

Wokingham Local Plan Update

Reg.19 HRA

Wokingham Borough Council

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Quality information

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1. Introduction

Background

- 1.1 AECOM was appointed by Wokingham Borough Council (hereafter referred to as 'WBC') to undertake a report to inform the Habitats Regulations Assessment (HRA) of its Regulation 19 Wokingham Borough Local Plan Update (WBLPU). The objective of this assessment is to identify any aspects of the WBLPU that may result in Likely Significant Effects (LSEs) and, where these are present, adverse effects on the integrity of Habitats Sites, (formerly referred to as European sites), including Special Areas of Conservation (SACs), Special Protection Areas (SPAs) and, as a matter of Government policy, Ramsar sites. Under the Conservation of Habitats and Species Regulations 2017 (as amended), an Appropriate Assessment (AA; a more detailed stage of analysis) is required, where a plan or project is likely to result in LSEs on Habitats Sites. HRA appraisal considers potential impacts alone and in-combination with other plans and projects. Where adverse effects on site integrity cannot be excluded, the AA also advises on appropriate policy mechanisms to completely avoid or mitigate the impact.
- 1.2 The emerging WBLPU will cover the period between 2023 and 2040, detailing WBC's strategy for managing development to deliver their vision for the borough and providing the legal framework within which new planning applications will be assessed. The WBLPU comprises several components, such as Strategic Policies (identifying the spatial strategy for different parts of Wokingham Borough, such as the delivery of new housing and employment land in Strategic Development Locations) and Design and Connections Policies (stipulating detail on the criteria that future development will have to satisfy).
- 1.3 Wokingham Borough lies in the heart of the Thames Valley, approx. 50km west of London. It covers an area of 17,892ha and is divided into 17 parishes, which comprise a range of settlements including Earley, Winnersh, Woodley and Wokingham. The borough is permeated by good transport connections, both in terms of the available road network and public transport. For example, the M4 runs on a west-east trajectory through the centre and provides good connectivity for commuters travelling to adjoining boroughs and Greater London. The borough supports a population of 177,502, with a population growth of 15% between 2011 and 2021.
- 1.4 The WBLPU seeks to achieve visions of meeting the needs of its community, sustainability and delivering the 'right kind of growth'. Two key targets of the WBLPU with direct relevance to HRA are the delivery of more jobs and homes. For example, it has been identified that Wokingham Borough has a net need of 24,741m³ of industrial floorspace, and net need of 15,531m² of office floor space in the period to 2040, with additional employment floorspace being delivered through consented planning applications. Furthermore, as determined by the nationally calculated local housing need, an additional 12,763 new dwellings are required over the WBLPU timeline. To this end, WBC have identified Strategic Development Locations and further housing allocations that will deliver the housing requirement over the Plan period.

- 1.5 There are no Habitats Sites within Wokingham Borough, although there are several such sites within 15km of the authority boundary, the closest one being the Thames Basin Heaths SPA. The SPA is designated for several breeding bird species (i.e. nightjar, woodlark, and Dartford warbler) that nest on, or close to, the ground. Given the SPA's location in a densely populated landscape, it has been under long-standing pressure from development impacts in relation to recreational pressure and atmospheric pollution. The closest component parts of the SPA to Wokingham Borough are the Bramshill SSSI and Broadmoor to Bagshot Woods and Heaths SSSI.
- 1.6 Other Habitats Sites lie further from Wokingham Borough than the Thames Basin Heaths SPA. Relevant sites are Thursley, Ash, Pirbright & Chobham SAC, Windsor Forest & Great Park SAC, Burnham Beeches SAC and Hartslock Wood SAC. These SAC sites are designated for their habitats and non-avian species.

Legislation

- 1.7 The UK left the European Union (EU) on 31 January 2020 under the terms set out in the EU (Withdrawal Agreement) Act 2020 ("the Withdrawal Act"). While the UK is no longer a member of the EU, a requirement for HRA continues as set out in the Conservation of Habitats and Species (Amendment) (EU Exit) Regulations 2019¹.
- 1.8 The HRA process applies the 'Precautionary Principle'² to Habitats Sites. Plans and projects can only be permitted having ascertained that there will be no adverse effect on the integrity of the Habitats Site(s) in question. To ascertain whether or not site integrity will be affected, an AA should be undertaken of the relevant Plan or project. Figure 1 below sets out the legislative basis for AA.
- 1.9 Plans and projects for which adverse effects on Habitats Sites cannot be excluded, avoided or mitigated, may still be permitted if there are no reasonable alternatives 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.

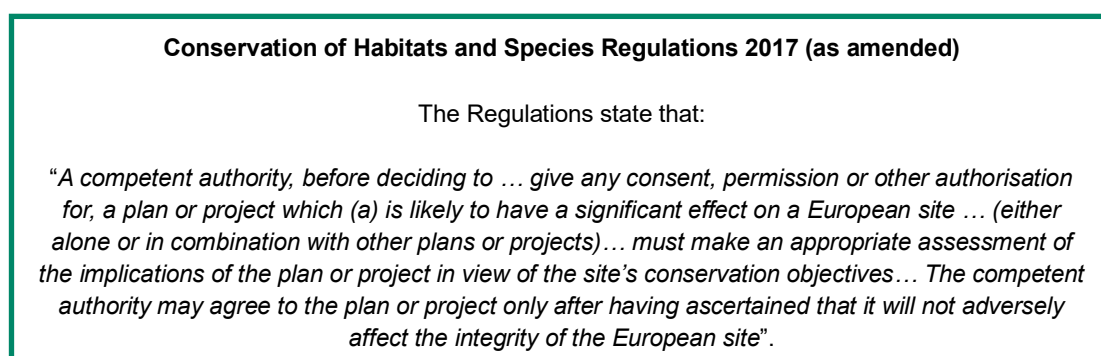


Figure 1: The legislative basis for Appropriate Assessment.

- 1.10 Over time the phrase 'Habitats Regulations Assessment' (HRA) has come into wide currency to describe the overall process set out in the Regulations from

¹ These don't replace the 2017 Regulations but are just another set of amendments.

² 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"*.

Screening through to IROPI. This has arisen in order to distinguish the process from the individual stage described in the law as ‘Appropriate Assessment’.

1.11 In spring 2018 the ‘Sweetman’ European Court of Justice ruling³ clarified that ‘mitigation’ (i.e. measures that are specifically introduced to avoid or reduce a harmful effect on a Habitats Site that would otherwise arise) should **not** be taken into account when forming a view on LSEs. Mitigation should instead only be considered at the AA stage. This HRA is cognisant of that ruling.

Project Scope

1.12 There is no pre-defined guidance that dictates the physical scope of an HRA of a Plan document. Current guidance suggests that the following Habitats Sites should be included in the scope:

- All Habitats Sites within the boundary of Wokingham Borough; and,
- Other Habitats Sites shown to be linked to development in Wokingham Borough through a known ‘pathway’ (discussed below).

1.13 Generally, it is uncommon for development plans to result in significant impacts on Habitats Sites situated more than 10km from areas of growth. For example, most core recreational catchments (except for some coastal sites) are under 10km in size and the average vehicle commuting distance of a UK resident is approx. 10km. It should be noted that the presence of a conceivable impact pathway linking a Plan to a Habitats Site does not mean that LSEs will occur.

1.14 In some cases, development impacts can extend beyond 10km, particularly where hydrological pathways are involved, which is why the source-pathway-receptor concept is also used to help determine whether there are potential pathways connecting development to Habitats Sites. This takes site-specific sensitivities into account, including issues such as nutrient neutrality or water levels, quantity and flow.

1.15 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 Habitats Site. An example of this would be new residential development resulting in an increased population and thus increased demand on recreational resources, which could affect Habitats Sites through, for example, disturbance of breeding birds. 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).

1.16 This basic principle has also been reflected in court rulings. The Court of Appeal⁴ has 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 planning permissions (rather than a Plan level document)⁵. 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*

³ People Over Wind and Sweetman v Coillte Teoranta (C-323/17)

⁴No Adastral New Town Ltd (NANT) v Suffolk Coastal District Council Court of Appeal, 17th February 2015

⁵High Court case of R (Devon Wildlife Trust) v Teignbridge District Council, 28 July 2015

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’.

1.17 Given an initial assessment of the relevant Habitats Sites and the impact pathways present, and referring to the HRA work that was undertaken for the Reg.18 version of the WLP, this HRA will discuss (at least as far as the LSEs stage) the following Habitats Sites:

- Thames Basin Heaths SPA (the closest component part is Bramshill SSSI, located 0.06km from Wokingham Borough at its southern extent, and Broadmoor to Bagshot Woods and Heaths SSSI located 0.01km from Wokingham Borough to the east);
- Chilterns Beechwoods SAC (the closest component part, the Hollowhill and Pullingshill Woods SSSI, lies approx. 2.9km to the north-east of Wokingham Borough);
- Thursley, Ash, Pirbright & Chobham SAC (the closest component part, the Colony Bog and Bagshot Heath SSSI, lies approx. 6.9km to the south-east of Wokingham Borough);
- Windsor Forest & Great Park SAC (located approx. 8.5km to the east of Wokingham Borough);
- Aston Rowant SAC (located approx. 11.3km to the north of Wokingham Borough);
- Hartslock Wood SAC (located approx. 11.8km to the west of Wokingham Borough); and
- Burnham Beeches SAC (located approx. 13.2km to the north-east of Wokingham Borough).

1.18 For the HRA, the views of the statutory nature conservation advisors, namely Natural England, will be sought as part of the consultation process on the identified scope. The distribution of the above Habitats Sites in relation to Wokingham Borough is shown in Appendix A. An introduction, the qualifying features (species and habitats), Conservation Objectives, and threats and pressures to the integrity of these Habitats Sites are set out in Chapter 3.

1.19 In order to fully inform the HRA, several studies and online information databases have been consulted, including:

- Future development proposed in the Local Plans and Core Strategies of the adjoining authorities of South Oxfordshire, Wycombe, Windsor and Maidenhead, Bracknell Forest, Hart, Basingstoke and Dean, West Berkshire and Reading borough;
- HRAs produced for the Reg.18 WBLPU and development plans of adjoining authorities;
- Road traffic statistics from the Department for Transport (<https://roadtraffic.dft.gov.uk>);

- Journey-to-work data from the 2011 Population Census (<https://www.nomisweb.co.uk/census/2011/WU03UK>);
- Natural England's Site Improvement Plans (SIPs) and Supplementary Advice on Conservation Objectives (SACOs) for all identified Habitats Sites;
- The UK Air Pollution Information System (www.apis.ac.uk);
- Traffic and air quality modelling specifically undertaken to inform the HRA; and
- Multi Agency Geographic Information for the Countryside (MAGIC) and its links to SSSI citations and the JNCC website (www.magic.gov.uk).

Quality Assurance

1.20 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.

1.21 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, 2022).

2. Methodology

Introduction

- 2.1 The HRA has been carried out with reference to the general EC guidance on HRA⁶ and general guidance on HRA published by government in July 2019⁷. AECOM has also been mindful of the implications of European case law in 2018, notably the Holohan ruling and the People over Wind ruling, both discussed below.
- 2.2 Figure 2 below outlines the stages of HRA according to current EC guidance. The stages are essentially iterative, being revisited as necessary in response to more detailed information becoming available, recommendations incorporated and any relevant changes to the Plan being made.

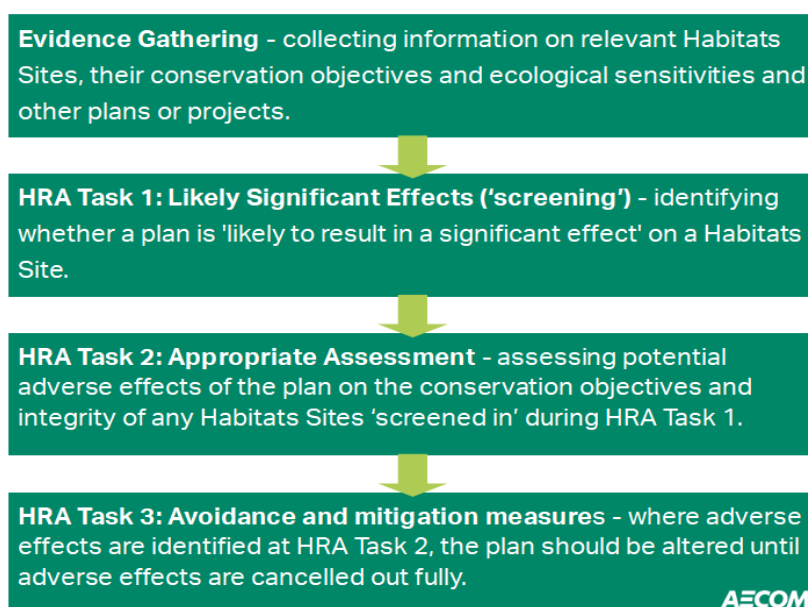


Figure 2: Four Stage Approach to HRA. (Adapted from EC, 2001¹)

Description of HRA Tasks

HRA Task 1 – Screening for Likely Significant Effects (LSEs)

- 2.3 Following evidence gathering, the first stage of any HRA is the screening for LSEs, essentially a high-level assessment to decide whether the full subsequent stage known as AA 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?"

- 2.4 The objective is to filter out those plans and projects that can, without any detailed appraisal, be concluded to be unlikely to result in any impacts upon

⁶ European Commission (2001): Assessment of plans and projects significantly affecting Natura 2000 Sites: Methodological Guidance on the Provisions of Article 6(3) and 6(4) of the Habitats Directive.

⁷ <https://www.gov.uk/guidance/appropriate-assessment>

Habitats Sites, usually because there is no mechanism for a negative interaction. This stage is undertaken in Chapter 5 of this report and in Appendix B.

HRA Task 2 – Appropriate Assessment (AA)

- 2.5 Where it is determined that a conclusion of ‘no LSEs’ cannot be drawn, the analysis proceeds to the next stage of HRA known as AA. Case law has clarified that AA 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 AA compared to the Screening stage.
- 2.6 By virtue of the fact that it follows Screening, there is a clear implication that the analysis will be more detailed than undertaken at the previous stage. One of the key considerations during AA is whether there is available mitigation that would entirely address any potential adverse effects. In practice, the AA would take any policies or allocations that could not be dismissed following the high-level screening and assess the potential for an effect in more detail, with a view to concluding whether there would be a potential for an adverse effect on site integrity (in other words, disruption of the coherent structure and function of the Habitats Site(s)).
- 2.7 Also, in 2018 the Holohan ruling⁸ 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]. Due account of this decision has been given in this HRA in relation to the Thames Basin Heaths SPA, which is designated for mobile breeding birds.

HRA Task 3 – Avoidance and Mitigation

- 2.8 Where necessary, measures are recommended for incorporation into the Plan in order to avoid or mitigate adverse effects on Habitats Sites. There is considerable precedent concerning the level of detail that a Local Plan document needs to contain regarding mitigation for impact pathways on Habitats Sites (e.g. regarding recreational pressure). The implication of this precedent is that it is not necessary for all measures to be fully developed prior to adoption of the Plan, but it must provide an adequate policy framework within which these measures can be delivered.
- 2.9 When discussing mitigation for a high-level development plan, one is concerned primarily with the policy framework to enable the delivery of such mitigation rather than the details of the mitigation measures themselves.
- 2.10 In any plan, there are numerous policies for which there is a limit to the degree of assessment that is possible at this strategic level. This is because either:
- The policy in question does not contain any specifics as to what will be delivered or where, and so cannot be assessed in detail. In these cases, the AA focusses on precautionary mitigation that can be included in the

⁸ Case C-461/17

plan to ensure that whatever proposals come forward will not result in adverse effects on integrity; or

- The nature of potential impacts (e.g. visual and noise disturbance arising from construction or loss of functionally linked habitat) is related to how the development will be designed and constructed. In these instances, the AA focusses on available mitigation measures, the extent to which such measures would be achievable and effective, and whether an adequate protective framework exists to ensure that the policy would not lead to an adverse effect on the integrity of any Habitats Sites. Typically, the AA will also discuss the requirement of project-level HRAs where detail at the plan-level is insufficient.

2.11 In these instances, the advice of Advocate-General Kokott⁹ is also worth considering. She commented that: *'It would ...hardly be proper to require a greater level of detail in preceding plans [rather than planning applications] or the abolition of multi-stage planning and approval procedures so that the assessment of implications can be concentrated on one point in the procedure. Rather, adverse effects on areas of conservation must be assessed at every relevant stage of the procedure to the extent possible on the basis of the precision of the plan. This assessment is to be updated with increasing specificity in subsequent stages of the procedure'* [emphasis added].

⁹ Opinion of Advocate General Kokott, 9th June 2005, Case C-6/04. Commission of the European Communities v United Kingdom of Great Britain and Northern Ireland, paragraph 49 <http://curia.europa.eu/juris/document/document.jsf?docid=58359&doclang=EN>

3. Relevant Habitats Sites

Chilterns Beechwoods SAC

Introduction

- 3.1 The Chilterns Beechwoods represent a very extensive tract of *Asperulo-Fagetum* beech forests in the centre of the habitat's UK range. The SAC comprises a number of semi-natural component woodlands in which beech *Fagus sylvatica* is the most prominent and / or dominant canopy tree. The woodland components occur in a variety of settings, including a variety of soil types ranging from nutrient-poor, highly calcareous soils to clay-rich, poorly drained soils on the plateaus. One distinctive feature in the woodland flora is the occurrence of the rare coralroot *Cardamine bulbifera*.
- 3.2 As a result of the diverse location of the SAC parcels, their woodland character varies substantially and is also greatly influenced by the woodlands' past management histories. Many of the component woodlands were formerly an important source of timber for furniture production. However, in recent times the Chilterns Beechwoods SAC has become a highly valued recreational resource, particularly for hiking and cycling. The closest component part of the Chilterns Beechwoods SAC, Pullingshill Wood, lies approx. 2.8km to the north-east of Wokingham Borough in Buckinghamshire.

Qualifying Features¹⁰

- 3.3 The site was designated as being of European importance for the following features:
- 3.4 Annex I habitats that are a primary reason for selection of this site:
- *Asperulo-Fagetum* beech forests
- 3.5 Annex I habitats present as a qualifying feature, but not a primary reason for selection of this site:
- Semi-natural dry grasslands and scrubland facies on calcareous substrates (*Festuco-Brometalia*; important orchid sites)
- 3.6 Annex II species present as a qualifying feature, but not a primary reason for selection of this site:
- Stag beetle *Lucanus cervus*

Conservation Objectives¹¹

- 3.7 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;

¹⁰ <https://sac.jncc.gov.uk/site/UK0012724> [Accessed on the 23/08/2024]

¹¹ <http://publications.naturalengland.org.uk/publication/4808896162037760> [Accessed on the 23/08/2024]

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

3.8 The following threats and pressures to the site integrity of the Chilterns Beechwoods SAC have been identified in Natural England’s Site Improvement Plan (SIP)¹² and Supplementary Advice on Conservation Objectives (SACO)¹³:

- Forestry and woodland management
- Deer
- Changes in species distributions
- Invasive species
- Disease
- Public access / disturbance
- Air pollution: Impact of atmospheric nitrogen deposition

Thames Basin Heaths SPA

Introduction

3.9 The Thames Basin Heaths Special Protection Area (SPA) consists of 8,274ha of lowland heathland spanning 11 authorities. It predominantly comprises dry and wet heath but also includes area of deciduous woodland, gorse scrub, acid grassland and mire, as well as associated conifer plantations. Historically, these habitats were almost continuous, but they are now fragmented by roads, housing and farmland. Most importantly from a conservation perspective, this heathland complex supports important breeding bird populations, such as the ground-nesting species nightjar and woodlark and the Dartford warbler, which nests close to the ground in heather or gorse.

