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Habitats Regulations Assessment of the Revised Growth Strategy for Wokingham

Wokingham Borough Council

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Quality information

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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.

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

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1. Background

1.1 Introduction

In February 2020, AECOM undertook a Habitats Regulations Assessment (HRA) of the Regulation 18 Wokingham Draft Local Plan Update, which allocated a minimum of 13,901 net new dwellings and additional employment space to be delivered across the Borough in the period up to 2036. However, Wokingham Borough Council (hereafter referred to as 'WBC') is now consulting on an updated approach to managing / delivering growth across the Borough in the period up to 2037/38 – the Revised Growth Strategy. The revisions to the growth strategy make the following important changes to the quantum and distribution of growth across the Borough:

- Removal of the proposed garden town at Grazeley;
- Inclusion of a new strategic garden village (including significant parkland) on land known as Hall Farm / Loddon Valley;
- Inclusion of additional smaller housing sites across Wokingham;
- Allocation of additional Local Green Spaces; and
- Extension of the Plan period to 2038.

Therefore, AECOM has been commissioned to subject the Revised Growth Strategy to HRA, focussing specifically on key changes that may have implications for European sites. The Regulation 18 HRA involved a screening assessment and identified impact pathways for which LSEs on European sites could not be excluded. Consequently, an Appropriate Assessment was undertaken of recreational pressure in the Thames Basin Heaths SPA and the Thursley, Ash, Pirbright & Chobham SAC, as well as atmospheric pollution effects in the Thames Basin Heaths SPA and Chilterns Beechwoods SAC. Since the impact pathways requiring Appropriate Assessment have already been identified, this stage of HRA will not be repeated here. Instead, this HRA will focus on the implications of the Revised Growth Strategy for recreational pressure and atmospheric pollution in the above-named sites. Furthermore, background detail will only be reproduced for the impact pathways and European sites taken forward to Appropriate Assessment.

Overall, the objective of this Revised Growth Strategy HRA is to identify any aspects of the Revised Growth Strategy that would potentially cause an adverse effect on the integrity of European sites, otherwise known as European sites (Special Areas of Conservation (SACs), Special Protection Areas (SPAs), candidate Special Areas of Conservation (cSACs), potential Special Protection Areas (pSPAs) and, as a matter of Government policy, Ramsar sites), either in isolation or 'in-combination' with other plans and projects, and to advise on appropriate policy mechanisms for delivering mitigation where such effects were identified. The UK is bound by the terms of the Conservation of Habitats and Species Regulations 2017 (as amended), which requires an Appropriate Assessment to be undertaken, where a plan or project is likely to result in LSEs on European sites, either individually or 'in-combination' with other plans and projects.

A full updated HRA will be produced to accompany the Pre-Submission Local Plan when it goes for consultation in 2022.

1.2 Legislative Context

The UK left the European Union (EU) on 31 January 2020 under the terms set out in the European Union (Withdrawal Agreement) Act 2020 ("the Withdrawal Act"). While the UK is no longer a member of the EU, a requirement for Habitats Regulations Assessment will continue as set out in the Conservation of Habitats and Species (Amendment) (EU Exit) Regulations 2019[1]. Figure 1 below sets out the legislative basis for Appropriate Assessment.

[1] these don't replace the 2017 Regulations but are just another set of amendments

The HRA process applies the 'Precautionary Principle'[2] to European sites. Plans and projects can only be permitted having ascertained that there will be no adverse effect on the integrity of the European site(s) in question. Plans and projects with predicted adverse impacts on European sites may still be permitted if there are no alternatives to them and there are Imperative Reasons of Overriding Public Interest (IROPI) as to why they should go ahead. In such cases, compensation would be necessary to ensure the overall integrity of the site network.

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

Conservation of Habitats and Species Regulations 2017 (as amended)

The Regulations state that:

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

Figure 1: The legislative basis for Appropriate Assessment

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

1.3 Scope of the Project

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

- All European sites within the boundary of Wokingham Borough; and,
- Other European sites within 10km shown to be linked to development in Wokingham through a known 'pathway' (discussed below).

Generally, it is uncommon for development plans to be deemed to have a significant effect on European 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, there are few bird species that make extensive use of functionally linked habitats located more than 10km from their core areas, 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 the Revised Growth Strategy to a European site does not mean that impacts will occur.

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

[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".*

This basic principle has also been reflected in court rulings. The Court of Appeal[3] 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 a planning permission (rather than a Core Strategy document)[4]. In this case the High Court ruled that for '*a multistage process, so long as there is sufficient information at any particular stage to enable the authority to be satisfied that the proposed mitigation can be achieved in practice it is not necessary for all matters concerning mitigation to be fully resolved before a decision maker is able to conclude that a development will satisfy the requirements of Reg 61 of the Habitats Regulations'*.

The HRA of the 2020 Wokingham Draft Local Plan Update identified that an Appropriate Assessment regarding recreational pressure and atmospheric pollution was required in relation to the following sites:

- Thames Basin Heaths SPA;
- Thursley, Ash, Pirbright & Chobham SAC; and
- Chilterns Beechwoods SAC.

The distribution of the above European sites in relation to Wokingham Borough is shown in Appendix A. An introduction to, the qualifying features (species and habitats), Conservation Objectives, and threats and pressures to the integrity of these sites are set out in the Appendix B of this report.

In order to fully inform the Appropriate Assessment, several pieces of evidence have been consulted to determine adverse effects that could arise from the Revised Growth Strategy. These include:

- Future development proposed (and, where available, HRAs) for Windsor and Maidenhead, Bracknell Forest, Surrey Heath, Hart, Basingstoke and Deane, West Berkshire, Reading, South Oxfordshire and the area of Buckinghamshire formerly known as Wycombe;
- Air Quality Impact Assessments for air quality-sensitive European sites (*note that these are not yet available*);
- Thames Basin Heaths Visitor Survey 2012 / 2013;
- The UK Air Pollution Information System (www.apis.ac.uk); and
- The Multi Agency Geographic Information for the Countryside (MAGIC) and its links to the JNCC website (www.magic.gov.uk)

[3]No Adastral New Town Ltd (NANT) v Suffolk Coastal District Council Court of Appeal, 17th February 2015
[4]High Court case of R (Devon Wildlife Trust) v Teignbridge District Council, 28 July 2015

2. Methodology

2.1 Introduction

The HRA has been carried out with reference to the general EC guidance on HRA[5] and that produced in July 2019 by the UK government[6]; Natural England has produced its own internal guidance[7]. These have also been referred to in undertaking this HRA.

