannot be excluded. This policy supports development proposals on previously developed land that provide or expand small-scale businesses (identified as employing up to 5 people and operating on a maximum floorspace of 1,000m2). It also defines additional development parameters, such as impact on the local road network. Although addressing small-scale development, typical impact pathways are associated with this policy because such developments can act in-combination with other proposals (e.g. Policy 9). **The following impact pathways are generally associated with an increase in employment provision:** • **Loss of functionally linked habitat** • **Water quantity, level and flow** • **Water quality** • **Atmospheric pollution** • **Recreational pressure** Because LSEs in relation to some of these linking impact pathways cannot be excluded, Policy 16 is screened in for Appropriate Assessment.
Aim 6 – Public Rights of Way	IPC will support development which does not encroach upon, or interfere with, established public rights of way. Where rights of way, green spaces and other natural features are currently bordered by natural hedgerows it will not be acceptable to replace such hedgerows with fences or walls.	The are no Likely Significant Effects of this aim on European Sites. This aim protects the Public Rights of Way and bordering natural features (e.g.

	If this is, in all the circumstances of the development proposal, impossible to achieve, the issue of mitigation and/or compensation shall be addressed.	hedgerows) throughout the parish. In doing so, the aim effectively safeguards the accessibility and connectivity of the parish regarding sustainable travel modes. Overall, this is a positive aim and there are no impact pathways linking to European sites. Therefore, Aim 6 is screened out from Appropriate Assessment.
Aim 7 – Bus Transport	IPC will support development proposals which provide convenient access to public bus transport, subject to compliance with other policies in the INP.	The are no Likely Significant Effects of this aim on European Sites. This aim supports development proposals that provide access to public bus transport. In doing so, the aim encourages sustainable transport modes and potentially helps reduce private car usage. This could benefit European sites that have been identified as being sensitive to atmospheric pollution arising from the Itchingfield NP. Overall, this is a positive aim and there are no impact pathways linking to European sites. Therefore, Aim 7 is screened out from Appropriate Assessment.
Aim 8 – Access For Emergency Vehicles	IPC will support development proposals which provide sufficient unimpeded access for emergency and public-service vehicles both within the development and immediately leading to the development.	The are no Likely Significant Effects of this aim on European Sites. This aim supports development proposals that provide access for emergency vehicles. This aim is irrelevant to European sites.

		There are no impact pathways linking to European sites. Therefore, Aim 8 is screened out from Appropriate Assessment.
Aim 9 – Pedestrian Pavements	IPC will support development proposals which include the provision of pedestrian pavements allowing safe passage for pedestrians past and through the development. The footpaths should be treated with suitable surfacing materials that reflect the rural character of the district. Black tarmac for both footpaths and roads should be avoided.	The are no Likely Significant Effects of this aim on European Sites. This aim provides for pedestrian pavements linking to and through new developments. However, the localized provision of pavements (although positive) is not relevant to European sites. There are no impact pathways linking to European sites. Therefore, Aim 9 is screened out from Appropriate Assessment.
Aim 10 – Increase Of Traffic	IPC will not support development proposals which would result in significant increases in traffic movements which have a disproportionately adverse affect on the Parish as a whole or on the locality surrounding the development.	The are no Likely Significant Effects of this aim on European Sites. This aim identifies that Itchingfield Parish Council will not support developments that would result in significant increases in traffic movements. This is a positive general aim, as it limits the potential impacts of traffic on European sites. For example, this would mean that the NP could not materially increase the nitrogen deposition in sensitive European sites, such as The Mens SAC. There are no impact pathways linking to European sites. Therefore, Aim 10 is screened out from Appropriate Assessment.