3.10 Around 75% of the SPA has open public access being either common land or designated as open country under the Countryside and Rights of Way Act 2000. The location of the Thames Basin Heaths amidst a highly populated area has resulted in the site being subject to high recreational pressure. Over the last c.

¹² <http://publications.naturalengland.org.uk/publication/6228755680854016> [Accessed on the 23/08/2024]

¹³ [UK0012724 Chilterns Beechwoods SAC Published 10 Jul 2024 \(naturalengland.org.uk\)](http://publications.naturalengland.org.uk/publication/6228755680854016) [Accessed 23/08/2024]

20 years (since 2005) affected local authorities have been working strategically with Natural England to ensure that no adverse impacts result on the SPA as a result of increased recreational pressure stemming from planned residential development in combination with other projects and plans. In May 2006 Natural England published a Draft Delivery Plan for the Thames Basin Heaths SPA. In 2009, the 'Thames Basin Heaths Special Protection Delivery Framework' was published by the Thames Basin Heaths Joint Strategic Partnership Board. Together, these documents allow a strategic approach to accommodating development by providing a method through which local authorities can meet the requirements of the Habitats Regulations through avoidance and mitigation measures. Wokingham Borough Council is an affected borough. The closest component parts of the Thames Basin Heaths SPA lie approx. 58m to the south of Wokingham Borough (in Hart District) and approx. 158m to the south-east of Wokingham Borough (in Bracknell Forest Borough).

Qualifying Features¹⁴

3.11 This site qualifies under Article 4.1 of the Directive (79/409/EEC) by supporting populations of European importance of the following species listed on Annex I of the Directive:

3.12 Annex I breeding species:

- European nightjar *Caprimulgus europaeus*
- Dartford warbler *Sylvia undata*
- Woodlark *Lullula arborea*

Conservation Objectives¹⁵

3.13 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;

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

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

Threats & Pressures to Site Integrity

3.15 The following threats and pressures to the site integrity of the Thames Basin Heaths SPA have been identified in Natural England's SIP¹⁶ and SACO¹⁷:

¹⁴ <http://publications.naturalengland.org.uk/publication/4952859267301376> [Accessed on the 23/08/2024].

¹⁵ <http://publications.naturalengland.org.uk/publication/4952859267301376> [Accessed on the 23/08/2024].

¹⁶ <http://publications.naturalengland.org.uk/publication/6249258780983296> [Accessed on the 23/08/2024].

¹⁷ <https://designatedsites.naturalengland.org.uk/TerrestrialAdvicePDFs/UK9012141.pdf> [Accessed 23/08/2024].

- Public access / disturbance
- Undergrazing
- Forestry and woodland management
- Hydrological changes
- Inappropriate scrub control
- Invasive species
- Wildfire / arson
- Air pollution: Impact of atmospheric nitrogen deposition
- Military
- Habitat fragmentation

Thursley, Ash, Pirbright and Chobham SAC

Introduction

3.16 The Thursley, Ash, Pirbright and Chobham SAC is located in south-east England and comprises various habitats, including heath and scrub (75%), bogs and marshes (10%), coniferous woodland (10%) and inland water bodies (5%). Most important from an HRA perspective is the complex of heaths, which includes both wet and dry heath, acid mire and bog pools. The underlying geology of the SAC allows little drainage, which gives rise to the mire systems. The complex supports an outstanding assemblage of valley mire systems with high diversity of wetland invertebrates, bryophytes and other scarce species. The SAC also provides important habitat to breeding birds such as curlew and snipe. Component heathlands of the SAC are managed as nature reserves with public access, while other parts have military training ranges and are off-limit to the public.

3.17 At Thursley Common the wet heath is NVC type M16 *Erica tetralix* – *Sphagnum compactum* and contains several rare plants, including great sundew *Drosera anglica*, bog hair-grass *Deschampsia setacea*, bog orchid *Hammarbya paludosa* and brown beak-sedge *Rhynchospora fusca*. Thursley Common is particularly important for invertebrates, such as the nationally rare white-faced darter *Leucorhinia dubia*.

3.18 The SAC also contains a series of large fragments of dry heathland, a key representative of NVC type H2 *Calluna vulgaris* – *Ulex minor*. The dry heathland components include transitions to wet heath, valley mire, scrub, woodland and acid grassland and harbour numerous rare invertebrate species. They also harbour European nightjar *Caprimulgus europaeus*, Dartford warbler *Sylvia undata*, sand lizard *Lacerta agilis* and smooth snake *Coronella austriaca*. The closest component part of the SAC lies approx. 6.9km to the south-east of Wokingham borough in the authority of Surrey Heath.

Qualifying Features¹⁸

3.19 The site was designated as being of European importance for the following features:

¹⁸ <https://publications.naturalengland.org.uk/file/6503438829486080> [Accessed on the 23/08/2024]

- Northern Atlantic wet heaths with *Erica tetralix*
- European dry heaths
- Depressions on peat substrates of the *Rhynchosporion*

Conservation Objectives¹⁹

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

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

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

Threats & Pressures to Site Integrity

3.22 The following threats and pressures to the site integrity of the Thursley, Ash, Pirbright and Chobham SAC have been identified in Natural England's SIP²⁰ and SACO²¹:

- Public access / disturbance
- Undergrazing
- Forestry and woodland management
- Hydrological changes
- Inappropriate scrub control
- Invasive species
- Wildfire / arson
- Air pollution: Impact of atmospheric nitrogen deposition
- Military
- Habitat fragmentation

Windsor Forest and Great Park SAC

Introduction

3.23 The Windsor Forest and Great Park SAC is internationally important for its landscape dominated by dry oaks, which supports internationally rare invertebrates, such as beetles and other species associated with ancient trees

¹⁹ <https://publications.naturalengland.org.uk/file/4677991053656064> [Accessed on the 23/08/2024]

²⁰ <http://publications.naturalengland.org.uk/publication/6249258780983296> [Accessed on the 23/08/2024]

²¹ <https://designatedsites.naturalengland.org.uk/TerrestrialAdvicePDFs/UK0012793.pdf> {Accessed 23/08/2024}

or dead wood. The SAC comprises damp, shady woodland, open parkland, grazed wood pasture, ponds / wetland, grassland and scrub. Most importantly, the site has one of the largest concentrations of ancient trees, especially oaks, in Europe. Special micro-habitats in ancient trees include rot cavities, sap runs, dead limbs, detached bark, pools and fungal fruiting bodies.

3.24 The SAC lies upon alluvial sediments which in turn rest on poorly-draining sandy and silty underlying soils. These soils can be moderately acidic, meaning that a portion of the vegetation is typical for acid grassland and heathland. While large parts of the site are highly modified in character (e.g. planted avenues of trees, broad vistas), some parts of the SAC have a highly characteristic oak – bracken – bramble vegetation, NVC type W10. Parts that are open to the public are very popular tourist destinations, especially for hikers, cyclists and horse riders. The closest part of the SAC lies approx. 8.5km to the east of Wokingham borough in the authority of Windsor and Maidenhead.

Qualifying Features²²

3.25 The site was designated as being of European importance for the following features:

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

- Old acidophilous oak woods with *Quercus robur* on sandy plains

3.27 Annex I habitats present as a qualifying feature, but not a primary reason for selection of this site

- Atlantic acidophilous beech forests with *Ilex* and sometimes also *Taxus* in the shrublayer

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

- Violet click beetle *Limoniscus violaceus*

Conservation Objective²³

3.29 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;

3.30 *“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*

²² <https://publications.naturalengland.org.uk/file/6277427382714368> [Accessed on the 23/08/2024]

²³ <https://publications.naturalengland.org.uk/file/6569964010209280> [Accessed on the 23/08/2024]

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

Threats & Pressures to Site Integrity

3.31 The following threats and pressures to the site integrity of the Windsor Forest & Great Park SAC have been identified in Natural England’s SIP²⁴ and SACO²⁵:

- Forestry and woodland management
- Invasive species
- Disease
- Air pollution: Impact of atmospheric nitrogen deposition

Aston Rowant SAC

Introduction

3.32 The Aston Rowant SAC is located 11.3km from Wokingham Borough. The SAC comprises an area of 124.89ha, including dry grassland / steppes, broad-leaved deciduous woodland (23%), heath / scrub (14%) and ‘other land’ (0.5%). It designated as a SAC because it supports one of the largest remaining populations of juniper in lowland Britain, specifically on chalk formations in the south-east of England. Juniper is present as isolated bushes in chalk grassland, as well as in mixed scrub communities. Successful reproduction and survival of new juniper plants is rare and, therefore, the SAC is heavily dependent on management interventions. The SAC also supports *Asperulo-Fagetum* beech forest.

Qualifying Features²⁶

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

- *Juniperus communis* formations on heaths or calcareous grasslands

3.34 Annex I habitats present as a qualifying feature, but not a primary reason for selection of this site:

- *Asperulo-Fagetum* beech forests

Conservation Objectives²⁷

3.35 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;

3.36 “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;*

²⁴ <https://publications.naturalengland.org.uk/file/5106041196904448> [Accessed on the 23/08/24]

²⁵ <https://designatedsites.naturalengland.org.uk/css/buttonImages/Thistle.png> [Accessed 23/08/2024]

²⁶ <https://sac.jncc.gov.uk/site/UK0030082> [Accessed on 23 August 2024]

²⁷: <https://publications.naturalengland.org.uk/publication/5596085330378752> [Accessed on 23 August 2024]

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

Threats / Pressures to Site Integrity

3.37 The following threats and pressures to the integrity of the Aston Rowant SAC have been identified in Natural England’s SIP²⁸ and SACO²⁹:

- Unsustainable on-site population or habitat
- Changes in species distribution
- Deer
- Conflicting conservation objectives
- Disease
- Air pollution: Risk of atmospheric nitrogen deposition

Hartslock Wood SAC

Introduction

3.38 The Hartslock Wood SAC is located 11.8km from Wokingham Borough. It is 34.16ha in size. It encompasses mixed woodland (87%) and dry grassland / steppes (13%). It hosts the priority habitat type ‘orchid-rich sites’ and is characterised by steep slopes on the chalk of the Chilterns. Habitats supported within the site boundary include chalk grassland, chalk scrub and broadleaved woodland. The chalk grassland is dominated by shorter species (e.g. *Festuca ovina* and *Avenula pratensis*) and some taller *Bromus erectus*. One of only three UK populations of monkey orchid *Orchis simia* is found within the SAC. Recent storms and landslides have diversified the age structure of the yew woodland, with open patches supporting southern wood rush *Luzula forsteri*, wood barley *Hordelymus europaeus* and narrow-lipped helleborine *Epipactis leptochila*.

Qualifying Features³⁰

3.39 Annex I species that are a primary reason for selection of this site:

- Semi-natural dry grasslands and scrubland facies on calcareous substrates (*Festuco-Brometalia*) (*important orchid sites)
- *Taxus baccata* woods of the British Isles (*priority feature)

²⁸ <https://publications.naturalengland.org.uk/publication/4960794580090880> [Accessed on 23 August 2024]

²⁹ <https://designatedsites.naturalengland.org.uk/TerrestrialAdvicePDFs/UK0030082.pdf> [Accessed 27/08/2024]

³⁰: <https://sac.jncc.gov.uk/site/UK0030164> [Accessed on 23 August 2024]

Conservation Objectives³¹

3.40 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;

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

Threats / Pressures to Site Integrity

3.42 The following threats and pressures to the integrity of the Hartslock Wood SAC have been identified in Natural England's SIP³² and SACO³³:

- Air pollution: Risk of atmospheric nitrogen deposition

Burnham Beeches SAC

Introduction

3.43 The Burnham Beeches SAC is located 11.7km from Wokingham Borough. It is 383.71ha in size. It encompasses broad-leaved deciduous woodland (90%), coniferous woodland (5%) and heath/scrub (5%). It constitutes an example of Atlantic acidophilous beech forest in central southern England in an extensive area of former beech wood-pasture. The SAC supports many old pollarded trees, as well as beech *Fagus sylvatica* and oak *Quercus* spp. high forest. It is one of the richest sites for saproxylic invertebrates in the UK, as well as nationally important epiphytic communities (e.g. the moss *Zygodon forsteri*).

Qualifying Features³⁴

3.44 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 roburi-petraeae* or *Ilici-Fagenion*)

Conservation Objectives³⁵

3.45 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;

³¹ <https://publications.naturalengland.org.uk/publication/5307946309255168> [Accessed on 23 August 2024]

³² <https://publications.naturalengland.org.uk/publication/4874314121740288> [Accessed on 23 August 2024]

³³ <https://designatedsites.naturalengland.org.uk/TerrestrialAdvicePDFs/UK0030164.pdf> [Accessed 27/08/2024]

³⁴ <https://sac.jncc.gov.uk/site/UK0030034> [Accessed on 23 August 2024]

³⁵ <https://publications.naturalengland.org.uk/publication/6014456282742784> [Accessed on 23 August 2024]

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

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

Threats / Pressures to Site Integrity

3.47 The following threats and pressures to the integrity of the Burnham Beeches SAC have been identified in Natural England’s SIP³⁶ and SACO³⁷

- Air pollution: Risk of atmospheric nitrogen deposition
- Public access / disturbance
- Habitat fragmentation
- Deer
- Species decline
- Invasive species

³⁶ <https://publications.naturalengland.org.uk/publication/5689860228644864> [Accessed on 23 August 2024]

³⁷ <https://designatedsites.naturalengland.org.uk/TerrestrialAdvicePDFs/UK0030034.pdf> [Accessed 27/08/2024]

4. Potential Linking Impact Pathways

Impact Pathways Considered

4.1 The following impact pathways are considered relevant to the WBLPU:

- Recreational pressure;
- Atmospheric pollution;
- Loss of functionally linked land; and
- Water quantity, level and flow.

Background to Recreational Pressure

Disturbance to breeding birds

4.2 There is concern about 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. This applies to any habitat, but the key qualifying features in lowland heathland are particularly vulnerable to human disturbance. An English Nature (the predecessor of Natural England) Research Report summarizes the key urban effects on heathland as habitat fragmentation, human disturbance, disturbance by animals linked to human presence (i.e. dogs and cats), increased risk of fires and trampling damage³⁸. Various research reports have provided compelling links between changes in housing and access levels and impacts on Habitats Sites^{39 40}.

4.3 Particular concern applies to recreation effects on ground-nesting birds, with many studies concluding that more urban sites support lower densities of key species, such as stone curlew and nightjar.^{41 42} This is a direct consequence from the fact that birds are expending energy avoiding the stressor and this is time that is not spent feeding or incubating the eggs⁴³. Overall, disturbance is likely to increase energetic output while reducing energetic input, which can adversely affect the 'condition' and ultimately survival of the birds.

4.4 Evidence in the literature suggests that the magnitude of disturbance clearly differs between different types of recreational activities. For example, dog walking leads to a significantly higher reduction in bird diversity and abundance than hiking⁴⁴. Scientific evidence also suggests that key disturbance parameters, such as areas of influence and flush distance, are significantly greater for dog

³⁸ Underhill-Day, J. 2005. A literature review of urban effects on lowland heaths and their wildlife. English Nature Research Reports 623. 56pp.

³⁹ 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.

⁴⁰ 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.

⁴¹ Clarke R.T., Liley D., Sharp J.M., Green R.E. 2013. Building development and roads: Implications for the distribution of stone curlews across the Brecks. PLOS ONE. doi:10.1371/journal.pone.0072984.

⁴² Liley D., Clarke R.T. 2003. The impact of urban development and human disturbance on the numbers of nightjar *Caprimulgus europaeus* on heathlands in Dorset, England. Biological Conservation 114: 219-230.

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

⁴⁴ Banks P.B., Bryant J.Y. 2007. Four-legged friend or foe? Dog walking displaces native birds from natural areas. *Biology Letters* 3: 14pp.

walkers than hikers⁴⁵. A UK meta-analysis suggests that important spatial (e.g. the area of a site potentially influenced) and temporal (e.g. how often or long an activity is carried out) parameters differ between recreational activities, suggesting that these are factors that should ideally be considered in ecological assessments⁴⁶. In addition, displacement of birds from one feeding site to others can increase the feeding pressure on available resources, which need to sustain greater numbers of birds⁴⁷. Importantly, recreational disturbance is generally higher in summer than in winter (due to more people engaging in outdoor activities) and this is also when the qualifying bird features are breeding in the SPA.

- 4.5 Disturbance can also arise from a much wider urbanisation effect that presents itself as a much more direct threat to survival, such as in the case of predation by dogs and cats. Dogs are often exercised off-lead and roam out of sight of their owners and have been documented to kill ground-nesting birds. Cats tend to roam freely at night, potentially hunting prey many kilometres away from their home.

Trampling damage, erosion and nutrient enrichment

- 4.6 Most terrestrial sites can be affected by trampling and other mechanical damage, which in turn causes soil compaction and / or erosion. Multiple research studies have experimentally shown the effects of trampling on plant community structure, often comparing several recreational activities:

- Wilson & Seney⁴⁸ examined the degree of track erosion caused by hikers, motorcycles, horses and cyclists from 108 plots along tracks in the Gallatin National Forest, Montana. Although the results proved difficult to interpret, it was concluded that horses and hikers disturbed more sediment on wet tracks, and therefore caused more erosion, than motorcycles and bicycles.
- Cole et al⁴⁹ 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

⁴⁵ Miller S.G., Knight R.L., Miller C.K. 2001. Wildlife responses to pedestrians and dogs. 29: 124-132.

⁴⁶ Weitowitz D., Panter C., Hoskin R., Liley D. The spatio-temporal footprint of key recreation activities in European protected sites. Manuscript in preparation.

⁴⁷ Gill, J.A., Sutherland, W.J. & Norris, K. 1998. The consequences of human disturbance for estuarine birds. *RSPB Conservation Review* 12: 67-72

⁴⁸ 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

⁴⁹ Cole, D.N. 1995a. Experimental trampling of vegetation. I. Relationship between trampling intensity and vegetation response. *Journal of Applied Ecology* 32: 203-214

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

(plants 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.

- Cole⁵⁰ conducted a follow-up study (in 4 vegetation types) in which shoe type (trainers or walking boots) and trampler weight were varied. Although immediate damage was greater with walking boots, there was no significant difference after one year. Heavier trampers caused a greater reduction in vegetation height than lighter trampers, but there was no difference in the effect on cover.
- Cole & Spildie⁵¹ 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.
- In heathland sites, trampling damage can also affect the value of a site to wildlife. For example, heavy use of sandy tracks loosens and continuously disturbs sand particles, reducing the habitat's suitability for invertebrates⁵². Species that burrow into flat surfaces such as the centres of paths, are likely to be particularly vulnerable, as the loose sediment can no longer maintain their burrow. In some instances, nature conservation bodies and local authorities resort to hardening paths to prevent further erosion. However, this is concomitant with the loss of habitat used by wildlife, such as sand lizards and burrowing invertebrates.

4.7 Prolonged or repeated excessive trampling and the resulting erosion may, over time, lead to the exposure of tree roots. It has been demonstrated that recreational trails with high usage are subject to significantly more erosion and root exposure⁵³. Due to their size such root systems might not immediately appear to be sensitive to trampling damage. Indeed, a research study in 2002 showed that recreational trampling led to significant damage in the vegetation layer, particularly the beech seedlings and their fine mycorrhizal roots, but that the roots of mature trees were resilient to trampling⁵⁴. However, it has also been found that tree root exposure is associated with a higher risk of infection and rot. Furthermore, while trampling may not directly damage the tree roots, it does affect the soil structure around the root zones of mature and ancient trees, which in turn determines root growth, associations with mycorrhizal fungi and overall tree growth. Soil compaction leads to a loss of space for air and water molecules,

⁵⁰ 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.