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

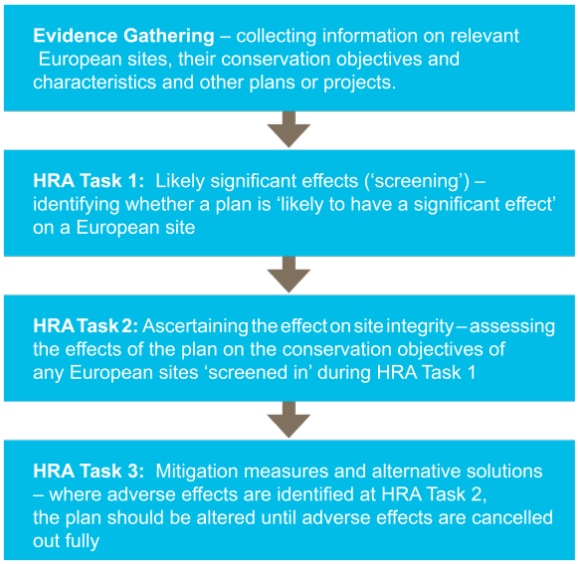

Figure 2. Four Stage Approach to Habitats Regulations Assessment. Source EC, 2001[1].

2.2 Description of HRA Tasks

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

The Revised Growth Strategy consultation focuses on the areas of change from the Draft Local Plan consultation (2020), that is those policies relating to the amount of development required and how this is proposed to be met across the borough. Additional areas are therefore proposed for housing development which were not included in the Draft Local Plan consultation, notably strategic development at Hall Farm / Loddon Valley. Given this focus, most of the development management style policies included in the Draft Local Plan are not repeated in the consultation, but vision and objectives remain consistent, in addition to the approach towards policy areas such as net zero carbon development, affordable housing, and biodiversity net gain, are retained. As a result, these policy approaches have been used to inform this HRA, in recognising that they will also form part of managing future development, including in forthcoming stages of the Local Plan.

The first stage of HRA is the Test of Likely Significant Effects. 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?"* The objective is to 'screen out' those plans and projects that can, without any detailed appraisal, be said to be unlikely to result in significant adverse effects upon European sites, usually because there is no mechanism for an adverse interaction with European sites. The previous HRA already screened in relevant policies allocating growth (except for Policy SS3 – Hall Farm / Loddon Valley Strategic Development Location, which replaces Grazeley Garden Town and is also screened

[5] 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.
[6] https://www.gov.uk/guidance/appropriate-assessment
[7] http://www.ukmpas.org/pdf/practical_guidance/HRGN1.pdf

in). Therefore, screening for Likely Significant Effects (LSEs) will not be repeated in this HRA which will instead focus on Appropriate Assessment.

2.2.2 HRA Task 2 – Appropriate Assessment (AA)

Since it is determined that a conclusion of 'no likely significant effect' cannot be drawn, the analysis has proceeded to the next stage of HRA known as Appropriate Assessment. Case law has clarified that 'appropriate assessment' is not a technical term. In other words, there are no particular technical analyses, or level of technical analysis, that are classified by law as belonging to appropriate assessment rather than determination of likely significant effects.

By virtue of the fact that it follows the screening process, there is a clear implication that the analysis will be more detailed than undertaken at the LSEs stage. One of the key considerations during appropriate assessment is whether there is available mitigation that would entirely address the potential effect. In practice, the Appropriate Assessment would take any policies or allocations that could not be dismissed following the high-level Screening analysis and analyse the potential for an effect in more detail, with a view to concluding whether there would actually be an adverse effect on the integrity of European sites (in other words, disruption of the coherent structure and function of the European site(s) and interference with the sites ability to achieve its conservation objectives).

A decision by the European Court of Justice[8] in 2018 concluded that measures intended to avoid or reduce the harmful effects of a proposed project on a European site may not be taken into account by competent authorities at the Likely Significant Effects or 'screening' stage of HRA. That ruling has been taken into account in producing this HRA.

Also, in 2018 the Holohan ruling[9] was handed down by the European Court of Justice. Among other provisions paragraph 39 of the ruling states that '*As regards other habitat types or species, which are present on the site, but for which that site has not been listed, and with respect to habitat types and species located outside that site, … typical habitats or species must be included in the appropriate assessment, if they are necessary to the conservation of the habitat types and species listed for the protected area*' [emphasis added]. This ruling has been taken into account in the HRA process, particularly regarding the qualifying bird species of the Thames Basin Heaths SPA (e.g. nightjar, Dartford warbler, woodlark), which may nest in heathland, acid grassland and rotationally-managed conifer plantation beyond the SPA boundary.

2.2.3 HRA Task 3 – Avoidance and Mitigation

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

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

2.3 Physical Scope of the HRA

There are no standard criteria for determining the ultimate physical scope of an HRA. Rather, the source-pathway-receptor model should be used to determine whether there is any potential pathway connecting development to any European sites. In the case of the Revised Growth Strategy, it was decided that this HRA would focus on the following European sites (the Windsor Forest & Great Park SAC was screened out in the HRA of the 2020 Draft Local Plan Update):

[8] People Over Wind and Sweetman v Coillte Teoranta (C-323/17)
[9] Case C-461/17

- Thames Basin Heaths SPA;
- Chilterns Beechwoods SAC; and
- Thursley, Ash, Pirbright and Chobham SAC.

An introduction to these sites, their qualifying features, their conservation objectives, and the current pressures and threats to site integrity are provided in chapter 3. Appendix 1 shows these European sites in relation to Wokingham Borough's boundary, and the site allocations provided for in the Revised Growth Strategy.

3. Relevant European Sites

3.1 Chilterns Beechwoods SAC

3.1.1 Introduction

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 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*.

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 history. 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 the Buckinghamshire Unitary Authority.

3.1.2 Qualifying Features[10]

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

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

- *Asperulo-Fagetum* beech forests

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)

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

- Stag beetle *Lucanus cervus*

3.1.3 Conservation Objectives[11]

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;

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.

[10] https://sac.jncc.gov.uk/site/UK0012724 [Accessed on the 08/11/2021]
[11] http://publications.naturalengland.org.uk/publication/4808896162037760 [Accessed on the 08/11/2021]

3.1.4 Threats & Pressures to Site Integrity[12]

The following threats and pressures to the site integrity of the Chilterns Beechwoods SAC have been identified in Natural England's Site Improvement Plan:

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

3.2 Thames Basin Heaths SPA

3.2.1 Introduction

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.

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. Natural England published a Draft Delivery Plan for the Thames Basin Heaths SPA in May 2006, partly in response to the European Court of Justice ruling of October 2005. This was updated by the 'Thames Basin Heaths Special Protection Delivery Framework' published by the Thames Basin Heaths Joint Strategic Partnership Board in January 2009. These documents 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. 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 District).

3.2.2 Qualifying Features[13]

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:

Annex I breeding species:

- European nightjar *Caprimulgus europaeus*: 7.8% of the GB population
- Dartford warbler *Sylvia undata*: 27.8% of the GB population
- Woodlark *Lullula arborea*: 9.9% of the GB population

[12] http://publications.naturalengland.org.uk/publication/6228755680854016 [Accessed on the 08/11/2021]
[13] http://publications.naturalengland.org.uk/publication/4952859267301376 [Accessed on the 08/11/2021]

3.2.3 Conservation Objectives[14]

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

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.

3.2.4 Threats & Pressures to Site Integrity[15]

The following threats and pressures to the site integrity of the Thames Basin Heaths SPA have been identified in Natural England's Site Improvement Plan:

- 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

3.3 Thursley, Ash, Pirbright and Chobham SAC

3.3.1 Introduction

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.

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

[14] http://publications.naturalengland.org.uk/publication/4952859267301376 [Accessed on the 08/11/2021]
[15] http://publications.naturalengland.org.uk/publication/6249258780983296 [Accessed on the 08/11/2021]

Common is particularly important for invertebrates, such as the nationally rare white-faced darter *Leuccorhinia dubia*.

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.

3.3.2 Qualifying Features[16]

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

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

3.3.3 Conservation Objectives[17]

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;

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.

3.3.4 Threats & Pressures to Site Integrity[18]

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

- 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

[16] http://archive.jncc.gov.uk/default.aspx?page=2051 [Accessed on the 08/11/2021]
[17] https://sac.jncc.gov.uk/site/UK0012793 [Accessed on the 08/11/2021]
[18] http://publications.naturalengland.org.uk/publication/6249258780983296 [Accessed on the 08/11/2021]

4. Impact Pathways

4.1 Impact Pathways Considered

The following impact pathways are considered relevant to the Revised Growth Strategy for Wokingham (note that the impact pathways loss of functionally linked land and water quantity, level and flow were screened out in the 2020 Wokingham Draft Local Plan Update HRA and are not reassessed here):

- Recreational pressure; and
- Atmospheric pollution.

4.2 Background to Recreational Pressure

4.2.1 Disturbance to breeding birds

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 damage[19]. Various research reports have provided compelling links between changes in housing and access levels and impacts on European protected sites[20] [21].

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[22] [23] 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 eggs[24]. Overall, disturbance is likely to increase energetic output while reducing energetic input, which can adversely affect the 'condition' and ultimately survival of the birds.

Evidence in the literature suggests that the magnitude of disturbance clearly differs between different types of recreational activities. For example, dog walking leads to a significantly higher reduction in bird diversity and abundance than hiking[25]. Scientific evidence also suggests that key disturbance parameters, such as areas of influence and flush distance, are significantly greater for dog walkers than hikers[26]. 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 assessments[27]. 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 birds[28]. 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.

[19] Underhill-Day, J. 2005. A literature review of urban effects on lowland heaths and their wildlife. English Nature Research Reports 623. 56pp.
[20] 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.
[21] 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.
[22] 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.
[23] 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.
[24] Riddington, R. *et al.* 1996. The impact of disturbance on the behaviour and energy budgets of Brent geese. *Bird Study* 43:269-279
[25] Banks P.B., Bryant J.Y. 2007. Four-legged friend or foe? Dog walking displaces native birds from natural areas. Biology Letters 3: 14pp.
[26] Miller S.G., Knight R.L., Miller C.K. 2001. Wildlife responses to pedestrians and dogs. 29: 124-132.
[27] Weitowitz D., Panter C., Hoskin R., Liley D. The spatio-temporal footprint of key recreation activities in European protected sites. Manuscript in preparation.
[28] Gill, J.A., Sutherland, W.J. & Norris, K. 1998. The consequences of human disturbance for estuarine birds. *RSPB Conservation Review* 12: 67-72

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.

4.2.2 Trampling damage, erosion and nutrient enrichment

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 & Seney)[29] examined the degree of track erosion caused by hikers, motorcycles, horses and cyclists from 108 plots along tracks in the Gallatin National Forest, Montana. Although the results proved difficult to interpret, it was concluded that horses and hikers disturbed more sediment on wet tracks, and therefore caused more erosion, than motorcycles and bicycles.

- Cole et al[30] conducted experimental off-track trampling in 18 closed forest, dwarf scrub and meadow & grassland communities (each tramped between 0 – 500 times) over five mountain regions in the US. Vegetation cover was assessed two weeks and one year after trampling, and an inverse relationship with trampling intensity was discovered, although this relationship was weaker after one year than two weeks indicating some recovery of the vegetation. Differences in plant morphological characteristics were found to explain more variation in response between different vegetation types than soil and topographic factors. Low-growing, mat-forming grasses regained their cover best after two weeks and were considered most resistant to trampling, while tall forbs (non-woody vascular plants other than grasses, sedges, rushes and ferns) were considered least resistant. The cover of hemicryptophytes and geophytes (plants with buds below the soil surface) was heavily reduced after two weeks but had recovered well after one year and as such these were considered most resilient to trampling. Chamaephytes (plants with buds above the soil surface) were least resilient to trampling. It was concluded that these would be the least tolerant of a regular cycle of disturbance.

- Cole [31] conducted a follow-up study (in 4 vegetation types) in which shoe type (trainers or walking boots) and trampler weight were varied. Although immediate damage was greater with walking boots, there was no significant difference after one year. Heavier tramplers caused a greater reduction in vegetation height than lighter tramplers, but there was no difference in the effect on cover.

- Cole & Spildie[32] 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 invertebrates[33]. Species that burrow into flat surfaces such as the centres of paths, are likely to be particularly vulnerable, as the loose

[29] 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
[30] 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
[31] 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.
[32] 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
[33] 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.

> 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.

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 exposure[34]. 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 trampling[35]. 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, both of which are integral to tree health[36]. 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.