⁵¹ 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

⁵² Taylor K., Anderson P., Liley D. & Underhill-Day J.C. 2006. Promoting positive access management to sites of nature conservation value: A guide to good practice. English Nature / Countryside Agency, Peterborough and Cheltenham.

⁵³ Leung Y.-F. & Marion J. F. (2000). Recreation impacts and management in wilderness: A state-of-knowledge review. *USDA Forest Service Proceedings* 5: 23-48.

⁵⁴ Waltert B., Wiemken V., Rusterholz H.-P., Boller T. & Baur B. (2002). Disturbance of forest by trampling: Effects on mycorrhizal roots of seedlings and mature trees of *Fagus sylvatica*. *Plant and Soil* 243: 143-154.

both of which are integral to tree health⁵⁵. Due to their enhanced ecological value, this can be a particular issue for ancient and veteran tree assemblages, such as those present in Windsor Forest & Great Park SAC. For Chilterns Beechwoods SAC the Site Improvement Plan specifically identifies a target to reduce visitor impact on dead wood, as removal of dead wood by the general public is an issue on some parts of the SAC. However, this is more a matter of individual behaviour, rather than an inevitable corollary of an increasing population.

- 4.8 A major concern for nutrient-poor habitats (e.g. heathlands, bogs and fens) is nutrient enrichment associated with dog fouling, which has been addressed in various reviews (e.g.⁵⁶). It is estimated that dogs will defecate within 10 minutes of starting a walk and therefore most nutrient enrichment arising from dog faeces will occur within 400m of a site entrance. In contrast, dogs will urinate at frequent intervals during a walk, resulting in a more spread out distribution of urine. For example, in Burnham Beeches National Nature Reserve it is estimated that 30,000 litres of urine and 60 tonnes of dog faeces are deposited annually⁵⁷. While there is little information on the chemical constituents of dog faeces, nitrogen is one of the main components⁵⁸. Nutrient levels are the major determinant of plant community composition and the effect of dog defecation in sensitive habitats (e.g. heathland) is comparable to a high-level application of fertiliser, potentially resulting in the shift to plant communities that are more typical for improved grasslands.
- 4.9 The available baseline information suggests that the Thames Basin Heaths SPA and the Thursley, Ash, Pirbright & Chobham SAC (which largely overlaps with the SPA) are the most vulnerable of the sites to recreational pressure. In the SPA the main risk of recreational pressure is a reduced breeding success of nightjar, Dartford warbler and woodlark, all of which nest on or close to the ground. In the SAC recreational disturbance might lead to trampling damage of heathland plants, track erosion and nutrient enrichment. Wokingham borough is only approx. 158m from the SPA and 6.9km from the SAC, and the spatial distribution of residential dwellings is likely to affect the contribution of growth in the borough to this impact pathway, with allocations in the northern part of Wokingham borough likely having a much lower recreational footprint in these Habitats Sites than allocations in the south.
- 4.10 The Thames Basin Heaths SPA is a 8,274ha site in south-eastern England, an area of the country which is highly populated and where housing growth will lead to a further increase in the population of Boroughs and Districts surrounding the SPA. Recognising this as a key issue, English Nature (the predecessor of Natural England) commissioned a visitor survey in 2005 to establish a baseline level of recreational use in the SPA⁵⁹. This initial survey provided an estimate of approx. 5 million annual visits to the SPA, highlighting it as a recreational honeypot resource in the region. Due to the ongoing issue of housing growth in the region,

⁵⁵ Natural England Site Conservation Objectives Supplementary Advice Note for the Windsor Forest & Great Park SAC. Available at:

<https://designatedsites.naturalengland.org.uk/TerrestrialAdvicePDFs/UK0012586.pdf> [Accessed on the 23/08/2024].

⁵⁶ Taylor K., Anderson P., Taylor R.P., Longden K. & Fisher P. 2005. Dogs, access and nature conservation. English Nature Research Report, Peterborough.

⁵⁷ Barnard A. 2003. Getting the facts – Dog walking and visitor number surveys at Burnham Beeches and their implications for the management process. Countryside Recreation 11:16-19.

⁵⁸ Taylor K., Anderson P., Liley D. & Underhill-Day J.C. 2006. Promoting positive access management to sites of nature conservation value: A guide to good practice. English Nature / Countryside Agency, Peterborough and Cheltenham.

⁵⁹ Liley D., Jackson D.B. & Underhill-Day J.C. (2006). Visitor Access Patterns on the Thames Basin Heaths. English Nature Research Reports, N682, Peterborough. Available at [Microsoft Word - TBH VISITOR REPORT 28nov2005-FINAL.doc](https://tbhpartnership.org.uk) [Accessed 04/09/2024]

and to monitor potential changes in recreational pressure within the SPA, subsequent to the 2005 visitor survey, Natural England has commissioned a total of three repeat visitor surveys. These were in 2012 / 2013⁶⁰, 2018⁶¹, with the most recent being in 2023⁶². Across the four visitor surveys, the methodology from the original 2005 visitor survey was followed as much as possible to allow comparisons across the four different years that visitor surveys have been conducted at Thames Basin Heaths SPA. Data from these studies will be used to assess the potential recreational impact of the WBLPU on the Thames Basin Heaths SPA, but also the Thursley, Ash, Pirbright & Chobham SAC (which partly overlaps with the SPA).

4.11 The following Habitats Sites are potentially sensitive to recreational pressure stemming from the Wokingham Borough:

- Thames Basin Heaths SPA (the closest parcel of the SPA lies only approx. 58m to the south of Wokingham Borough in Hart District)
- Thursley, Ash, Pirbright & Chobham SAC (the closest parcel is located approx. 6.9km to the south-west of Wokingham Borough in the authority of Surrey Heath)
- Chilterns Beechwoods SAC (the closest parcel is located approx. 2.8km to the north-east of the authority’s boundary)
- Windsor Forest and Great Park SAC (the closest parcel is located approx. 8.5km to the east of Wokingham Borough’s boundary)
- Burnham Beeches SAC (the closest parcel is located approx. 9.9km to the north of Wokingham Borough’s boundary)

Background to Atmospheric Pollution

4.12 The following table (Table 4-1) sets out the main sources and effects of air pollutants on habitats and species.

Table 4-1: Main sources and effects of air pollutants on habitats and species⁶³

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.	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

⁶⁰ Fearnley H. & Liley D. (2013). Results of the 2012/13 visitor survey on the Thames Basin Heaths Special Protection Area (SPA). Natural England Commissioned Reports, No. 136. 107pp. Available at <https://www.tbhpartnership.org.uk/index.php?pdf=1&uri=https://www.tbhpartnership.org.uk/content/uploads/2022/04/TBH-SPA-Visitor-Survey-Analysis-2012-13> [Accessed 04/09/2024]

⁶¹ EPR (2018) Visitor Access Patterns on the Thames Basin Heaths SPA. Visitor Questionnaire Survey 2018. Available at <https://www.tbhpartnership.org.uk/?pdf=1&uri=https://www.tbhpartnership.org.uk/content/uploads/2022/04/TBH-SPA-Visitor-Survey-Analysis-2018> [Accessed 04/09/2024]

⁶² Panter, C., Bishop, E. & Rush, E (2024). Thames Basin Heaths Special Protection Area 2023 Visitor Survey. Report by Footprint Ecology for Natural England. Available at <https://www.tbhpartnership.org.uk/content/uploads/2024/04/TBH-visitor-survey-2023-Final.pdf> [Accessed 04/09/2024]

⁶³ Information summarised from the Air Pollution Information System (<http://www.apis.ac.uk/>)

Pollutant	Source	Effects on habitats and species
	<p>Another origin of sulphur dioxide is the shipping industry and high atmospheric concentrations of SO₂ have been documented in busy ports. In future years shipping is likely to become one of the most important contributors to SO₂ emissions in the UK.</p>	<p>and the sensitivity of impacted species.</p> <p>However, SO₂ background levels have fallen considerably since the 1970's and are now not regarded a threat to plant communities. For example, decreases in Sulphur dioxide concentrations have been linked to returning lichen species and improved tree health in London.</p>
<p>Acid deposition</p>	<p>Leads to acidification of soils and freshwater via atmospheric deposition of SO₂, NO_x, ammonia and hydrochloric acid. Acid deposition from rain has declined by 85% in the last 20 years, with most of this as a result of lower sulphate levels.</p> <p>Although future trends in Sulphur emissions and subsequent deposition to terrestrial and aquatic ecosystems will continue to decline, increased N emissions may cancel out any gains produced by reduced S levels.</p>	<p>Gaseous precursors (e.g. SO₂) can cause direct damage to sensitive vegetation, such as lichen, upon deposition.</p> <p>Can affect habitats and species through both wet (acid rain) and dry deposition. The effects of acidification include lowering of soil pH, leaf chlorosis, reduced decomposition rates, and compromised reproduction in birds / plants.</p> <p>Not all sites are equally susceptible to acidification. This varies depending on soil type, bed rock geology, weathering rate and buffering capacity. For example, sites with an underlying geology of granite, gneiss and quartz rich rocks tend to be more susceptible.</p>
<p>Ammonia (NH₃)</p>	<p>NH₃ is a reactive, soluble alkaline gas that is released following decomposition and volatilisation of animal wastes. It is a naturally occurring trace gas, but NH₃ concentrations are directly related to the distribution of livestock.</p> <p>NH₃ reacts with acid pollutants such as the products of SO₂ and NO_x emissions to produce fine ammonium (NH₄⁺) - containing aerosol. Due to its significantly</p>	<p>The negative effect of NH₄⁺ may occur via direct toxicity, when uptake exceeds detoxification capacity and via N accumulation.</p> <p>Its main adverse effect is eutrophication, leading to species assemblages that are dominated by fast-growing and tall species. For example, a shift in dominance from heath</p>

Pollutant	Source	Effects on habitats and species
	<p>longer lifetime, NH₄⁺ may be transferred much longer distances (and can therefore be a significant trans-boundary issue).</p> <p>While NH₃ deposition may be estimated from its atmospheric concentration, the deposition rates are strongly influenced by meteorology and ecosystem type.</p>	<p>species (lichens, mosses) to grasses is often seen.</p> <p>As emissions mostly occur at ground level in the rural environment and NH₃ is rapidly deposited, some of the most acute problems of NH₃ deposition are for small relict nature reserves located in intensive agricultural landscapes.</p>
<p>Nitrogen oxides (NO_x)</p>	<p>Nitrogen oxides are mostly produced in combustion processes. Half of NO_x emissions in the UK derive from motor vehicles, one quarter from power stations and the rest from other industrial and domestic combustion processes.</p> <p>In contrast to the steep decline in Sulphur dioxide emissions, nitrogen oxides are falling slowly due to control strategies being offset by increasing numbers of vehicles.</p>	<p>Direct toxicity effects of gaseous nitrates are likely to be important in areas close to the source (e.g. roadside verges). A critical level of NO_x for all vegetation types has been set to 30 ug/m³.</p> <p>Deposition of nitrogen compounds (nitrates (NO₃), nitrogen dioxide (NO₂) and nitric acid (HNO₃)) contributes to the total nitrogen deposition and may lead to both soil and freshwater acidification.</p> <p>In addition, NO_x contributes to the eutrophication of soils and water, altering the species composition of plant communities at the expense of sensitive species.</p>
<p>Nitrogen deposition</p>	<p>The pollutants that contribute to the total nitrogen deposition derive mainly from oxidized (e.g. NO_x) or reduced (e.g. NH₃) nitrogen emissions (described separately above). While oxidized nitrogen mainly originates from major conurbations or highways, reduced nitrogen mostly derives from farming practices.</p> <p>The N pollutants together are a large contributor to acidification (see above).</p>	<p>All plants require nitrogen compounds to grow, but too much overall N is regarded as the major driver of biodiversity change globally.</p> <p>Species-rich plant communities with high proportions of slow-growing perennial species and bryophytes are most at risk from N eutrophication. This is because many semi-natural plants cannot assimilate the surplus N as well as many graminoid (grass) species.</p>

Pollutant	Source	Effects on habitats and species
		N deposition can also increase the risk of damage from abiotic factors, e.g. drought and frost.
Ozone (O ₃)	<p>A secondary pollutant generated by photochemical reactions involving NO_x, volatile organic compounds (VOCs) and sunlight. These precursors are mainly released by the combustion of fossil fuels (as discussed above).</p> <p>Increasing anthropogenic emissions of ozone precursors in the UK have led to an increased number of days when ozone levels rise above 40ppb ('episodes' or 'smog'). Reducing ozone pollution is believed to require action at international level to reduce levels of the precursors that form ozone.</p>	<p>Concentrations of O₃ above 40 ppb can be toxic to both humans and wildlife, and can affect buildings.</p> <p>High O₃ concentrations are widely documented to cause damage to vegetation, including visible leaf damage, reduction in floral biomass, reduction in crop yield (e.g. cereal grains, tomato, potato), reduction in the number of flowers, decrease in forest production and altered species composition in semi-natural plant communities.</p>

4.13 As highlighted in Table 4-1, the main pollutants of concern for Habitats Sites are oxides of nitrogen (NO_x), NH₃ and SO₂. NH₃ can have a directly toxic effect upon vegetation even at low concentrations, particularly at close distances to the source such as near road verges⁶⁴. NO_x can also be toxic at high concentrations. Increased NO_x and NH₃ is 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 can, if sufficiently great, enhance soil fertility and lead to eutrophication. This often has adverse effects on the community composition and quality of semi-natural, nitrogen-limited terrestrial and aquatic habitats^{65 66}.

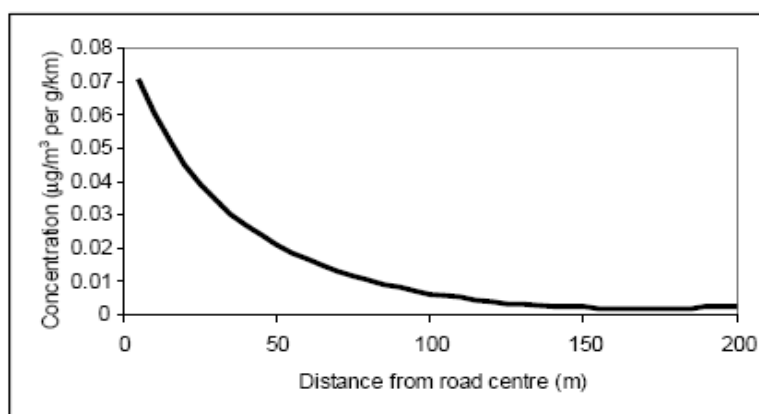
4.14 In woodlands exceedance of the critical nitrogen load may lead to a nutrient imbalance, decrease in mycorrhiza, loss of epiphytic lichens and bryophytes, changes in ground vegetation and a change in soil fauna. In mires and fens increased nitrogen deposition may lead to increase in the abundance and percentage cover of sedges and vascular plants, and the reduction of bryophytes. In heathlands, the primary concern associated with eutrophication is a shift towards the dominance of more competitive graminoids, a decline in lichens, changes in the plant biochemistry and an increased sensitivity to abiotic stress.

⁶⁴ http://www.apis.ac.uk/overview/pollutants/overview_NOx.htm.

⁶⁵ 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

⁶⁶ 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

- 4.15 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) shipping⁶⁷. NH₃ emissions originate particularly from agricultural practices⁶⁸, but some chemical processes and certain vehicles also make notable contributions. NOx emissions 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 NOx footprint (92%) through the associated road traffic. Other sources, although relevant, are of minor importance in comparison⁶⁹. The total nitrogen deposition is a metric that represents the cumulative nitrogen addition from several sources and is perhaps most useful from an HRA perspective, because it allows a habitat-specific assessment of air quality impacts⁷⁰. Given the origin of nitrogen-derived atmospheric pollutants, it is considered that the WBLPU might be associated with an increase in such atmospheric pollutants.
- 4.16 Critical thresholds are now available for most atmospheric pollutants. For example, according to the World Health Organisation, the critical NOx concentration (critical threshold) for the protection of vegetation is 30 µgm⁻³; while the threshold for sulphur dioxide is 20 µgm⁻³. In addition, ecological studies have determined 'critical loads'⁷¹ of atmospheric nitrogen deposition (that is, NOx combined with NH₃).
- 4.17 The Department of Transport's Transport Analysis Guidance highlights that, beyond 200m, the contribution of vehicle emissions from the roadside to local pollution levels is not significant⁷² (Figure 3). The same 200m distance is utilised by Highways England in their road assessments⁷³ and is cited in recently published guidance from the Institute of Air Quality Management⁷⁴. This is therefore the distance that has been used throughout this HRA in order to determine whether Habitats Sites are likely to be significantly affected by development outlined in a Plan document.



⁶⁷ http://www.apis.ac.uk/overview/pollutants/overview_SO2.htm.

⁶⁸ 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

⁶⁹ 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>

⁷⁰ As opposed to the generic NOx limit set for all vegetation.

⁷¹ The critical load is the rate of deposition beyond which research indicates that adverse effects can reasonably be expected to occur

⁷² <http://www.dft.gov.uk/webtag/documents/expert/unit3.3.3.php#013>; accessed 12/05/2016

⁷³ http://www.standardsforhighways.co.uk/ha/standards/dmrb/vol11/section3/LA_105_Air_quality-web.pdf

⁷⁴ <http://iaqm.co.uk/text/guidance/air-quality-impacts-on-nature-sites-2019.pdf>, paragraph 5.3.6

Figure 3: Traffic contribution to concentrations of pollutants at different distances from a road (Source: DfT75)

4.18 Exhaust emissions from vehicles are capable of adversely affecting both woodland and heathland habitats. Considering this, an increase in the net population and employment growth within the Wokingham Borough is likely to result in increased traffic flows past Habitats Sites that are sensitive to atmospheric pollution, which is particularly important where major roads lie within 200m of the protected site boundary. Atmospheric pollution is a particularly pertinent issue for Wokingham Borough, because it lies close to Habitats Sites that are designated for heathland and ancient trees. For example, heathland is particularly sensitive to nitrogen deposition, because its component plant species are adapted to very low nutrient conditions and are therefore at a competitive disadvantage to grasses and other plants, which grow much faster under increased nutrient concentrations.

4.19 The following Habitats Sites are potentially sensitive to atmospheric pollution resulting from an increase in the number of car-based commuter journeys and these may be affected by changes in vehicle numbers and commuter journeys in Wokingham Borough depending on the key journey to work routes out of the borough and the proximity of sensitive habitats to those routes:

- Chilterns Beechwoods SAC (located approx. 2.3km to the north-east of Wokingham Borough)
- Thames Basin Heaths SPA (located approx. 58m to the south of Wokingham Borough)
- Thursley, Ash, Pirbright and Chobham SAC (located approx. 6.9km to the south-east of Wokingham Borough)
- Windsor Forest & Great Park SAC (located approx. 8.6km to the east of Wokingham Borough)
- Burnham Beeches SAC (located approx. 9.9km to the north of Wokingham Borough)
- Hartslock Wood SAC (located approx. 10.9km to the west of Wokingham Borough)
- Aston Rowant SAC (located approx. 11.2km to the north of Wokingham Borough)

4.20 The Air Pollution Information System (APIS)⁷⁶ indicates that some of the qualifying features of the Chilterns Beechwoods SAC are sensitive to atmospheric pollutants. For example, the *Asperulo-Fagetum* beech forests have a critical nitrogen limit of 10-20 kg N/ha/yr. Equally, the semi-natural dry grasslands and scrubland facies on calcareous substrates (important orchid sites) are sensitive to atmospheric pollution, with an empirical critical nitrogen load of 10-20 kg N/ha/yr. In contrast, the stag beetles themselves would not be affected by nitrogen deposition according to APIS.

4.21 The Thames Basin Heaths SPA is designated for its breeding populations of specialist heathlands birds, including European nightjar, woodlark and Dartford warbler. APIS classifies the SPA as susceptible to atmospheric pollution, due to

⁷⁵ <http://www.dft.gov.uk/ha/standards/dmrb/vol11/section3/ha20707.pdf>

⁷⁶ [Air Pollution Information System | Air Pollution Information System \(apis.ac.uk\)](http://www.apis.ac.uk) [Accessed on the 23/08/2024]

negative impacts on the habitats (particularly heathland and acid grassland) in which the qualifying birds' nest. Dwarf shrub heath has a critical load of 5-15 kg N/ha/yr. Nightjar and woodlark also nest within rotationally-managed conifer plantation⁷⁷ but it is likely that plantation management (the sequential process of ground preparation, tree planting, weed suppression, tree thinning and clear-felling) is the primary influence on the suitability of a plantation for nesting by either species.

- 4.22 Thursley, Ash, Pirbright and Chobham SAC is designated for its depressions on peat substrates of the *Rhynchosporion* and its European dry heaths, which are both sensitive to atmospheric pollution. APIS highlights that the peat substrate depressions and European dry heath have a critical nitrogen load of 5-15 kg N/ha/yr⁷⁸.
- 4.23 The large assemblage of veteran and / or ancient trees in the Windsor Forest & Great Park SAC is of particular concern regarding atmospheric pollution, due to its disproportionate ecological value. The old acidophilous oak woods within the site boundary and the Atlantic acidophilous beech forests dominated by *Ilex* and *Taxus* have a relatively low critical nitrogen load of 10-15 kg N/ha/yr⁷⁹. Violet click beetle would not be affected by nitrogen deposition, according to APIS.

Background to Water Quantity, Level and Flow

- 4.24 In addition to water quality, both the water level and flow (and its natural diurnal and annual variation) are important determinants of the ecological status of Habitats Sites. Hydrological processes are critical in influencing habitat characteristics, including current velocity, water depth, dissolved oxygen levels and water temperature in rivers and / or lakes. In turn these habitat features determine the short- and long-term viability of plant and animal species, as well as overall ecosystem composition.
- 4.25 A widely cited review paper summarised the ecological effects of reduced flow in rivers⁸⁰. Droughts (ranging in their magnitude from flow reduction to a complete loss of surface water) have both direct and indirect effects on stream communities. For example, a marked direct effect is the loss of water and habitat for aquatic organisms. Indirect effects include a deterioration in water quality, changes to the food resources and alterations in interspecific interactions. An increased stability of baseflow and a reduction in the natural flow variability of rivers has been linked to the excessive growth of macrophytes and a reduction in fish populations⁸¹.
- 4.26 Furthermore, the flow and water level in surface waterbodies, and the groundwater level affect the water supply to Habitats Sites within their respective hydrological catchments. Abstraction of freshwater for the potable water supply to new dwellings and employment space might result in an overall drop of groundwater and / or surface water levels. This in turn is likely to decrease the wetted area within Habitats Sites that depend on a natural hydrological regime.

⁷⁷ Rotationally-managed conifer plantation is generally suitable for nesting woodlark during the first 5-6 years, and for nesting nightjar during the first c. 20 years, of a typical growth cycle. After that time the woody growth is too mature and dense to be suitable and the birds nest elsewhere until the trees are felled and the plantation cycle starts again.

⁷⁸ [APIS app | Air Pollution Information System](#) [Accessed on the 23/08/2024].

⁷⁹ [APIS app | Air Pollution Information System](#) [Accessed on the 23/08/2024].

⁸⁰ Lake P.S. 2003. Ecological effects of perturbation by drought in flowing waters. *Freshwater Biology* 48: 1161-1172.

⁸¹ Bunn S.E. & Arthington A.H. 2002. Basic principles and ecological consequences of altered flow regimes for aquatic biodiversity. *Environmental Management* 30: 492-507.

According to Natural England's Site Improvement Plans several Habitats Sites depend on hydrological conditions (discussed further in the LSEs section). These SACs lie within resource zones supplied by Thames Water and South East Water. It is therefore important to consider the Water Resource Management Plans (WRMPs, and their HRAs) to determine whether the company's proposed abstraction regimes might result in changes to the flow regimes of waterbodies supplying these SACs.

4.27 The following Habitats Sites are potentially sensitive to changes in the water quantity, level, flow or overall hydrological regime stemming from Wokingham Borough:

- Thursley, Ash, Pirbright & Chobham SAC
- Windsor Forest & Great Park SAC
- Chilterns Beechwoods SAC

Background to Loss of Functionally Linked Land

4.28 While most Habitats 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 always the case. A diverse array of qualifying species including birds, bats and amphibians are not confined to the boundary of designated sites.

4.29 For example, the highly mobile nature of both wildfowl and heathland birds implies that areas of habitat of crucial importance to the maintenance of their populations are outside the physical limits of Habitats Sites. Despite not being designated, this area is still integral to the maintenance of the structure and function of the interest feature on the designated site and, therefore, land use plans that may affect such areas should be subject to further assessment.

4.30 The Thames Basin Heaths SPA is the only Habitats Site that supports mobile species, namely nightjar, Dartford warbler and woodlark. Their main habitat requirements are the following:

- Nightjar show a preference for bare patches or areas of very short or sparse vegetation with widely scattered trees where they are able to see predators approaching. These patches may be on open heath, in patchy scrub and in the interface between heath and woodland, as well as in clearings in woodland or plantations. Nightjars are known to forage up to 6 kilometres away from their nesting territory.
- Woodlark are strongly associated with bare ground, especially where this is adjacent to structurally diverse vegetation and short heather. They utilise scattered trees and large bushes as song-posts. Woodlark use a variety of habitats adjacent to heathland for foraging, including short grassland, stubble fields or margins of arable fields, golf courses and bare areas in quarry sites.
- Dartford warbler favour large areas of open terrain, largely free of obstructions, in and around nesting, roosting and feeding areas in lowland heathland with gorse and heather. They benefit from availability of an unobstructed line of sight within nesting, feeding or roosting to enable birds to detect approaching predators, or to ensure visibility of displaying

behaviour. However, they will utilise enclosed features such as clearings in conifer plantations⁸².

- 4.31 The SPA is designated for its breeding nightjar, woodlark and Dartford warbler. Most of these qualifying species forage in a range of different habitats, including common and widespread ones. It is widely considered that the main habitat factor that controls these populations and their breeding success is availability of suitable nesting habitat. The breeding habitat requirements for the SPA bird species are much more specific than their foraging habitats. As such the focus of this assessment is therefore on nesting habitat.
- 4.32 Generally, the long-term substantial loss, degradation and fragmentation of lowland heathland habitats has been the major factor associated with the decline of nightjar and woodlark⁸³. Whilst a large portion of woodland and heathland in the area is located within the Thames Basin Heaths SPA, there are various parcels of such habitats outside the designated site boundary, all of which could provide functionally linked supporting habitat to SPA species.
- 4.33 The most suitable habitats for nesting nightjar and woodlark are heathland, acid grassland and rotationally-managed plantation woodland (meaning any woodland that is cropped and replanted on a regular cycle, creating clearings in which the birds can nest). Woodland that is maintained as continuous-cover forestry is generally unsuitable for nesting nightjar and woodlark, unless they incorporate a sufficient number of large, sparsely vegetated, clearings. Development that would affect areas of rotationally-managed plantation woodland, heathland or acid grassland (irrespective of whether they are part of the Habitats Sites) could potentially affect nightjar and woodlark.
- 4.34 Research undertaken in Breckland Forest⁸⁴ has shown that nightjar are most likely to use conventionally managed plantation during the first 20 years of 60 year forestry cycles, including the initial 2 year ‘felled unplanted’ period. Population densities are highest during the restock phase (plantation age of 0-5 years), although significant densities can also be supported during the pre-thicket (6-10 years) and thicket (11 – 20 years) stages. Woodlark most likely use conventionally managed plantation during the first seven years (including the initial 2 year felled unplanted period), particularly the restock phase (plantation age of 0-5 years). It is very unlikely that sites with heathland or managed plantations will be allocated as part of the WBLPU. However, if any such sites were considered, the loss of potential nesting habitat for SPA qualifying species would have to be assessed. Habitat mapping on MAGIC shows that there are small off-site fragments of heathland within Wokingham Borough, which might be used by nesting nightjar, Dartford warbler or woodlark.
- 4.35 The stag beetle population for which Chilterns Beechwoods SAC is designated may conceivably be found using habitat outside the SAC boundary. The adult stag beetle lives for just a few weeks and barely feeds at all, drinking from sap runs and fallen soft fruit. The species spends most of its life (up to seven years) in its larval stage, which is dependent on a plentiful supply of partially-buried

⁸² Research examples that support/explore this include: Rose, et al. 2000. Changes in heathland in Dorset, England between 1987 and 1996. *Biological Conservation*, 121: 93-105. & Langston et al. 2007. Nightjar *Carprimumulgus europaeus* and Woodlark *Lullula arborea* – recovering species in Britain? *Ibis*, 149: 250-260.

⁸³ Research examples that support/explore this include: Rose, et al. 2000. Changes in heathland in Dorset, England between 1987 and 1996. *Biological Conservation*, 121: 93-105. & Langston et al. 2007. Nightjar *Carprimumulgus europaeus* and Woodlark *Lullula arborea* – recovering species in Britain? *Ibis*, 149: 250-260.

⁸⁴ Dolman PM & Morrison C, 2012. Temporal change in territory density and habitat quality for Breckland Forest SSSI woodlark and nightjar populations, Unpublished report for Forestry Commission and Natural England.

decaying wood (its sole food source). Therefore, the key dependency to sustaining the stag beetle population of the SAC (whether within or beyond the SAC boundary) is to ensure a plentiful supply of large pieces of partially buried dead wood (such as fallen or standing rotting trunks) in a forest or parkland context.

4.36 The following Habitats Sites are potentially sensitive to the loss of functionally linked land due to the emerging Local Plan, because they are designated for mobile species:

- Thames Basin Heaths SPA (the closest parcel of the SPA lies only approx. 58m to the south of Wokingham Borough in the Hart District); and
- Chilterns Beechwoods SAC.

Summary

4.37 In summary, therefore, this HRA will focus upon recreational pressure on the Thames Basin Heaths SPA and atmospheric pollution impacts on the Thames Basin Heaths SPA, the Chilterns Beechwoods SAC, Thursley, Ash Pirbright & Chobham SAC and the Windsor Forest and Great Park SAC. The impact pathways water quantity, level and flow, and loss of functionally linked land are also considered.

5. Test of Likely Significant Effects (LSEs)

Overview of strategic policies providing for residential and employment growth

- 5.1 The following section provides an overview of the strategic policies that provide for residential and employment growth and detail the outcome of the LSEs Screening assessment. This identifies policies and site allocations that (prior to considering the role of mitigation) have a potential to result in LSEs upon European sites.
- 5.2 The full LSEs assessment of strategic policies within the WBLPU can be found in Appendix B.

Strategic policies

- 5.3 The following policies have been identified as providing for residential and employment growth within Wokingham Borough (see Appendix B) for screening of strategic policies). These policies therefore present potential impact pathways through which LSEs on Habitats Sites might arise, prior to the consideration of mitigation measures:
- Policy SS2: Spatial Strategy and Settlement Hierarchy. This policy **specifies the settlements and geographic areas in which growth is likely to be delivered.**
 - Policy SS8: Meeting employment needs. The policy identifies a **quantum and geographic location of employment development.**
 - Policy SS10: Meeting our housing needs. Provides for a minimum of **12,763 net additional dwellings** for the period 1 April 2023 to 31 March 2040, an average of 751 dwellings per annum.
 - Policy SS11: Arborfield Green Strategic Development Location. Provides for **mixed use development, including provision of 3,047 net new dwellings** (2,137 dwellings through extant planning permissions and completions; 600 dwellings at Barkham Square; 300 dwellings by optimizing density at land currently occupied by Arborfield Studios; and 10 dwellings at Westwood Yard, Sheerlands Road), **and 6,000m² of employment floorspace.**
 - Policy SS12: South Wokingham Strategic Development Location. **Provides for 2,975 new dwellings** (1,100 net new dwellings on land south of Waterloo Road (980 dwellings of which are to be delivered by March 2040, and 1,875 dwellings through extant planning permissions and completions)
 - Policy SS13: Loddon Valley Garden Village. **Provides for 3,930 new dwellings** (2,700 dwellings of which are to be delivered by March 2040), **and 100,000m² of research and development floorspace** (or equivalent use class E(g).

- Policy SS14: Sites allocated for residential, including residential as part of mixed-use development. Provides **residential site allocations** including location and quantum of development.
- Policy ER1: Core Employment Areas. Provides for the **possible expansion of existing Core Employment Areas**
- Policy H9: Gypsies and Travellers and Travelling Showpeople provision. Allocates a **minimum of 86 net new gypsy, traveller and travelling showpeople pitches** in Wokingham Borough.

Local plans to be considered ‘in-combination’

5.4 It is obligatory to not only assess LSEs of a proposed plan alone, but also to investigate whether there might be ‘in-combination’ effects with plans proposing development in other authorities surrounding a Habitats Site. In practice, such an ‘in-combination’ assessment is of greatest relevance when the plan would otherwise be screened out because its individual contribution is inconsequential.

5.5 For the purposes of this HRA, several authorities adjacent to Wokingham Borough have been identified that have developed their own Local Plans, outlining residential and / or employment growth within their boundary. These include Bracknell Forest, Windsor and Maidenhead, Surrey Heath, Hart, Basingstoke and Deane, West Berkshire, South Oxfordshire, Reading and Buckinghamshire (formerly known as Wycombe). Table 5-1 summarises the proposed residential and employment growth allocated within the respective Local Plans for these authorities.

5.6 For the purposes of traffic and air quality modelling undertaken with regard to the atmospheric pollution sensitive SPA and SACs, the prediction of changes in traffic flows on relevant links adjacent to Habitats Site boundaries will draw upon data for each surrounding local authority district. As such, growth in other authorities not listed below, is also included in the ‘in combination’ assessment of atmospheric pollution.

Table 5-1: Overview of the extent of residential and employment development to be delivered in authorities adjacent to Wokingham Borough, according to adopted and emerging Core Strategies and Local Plans.

Local Authority	Number of Dwellings	Total Employment Space (ha)
Wycombe (2013-2033) ⁸⁵	10,925	21ha
Windsor and Maidenhead (2013-2033) ⁸⁶	14,240	49.1ha
Bracknell Forest (2020-2037) ⁸⁷	10,438	2.6 ha
Hart (2016-2032) ⁸⁸	7,614	1ha

⁸⁵ Wycombe District Local Plan. Adopted August 2019. Available at: <https://www.wycombe.gov.uk/uploads/public/documents/Planning/Adopted-Wycombe-local-plan/Wycombe-District-Local-Plan-Adopted-August-2019.pdf> [Accessed on the 23/08/2024].

⁸⁶ Windsor & Maidenhead Borough Local Plan. Adopted 2022. Available at: <https://consult.rbwm.gov.uk/file/5967538> Accessed on the 23/08/2024].

⁸⁷ Adopted Bracknell Forest Local Plan. Adopted March 2024. [About the Bracknell Forest Local Plan | Bracknell Forest Council \(bracknell-forest.gov.uk\)](https://www.bracknell-forest.gov.uk/about-the-bracknell-forest-local-plan) [Accessed on the 23/08/2024]

⁸⁸ Hart Local Plan. Adopted April 2020 Available at [Plans and policies | Hart District Council](https://www.hart.gov.uk/plans-and-policies). [Accessed on the 23/08/2024]

Basingstoke and Deane (2011-2029) ⁸⁹	15,300	At least 15.3ha
West Berkshire (2006-2026) ⁹⁰	10,500	At least 8ha
Reading (2013-2036) ⁹¹	15,847	Circa 26 ha
South Oxfordshire (2035) ⁹²	10,469	At least 39.1 ha
Total	95,333	At least 162.1

Recreational Pressure

Thames Basin Heaths SPA

5.7 The delivery of 12,763 net new dwellings in the WBLPU will be accompanied by an increase the local population as well as the demand for recreational resources. Being a local and attractive destination, the Thames Basin Heaths SPA (a composite Habitats Site) is likely to receive some of this additional recreational pressure. The SPA harbours breeding bird populations of nightjar, woodlark and Dartford warbler. All these bird species are ground-nesting (or build their nests close to the ground in gorse) and are therefore highly susceptible to recreational disturbance, particularly from dog walkers. Natural England's Site Improvement Plan highlights that the SPA is already subject to high levels of recreational use, which is likely to affect the distribution and breeding success of its Annex I bird species.

5.8 As detailed in paragraph 3.10, Wokingham Borough Council is an affected council, within which residential development could contribute to in combination recreational pressures on the Thames Basin Heaths SPA. As such, any development within the Borough needs to accord with the agreed mitigation approach, as outlined by Natural England in 2006, the Thames Basin Heaths Joint Strategic Partnership Board in 2009. This is outlined on Wokingham Borough's website⁹³. The strategy identifies mitigation zones as follows:

- Within 400m of the SPA - No net new residential development
- Between 400m and 5km - All residential development to contribute to Strategic Access Management and Monitoring (SAMM) measures, and provision of Suitable Alternative Natural Greenspace (SANG) either bespoke or utilising strategic SANG.
- Between 5km and 7km for developments of 50 dwellings or more - to contribute to Strategic Access Management and Monitoring (SAMM) measures, and provision of Suitable Alternative Natural Greenspace (SANG) either bespoke or utilising strategic SANG.

5.9 The closest component part of the SPA (Bramshill SSSI) lies just outside of Wokingham Borough (0.06km at its closest) but are within the travel distance that

⁸⁹ Basingstoke and Deane Local Plan. Adopted May 2016. Available at: <https://www.basingstoke.gov.uk/content/doclib/1592.pdf> [Accessed on the 27/08/2024].

⁹⁰ West Berkshire Core Strategy Development Plan Document. Adopted July 2012. Available at: <https://info.westberks.gov.uk/CHttpHandler.ashx?id=36374&p=0> [Accessed on the 27/08/2024].