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.[37]). 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 annually[38]. While there is little information on the chemical constituents of dog faeces, nitrogen is one of the main components[39]. 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.

The available baseline information suggests that the Thames Basin Heaths SPA and the Thursley, Ash, Pirbright & Chobham SAC 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 lies only approx. 158m from the SPA 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 this European site than allocations in the south.

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 SPA[40]. This initial survey provided an estimate of approx. 5 million annual visits

[34] 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.
[35] 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.
[36] Natural England Site Conservation Objectives Supplementary Advice Note for the Windsor Forest & Great Park SAC. Available at: http://publications.naturalengland.org.uk/publication/5175000009015296 [Accessed on the 08/11/2021].
[37] Taylor K., Anderson P., Taylor R.P., Longden K. & Fisher P. 2005. Dogs, access and nature conservation. English Nature Research Report, Peterborough.
[38] 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.
[39] 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.

[40] Liley D., Jackson D.B. & Underhil-Day J.C. (2006). Visitor Access Patterns on the Thames Basin Heaths. English Nature Research Reports, N682, Peterborough.

to the SPA, highlighting it as a recreational honeypot resource in the region. Due to the ongoing issue of housing growth in the region, and to monitor potential changes in recreational pressure within the SPA, Natural England commissioned a repeat visitor survey in 2012 / 2013, and again in 2018, aiming as much as possible to repeat the methodology used in the 2005 survey[41]. Data from these studies will be used to assess the potential recreational impact of the Revised Growth Strategy for Wokingham on the Thames Basin Heaths SPA and the Thursley, Ash, Pirbright & Chobham SAC.

Overall, the following European sites within 10km of Wokingham Borough are sensitive to recreational pressure:

- **Thames Basin Heaths SPA (the closest parcel of the SPA lies only approx. 58m to the south of Wokingham Borough in the 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) – screened out in the HRA of the 2020 Wokingham Draft Local Plan Update regarding recreational pressure
- Windsor Forest and Great Park SAC (the closest parcel is located approx. 8.5km to the east of Wokingham Borough's boundary) – screened out in the HRA of the 2020 Wokingham Draft Local Plan Update regarding recreational pressure

4.3 Background to Atmospheric Pollution

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

Table 1: Main sources and effects of air pollutants on habitats and species[42]

Pollutant	Source	Effects on habitats and species
Sulphur Dioxide (SO_2)	The main sources of SO_2 are electricity generation, and industrial and domestic fuel combustion. However, total SO_2 emissions in the UK have decreased substantially since the 1980's. Another origin of sulphur dioxide is the shipping industry and high atmospheric concentrations of SO_2 have been documented in busy ports. In future years shipping is likely to become one of the most important contributors to SO_2 emissions in the UK.	Wet and dry deposition of SO_2 acidifies soils and freshwater and may alter the composition of plant and animal communities. The magnitude of effects depends on levels of deposition, the buffering capacity of soils and the sensitivity of impacted species. However, SO_2 background levels have fallen considerably since the 1970's and are now not regarded a threat to plant communities. For example, decreases in Sulphur dioxide concentrations have been linked to returning lichen species and improved tree health in London.
Acid deposition	Leads to acidification of soils and freshwater via atmospheric deposition of SO_2, NOx, ammonia and hydrochloric acid. Acid deposition from rain has declined by 85% in the last 20 years, which most of this contributed by lower sulphate levels. Although future trends in S emissions and subsequent deposition to terrestrial and aquatic ecosystems will continue to decline, increased N emissions may cancel out any gains produced by reduced S levels.	Gaseous precursors (e.g. SO_2) can cause direct damage to sensitive vegetation, such as lichen, upon deposition. Can affect habitats and species through both wet (acid rain) and dry deposition. The effects of acidification include lowering of soil pH, leaf chlorosis, reduced decomposition rates, and compromised reproduction in birds / plants.

[41] 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.
[42] Information summarised from the Air Pollution Information System (http://www.apis.ac.uk/)

Pollutant	Source	Effects on habitats and species
		Not all sites are equally susceptible to acidification. This varies depending on soil type, bed rock geology, weathering rate and buffering capacity. For example, sites with an underlying geology of granite, gneiss and quartz rich rocks tend to be more susceptible.
Ammonia (NH_3)	Ammonia is a reactive, soluble alkaline gas that is released following decomposition and volatilisation of animal wastes. It is a naturally occurring trace gas, but ammonia concentrations are directly related to the distribution of livestock, although at a local scale traffic also contributes to ammonia emissions. Ammonia reacts with acid pollutants such as the products of SO_2 and NO_X emissions to produce fine ammonium (NH_4+) - containing aerosol. Due to its significantly longer lifetime, NH_4+ may be transferred much longer distances (and can therefore be a significant trans-boundary issue). While ammonia deposition may be estimated from its atmospheric concentration, the deposition rates are strongly influenced by meteorology and ecosystem type.	The negative effect of NH_4+ may occur via direct toxicity when uptake exceeds detoxification capacity and via N accumulation. Its main adverse effect is its contribution to eutrophication, leading to species assemblages that are dominated by fast-growing and tall species. For example, a shift in dominance from heath species (lichens, mosses) to grasses is often seen. However, it is also toxic to vegetation in low concentrations. As emissions mostly occur at ground level in the rural environment and NH_3 is rapidly deposited, some of the most acute problems of NH_3 deposition are for small relict nature reserves located in intensive agricultural landscapes.
Nitrogen oxides (NO_x)	Nitrogen oxides are mostly produced in combustion processes. Half of NO_X emissions in the UK derive from motor vehicles, one quarter from power stations and the rest from other industrial and domestic combustion processes.	Direct toxicity effects of gaseous nitrates are likely to be important in areas close to the source (e.g. roadside verges) but only when sulphur dioxide is also elevated. A critical level of NOx for all vegetation types has been set to 30 ug/m^3. Deposition of nitrogen compounds (nitrates (NO_3), nitrogen dioxide (NO_2) and nitric acid (HNO_3)) contributes to the total nitrogen deposition and may lead to both soil and freshwater acidification. The main ecologically significant role of NO_x is through its contribution to the eutrophication of soils and water, altering the species composition of plant communities at the expense of sensitive species.
Nitrogen deposition	The pollutants that contribute to the total nitrogen deposition derive mainly from oxidized (e.g. NO_X) or reduced (e.g. NH_3) nitrogen emissions (described separately above). While oxidized nitrogen mainly originates from major conurbations or highways, reduced nitrogen mostly derives from farming practices. The N pollutants together are a large contributor to acidification (see above).	All plants require nitrogen compounds to grow, but too much overall N is regarded as the major driver of biodiversity change globally. Species-rich plant communities with high proportions of slow-growing perennial species and bryophytes are most at risk from N eutrophication. This is because many semi-natural plants cannot assimilate the surplus N as well as many graminoid (grass) species. N deposition can also increase the risk of damage from abiotic factors, e.g. drought and frost.
Ozone (O_3)	A secondary pollutant generated by photochemical reactions involving NOx, volatile organic compounds (VOCs) and sunlight. These precursors are mainly	Concentrations of O_3 above 40 ppb can be toxic to both humans and wildlife, and can affect buildings. High O_3 concentrations are widely documented to cause damage to vegetation, including visible leaf

Pollutant	Source	Effects on habitats and species
	released by the combustion of fossil fuels (as discussed above). Increasing anthropogenic emissions of ozone precursors in the UK have led to an increased number of days when ozone levels rise above 40ppb ('episodes' or 'smog'). Reducing ozone pollution is believed to require action at international level to reduce levels of the precursors that form ozone.	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.

As highlighted in Table 1, the main pollutants of concern for European sites are oxides of nitrogen (NOx), ammonia (NH_3) and sulphur dioxide (SO_2). Ammonia can have a directly toxic effect upon vegetation even at low concentrations, particularly at close distances to the source such as near road verges[43]. NOx can also be toxic at high concentrations although generally only in the presence of elevated sulphur dioxide. Increased NOx and NH_3 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[44] [45]. 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.

Sulphur dioxide emissions overwhelmingly derive from power stations and industrial processes that require the combustion of coal and oil, as well as (particularly on a local scale) shipping[46]. Ammonia emissions originate particularly from agricultural practices[47], 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 comparison[48]. 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 impacts[49]. Given the origin of nitrogen-derived atmospheric pollutants, it is considered that the Revised Growth Strategy might be associated with an increase in such atmospheric pollutants.

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

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 significant[51] (Figure

[43] http://www.apis.ac.uk/overview/pollutants/overview_NOx.htm.
[44] 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
[45] 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
[46] http://www.apis.ac.uk/overview/pollutants/overview_SO2.htm.
[47] 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
[48] 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
[49] As opposed to the generic NOx limit set for all vegetation.
[50] The critical load is the rate of deposition beyond which research indicates that adverse effects can reasonably be expected to occur
[51] http://www.dft.gov.uk/webtag/documents/expert/unit3.3.3.php#013 [Accessed on the 08/11/2021]

3). The same 200m distance is utilised by Highways England in their road assessments[52] and is cited in recently published guidance from the Institute of Air Quality Management[53]. This is therefore the distance that has been used throughout this HRA in order to determine whether European sites are likely to be significantly affected by development outlined in a Plan document.

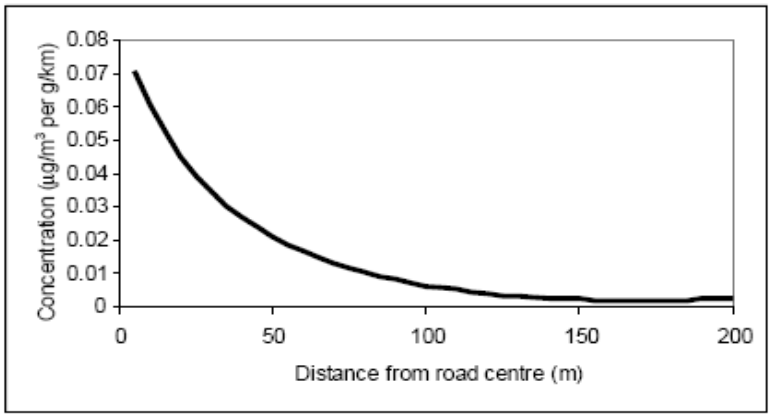

Figure 3: Traffic contribution to concentrations of pollutants at different distances from a road (Source: DfT[54])

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 Wokingham Borough is likely to result in increased traffic flows past European 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 European 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.

The following European sites within 10km of Wokingham Borough are 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) – screened out in the 2020 Wokingham Draft Local Plan Update HRA
- Windsor Forest & Great Park (located approx. 8.6km to the east of Wokingham Borough) – screened out in the 2020 Wokingham Draft Local Plan Update HRA

The Air Pollution Information System (APIS)[55] 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 15-25 kg N/ha/yr. In contrast, the stag beetles themselves would not be affected by nitrogen deposition according to APIS.

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 negative impacts on the habitats (particularly heathland and acid

[52] http://www.standardsforhighways.co.uk/ha/standards/dmrb/vol11/section3/LA 105 Air quality-web.pdf
[53] http://iaqm.co.uk/text/guidance/air-quality-impacts-on-nature-sites-2019.pdf, paragraph 5.3.6
[54] http://www.dft.gov.uk/ha/standards/dmrb/vol11/section3/ha20707.pdf
[55] http://www.apis.ac.uk/srcl/select-a-feature?site=UK0012724&SiteType=SAC&submit=Next [Accessed on the 08/11/2021]

grassland) in which the qualifying birds' nest. Dwarf shrub heath has a critical load of 10-20 kg N/ha/yr. Nightjar and woodlark also nest within rotationally-managed conifer plantation[56] 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.

4.4 Summary

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 and the Chilterns Beechwoods SAC.

[56] 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.