⁹¹ Reading Borough Local Plan. Adopted November 2019. Available at: [Local Plan Adopted November 2019.pdf](https://www.reading.gov.uk/content/doclib/1592.pdf) (reading.gov.uk) [Accessed on the 27/08/2024]

⁹² South Oxfordshire Local Plan. Adopted December 2020. Available at: [SODC-LP2035-Publication-Feb-2021.pdf](https://www.southoxon.gov.uk/content/doclib/1592.pdf) (southoxon.gov.uk) [Accessed on the 27/08/2024]

⁹³ [Thames Basin Heath Special Protection Area \(wokingham.gov.uk\)](https://www.wokingham.gov.uk/content/doclib/1592.pdf) [Accessed 29-08/2024]

residents are expected to travel. Given that proximity to home determines the likelihood of people visiting Habitats Sites, it is likely that the component parcels of the SPA closer to Wokingham Borough are more likely to be visited by residents from the authority. As such, Bramshill Plantation, Yateley and Hawley Common, and Owlsmoor Bogs and Heaths (all to the south-east of Wokingham) are most likely to receive recreational pressure resulting from the LP. **Due to this, LSEs cannot be excluded, and the site is screened in for AA.**

5.10 The following strategic policies and site allocations providing for residential growth in Wokingham Borough have been screened in for AA, because they increase the local population and are likely to intensify recreational pressure in the Thames Basin Heaths SPA:

Policies

- Policy SS2: Spatial Strategy and Settlement Hierarchy. This policy specifies the settlements and geographic areas in which growth is likely to be delivered. This includes settlements and geographical areas within 7km of the SPA.
- Policy SS10: Meeting our housing needs. Provides for a minimum of **12,763 net additional dwellings** for the period 1 April 2023 to 31 March 2040, an average of 751 dwellings per annum.
- Policy SS11: Arborfield Green Strategic Development Location. Provides for **mixed use development, including provision of 3, net new dwellings** (2,137 dwellings through extant planning permissions and completions (all residential development at this location is located between 400m and 5km from the SPA); 600 dwellings at Barkham Square; 300 dwellings by optimizing density at land currently occupied by Arborfield Studios; and 10 dwellings at Westwood Yard, Sheerlands Road), **and 6,000m² of employment floorspace**.
- Policy SS12: South Wokingham Strategic Development Location. **Provides for 2,975 new dwellings** (1,100 net new dwellings on land south of Waterloo Road (980 dwellings of which are to be delivered by March 2040, and 1,875 dwellings through extant planning permissions and completions). All residential development at this location is located between 400m and 5km from the SPA.
- Policy SS13: Loddon Valley Garden Village. **Provides for 3,930 new dwellings** (2,700 dwellings of which are to be delivered by March 2040), **and 100,000m² of research and development floorspace** (or equivalent use class E(g)). This is a large allocation. Circa 132ha of the site is located within 400m and 5km from the SPA, circa 536 ha of the site is located within 5km to 7km of the SPA, and circa 67 ha of the site is located more than 7km from the SPA.
- Policy SS14: Sites allocated for residential, including residential as part of mixed-use development. Provides **residential site allocations** including location and quantum of development.
- Policy H9: Gypsies and Travellers and Travelling Showpeople provision. Allocates a **minimum of 86 net new gypsy, traveller and travelling showpeople pitches** in Wokingham Borough.

Site Allocations

5.11 Located between 400m and 5km of the Thames Basin Heaths SPA

- 5WW017, 026, 030, 031 - South Wokingham SDL extension for 1,100 dwellings (980 during the plan period). It is noted that these allocations are provided by Policy SS12: South Wokingham Strategic Development Location.
- 5SH025 - Land north of Arborfield Road for 191 dwellings
- 5FI003 - 31 and 33 Barkham Ride for 80 dwellings
- 5SW019 - Land west of Trowes Lane for 81 dwellings
- 5BA032 - 24 Barkham Ride for 30 dwellings
- 5BA013 - Woodlands Farm, Wood Lane for 15 pitches
- 5WK043 - Land at St Annes Drive for 54 dwellings
- 5SH023, 27 - Land east and west of Hyde End Road for 175 dwellings
- 5WK045 - Land at Bridge Retail Park for 59 dwellings
- 5FI004 - Greenacres Farm, Nine Mile Ride for 100 dwellings
- 5FI024 - Hillside, Lower Wokingham Road for 15 dwellings
- 5BA036 - High Barn Farm, Commonfield Lane, Wokingham, RG40 4PR for 20 pitches
- 5FI032 - Honeysuckle Lodge, Commonfield Lane for 4 pitches
- 5BA010 - Barkham Square for 600 dwellings. It is noted that this allocation is provided by Policy SS13: Loddon Valley Garden Village.
- 5WK011 - Land south of London Road (Western Field) for 12 dwellings

5.12 Located between 5km and 7km from the Thames Basin Heaths SPA and for 50 dwellings or more.

- 5WK051 - Land east of Toutley Depot for 130 dwellings
- 5WK054 - WBC council offices, Shute End, Wokingham for 100 dwellings

Thursley, Ash, Pirbright & Chobham SAC

5.13 The Thursley, Ash, Pirbright & Chobham SAC is designated for its Northern Atlantic wet heaths with *Erica tetralix* and its European dry heaths. Importantly, these habitats also support the ground-nesting birds of the Thames Basin Heaths SPA, which largely overlaps with the SAC. An increase in the number of recreational visits to the SAC, and particularly off-track activities, are likely to lead to trampling damage to heathland plants as well as path widening. Furthermore, an increase in the number of dog walkers in the SAC will lead to nutrient enrichment of the soil and, ultimately, to a change in plant community composition. Heathland plants are adapted to depauperate nutrient conditions and dog fouling might put them at a disadvantage with more competitive grass species. The closest component parcel of the Thursley, Ash, Pirbright and Chobham SAC lies 6.9km to the south-east of Wokingham Borough, which lies beyond the typical core visitor catchment for heathland sites. Within Wokingham Borough, only a very small area (circa 2.2ha) of Pinewood (Crowthorne) is located within the 7km core recreational catchment zone (taken from the Thames

Basin Heaths strategic approach) for the SAC. **As a precautionary measure, the SAC is screened in for AA.**

5.14 The following strategic policies could potentially provide for windfall development for residential growth in Wokingham Borough within the core recreational catchment of the SAC have been screened in for AA, because they could potentially increase the local population and might intensify recreational pressure in the Thursley, Ash, Pirbright and Chobham SAC:

- Policy SS2: Spatial Strategy and Settlement Hierarchy. This policy **specifies the settlements and geographic areas** in which growth is likely to be delivered. This includes mention of Crowthorne within which windfall development could occur.
- Policy SS10: Meeting our housing needs. Provides for a minimum of **12,763 net additional dwellings** within Wokingham Borough for the period 1 April 2023 to 31 March 2040, an average of 751 dwellings per annum. Windfall development could occur within the 7km recreational catchment zone.

5.15 No Site allocations are located within the 7km core recreational catchment zone for the Thursley, Ash, Pirbright and Chobham SAC:

Chilterns Beechwoods SAC

5.16 The Chilterns Beechwoods SAC is designated for its *Asperulo-Fagetum* beech forests, semi-natural dry grasslands and scrubland facies, and its stag beetle populations. The closest component parts of the SAC, and therefore the most likely destination of residents from Wokingham Borough, is Hollowhill and Pullingshill Woods SSSI located 2.9km to the north-east of the authority (within Wycombe District, Buckinghamshire Council) and Bisham Woods SSSI located 4.7km east of the authority within the Royal Borough of Windsor and Maidenhead. Natural England's Site Conservation Objectives Supplementary Advice Note states that the SAC has become an important recreational resource for hiking and cycling⁹⁴. The Site Improvement Plan highlights recreational pressure as a particular threat to the site, specifically the impacts of visitors on dead wood⁹⁵, a critical resource for the stag beetle.

5.17 For clarity, it is noted that a strategic Mitigation Strategy exists for the Chiltern Beechwoods SAC⁹⁶. This was led by Dacorum Borough Council, signatories include Buckinghamshire Council, Central Bedfordshire Council, and St Albans City and District Council. The Mitigation Strategy was approved by Natural England. The Strategy came about because the Ashridge Commons and Woods SSSI component of the SAC (which is located more than 30km north east of Wokingham Borough boundary) was noted to be subject to very high recreational pressure and was at threat of failing its conservation objectives due to increased recreational pressure stemming from new residential development provided by local plan documents. The Mitigation Strategy identifies a core recreational catchment of 12.6km, from Ashridge Commons and Woods SSSI only. Due to the large distance involved of Wokingham Borough to the Ashridge Commons and Woods SSSI component of the SAC (more than 30km), recreational

⁹⁴ <http://publications.naturalengland.org.uk/publication/4808896162037760> [Accessed on the 27/08/2024]

⁹⁵ <http://publications.naturalengland.org.uk/publication/6228755680854016> [Accessed on the 27/08/2024]

⁹⁶ [Chiltern Beechwoods SAC Mitigation Strategy - accessible \(buckinghamshire-gov-uk.s3.amazonaws.com\)](http://publications.naturalengland.org.uk/publication/6228755680854016) [Accessed 27/08/2024]

pressure on the SAC relating to the Ashridge Commons and Woods SSSI does not require further consideration within this HRA.

- 5.18 Hollowhill and Pullingshill Woods SSSI is not noted to be vulnerable to recreational pressure⁹⁷ and the SSSI Condition Summary identifies that the SSSI is in 100% Favourable condition⁹⁸. Bisham Woods SSSI is similar in that it is not noted to be vulnerable to recreational pressure⁹⁹ and the SSSI Condition Summary identifies that the 97.37% of the SSSI is in Favourable condition, with 2.63% of the SSSI being in Unfavourable- Recovering condition¹⁰⁰. The Unfavourable- Recovering condition is due to historical storm damage¹⁰¹ rather than recreational pressure.
- 5.19 Given the distance of the SAC to Wokingham Borough (more than 30km to the recreationally sensitive Ashridge Commons and Woods SSSI), and the observation in the pathways of impact section that collecting dead wood is a personal behaviour trait rather than an inevitable corollary of an increased population, it is considered that the Local Plan would only result in a relatively small change in recreational pressure in the SAC and only a small fraction of these new visitors would realistically affect the availability of dead wood (e.g. by taking pieces of wood). As such it is concluded that there will be no LSEs and this site is therefore screened out from AA.

Windsor Forest & Great Park SAC

- 5.20 Windsor Forest & Great Park SAC is designated for its oak woods with *Quercus robur* and its beech forests with *Ilex* and *Taxus* in the shrublayer. The closest part of the SAC lies approx. 8.4km to the east of the Wokingham Borough boundary, but the part that is most likely to be accessed (due to the existing road infrastructure) lies over 10km from Wokingham Borough along the A332. The site contains a large number of ancient and / or veteran trees, which are sensitive to trampling damage. The compaction of the soil surrounding the tree can affect its root system, nutrient uptake rates and associations with mycorrhiza. However, Natural England's Site Improvement Plan¹⁰² and Supplementary Advice on Conservation Objectives do not mention recreational pressure as a particular concern for the site notwithstanding the heavy recreational use. Furthermore, the focal points of recreational activity are on the existing paths and open parkland rather than concentrated beneath the canopies of the veteran trees. Finally, most parts of the SAC, especially the ones that are most likely to be accessed, lie beyond 10km. Therefore, Wokingham Borough is unlikely to contribute much to the recreational footprint in the SAC. As such, LSEs can be excluded, and the site is screened out from AA.

Burnham Beeches SAC

- 5.21 Burnham Beechwoods SAC is designated for its Atlantic beech forests with *Ilex* and *Taxus* in the shrub layer. The SIP and SACO for the site identify that part of the site has open public access and has a long history as being used as open space that is managed by the City of London. It receives over 500,000 visitors a year. It is noted that the veteran trees are vulnerable to damage as a result of

⁹⁷ [Site Pressures \(naturalengland.org.uk\)](https://naturalengland.org.uk) [Accessed 05/09/2024]

⁹⁸ [Designated Sites View \(naturalengland.org.uk\)](https://naturalengland.org.uk) [Accessed 05/09/2024]

⁹⁹ [Site Pressures \(naturalengland.org.uk\)](https://naturalengland.org.uk) [Accessed 05/089/2024]

¹⁰⁰ [Designated Sites View \(naturalengland.org.uk\)](https://naturalengland.org.uk) [Accessed 05/09/2024]

¹⁰¹ [Site feature condition \(naturalengland.org.uk\)](https://naturalengland.org.uk) [Accessed 05/09/2024]

¹⁰² [http://publications.naturalengland.org.uk/publication/6221375450644480](https://publications.naturalengland.org.uk/publication/6221375450644480) [Accessed 27/08/2024]

soil compaction due to trampling and vehicle movements within their root zones. To support planned development within Chiltern District and South Bucks District (now under Buckinghamshire Council), a report was commissioned to investigate then current impacts of housing growth from Chiltern District and South Bucks District on the Burnham Beeches SAC¹⁰³. The report identified a core recreational catchment zone of 5.6km. In 2020 a Strategic Access Management and Monitoring Strategy (SAMMS) SPD was adopted¹⁰⁴. The SPD sets out the need for financial contributions for all net new dwellings within 5.6km of the SAC. These contributions will be utilised to fund the Burnham Beeches SAC SAMMS. Wokingham Borough is located more than 13km from the Burnham Beeches SAC and as such is located outside of the core recreation catchment zone. As such, LSEs can be excluded, and the site is screened out from AA.

Summary

5.22 Due to the in-combination nature of recreational pressure, its impacts will be determined by the cumulative effect of all new development that leads to an increase in the number of recreational visitors and associated pressures. The following strategic policies and site allocations are **screened in for AA** in relation to the **Thames Basin Heaths SPA** and **Thursley, Ash, Pirbright & Chobham SAC**:

- Policy SS2: Spatial Strategy and Settlement Hierarchy. This policy specifies the settlements and geographic areas in which growth is likely to be delivered. This includes settlements and geographical areas within 7km of the SPA.
- Policy SS10: Meeting our housing needs. Provides for a minimum of **12,763 net additional dwellings** for the period 1 April 2023 to 31 March 2040, an average of 751 dwellings per annum.
- Policy SS11: Arborfield Green Strategic Development Location. Provides for **mixed use development, including provision of 3,047 net new dwellings** (2,137 dwellings through extant planning permissions and completions (all residential development at this location is located between 400m and 5km from the SPA); 600 dwellings at Barkham Square; 300 dwellings by optimizing density at land currently occupied by Arborfield Studios; and 10 dwellings at Westwood Yard, Sheerlands Road), **and 6,000m² of employment floorspace**.
- Policy SS12: South Wokingham Strategic Development Location. **Provides for 2,975 new dwellings** (1,100 net new dwellings on land south of Waterloo Road (980 dwellings of which are to be delivered by March 2040, and 1,875 dwellings through extant planning permissions and completions). Located between 400m and 5km from the SPA. All residential development at this location is located between 400m and 5km from the SPA.
- Policy SS13: Loddon Valley Garden Village. **Provides for 3,930 new dwellings** (2,700 dwellings of which are to be delivered by March 2040), **and 100,000m² of research and development floorspace** (or equivalent use class E(g)). This is a large allocation. Circa 132ha of the site is located within 400m and 5km from the SPA, circa 536 ha of the site

¹⁰³ [Burnham Beeches Recreation Report.pdf \(buckinghamshire-gov-uk.s3.amazonaws.com\)](#) [Accessed 27/08/2024]

¹⁰⁴ [Covid 19 support offer \(buckinghamshire-gov-uk.s3.amazonaws.com\)](#) [Accessed 27/08/2024]

is located within 5km to 7km of the SPA, and circa 67 ha of the site is located more than 7km from the SPA.

- Policy SS14: Sites allocated for residential, including residential as part of mixed-use development. Provides **residential site allocations** including location and quantum of development.
- Policy H9: Gypsies and Travellers and Travelling Showpeople provision. Allocates a **minimum of 86 net new gypsy, traveller and travelling showpeople pitches** in Wokingham Borough.

Site Allocations

- Located between 400m and 5km of the Thames Basin Heaths SPA
- 5WW017, 026, 030, 031 - South Wokingham SDL extension for 1,100 dwellings.
- 5SH025 - Land north of Arborfield Road for 191 dwellings
- 5FI003 - 31 and 33 Barkham Ride for 80 dwellings
- 5SW019 - Land west of Trowes Lane for 81 dwellings
- 5BA032 - 24 Barkham Ride for 30 dwellings
- 5BA013 - Woodlands Farm, Wood Lane for 15 pitches
- 5WK043 - Land at St Annes Drive for 54 dwellings
- 5SH023, 27 - Land east and west of Hyde End Road for 175 dwellings
- 5WK045 - Land at Bridge Retail Park for 59 dwellings
- 5FI004 - Greenacres Farm, Nine Mile Ride for 100 dwellings
- 5FI024 - Hillside, Lower Wokingham Road for 15 dwellings
- 5BA036 - High Barn Farm, Commonfield Lane, Wokingham, RG40 4PR for 20 pitches
- 5FI032 - Honeysuckle Lodge, Commonfield Lane for 4 pitches
- 5BA010 - Barkham Square for 600 dwellings
- 5WK011 - Land south of London Road (Western Field) for 12 dwellings

5.23 Located between 5km and 7km from the Thames Basin Heaths SPA and for 50 dwellings or more.

- 5WK051 - Land east of Toutley Depot for 130 dwellings
- 5WK054 - WBC council offices, Shute End, Wokingham for 100 dwellings

Atmospheric Pollution

Thames Basin Heaths SPA

5.24 Nightjar, woodlark and Dartford warbler, the qualifying species of the Thames Basin Heaths SPA, are not directly sensitive to atmospheric pollution. However, atmospheric nitrogen deposition has the potential to affect these species through indirect effects on these species' broad habitats, notably areas of heathland or acid grassland, if it is sufficiently extensive to materially change habitat structure,

depending on management. APIS highlights that European dry heaths, which all these species depend on, have a critical nitrogen load of 5-15 kg N/ha/yr. Exceedance of this critical load would lead to a transition from heather to coarse grass dominance and therefore change how the qualifying birds are able to use the micro-habitats in heathland. The current background atmospheric nitrogen deposition rate for the heathland components of the SPA is a maximum of 16 kgN/ha/yr, thus exceeding the critical load. Multiple component parts of the SPA lie directly adjacent to major roads that are likely to constitute significant journey to work routes for residents of Wokingham Borough. For example, there are multiple parcels of lowland heathland within 200m of the A30 in Yateley Common Country Park to the south of Wokingham Borough in Hart District. Another parcel of heathland lies approx. 20m from the A3095 to the east of Wokingham Borough in the adjoining authority of Bracknell Forest. Given that this is a potential commuter route for Wokingham Borough residents, especially those originating in the southern part of the authority, **the Thames Basin Heaths SPA is screened in for AA.**

Thursley, Ash, Pirbright & Chobham SAC

- 5.25 Thursley, Ash, Pirbright & Chobham SAC is designated for its depressions on peat substrates, Northern Atlantic wet heaths and European dry heaths. From an atmospheric pollution perspective, all three designated habitats have a critical nitrogen load of 5-15 kg N/ha/yr)
- 5.26 Considerable parts of the SAC are located near major roads. For example, in the authority of Surrey Heath, the M3 runs directly past the Lightwater Country Park (which contains heathland elements of the SAC). Further along the M3 (and still within Surrey Heath), lowland fen and heathland habitats in Chobham Common also lie directly adjacent to the M3. Review of the Department for Transport's traffic statistics shows that at manual count point 46010, the M3 had an Annual Average Daily Traffic (AADT) for 2022 (the most recent manual count available) of 96,020 cars, 25,124 light goods vehicles and 8,497 heavy goods vehicles¹⁰⁵. However, the 2021 Census Data indicates that 1238 people (c. 1.4% of commuters from Wokingham) commute into Surrey¹⁰⁶. Furthermore, the Transport Assessment Report (2020) has further highlighted how a number of other destinations are more regularly used to commute to, or from Wokingham Borough.
- 5.27 The M3 leads through the authorities of Runnymede, Spelthorne and Hounslow. None of these authorities are on the list of the most popular commuter destinations for residents from Wokingham Borough. Furthermore, only 2.3% (545 out of 23,329 people commuting by car) of the total inflow into Wokingham Borough comes from Surrey Heath. **Nonetheless, Thursley, Ash, Pirbright and Chobham SAC has been screened in for AA.**

Chilterns Beechwoods SAC

- 5.28 The Chilterns Beechwoods SAC is designated for several habitat features that are sensitive to atmospheric pollution. The site's most sensitive habitat feature is *Asperulo-Fagetum* beech forest, which has a critical nitrogen load of 10-15 kg N/ha/yr. To a lesser extent its semi-natural dry grasslands and scrubland facies

¹⁰⁵ <https://roadtraffic.dft.gov.uk/manualcountpoints/46010> [Accessed on the 27/08/2024]

¹⁰⁶ [Origin-destination data, England and Wales: Census 2021 - Nomis - Official Census and Labour Market Statistics \(nomisweb.co.uk\)](https://www.nomisweb.co.uk/census/2021/origin-destination) [Accessed 28/08/2024]

(important orchid sites) are also vulnerable to changes in air quality (critical nitrogen load of 10-20 kg N/ha/yr). The current background atmospheric nitrogen deposition rate for the *Asperulo-Fagetum* habitat (maximum of 33.5 kg N/ha/yr) far exceeds this critical load. A Local Plan is only likely to result in air quality changes in a Habitats Site if major roads are located within 200m of the site boundary and these will form significant journey to work routes. A review of the location of Wokingham Borough in relation to adjacent authorities and the road infrastructure highlights that a component part of the SAC (Bisham Woods SSSI) lies immediately adjacent to the A404. To get to Bisham Woods SSSI, a commuter from Wokingham would have to travel c. 17km along the M4 and then A404. The 2021 census data suggests that only 814 people (0.9% of commuters)¹⁰⁷ travel from Wokingham into Buckinghamshire. **Nonetheless, the Chilterns Beechwoods SAC is screened into AA.**

Windsor Forest & Great Park SAC

5.29 Several habitats in the Windsor Forest and Great Park SAC are sensitive to impacts from atmospheric nitrogen deposition, most notably the oak woods with *Quercus robur* (empirical critical nitrogen load of 10-15 kg N/ha/yr) and the Atlantic beech forests with *Ilex* and *Taxus* in the shrublayer (critical nitrogen load of 10-20 kg N/ha/yr). Exceedance effects in the oak woods would include a loss of mycorrhiza, epiphytic lichens and bryophytes. Notably the current deposition rates in the SAC far exceed the critical loads in both the oak woods and the beech forest, equating to a maximum of 28.7 kg N/ha/yr. The SAC and woodland habitat therein lies directly adjacent to the B383 and the A332 in the adjoining authority of Windsor and Maidenhead. Census data¹⁰⁸ indicates that 3,124 commuters travel daily from Wokingham into Windsor & Maidenhead (7% of the total). **The Windsor Forest & Great Park SAC is screened in for AA.**

Aston Rowant SAC

5.30 Designated habitats of Aston Rowant SAC are sensitive to increased atmospheric nitrogen deposition. The Juniper community on dry heaths has a nitrogen critical load of 5-15kg N/ha/yr, the juniper community on semi dry calcareous grassland has a nitrogen critical load of 10-15 kg N/ha/yr, whilst the beach forest is less sensitive, with a nitrogen critical load of 10-20 kg N/ha/yr. Portions of the SAC are located within less than 200m of the M40 road within Buckinghamshire and South Oxfordshire. As such there is a possibility of traffic flows along the A40 affecting the atmospheric nitrogen deposition within the SAC. The SAC is located more than 11km from Wokingham Borough boundary as the crow flies, or c. 38km if travelling via the M4, A404 and M40. Although 1123 people (c 1.25% of commuters)¹⁰⁹, travel from Wokingham to Oxford (the main town located on the M40 in proximity to Wokingham), the M40 past Aston Rowant SAC is not considered to be a primary commuter route. Aston Rowant SAC is screened out from AA.

¹⁰⁷ [Origin-destination data, England and Wales: Census 2021 - Nomis - Official Census and Labour Market Statistics \(nomisweb.co.uk\)](https://nomisweb.co.uk) [Accessed 28/08/2024]

¹⁰⁸ [Origin-destination data, England and Wales: Census 2021 - Nomis - Official Census and Labour Market Statistics \(nomisweb.co.uk\)](https://nomisweb.co.uk) [Accessed 28/08/2024]

¹⁰⁹ [Origin-destination data, England and Wales: Census 2021 - Nomis - Official Census and Labour Market Statistics \(nomisweb.co.uk\)](https://nomisweb.co.uk) [Accessed 28/08/2024]

Hartslock Wood SAC

5.31 Habitats of Hartslock Woods SAC have been identified as being sensitive to increased atmospheric nitrogen deposition. The calcareous grassland (also an important orchid site), has a critical nitrogen load of 10-20kg N/ha/yr, whilst the *Taxus baccata* woods are more sensitive, with a critical load of 10-15 kg N/ha/yr. However, the SAC is relatively isolated and is not located within 200m of any roads that could be considered a main significant commuter route. Further, as this SAC is located more than 10km from Wokingham Borough, Hartslock Wood SAC is screened out from AA.

Burnham Beeches SAC

5.32 The beech forest on acidic soils for which the SAC is designated have been identified to be sensitive to increased atmospheric nitrogen deposition. They have a nitrogen critical load of 10-15 kg N/ha/yr. The SAC is located more than 13km as the crow flies from Wokingham Borough boundary. The area of Burnham Beeches SAC includes small roads that pass through the SAC itself. These small roads are not considered to be a key commuting route for residents of Wokingham and would more provide local rural connectivity. Burnham Beeches SAC is screened out from AA.

Summary

5.33 Due to the in-combination nature of atmospheric pollution, its impacts will be determined by the cumulative effect of all new development that leads to an increase in the number of car commuter journeys. The following strategic policies are **screened in for AA** in relation to the **Thames Basin Heaths SPA, Thursley Ash Pirbright & Chobham SAC, Chilterns Beechwoods SAC** and the **Windsor Forest & Great Park SAC**:

- Policy SS2: Spatial Strategy and Settlement Hierarchy. This policy **specifies the settlements and geographic areas in which growth is likely to be delivered.**
- Policy SS8: Meeting employment needs. The policy identifies a **quantum and geographic location of employment development.**
- Policy SS10: Meeting our housing needs. Provides for a minimum of **12,763 net additional dwellings** for the period 1 April 2023 to 31 March 2040, an average of 751 dwellings per annum.
- Policy SS11: Arborfield Green Strategic Development Location. Provides for **mixed use development, including provision of 3,047 net new dwellings** (2,137 dwellings through extant planning permissions and completions; 600 dwellings at Barkham Square; 300 dwellings by optimizing density at land currently occupied by Arborfield Studios; and 10 dwellings at Westwood Yard, Sheerlands Road), **and 6,000m² of employment floorspace.**
- Policy SS12: South Wokingham Strategic Development Location. **Provides for 2,975 new dwellings** (1,100 net new dwellings on land south of Waterloo Road (980 dwellings of which are to be delivered by March 2040, and 1,875 dwellings through extant planning permissions and completions)

- Policy SS13: Loddon Valley Garden Village. **Provides for 3,930 new dwellings** (2,700 dwellings of which are to be delivered by March 2040), and **100,000m² of research and development floorspace** (or equivalent use class E(g)).
- Policy SS14: Sites allocated for residential, including residential as part of mixed-use development. Provides **residential site allocations** including location and quantum of development.
- Policy ER1: Core Employment Areas. Provides for the **possible expansion of existing Core Employment Areas**
- Policy H9: Gypsies and Travellers and Travelling Showpeople provision. Allocates a **minimum of 86 net new gypsy, traveller and travelling showpeople pitches** in Wokingham Borough.

Loss of Functionally Linked Land

Thames Basin Heaths SPA

5.34 The Thames Basin Heaths SPA is designated for its mobile breeding bird species, including nightjar, Dartford warbler and woodlark. These species routinely forage beyond the designated site boundary but can also nest in suitable locations (e.g. patches of heathland, acid grassland and plantation woodland) outside the SPA. The closest part of the SPA is only approx. 58m to the south of Wokingham Borough, and any of the qualifying species could use habitats in the southern part of the authority. Section 4.5 has established that neither nightjar nor woodlark has highly specialised prey requirements and as a result they include many common and widespread habitats in their foraging resource. In contrast, they do have highly specialised nesting requirements; suitable habitat for nesting is therefore sparse and the loss of such habitat, even outside the SPA, could affect the overall SPA population (depending on whether the land parcels are actually used for nesting). However, a review of the WBLPU's allocated sites indicates that none of these comprise heathland, acid grassland or plantation woodland. Therefore, it is concluded that the WBLPU will not result in LSEs on the Thames Basin Heaths SPA regarding the impact pathway loss of functionally linked land. The site is screened out from AA.

Water Quantity, Level and Flow

Thursley, Ash, Pirbright & Chobham SAC

5.35 The Thursley, Ash, Pirbright & Chobham SAC is partly designated for its Northern Atlantic wet heaths with *Erica tetralix* and depressions on peat substrates. Both these habitat features require a naturally fluctuating hydrological regime. Natural England's Site Conservation Objectives Supplementary Advice Note highlights that any changes in the source, depth, duration, frequency and magnitude of water supply may affect the site's characteristics assemblage of plant species¹¹⁰. However, the Site Improvement Plan highlights that the main concern regarding the SAC is the presence of drainage ditches that may change the water level within the site. A review of the Phase 2 Water Cycle Study (WCS) for Wokingham

¹¹⁰ <http://publications.naturalengland.org.uk/publication/5141075941392384> [Accessed on the 28/08/2024]

Borough¹¹¹ indicates that the closest part of the SAC to the Borough lies in the Loddon Management Catchment, which forms part of the South East Water Resource Zone. The WCS shows that there is sufficient water availability to accommodate the growing demand in this part of the authority. The WCS did note that water resources are limited due to climate change and that new development would not result in an unsustainable increase in water abstraction. The WCS also noted that development could be provided to ensure that unsustainable abstraction was not needed via the implementation of strategies. Moreover, Thames Water have prepared a Water Resource Management Plan (WRMP) setting out how they would meet the water needs of population growth across their supply area to 2050. This was subject to HRA that specifically considered potential effects on Habitats Sites which confirmed that no significant effects on any Habitats Sites would arise from its implementation¹¹². It is noted that at the time of producing this HRA, Thames Water have produced a revised draft WRMP 2024 (rdWRMP4) which looks ahead to 2075. This has also been subject to its own HRA¹¹³ which concluded no adverse effects on Habitats Sites. The WRMP and rdWRMP24 considered population growth across Thames Water's entire supply area (including Wokingham Borough) and the supply strategy runs well beyond the period covered by the Local Plan Update. Therefore, LSEs arising from the WBLPU can be excluded, and the site is screened out from AA.

Chilterns Beechwoods SAC

5.36 The *Asperulo-Fagetum* beech forests in the Chilterns Beechwoods SAC are sensitive to changes in the water supply. As for the Windsor Forest and Great Park SAC, Natural England's Site Conservation Objectives Supplementary Advice Note¹¹⁴ highlights that maintaining the hydrological regime is a key step in meeting the site's conservation objectives¹¹⁵. The closest component part of the SAC lies 2.8km to the north-east of Wokingham Borough in the Lower Thames operational catchment¹¹⁶. As identified, the northern part of Wokingham Borough is supplied by Thames Water, which extracts water from the Lower Thames operational catchment. Thames Water undertook an HRA¹¹⁷ of their draft Water Resources Management Plan in 2019, which determined that there would be no adverse effects on any Habitats Site. The HRA¹¹⁸ of the rdWRMP24 also concluded no adverse effects on Habitats Sites. Given this evidence, LSEs can be excluded, and the site is screened out from AA.

Windsor Forest and Great Park SAC

5.37 The Windsor Forest and Great Park SAC, designated for its oak woods and its beech forests, lies approx. 8.8km to the east of Wokingham Borough. Natural England's Site Conservation Objectives Supplementary Advice Note states that

¹¹¹ JBA Consulting. (2024). Wokingham Borough Council Water Cycle Study – Phase 2

¹¹² <https://corporate.thameswater.co.uk/-/media/Site-Content/Your-water-future-2018/Appendices/dWRMP19-Appendix-C---HRA---Stage-1-screening-151217.pdf>

¹¹³ <https://www.thameswater.co.uk/media-library/home/about-us/regulation/water-resources/wrmp24-draft/technical-appendices/habitats-regulation-assessment.pdf> [Accessed 28/08/2024]

¹¹⁴ <https://designatedsites.naturalengland.org.uk/TerrestrialAdvicePDFs/UK0012724.pdf> [Accessed 28/08/2024]

¹¹⁵ <http://publications.naturalengland.org.uk/publication/4808896162037760> [Accessed on the 28/08/2024]

¹¹⁶ <https://environment.data.gov.uk/catchment-planning/OperationalCatchment/3285> [Accessed on the 03/12/2019]

¹¹⁷ Ricardo. Thames Water Revised Draft Water Resources Management Plan 2019 Habitat Regulations Assessment (2018).

Available at: <https://corporate.thameswater.co.uk/-/media/Site-Content/Your-water-future2018/Appendices/dWRMP19-Appendix-C---HRA---Stage-1-screening-151217.pdf> [Accessed on the 28/08/2024]

¹¹⁸ <https://www.thameswater.co.uk/media-library/home/about-us/regulation/water-resources/wrmp24-draft/technical-appendices/habitats-regulation-assessment.pdf> [Accessed 28/08/2024]

maintaining an appropriate hydrological regime for the site is a key requirement for meeting the site's conservation objectives¹¹⁹. Specifically, any change to the source, depth, duration, frequency, magnitude and the timing of water supply can alter the assemblage of plant species found in the site. The northern part of Wokingham Borough is supplied by the Henley Water Resource Zone within the Thames Water supply boundary. Water abstractions for this supply zone derive from the Lower Thames operational catchment¹²⁰, the geographic boundaries of which include Windsor Forest and Great Park SAC. However, Thames Water produced a Water Resource Management Plan (WRMP) setting out how they would meet the water needs of population growth across their supply area (including Wokingham Borough) to 2050. They undertook an HRA¹²¹ of the WRMP in 2019, which determined that there would be no adverse effects on any European site. The HRA¹²² of the rdWRMP24 also concluded no adverse effects on Habitats Sites. Given that population growth across their supply area (including Wokingham Borough) was factored into their WRMP and rdWRMP2024 and that their supply strategy runs well beyond the period covered by the Local Plan Update, LSEs of the WBLPU can be excluded, and the site is screened out from AA.

Summary

5.38 Overall, two of the impact pathways and linked Habitats Sites were screened in for AA, because LSEs could not be excluded. The impact pathway recreational pressure was taken forward to AA in relation to the Thames Basin Heaths SPA and Thursley, Ash, Pirbright & Chobham SAC. The impact pathway atmospheric pollution was screened in regarding the Thames Basin Heaths SPA and the Windsor Forest and Great Park SAC.

¹¹⁹ <http://publications.naturalengland.org.uk/publication/517500009015296> [Accessed on the 28/08/2024]

¹²⁰ River catchments can be identified using the Environment Agency's Catchment Data Explorer. <https://environment.data.gov.uk/catchment-planning/OperationalCatchment/3285> [Accessed on the 28/08/2024]

¹²¹ Ricardo. Thames Water Revised Draft Water Resources Management Plan 2019 Habitat Regulations Assessment (2018). Available at: <https://corporate.thameswater.co.uk/-/media/Site-Content/Your-water-future2018/Appendices/dWRMP19-Appendix-C---HRA---Stage-1-screening-151217.pdf> [Accessed on the 03/12/2019]

¹²² <https://www.thameswater.co.uk/media-library/home/about-us/regulation/water-resources/wrmp24-draft/technical-appendices/habitats-regulation-assessment.pdf> [Accessed 28/08/2024]

6. Appropriate Assessment

Recreational Pressure

Thames Basin Heaths SPA and Thursley, Ash, Pirbright & Chobham SAC

- 6.1 The Screening chapter established that LSEs of the WBLPU on the Thames Basin Heaths SPA from an increase in recreational pressure cannot be excluded. Natural England's Site Improvement Plan for the SPA highlights recreational disturbance as a threat to the qualifying birds for the site, particularly because the SPA species nest on (or close to) the ground and are therefore highly sensitive recreational users (such as from dog walkers). The parcels of the SPA that are most likely to be accessed by new residents lie to the south and the south-east of the Wokingham Borough boundary, including the Bramshill SSSI and Broadmoor to Bagshot Woods and Heaths SSSI.
- 6.2 Much of the available evidence base relating to the in-combination recreational pressure in the Thames Basin Heaths SPA, stems from four visitor surveys undertaken in 2005, 2012 / 2013, 2018 and 2023. The 2005 visitor survey was commissioned by English Nature (the predecessor of Natural England) to provide a baseline on recreational pressure in the SPA. Given the significant housing growth in south-east England, a further visitor survey was then undertaken on behalf of Natural England in 2012 / 2013¹²³, 2018¹²⁴ and 2023¹²⁵, replicating the original methodology where possible. The results of these visitor surveys (as relevant to Wokingham Borough) are discussed in the following to assess whether the WBLPU might affect the recreational footprint in the SPA.

Overview of In-Combination Visitor Survey Results as Relevant to Wokingham Borough

- 6.3 The most relevant access points to the SPA for Wokingham Borough's residents covered by the visitor surveys, based on proximity to Wokingham Borough and good accessibility via main road links, are the following:
- Broadmoor to Bagshot Woods & Heaths SSSI, and Bracknell Forest (survey locations 3 and 30 respectively), which are easily accessible via the A322 and the B3430 (in Bracknell Forest);
 - Wildmoor Heath near Sandhurst (covered by survey locations 19 and 20 respectively) (in Bracknell Forest);
 - Bramshill Plantation and Warren Heath (survey locations 7 and 8 respectively) are two parcels of the SPA that lie immediately south of Wokingham Borough and are easily accessible via the A327 and Bramshill Road. (in Hart District); and

¹²³ Fearnley H. & Liley D. (2013). Results of the 2012/13 visitor survey on the Thames Basin Heaths Special Protection Area (SPA). Natural England Commissioned Reports, Number 135. 107pp.

¹²⁴ Visitor Access Patterns on the Thames Basin Heaths 2018 (EPR for Natural England). Available at: <https://surreyheath.moderngov.co.uk/documents/g3273/Public%20reports%20pack%2019th-Sep-2019%2010.00%20Thames%20Basin%20Heaths%20Joint%20Strategic%20Partnership%20Board.pdf?T=10>

¹²⁵ Panter C., Bishop E. & Rush E. (2024). Thames Basin Heaths Special Protection Area 2023 Visitor Survey. Report by Footprint Ecology for Natural England.