5. Appropriate Assessment

5.1 Recreational Pressure

The HRA has identified several policies in the Revised Growth Strategy that provide for new residential development within Wokingham Borough, which will increase the local population and result in increased recreational pressure in the borough and beyond. The following policies need to be considered in relation to the impact pathway recreational pressure:

- Policy SS1 – Spatial Strategy: Provides for 15,513 net additional dwellings over the plan period 2018-2038
- Policy SS3 – Hall Farm / Loddon Valley: Provides for at least 2,200 net new dwellings within the Plan period, and 4,500 in total
- Policy SS5 – South of the M4 Strategic Development Location: Provides for an additional 366 net new dwellings (see Table 2)
- Policy SS6 – North Wokingham Strategic Development Location: Provides for an additional 33 net new dwellings and a care home (see Table 2)
- Policy SS7 – South Wokingham Strategic Development Location: Provides for an additional 889 net new dwellings (see Table 2)
- Policy H1 – Housing Provision: Provides for a minimum of 15,513 net new dwellings in the Plan period between 2018 and 2038
- Policy H2 – Sites allocated for residential / mixed use development: Lists 24 proposed residential sites retained from the 2020 Wokingham Draft Local Plan Update and proposes to allocate an additional 19 new sites as part of the Revised Growth Strategy (totalling 967 dwellings)

Several policies retained in the Revised Growth Strategy are not being consulted upon, but need to be considered in the context of recreational pressure:

- Policy SS2 – Settlement Hierarchy: Identifies the location of major development throughout Wokingham Borough
- Policy ER10 – Whiteknights Campus: Provides for additional student accommodation
- Policy H11 – Gypsies and Travellers and Travelling Showpeople provision: Provides for 24 net new gypsy and traveller pitches

5.1.1 Thames Basin Heaths SPA

The HRA of the 2020 Wokingham Draft Local Plan Update established that LSEs of the Plan on the Thames Basin Heaths SPA from an increase in recreational pressure could not 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 to recreational disturbance (such as from dog walkers). The main 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.

Much of the available evidence base relating to the in-combination recreational pressure in the Thames Basin Heaths SPA, stems from three visitor surveys undertaken in 2005, 2012 / 2013 and 2018. 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 / 2013[57], and again in 2018[58], replicating the original methodology where possible. The results of these

[57] 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.
[58] 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

visitor surveys (as relevant to Wokingham Borough) are discussed in the following to assess whether the Revised Growth Strategy for Wokingham might affect the recreational footprint in the SPA.

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

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)
- 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)

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.

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 Revised Growth Strategy.

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.

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 encompass significant areas 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.

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

The evidence base from the aforementioned visitor surveys has fed into HRAs of numerous of the SPA's adjacent authorities and has culminated in the Thames Basin Heaths (TBH) Joint Strategic Partnership Board (JSPB), comprised of eleven local authorities and two County Councils.

Most importantly, visitor catchment data from the visitor surveys have informed several TBH SPA Avoidance Strategies (such as the Guildford Borough Council Avoidance Strategy[59]). 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
- 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)
- the 5-7km zone where residential development over 50 dwellings must be mitigated as above, on a case-by-case basis

The 2020 Wokingham Draft Local Plan Update proposed new land for development, including smaller residential sites across Wokingham Borough, and most importantly the large residential allocation at Grazeley Garden Town providing for 3,750 dwellings within the Plan period (and a minimum of 10,000 dwellings in Wokingham Borough in total). The key change between the 2020 Wokingham Draft Local Plan Update and the Revised Growth Strategy is the removal of Grazeley and the addition of the SDL at Hall Farm / Loddon Valley (allocating 2,200 dwellings in the period to 2038). The new SDL lies in the south-western part of the Borough, partly within the 5km and 5-7km buffer zones surrounding the TBH SPA, adjoining the existing conurbation of Shinfield. Therefore, the Hall Farm / Loddon Valley SDL will need to provide SANG and SAMM to protect the Thames Basin Heaths SPA from an increase in recreational pressure.

A series of smaller housing sites have been included in the Revised Growth Strategy in order for the Council to meet its assigned Local Housing Need (LHN; the overall quantum of growth has increased from 13,901 dwellings in the 2020 Draft Local Plan Update to 15,513 in the Revised Growth Strategy). Table 3 lists the net increase or decrease in housing quantum delivered by SDLs, revised smaller housing allocations and new housing sites.

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

Table 2: List of changes in the number of allocated dwellings in Strategic Development Locations and smaller residential sites between the Revised Growth Strategy and the 2020 Wokingham Draft Local Plan Update.

Strategic Development Location (SDL)	Residential Allocations (within SDLs where relevant)	Net Change in Dwellings
Grazeley Garden Town	Deleted	- 3,750 (of overall quantum of 10,000 to be delivered including beyond the Plan period)
Hall Farm / Loddon Valley SDL	Added	+ 2,200 (total of 4,500 to be delivered including beyond the Plan period)
Arborfield Garrison SDL	Westward Cottage, Sheerlands Road	+ 10
South of the M4 SDL	Land north of Arborfield Road, Shinfield	+ 191
	Land east and west of Hyde Road	+ 175
North Wokingham SDL	Ashridge Farm	+ 3
	Land east of Toutley Depot	+ 30 and a care home
South Wokingham SDL	Land south of Waterloo Road	+ 835
	Land to the west of St Anne's Drive and south of London Road	+ 54
Changes in Smaller Residential Allocations (not part of SDLs)	Land north of the Shires, Barkham	-1
	Land east of Park View Drive North, Charvil	- 7
	Land west of Park Lane, Charvil	- 14
	Land to the rear of 9-17 Northbury Lane, Ruscombe	+ 5
	Land between 39-53 New Road, Ruscombe	+ 7
	Land at Bridge Farm, Twyford	+ 30
	Winnersh Plan Hire, Reading Road, Winnersh	+ 65
	Winnersh Farms, Winnersh	+ 37
	Station Industrial Estate, Oxford Road, Wokingham	- 52
	54-58 Reading Road, Wokingham	+ 22
Additional Sites Proposed in the Revised Growth Strategy which were not in the 2020 Draft	Rooks Nest Farm and 24 Barkham Ride, Finchampstead	+ 270
	31-33 Barkham Ride, Finchampstead	+ 66
	Greenacres Farm, Nine Mile Ride, Finchampstead	+ 100

Strategic Development Location (SDL)	Residential Allocations (within SDLs where relevant)	Net Change in Dwellings
Local Plan (not part of SDLs)	Land north of London Road and East of A329(M)	+ 45
	Land east of Pound Lane, Sonning (Sonning Golf Club)	+ 24
	Land west of Trowes Lane, Swallowfield	+ 70
	Land to the rear of Bulldog Garage, Reading Road, Wokingham	+ 25
	69 King Street Lane, Winnersh	+ 25
	Land to the rear of Toutley Hall, north west of Old Forest Road, Winnersh	+ 15
	Former M&S, 26-36 Peach Street, Wokingham	+ 15
	Wokingham Library, Denmark Street, Wokingham	+ 15
	Suffolk Lodge, Rectory Road, Wokingham	+ 20
	Land at the corner of Wellington Road and Station Road (accessed via Park Road), Wokingham	+ 21
	Millars Business Park, Molly Millars Lane, Wokingham	+ 90
	Bridge Retail Park, Finchampstead Road, Wokingham	+ 59
	Land to the rear of Sandford Pumping Station, Mohawk Way, Woodley	+ 15
Total change in residential growth		**+ 721**

5.1.1.3 Relevant Mitigation identified in the 2020 Wokingham Draft Local Plan Update

Table 3 shows the allocated sites in the Revised Growth Strategy that provide for residential development within 7km of the Thames Basin Heaths SPA, the catchment zone that has been identified by Natural England as requiring mitigation for at least some residential sites. All allocations within 5km of the SPA, and those within 5-7km delivering more than 50 dwellings, must be mitigated (marked in orange). The Arborfield Garrison SDL was allocated, assessed and mitigated as part of the adopted Core Strategy and its HRA, and therefore does not require mitigation (marked in green, see * in Table 3 for reference). Allocations within the 5-7km zone with less than 50 dwellings also do not require mitigation (also marked in green).