- Castle Bottom to Yateley & Hawley Common (survey locations 9 and 10 respectively) are components of the SPA that lie along the A30 to the south of Wokingham Borough (in Hart District).
- 6.4 The 2012 tally counts indicate that survey points 3 and 30, which provide access to the Broadmoor and Bagshot Woods & Heaths SSSI, are very popular for recreational users. Survey point 3 (The Lookout) was the second most popular of all sites surveyed in the Thames Basin Heaths SPA, totalling 541 adults and 153 dogs entering over a 32-hour survey period. Survey point 30 was slightly quieter with 188 adults and 201 dogs entering over a similar timeframe. The fact that more dogs than adults were counted as entering in this location, likely means that this location is used by professional dog walkers, who are often accompanied by multiple dogs. It is considered that these two locations are among the most likely to be visited by residents from Wokingham Borough, because they can be conveniently reached via the A322 that connects this part of Bracknell Forest with Wokingham Borough.
- 6.5 In contrast, on Warren Heath (survey point 8) just south of Wokingham Borough in Hart District, only 40 adults and 34 dogs were entering over a 32-hour period. No count data were available for the nearby Bramshill Plantation. This area of the SPA appears to be considerably less busy than the 'honeypot' component parcels in Bracknell Forest. Survey points 9 and 10, which are the main access points to Yateley Common Country Park, were slightly busier than the SPA sites around Bramshill. Seventy-six people and 37 dogs were observed entering at survey point 9, whereas 140 people and 87 dogs entered at survey point 10 (both over 16-hour periods). These parts of the SPA are a short distance south of Wokingham Borough but can be relatively easily accessed via the A327 and the A30 road link. It is likely that most recreational use would arise from residents originating from Hart, but due to the proximity of these parts of the SPA to Wokingham Borough, some additional recreational usage might arise from the WBLPU.
- 6.6 More generally, the data from the visitor surveys in May / June and August 2012 indicate that most interviewees visit the SPA daily (929 interviewees, 38%) or more than once a week (833 interviewees, 34%). Notably, most visitors undertake dog walking as their main activity (1,939 interviewees, 66%), followed by walking (614 interviewees, 21%) and cycling (124 interviewees, 4%). Furthermore, only 10% of interviewees have visited the site for less than a year, while 26% have been using the SPA between 1 and 5 years and a further 25% having visited between 5 and 10 years. 75% of interviewees visit the site by car and 22% travel on foot, the latter being local residents that live within walking distance of the SPA. These results are important because they demonstrate that the Thames Basin Heaths SPA is subject to high levels of repeat recreational pressure, most notably from dog walkers, which is the user group that is likely to have the highest disturbance impact to ground-nesting birds.
- 6.7 The 2012 visitor survey showed that of 2,316 interviewees giving a valid postcode, 2,177 (94%) lived within a 5km radius from the SPA. Only 6% of visitors travelled from beyond a 5km catchment zone. Interestingly, in comparison to the earlier visitor survey undertaken in 2005, the number of visitors from within the 5km zone increased from 88% to 93%. This is most likely due to an increase in the number of dwellings within 5km of the Thames Basin Heaths SPA in that 7-year timeframe. 75% of car-based visitors that were on a short visit

from home, lived within 4.61km of the survey location. Importantly, the 2012 visitor survey also identified which Local Planning Authorities interviewees lived in. Unsurprisingly, most visitors originate from districts that include parcels of the SPA, including Surrey Heath (540 interviewees, 23%), Woking (355 interviewees, 15%) and Hart Districts (341 interviewees, 15%). Wokingham Borough's contribution to the overall recreational footprint in the SPA was considerably lower, with only 112 interviewees (5%) coming from this authority. According to the map showing the distribution of visitor postcodes, most visitors from the borough come from the wider area surrounding the market town of Wokingham. While this evidence indicates that Wokingham Borough is not one of the top five contributors to recreational pressure in the SPA, due consideration to its impact must be given, particularly in-combination with the residential growth in other authorities surrounding the SPA.

- 6.8 Cyclical updates to visitor surveys are being undertaken as part of the long-term access monitoring in the SPA and to ensure that the current level of SAMM / SANG provision is effective in protecting the site. Broadly, the interview data presented in the 2024 report are similar to that of previous surveys, except for the following. The number of people entering the SPA per hour was higher than in any of the previous surveys at 23 out of 29 comparable survey points (80%). This ties in with the number of dwellings within 5km of the SPA, which has increased by 11% since December 2011 and 6% since January 2018. Most interviewees were dog walking (74%) or walking without a dog (19%), and around a quarter of interviewees (24%) are visiting the site daily. Visitors travelled a 'typical' (median) distance of 2.4km to the site and 75% lived within 4.6km from the relevant survey point. Importantly, these data indicate that the 5km core catchment of the Thames Basin Heaths SPA, the area within which all new dwellings require SANG and SAMM mitigation, still applies. The proportion of interviewees coming from Wokingham Borough was 4% in 2023, which represented a small decrease to the 5% recorded in the 2012 / 2013 visitor survey.

In-Combination Approach to Mitigation in the Thames Basin Heaths SPA

- 6.9 The evidence base from the aforementioned visitor surveys has fed into Local Plan HRAs of several authorities that contribute to recreational pressure in the Thames Basin Heaths SPA, culminating in the Thames Basin Heaths (TBH) Joint Strategic Partnership Board (JSPB), comprised of eleven local authorities and two County Councils.
- 6.10 Most importantly, visitor catchment data from the visitor surveys have informed several TBH SPA Avoidance Strategies (such as the Guildford Borough Council Avoidance Strategy¹²⁶). These are effectively Supplementary Planning Documents agreed with Natural England), which detail how authorities propose to avoid adverse effects on the site integrity of the SPA. Primarily, these strategies identify buffer zones around the SPA, which are associated with specific conditions and / or mitigation requirements. For the Thames Basin Heaths SPA, these zones have been identified as follows:

- a 400m exclusion zone, where no additional development is permitted;

¹²⁶ Guildford Borough Council. (2017). Thames Basin Heaths Special Protection Area Avoidance Strategy 2017 – Supplementary Planning Document.

- the SPA’s primary visitor catchment zone between 400m and 5km, where additional residential development must be mitigated through a combination of Suitable Alternative Natural Greenspace (SANG) and Strategic Access Management and Monitoring (SAMM); and
- the 5-7km zone where residential development over 50 dwellings must be mitigated as above, on a case-by-case basis.

6.11 To meet the identified housing need in the period to 2040, WBC have allocated several sites for housing development. These include large SDLs (allocated for mixed use), in which the largest proportion of residential growth will be delivered. Furthermore, a series of smaller housing sites have been included to deliver net new dwellings across the smaller settlements within the borough. Table 5-2 assesses each of these allocations regarding their distance to the Thames Basin Heaths SPA and anticipated capacity. For the sites that trigger mitigation requirements, it also specifies the parameters according to which SANG and SAMM mitigation will need to be delivered.

Table 5-2: Number of dwellings and distance to the Thames Basin Heaths SPA of residential allocations (including SDLs) allocated in the WBLPU and mitigation requirements.

Site Reference	Site Name	Number of Net New Dwellings	Approx. Distance (m) to the Thames Basin Heaths SPA	Type of Mitigation Required
5WW017, 026, 030, 031	South Wokingham SDL extension	980	5km	<ul style="list-style-type: none"> • Bespoke (on-site) SANG provision • SAMM contribution according to the latest per-dwelling tariff
NA	Arborfield Green SDL intensification	300	5km	<ul style="list-style-type: none"> • Bespoke SANG solution provided (Barkham Square adjacent to the allocation) • SAMM contribution according to the latest per-dwelling tariff
NA	Loddon Valley Garden Village SDL	2,700	5km, 5-7km, beyond 7km ¹²⁷	<ul style="list-style-type: none"> • Bespoke (on-site) SANG provision • SAMM contribution according to the latest per-dwelling tariff

¹²⁷ The Loddon Valley Garden Village SDL stretches over all three buffer zones surrounding the Thames Basin Heaths SPA, including 5km, 5-7km and beyond 7km (the latter being the distance in which no mitigation is required). Therefore, the ultimate mitigation requirements for this SDL will depend on the final distribution of dwellings, with some dwellings not in need of SANG and SAMM measures.

Site Reference	Site Name	Number of Net New Dwellings	Approx. Distance (m) to the Thames Basin Heaths SPA	Type of Mitigation Required
5FI028	Westwood Yard, Sheerlands Road	10	5km	<ul style="list-style-type: none"> Contribution to strategic council-owned SANG (with the specific SANG having sufficient capacity and encompassing the site within its catchment) SAMM contribution according to the latest per-dwelling tariff
5SH025	Land north of Arborfield Road	191	5km	<ul style="list-style-type: none"> Bespoke (on-site) SANG provision SAMM contribution according to the latest per-dwelling tariff
5FI003	31 and 33 Barkham Ride	80	5km	<ul style="list-style-type: none"> Bespoke (on-site) SANG provision SAMM contribution according to the latest per-dwelling tariff
5SW019	Land west of Trowes Lane	81	5km	<ul style="list-style-type: none"> Strategic (off-site) SANG provision. Strategic SANG capacity at University of Reading owned SANG (with the specific SANG having sufficient capacity and encompassing the site within its catchment) SAMM contribution according to the latest per-dwelling tariff
5BA032	24 Barkham Ride	30	5km	<ul style="list-style-type: none"> Contribution to strategic council-owned SANG (with the specific SANG having sufficient capacity and encompassing the site within its catchment)

Site Reference	Site Name	Number of Net New Dwellings	Approx. Distance (m) to the Thames Basin Heaths SPA	Type of Mitigation Required
				<ul style="list-style-type: none"> SAMM contribution according to the latest per-dwelling tariff
5BA013	Woodlands Farm, Wood Lane	15 pitches	5km	<ul style="list-style-type: none"> Contribution to strategic council-owned SANG (with the specific SANG having sufficient capacity and encompassing the site within its catchment) SAMM contribution according to the latest per-dwelling tariff
5WK043	Land at St Annes Drive	54	5km	<ul style="list-style-type: none"> Strategic (off-site) SANG provision SAMM contribution according to the latest per-dwelling tariff
5SH023, 27	Land east and west of Hyde End Road	175	5km	<ul style="list-style-type: none"> Strategic (off-site) SANG provision. Strategic SANG capacity at University of Reading owned SANG (with the specific SANG having sufficient capacity and encompassing the site within its catchment. SAMM contribution according to the latest per-dwelling tariff
5WK045	Land at Bridge Retail Park	59	5km (partially within 5km to 7km Zol)	<ul style="list-style-type: none"> Strategic (off-site) SANG provision SAMM contribution according to the latest per-dwelling tariff
5FI004	Greenacres Farm, Nine Mile Ride	100	5km	<ul style="list-style-type: none"> Bespoke (on-site) SANG provision SAMM contribution according to the latest per-dwelling tariff

Site Reference	Site Name	Number of Net New Dwellings	Approx. Distance (m) to the Thames Basin Heaths SPA	Type of Mitigation Required
5FI024	Hillside, Lower Wokingham Road	15	5km	<ul style="list-style-type: none"> Contribution to strategic council-owned SANG (with the specific SANG having sufficient capacity and encompassing the site within its catchment) SAMM contribution according to the latest per-dwelling tariff
5BA036	High Barn Farm, Commonfield Lane, Wokingham, RG40 4PR	20 pitches	5km	<ul style="list-style-type: none"> Contribution to strategic council-owned SANG (with the specific SANG having sufficient capacity and encompassing the site within its catchment) SAMM contribution according to the latest per-dwelling tariff
5FI032	Honeysuckle Lodge, Commonfield Lane	4 pitches	5km	<ul style="list-style-type: none"> Contribution to strategic council-owned SANG (sufficient overall capacity must be present) SAMM contribution according to the latest per-dwelling tariff
5BA010	Barkham Square	600	5km	<ul style="list-style-type: none"> Bespoke (on-site) SANG provision SAMM contribution according to the latest per-dwelling tariff
5WK011	Land south of London Road (Western Field)	12	5km	<ul style="list-style-type: none"> Contribution to strategic council-owned SANG (with the specific SANG having sufficient capacity and encompassing the site within its catchment)

Site Reference	Site Name	Number of Net New Dwellings	Approx. Distance (m) to the Thames Basin Heaths SPA	Type of Mitigation Required
				<ul style="list-style-type: none"> SAMM contribution according to the latest per-dwelling tariff
5WK046	Land at Wellington Road, Wokingham	20	5-7km	None
5WI011	Land off Wheatsheaf Close	24	5-7km	None
5SH031	Rustlings', 'The Spring' and land to the rear of 'Cushendall', Shinfield Road	10	5-7km	None
5WK029	Station Industrial Estate, Oxford Road	40	5-7km	None
5WK054	WBC council offices, Shute End, Wokingham	100	5-7km	<ul style="list-style-type: none"> Bespoke (off-site) SANG provision (at a lower standard than the 8ha per 1,000 population increase) SAMM contribution according to the latest per-dwelling tariff
5WK042	Woodside Caravan Park, Blagrove Lane	4 pitches	5-7km	None
5RU008	Land between 39-53 New Road, Ruscombe, RG10 9LQ	20	Beyond 7km	None
5CV002	Land west of Park Lane	61	Beyond 7km	None
5RU007	Land to the rear of 9-17 Northbury Lane, Ruscombe, RG10 9LH	12	Beyond 7km	None
5SO001	Land at Sonning Farm	25	Beyond 7km	None
5WI008	Winnersh Plant Hire	60	Beyond 7km	None
5TW005, 009, 010	Land at Bridge Farm	200	Beyond 7km	None

Site Reference	Site Name	Number of Net New Dwellings	Approx. Distance (m) to the Thames Basin Heaths SPA	Type of Mitigation Required
5SO008	Land east of Pound Lane (Sonning Golf Club)	50	Beyond 7km	None
5WI014	69 King Street Lane, Winnersh, RG41 5BA	28	Beyond 7km	None
5WI009, 019	Land north west of Old Forest Road	50	Beyond 7km	None
5WI012, 021	Land to the rear of Bulldog Garage and the BP filling station	34	Beyond 7km	None
	Land off Poplar Lane and Watmore Lane, Winnersh	111	Beyond 7km	None. Planning permission granted
	Roseary Cottage and 171 Evendons Lane, Wokingham	35	5-7km	None Care home Planning permission granted
	Land adjacent to Amen Corner, north of London Road, Bracknell	45	400m-5km	None Has resolution to grant August 2024. Will provide; <ul style="list-style-type: none"> Bespoke (on-site) SANG provision SAMM contribution according to the latest per-dwelling tariff

6.12 Generally, residential developments of 50 dwellings or more are expected to provide for bespoke SANG. Preference is for this to be provided on-site, but instances exist where this can be provided off-site. The responsibility for this lies with the developer and planning consent will not be granted, unless a project-level HRA demonstrates that sufficient SANG is in place to mitigate adverse effects on the integrity of the Thames Basin Heaths SPA. The Loddon Valley Garden Village SDL (Policy SS13) will be served by a multi-functional country park, comprising an area that is currently not accessible to the public. The country park will facilitate wide public access to the river corridor and open spaces. It will be a focal point for comprehensive habitat management, ecological restoration and enhancement, biodiversity improvement. The Arborfield Garrison

SDL Supplementary Planning Document (SPD)¹²⁸ indicates that a SANG will be made available in the southern part of the site, which is to provide capacity in line with the adopted SANG delivery standards and adequate parking facilities. Additional SANG will also be provided at the adjacent Barkham Square, to mitigate the proposed additional development. Further detail on the provision of bespoke SANGs will come forward as the planning applications and associated masterplans progress towards obtaining planning consent.

6.13 The remainder of this AA focuses on residential developments under 50 dwellings, which will need to make financial contributions towards council-owned and -operated strategic SANG. Table 5-3 below summarises the residential allocations of under 50 dwellings within 5km of the Thames Basin Heaths SPA. Overall, 106 net new dwellings on such sites will be delivered, equating to a population growth of 254 people. To mitigate this growth 2ha of strategic SANG capacity will need to be made available (assuming a SANG delivery standard of 8ha per 1,000 population increase, or 0.008ha per person). Moreover, the identified sites must be located in the catchment of any strategic SANG put forward for mitigation. Natural England advise that the following catchment areas should be applied to SANGs:

- SANGs with no car park available – 400m;
- SANGs of 2-12ha in size – 2km;
- SANGs of 12-20ha in size – 4km; and
- SANGs of 20+ha in size – 5km.

Table 5-3: Residential allocations of less than 50 dwellings within 5km of the Thames Basin Heaths SPA that require strategic SANG Capacity, and the resulting strategic SANG mitigation requirements.

Site Reference	Site Name	Capacity
5FI028	Westwood Yard, Sheerlands Road	10
5BA032	24 Barkham Ride	30
5BA013	Woodlands Farm, Wood Lane	15 pitches
5FI024	Hillside, Lower Wokingham Road	15
5BA036	High Barn Farm, Commonfield Lane, Wokingham, RG40 4PR	20 pitches
5FI032	Honeysuckle Lodge, Commonfield Lane	4 pitches
5WK011	Land south of London Road (Western Field)	12
Total number of dwellings		106

¹²⁸ Available at: https://www.wokingham.gov.uk/sites/wokingham/files/2023-06/Arborfield%20Garrison%20Adopt-ry%20Planning%20Document_0.pdf [Accessed on 27 August 2024]

Site Reference	Site Name	Capacity
Total population increase ¹²⁹		254
Total SANG requirement (ha)		2.03

6.14 Rooks Nest Wood SANG is one of the currently operational SANGs in Wokingham Borough. The SANG currently covers 18.3ha and was developed for its current purpose in 2011 to provide informal recreation opportunities for Wokingham residents. The site supports high wildlife and habitat diversity, comprising woodland (primarily oak, ash, silver birch, hazel, aspen and willow), grassland and fen. Its fen component is designated as a Local Wildlife Site, supporting spear thistle, marsh thistle, lesser spearwort and ragged robin. Visitors have access to a network of surfaced (totalling over 2km) and unsurfaced (1km) footpaths, enabling walks of various length. Rooks Nest Wood SANG is accessible on foot, but also has a car park that caters for visitors driving to the site.

6.15 WBC have committed to extend the 18.3ha site by 33ha of council-owned land, which will increase its overall area to 51.3ha. With the proposed extension in place, the catchment of Rooks Nest Wood SANG will increase from 4ha to 5ha. Considering this increase in catchment area, the identified residential sites were further assessed regarding their distance to the SANG (see Table 5-3). Most sites requiring strategic SANG mitigation lie within the 5km catchment of Rooks Nest Wood SANG. The only residential allocation that falls outside the SANG’s catchment is 5WK011 (Land south of London Road [Western Field]), for which alternative strategic SANG would need to be identified.

6.16 There are further third-party operated SANGs in Wokingham Borough with residual capacity available. For example, the University of Reading owns and operates The Ridge SANG, which lies off Hyde End Lane to the west of Shinfield. The SANG formally opened in July 2024 and offers enjoyable walks through semi-natural habitats and long-distance views. Within The Ridge SANG there are various internal footpaths that are connected to wider circular walks in surrounding greenspaces. The SANG also provides for the following:

- Dedicated car park with 10 spaces;
- Park ranger as the focal point for all conservation activities and recreational uses;
- Safe off-lead dog walking at all times of the year;
- Footpath connections to other greenspaces (e.g. High Copse, Langley Mead) that enhance connectivity and enable long distance walks; and
- Information boards and waymarkers that promote education and facilitate navigation.

6.17 Overall, given the available evidence base, it is considered that WBC have an adequate inventory of strategic SANG in place to mitigate the residential growth

¹²⁹ Based on an average household size of 2.4.

delivered by the WBLPU, potential windfall development, both in terms of residual capacity and geographic siting of the SANGs.

SAMM Provision

6.18 Aside from the SANG requirements discussed above, a SAMM project is in place to manage recreational pressure in the Thames Basin Heaths SPA. This is needed because a residual proportion of existing and future residents are likely to visit the SPA regardless of available SANG space. The SAMM strategy was first published in 2009 as part of the Thames Basin Heaths SPA Delivery Framework¹³⁰. It encompasses a wide range of measures to manage access, including the following:

- Delivering a consistent SPA / SANG message, such as through signs, leaflets, educational material;
- Modifying access patterns through the presence of rangers, seasonal restrictions and campaigns;
- Prioritising soft measures where possible and providing clear reasons where 'hard' access restrictions are imposed; and
- Undertaking extensive monitoring of the effectiveness of SAMM measures, such as by assessing habitat condition and bird numbers, and completing visitor surveys.

6.19 The SAMM project is delivered by Natural England and overseen by the Joint Strategic Partnership Board (JSPB). Fundamentally, measures in the SAMM inventory are facilitated by financial contributions from housing developments coming forward in the 11 authorities that wholly or partially fall within the core recreational catchment of the SPA.

6.20 Natural England and the JSPB have agreed that an annual uplift to the SAMM contributions is required to counteract inflation. This is to ensure that sufficient income is generated to deliver the SAMM objectives in-perpetuity. Without this cyclical increase in SAMM contributions, some measures may not be deliverable and adequate mitigation for the Thames Basin Heaths SPA could not be guaranteed. The financial SAMM tariffs discussed below are based on the information handed out to the Local Planning Authorities by Natural England for 2024.

6.21 All residential developments within the 5km zone and developments over 50 dwellings in the 5-7km zone are required to make financial contributions to SAMM via s106 agreements. The level of contributions is calculated on a per-bedroom basis and dependent on the buffer zone within which a development falls. WBC provides the following per-dwelling tariffs on their website based at 1 June 2024:

- Within 5km from the SPA – ranging from £563 (1 bedroom property) to £1,400 (5 bedroom property); and
- Within 5-7km from the SPA – ranging from £162 (1 bedroom property) to £401 (5 bedroom property).

¹³⁰ Thames Basin Heaths Partnership Board. (2009). Thames Basin Heaths Special Protection Area Delivery Framework. 14pp. Available at: <https://www.woking2027.info/allocations/sadpdexam/spadelivery> [Accessed on 23 August 2024]

Policy Mitigation Contained in the WBLPU

- 6.22 The previous sections have shown that there is an adequate strategic mitigation solution in place that protects the integrity of the Thames Basin Heaths SPA. This SANG and SAMM approach has been developed in partnership with (and is partially overseen by) Natural England. A comprehensive assessment of all policies in the WBLPU was undertaken to establish whether the essential policy mechanisms are in place to ensure that new development proposals will align with these legal requirements.
- 6.23 The WBLPU encompasses to key policies that address recreational pressure impacts in the Thames Basin Heaths SPA. **Policy NE1 (Biodiversity and geodiversity)** extends general protection to biodiversity in Wokingham Borough, including internationally designated sites. It places Habitats Sites at the top of the conservation priority hierarchy and specifies that *'Development proposals likely to result in a significant effect on internationally designated sites either alone or in combination with other plans or projects, will not be permitted unless it can be demonstrated that the adverse effects on the integrity of the designated site can be fully avoided, mitigated and/or compensated.'*
- 6.24 Regarding the protection of ground-nesting birds in the SPA from recreational pressure, **Policy NE3 (Thames Basin Heaths Special Protection Area)** is the most important Plan element. The policy states that development proposals which are likely to result in adverse effects on the integrity of the SPA will be refused if appropriate avoidance or mitigation measures are not delivered. Furthermore, the policy also highlights the three zones of influence surrounding the SPA (<400m, 400m-5km and 5-7km) and specifies precise SANG / SAMM requirements in each of the zones (while also accounting for the size of developments). Importantly, the policy also prevents the loss of SANG land for other uses, which is a key mechanism for ensuring that the borough's SANG inventory remains sufficient and functional.

Conclusion

- 6.25 Overall, it is considered that the WBLPU provides an adequate policy framework to protect the Thames Basin Heaths SPA from the increase in recreational pressure that will occur due to residential growth in the borough. The relevant policies discussed above provide for the general protection of Habitats Sites and reference the SANG / SAMM requirements of the formally adopted mitigation strategy for the SPA. Furthermore, WBC has secured sufficient capacity at various SANGs (e.g. Rooks Nest Wood SANG, The Ridge SANG) to absorb the additional footfall at the agreed SANG delivery standard. Therefore, adverse effects of the WBLPU on the integrity of the Thames Basin Heaths SPA regarding recreational pressure can be excluded, both alone and in-combination.

Atmospheric Pollution

- 6.26 Traffic and air quality modelling of the Thursley, Ash, Pirbright & Chobham SAC, Thames Basin Heaths SPA, Windsor Forest & Great Park SAC and Chilterns Beechwoods SAC was undertaken to inform the Local Plan HRA. A large number of transects (63 transects across the four sites) were modelled. The full results are provided in Appendix D. The results are summarised and discussed below, taking each pollutant in turn.

NO_x

- 6.27 The annual average critical level for NO_x is 30 µgm⁻³ and this applies to all Habitats sites. If this figure is not forecast to be exceeded then no likely significant effect can arise either alone or in combination with other projects and plans because the critical level is defined as the '*concentration of pollutants in the atmosphere above which direct adverse effects on receptors may occur*'. Therefore, if the critical level is not exceeded there is no basis on which to conclude negative effects could occur. At no point on any transect is annual average NO_x forecast to exceed the critical level by 2040 even in combination with other projects and plans (Table A-6 of the air quality technical note in Appendix D).
- 6.28 Although the air quality technical note in Appendix D has calculated 24hr NO_x, this is generally not considered in traffic-related assessments because point sources fluctuate much more on a short-term basis due in particular to changes in meteorology over the impact zone of the stack (which is much larger than that of a vehicle exhaust). In contrast, conditions close to the roadside fluctuate relatively little such that the annual average NO_x is the focus of assessment.

Ammonia (NH₃)

- 6.29 Table A-3 of Appendix D presents the 'in isolation' NH₃ results for the WBLPU for all Habitats sites. This is relevant because it has been agreed with Natural England on other projects that if a plan or project is too small to show in the model (which only reports results to two decimal places to avoid false precision) then it will effectively make no contribution to 'in combination' effects. This fits with the ruling in *Wealden v SSCLG* [2017] EWHC 351 (Admin) (2017), which specifically concerned the need for in combination assessment in air quality modelling for European sites. Mr. Justice Jay accepted that if the contribution of an individual plan or project to traffic growth or resulting air quality effects was 'very small indeed', it could be legitimately and legally excluded from in combination assessment. A contribution that is too small to show in the model would fall within the definition of 'very small indeed'.
- 6.30 Throughout the modelling, for all Habitats sites, the lower critical level of 1 µgm⁻³ applicable to lichens and bryophytes has been used as a precaution. Ecological interpretation of air quality modelling results typically commences with data for 10m from the roadside, because close to the road edge effects dominate and air quality models are less reliable due to the role of air turbulence. At 10m from the roadside, the contribution of the WBLPU to NH₃ concentrations by 2040 is modelled to be less than 0.01 µgm⁻³ and thus too small to show in the model for most transects. This is reported as '0.00', or as '0.01' where the third decimal place has been rounded up. If rounding is not applied these would also read '0.00'.
- 6.31 The exceptions are the following transects: TAP11, TAP14, TAP6, TAP7, TBH15, TBH16, TBH19, TBH20, TBH26, TBH28, TBH36, TBH38 and WG8.
- 6.32 However:
- For the transects which relate purely to the Thames Basin Heaths (i.e. those starting TBH, which do not overlap with Thursley, Ash, Pirbright & Chobham SAC) it is appropriate to use the upper NH₃ critical level of 3 µgm⁻³ because

lichen and bryophyte interest is not relevant to the ability of these areas to support SPA birds. When the higher critical level is applied none of these transects are forecast to have their total NH₃ concentrations exceed the critical level even 'in combination' with other projects or plans (Table A-8).

- For the sole Windsor Forest & Great Park transect (WG8) the contribution of the WBLPU becomes too small to show in the model by 15m from the roadside. Moreover, the in combination effect at this location (Table A-8) is slightly positive (being '-0.3 µgm⁻³' at 10m from the roadside) presumably because a reduction in traffic from other sources more than offsets the slight increase in traffic due to the WBLPU.

6.33 This leaves transects TAP11, TAP14, TAP6 and TAP7. These are all transects off the M3. Transects TAP11, TAP6 and TAP7 are all into Chobham Common, while TAP14 is into Lightwater Country Park. For Chobham Common, it has been established for other projects (e.g. the Surrey Heath Local Plan HRA) that a minimum 35m belt (wider in many places) of the SAC adjacent to the M3 is regularly mown as a firebreak, which is clearly visible on the ground and on Google Earth. The process of regular close mowing will have a much greater effect on ground flora and habitat structure than atmospheric nutrients.

6.34 Beyond the firebreak, NH₃ due to the WBLPU is still perceptible in the model and exceeds 1% of the critical level (Table A-3) throughout transect TAP11, being a maximum of 0.02 µgm⁻³ at 40m (i.e. 5m past the mown firebreak). In contrast, after 40m (i.e. 5-10m past the mown firebreak) the contribution of the WBLPU on TAP14 and TAP6 becomes imperceptible in the model, while TAP7 becomes imperceptible after 50m (10-15m past the mown firebreak). The fact that TAP11 (Chobham Common north of the M3) continues to be perceptible in the model throughout the transect while TAP6 and TAP7 (both Chobham Common south of the M3) fall to imperceptible by 40-50m from the M3 (5-15m past the firebreak) suggests meteorology is the main factor in the difference and illustrates the small contribution of the WBLPU.

6.35 Moreover, the M3 is one of the major strategic routes in south-east England. As such, traffic-related changes in air quality on the M3 are not a local (Wokingham) issue but a South-East England issue and is the responsibility of National Highways. This is relevant because Joint Nature Conservation Committee (JNCC) guidance on the issue¹³¹ states (pages 20/21) that: *'The trunk road network forms the core of the national transport system. Trunk roads are central to long distance travel and connectivity across the UK and traffic patterns on trunk roads are a consequence of predicted growth across the UK generally. The effects of development on traffic flows on trunk roads are more appropriately taken into account as part of national and regional strategic plan level HRAs.'* As such, this is considered to be an issue to be address at a strategic national scale rather than through the WBLPU.

Nitrogen (N)

Chilterns Beechwoods

6.36 At 10m from the road on transect CB1 the contribution of the WBLPU is 0.04 kg N/ha/yr (0.4% of the critical load) which is inconsequential by itself. The in combination effect at the same distance is 0.53 kg N/ha/yr (5.3% of the critical load). Approximately 93% of the forecast 'in combination' effect therefore derives

¹³¹ [Main Report: Guidance on Decision-making Thresholds for Air Pollution \(jncc.gov.uk\)](https://www.jncc.gov.uk/main-report-guidance-on-decision-making-thresholds-for-air-pollution)

from other plans or projects, particularly those authorities with population centres closer to or more directly connected with the SAC such as Windsor & Maidenhead and Buckinghamshire. Moreover, the air quality modelling indicates that, in the absence of traffic growth, nitrogen deposition on this transect is expected to have improved by 7.8 kg N/ha/yr by 2040. The contribution of the WBLPU would therefore retard this improvement by the equivalent of approximately 1 month¹³².

- 6.37 Therefore, while the designated beech woodland interest feature of Chilterns Beechwoods SAC would be affected by in combination nitrogen deposition, Wokingham Local Plan will make a sufficiently small contribution to the in combination effect (a one month delay in the improvement which would otherwise occur being 'very small indeed' as identified by Mr Justice Jay) that it will not make a material contribution to any adverse effect on integrity.

Thursley Ash Pirbright & Chobham SAC

- 6.38 For the vast majority of Thames Basin Heaths SPA transects the forecast nitrogen due to the WBLPU is effectively zero being between 0.00 and 0.04 kg N/ha/yr. This is almost too small to show in the model and is well within the limits of normal background variation in deposition rates. The exceptions are transects TAP11, TAP14, TAP6 and TAP7, where deposition due to the Local Plan varies from 0.08 kg N/ha/yr (TAP14) to 0.17 kg N/ha/yr (TAP11) at 10m from the roadside. As already discussed for NH₃, these four transects are all off the M3 into either Chobham Common or Lightwater Country Park.

- 6.39 A minimum 35m belt (wider in many places) of the SAC adjacent to the M3 is regularly mown as a firebreak, which is clearly visible on the ground and on Google Earth. The main negative effect of nitrogen deposition on heathlands is that it promotes excessive woody growth and an increased abundance of grasses, outcompeting the wildflower species that are less able to utilise the additional nitrogen and shading them out of the sward. However, a process of regular close mowing to maintain the firebreak removes growth and keeps the sward short and open.

- 6.40 This process of regular cutting will therefore have a more controlling effect on habitat structure and botanical diversity in this location than nitrogen deposition. As such, nitrogen deposition within the mown firebreak is not likely to materially affect botanical diversity or structure. At 35-40m from the road nitrogen deposition due to the WBLPU has reduced to a maximum of 0.09 kg N/ha/yr (on transect TAP11). The in combination effect is 0.26 kgN/ha/yr which is 5.3% of the critical load. Therefore, even allowing for the existence of the firebreak an in combination effect on the heathland in the SAC cannot be dismissed. Without any traffic growth the modelling undertaken for the Local Plan indicates that nitrogen deposition rates at 40m from the M3 would have reduced by 7.7 kgN/ha/yr by 2040. The contribution of the WBLPU would therefore retard this improvement by the equivalent of approximately 2 months¹³³. Therefore, while the designated heathland interest feature of the SAC would be affected by in combination nitrogen deposition, Wokingham Local Plan will make a sufficiently small contribution to the in combination effect (a two month delay in the improvement which would otherwise occur being 'very small indeed' as identified

¹³² 7.8/19 = 0.41 kgN/ha/yr per annum or 0.03 kgN/ha/yr per month

¹³³ 7.7/19 = 0.55 kgN/ha/yr per annum or 0.05 kgN/ha/yr per month

by Mr Justice Jay) that it will not make a material contribution to any adverse effect on integrity.

- 6.41 Moreover, the M3 is one of the major strategic routes in south-east England. As such, traffic-related changes in air quality on the M3 are not a local (Wokingham) issues but a South-East England issue and is the responsibility of National Highways. This is relevant because Joint Nature Conservation Committee (JNCC) guidance on the issue¹³⁴ states (pages 20/21) that: *'The trunk road network forms the core of the national transport system. Trunk roads are central to long distance travel and connectivity across the UK and traffic patterns on trunk roads are a consequence of predicted growth across the UK generally. The effects of development on traffic flows on truck roads are more appropriately taken into account as part of national and regional strategic plan level HRAs.'* As such, this is considered to be an issue to be addressed at a strategic national scale rather than through the WBLPU.

Thames Basin Heaths SPA

- 6.42 The nature and distribution of habitat, in other words the ecological context, is particularly relevant to interpreting effects on the integrity of Thames Basin Heaths SPA because this site is designated for breeding nightjar, woodlark, and Dartford warbler rather than for its vegetation or habitats. Nightjar and woodlark will nest in rotationally managed commercial forestry but not in mature permanent woodland and, in this SPA, they nest primarily in areas of heathland. This is relevant because much roadside habitat within this SPA constitutes permanent woodland. Nightjar will probably forage within permanent woodland and it is possible that any net increase in nitrogen deposition might somewhat reduce the abundance of some invertebrates (such as moths) in that belt.
- 6.43 However, nightjar do not have highly specialised foraging requirements, foraging in a wide range of common and widespread habitats well beyond the SPA wherever they can obtain a supply of insects of sufficient size including heathland, plantation woodland, deciduous woodland, rough pasture, arable field margins and gardens. This is supported by Natural England's Supplementary Advice on Conserving and Restoring Site Features¹³⁵ for the Thames Basin Heaths SPA, which states on page 4 that *'Within this SPA the principal habitats supporting these qualifying species are lowland heathland and rotationally managed coniferous plantation woodland'*.
- 6.44 Although nightjar and woodlark do nest in rotationally managed commercial plantations, research in Breckland Forest¹³⁶ has identified that the amount of plantation in each growth stage and (for woodlark) the planting and restock period management regime (such as whether the area was de-stumped or ploughed, and factors such as brash cover and weed control) explain the vast majority of the recorded spatial and temporal variation in nightjar and woodlark abundance. Provided these aspects of management are appropriate, other factors are therefore less likely to influence the achievement of biodiversity objectives for these species in rotational forestry than they do in more natural habitats.

¹³⁴ [Main Report: Guidance on Decision-making Thresholds for Air Pollution \(jncc.gov.uk\)](https://www.jncc.gov.uk/main-report-guidance-on-decision-making-thresholds-for-air-pollution)

¹³⁵ <http://publications.naturalengland.org.uk/file/4590853229117440>

¹³⁶ Probably the largest commercial plantation in England. Reference: Dolman, P. and Morrison, C. (2012). *Temporal change in territory density and habitat quality for Breckland Forest SSSI woodlark and nightjar populations*. Report to Forestry Commission and Natural England, number ENV103/11/19.

- 6.45 This is supported locally by the Site Improvement Plan for the Thames Basin Heaths SPA which states that '*Large parts of Thames Basin Heaths are occupied by commercial forestry plantations where the maintenance of suitable conditions for Annex 1 birds is dependent upon rotational felling*'. Therefore, impacts on heathland are most relevant to the consideration of whether the ability of the SPA to achieve its Conservation Objectives will be compromised. The minimum critical load for heathland is 5 kg N/ha/yr. However, this was lowered from 10 kg N/ha/yr because of emerging evidence that botanical changes can arise below 10 kg N/ha/yr. For impacts on the SPA, however, coarse habitat structure is much more relevant to suitability for nightjar/woodlark than the more subtle botanical and structural changes and 10 kg N/ha/yr is therefore considered appropriate for those heathland areas which are solely SPA and not also SAC.
- 6.46 For the vast majority of the Thames Basin Heaths SPA transects the forecast nitrogen due to the WBLPU is effectively zero being between 0.00 and 0.05 kg N/ha/yr. This is almost too small to show in the model and is well within the limits of normal background variation in deposition rates. The exceptions are transects TBH13, TBH15, TBH16, TBH19, TBH20, TBH26, TBH29, TBH36, TBH38 and TBH39, where nitrogen deposition due to the WBLPU at 10m from the road ranges from 0.06 kg N/ha/yr (TBH13) to 0.15 kg N/ha/yr (TBH36). However, there is no heathland on any of these transects, with the habitat being entirely woodland. This is based upon examination of habitat mapping on MAGIC (www.magic.gov.uk), cross-referenced to aerial photography on MAGIC and Google Maps. In all instances, the area of woodland is extensive managed plantation, and there is no indication it is to be cleared and put to heathland.

Windsor Forest & Great Park

- 6.47 For transects WG1 to WG5 the forecast nitrogen due to the WBLPU at 10m from the roadside is effectively zero or very slightly positive being between -0.01 and 0.00 kg N/ha/yr. On transect WG7 the contribution of the WBLPU is 0.04 kgN/ha/yr, which is greater than zero, but the 'in combination' deposition (Table A-9) is 0.01 kgN/ha/yr and thus less than 1% of the critical load¹³⁷. Therefore no adverse effect on integrity will arise either alone or in combination with other plans or projects.
- 6.48 For transect WG6 the contribution of WBLPU is 0.05 kgN/ha/yr. This is very small and well within the limits of normal background variation in deposition rates and therefore falls within the definition of 'very small indeed' which Mr Justice Jay identified plans or projects could be excluded from 'in combination' assessment. The in combination nitrogen impact at 10m from the roadside on transect WG6 is 0.30 (3% of the critical load). Therefore, 83% of the 'in combination' impact arises from other sources, particularly Windsor & Maidenhead and Bracknell Forest. In the absence of any growth Table A-9 indicates that a net improvement in nitrogen 5.9 kgN/ha/yr is forecast to arise at 10m from the roadside. Therefore the deposition due to WBLPU will retard (delay) this improvement by less than 2 months. This is considered sufficiently small that it will not be material and therefore the WBLPU will not contribute materially to any adverse in combination effect.
- 6.49 Deposition on transect WG8 is 0.09 kg N/ha/yr or 0.9% of the critical load) but the in combination nitrogen deposition is slightly positive (being '-0.03 kg N/ha/yr')

¹³⁷ This suggests that net reductions in forecast traffic from other sources offset the small increase in deposition due to the WBLPU

at 10m from the roadside) presumably because a reduction in traffic from other sources more than offsets the slight increase in traffic due to the WBLPU.

Acid deposition

6.50 Since vehicle exhausts do not emit sulphur dioxide the only source of acid is the nitrogen deposition. Therefore, the patterns for acid deposition reflect those for nitrogen deposition and the conclusions are the same.

Conclusion

6.51 It is therefore concluded that the WBLPU will not have an adverse effect on the integrity of any Habitats sites, either alone or in combination with other projects and plans.

7. Conclusions

- 7.1 Following completion of this HRA, it is concluded that the WBLPU will not have an adverse effect on the integrity of any Habitats sites, either alone or in combination with other plans or projects.