The bulk of this growth will be delivered through five SDLs, most notably the new Hall Farm / Loddon Valley SDL, which allocates 2,200 new residential dwellings in Wokingham Borough in the Plan period to 2038. All SDLs lie within 5km of the Thames Basin Heaths SPA (or in the case of Hall Farm / Loddon Valley, South of the M4 and North Wokingham SDLs partially in the 5-7km zone), in the core mitigation zone surrounding the SPA. **Policy H2** (Sites allocated for residential / mixed uses) also allocates 25 smaller residential sites within Natural England's 7km wider mitigation zone (four of these allocations are within the 5-7km zone but comprise more than 50 dwellings). Overall, the Revised Growth Strategy

for Wokingham proposes to deliver 5,191 net new residential dwellings within the wider 7km mitigation boundary, equating to 11,420 new residents[60].

Using Natural England's SANG standards and the average occupancy rates in the UK, Table 4 shows the total amount of SANG that would be needed to mitigate the overall residential growth surrounding the Thames Basin Heaths SPA. According to Natural England advice these allocations will also require mitigation in the form of Strategic Access Management and Monitoring (SAMM).

Table 3: Residential site allocations proposed in the Revised Growth Strategy within 7km of the Thames Basin Heaths SPA. Residential allocations that require mitigation are marked in orange, because they either fall within the 5km catchment zone, or they lie between 5-7km away and allocate over 50 dwellings.

*** For an explanation of why this site is shaded green please see the main body of text.**

+ The Revised Growth Strategy includes these residential sites in Strategic Development Locations, but they are listed here separately for clarity.

Site Type	Site Reference[61]	Site Address	Number of Dwellings	Approx. Shortest Distance (m) to the Thames Basin Heaths SPA boundary
Strategic Development Allocations	NA	Arborfield Garrison	3,479*	817.91
	5FI028	Westwood Cottage, Sheerlands Road+	10	1,903.47
	NA	South Wokingham	2,899	2,063.9
	5WK006	Land South of Gipsy Lane	17	4,551.84
	5WW030	Land South of Waterloo Road+	835	2,072.87
	5WK043	Land to the west of St Anne's Drive and south of London Road+	54	3,678.4
	NA	North Wokingham	1,537	3,502.4
	5WK002	Ashridge Farm, Warren House Road+	153	5,442.88
	5WK051	Land east of Toutley Depot+	130	6,435.53
	NA	South of M4	2,436	3,678.4
	SH011	Land End House	5	5,717.71
	5SH025	Land north of Arborfield Road, Shinfield	191	4,734.22
	5SH023, 27	Land east and west of Hyde Road	175	4,136.05
	NA	Hall Farm / Loddon Valley	2,200	3,674.11
	5SW019	Land west of Trowes Lane, Swallowfield	70	2,342.6

[60] Note this assumes an average occupancy rate of 2.4 people per dwelling. This number is typically used in SANG capacity calculations.
[61] The site boundaries of the proposed residential allocations are set out in the Revised Growth Strategy. As part of the plan making process, the proposed site allocation boundaries do not always match those of the land promoted.

Site Type	Site Reference[61]	Site Address	Number of Dwellings	Approx. Shortest Distance (m) to the Thames Basin Heaths SPA boundary
Smaller Housing Allocations	5FI004	Greenacres Farm, Nine Mile Ride, Finchampstead	100	2,659.47
	5FI024	Jovike, Lower Wokingham Road	15	2,676.27
	5BA032, 33	Rooks Nest Farm and 24 Barkham Ride, Finchampstead	270	3,426.4
	5HU051	Land north of London Road and East of A329	45	3,538.33
	5FI015	Land to the rear of 166 Nine Mile Ride	4	3,813.95
	5FI001	Tintagel Farm, Sandhurst Road	5	3,985.06
	5FI003	31-33 Barkham Ride, Finchampstead	66	4,066.7
	5BA013	Woodlands Farm, Wood Lane	15	4,180.56
	5WK006	Land South of Gipsy Lane	17	4,531.67
	5WK050	Former M&S, 26-36 Peach Street, Wokingham	15	4,933,33
	5WK047	Wokingham Library, Denmark Street, Wokingham	15	4,990.56
	5WK045	Bridge Retail Park, Finchampstead Road, Wokingham	59	5,020.17
	5WK048	Suffolk Lodge, Rectory Road, Wokingham	20	5,223.18
	5WK030	Millars Business Park, Molly Millars Lane, Wokingham	90	5,539.57
	5WK029	Station Industrial Estate, Oxford Road	40	5,649.89
	5BA024	Land North of The Shires	5	5,641.85
	5WK012	54 - 58 Reading Road	31	5,731.35
	5SH031	Rustlings', 'The Spring' and land to the rear of 'Cushendall', Shinfield Road	10	6,348.99
	5WI011	Wheatsheaf Close	25	6,392.53
All Residential			**11,423 dwellings**	

Site Type	Site Reference[61]	Site Address	Number of Dwellings	Approx. Shortest Distance (m) to the Thames Basin Heaths SPA boundary
Sites Requiring Mitigation				

Table 4 below draws on the data in Table 3 to determine the total SANG capacity that will be required to mitigate all allocations in the 5km and 7km zones (the latter only including allocations of 50 or more dwellings). It uses a worst-case scenario of SANG at 8ha/1000 population for all development within 5-7km of the SPA, whereas in practice a standard of 2ha/1000 population has been used for that zone on a case-by-case basis.

Table 4: Calculation of SANG capacity requirements to mitigate the residential growth allocated in the Revised Growth Strategy within the agreed mitigation zone for the Thames Basin Heaths SPA. This is based on average occupancy rate of residential housing and Natural England SANG standards.

Mitigation Requirement	Natural England Requirement	SANG Requirement
Number of Dwellings: 11,423	8ha per 1000 new residents	Required Total SANG area: 219.32**ha**
Number of Residents*:27,415 According to average occupancy of 2.4 residents / dwelling	0.008ha per every 1 new resident	

The Revised Growth Strategy does not consult on most policies from the 2020 Draft Local Plan Update, but proposes to retain the policy framework, and the aims and objectives set out in the earlier consultation and therefore an adequate mitigation framework in policy text remains. Recognition to SANG and SAMM is given in **Policy NE2** (Thames Basin Heaths Special Protection Area), which introduces the agreed mitigation zones around the SPA and details Natural England's SANG criteria. Specifically, the policy states that '*the Council has identified sufficient SANG provision as part of the avoidance and mitigation measures required for the Development Plan*'. Furthermore, the policy also specifies that '*Proposals will be required to make financial contributions towards avoidance and mitigation measures, including SANG and SAMM*'. Overall, this policy provides additional details about the mitigation measures to be delivered regarding the SPA. Wokingham Borough Council has estimated future SANG requirements based on current information and capacities. As a result, future options and opportunities will be considered and investigated, and the council is confident that a solution to provide suitable mitigation can be found prior to submission of the Local Plan Update to the Secretary of State.

The Revised Growth Strategy also acknowledges the need for both SANG and SAMM mitigation in the policies for the Strategic Development Locations, the allocations that propose the main residential growth in Wokingham. The necessity of SANG is referred to in **Policies SS4** (Arborfield Garrison Strategic Development Site), **SS5** (South of the M4 Strategic Development Site), **SS6** (North Wokingham Strategic Development Site) and **SS7** (South Wokingham Strategic Development Site). This is most important with respect to the Hall Farm / Loddon Valley SDL, which allocates 2,200 net new residential dwellings within the core mitigation zone surrounding the SPA (distributed between the 5km and 5-7km mitigation zones surrounding the SPA). **Policy SS3** stipulates that one of the site's development principles is to '*deliver a comprehensive strategic landscape and connectivity strategy, and a network of multi-functional green and blue infrastructure, incorporating River Loddon and Barkham Brook, to create a country park supplemented by ecological networks and habitats and promote high levels of connectivity, including to the Loddon long distance footpath and greenways*'. SANG and SAMM requirements for new housing are already mandatory through other policies in the

Revised Growth Strategy. However, it is recommended that specific SANG requirements are incorporated to all strategic development policies to ensure that the Revised Growth Strategy is compliant with the requirements of the Conservation of Habitats and Species Regulations 2017 (as amended).

The current iteration of the Revised Growth Strategy does not include specifics on the amount and location of SANG that is to be delivered. Based on the allocated number of residential dwellings within the SPA's 7km mitigation zone, a total of 219.32ha of SANG would be required (see Table 4; assuming that a 8ha / 1,000 population would also be required for dwellings in the 5-7km mitigation zone) to ensure that there is sufficient capacity to absorb the residential growth. However, there are several SANGs within the borough, several of which have remaining unused capacity. In addition, SANGs already provided as part of the SDLs will continue to provide on-site mitigation for existing committed development. Due regard should be given to the geographic siting of the SANGs for them to represent a realistic alternative destination for local residents. For example, ideally a SANG should be situated closer to the proposed residential development than any component parcel of the SPA. This is because increasing distance from home is negatively correlated with the likelihood of visiting and the SANG's lower appeal (compared to the TBH SPA, which is an iconic destination) is more likely to be compensated for. It is to be noted that SANGs can be created from existing open space with no prior access or a greenspace that is already in publicly accessible. If a proposed SANG is already in public use, a discounting exercise is required to establish the current level of use and to confirm the residual capacity. Furthermore, SANGs would need to conform to Natural England standards, including a circular walk of 2.3-2.5km, adequate parking (for SANGs over 4ha in size) and a well-maintained path network.

Despite the provision of appropriately sized and located SANG, a small proportion of new Wokingham Borough residents would still visit the Thames Basin Heaths SPA, because:

- Some of the proposed residential site allocations are located in the south of Wokingham Borough and lie within a relatively short driving distance from component parcels (e.g. Bramshill SSSI) of the Thames Basin Heaths SPA
- The SPA has a unique draw (e.g. habitats, wildlife interest, feeling of openness) that is difficult to replicate in SANGs

The Revised Growth Strategy recognises that developers should provide financial contributions to SAMM delivery. SAMM is a programme of Strategic Access Management and Monitoring measures that was set up by the Thames Basin Heaths Joint Strategic Partnership Board (JSPB) in 2009. The Outline Business Plan for the project established a set of strategic avoidance measures, namely:

- A team of on-site full-time and voluntary wardens to mitigate the impacts of recreational pressure
- A long-term monitoring programme of visitor numbers in the component parcels of the SPA
- A long-term monitoring programme of the SPA's qualifying bird species to ensure that breeding bird numbers are not affected by the increasing visitor pressure

Previously, it was agreed that the SAMM delivery would be funded by developer contributions. SAMM contributions are currently calculated on the basis of the number of bedrooms per dwelling[62], depending on whether they lie in the 5km or 5-7km mitigation zone, with Local Authorities collecting the contributions from developers. However, Natural England is continually reviewing the appropriate per-dwelling tariff for SAMM contributions in line with emerging evidence.

Overall, the SANG and SAMM mitigation package was developed by Natural England to avoid adverse effects on the integrity of the Thames Basin Heaths SPA. Therefore, it is considered that given the adequate recognition of SANG and SAMM in the Revised Growth Strategy for Wokingham, the Plan would not have significant negative impacts on the SPA. Specifically, given the adequate provision of SANG, the residual number of new Wokingham Borough residents visiting the TBH SPA would result in only a small overall increase in the recreational footprint within the site.

[62] Up-to-date developer contributions can be accessed at: https://www.wokingham.gov.uk/planning-policy/planning-policy-information/environment-evidence/ [Accessed on the 18/11/2021]

In addition to recognising the requirements for SANG and SAMM mitigation, the Draft Local Plan consultation (2020) contained further policies that are likely to reduce recreational pressure in the Thames Basin Heaths SPA by enhancing connectivity in the borough, promoting physical activities and providing more recreational greenspace. For example, **Policy SS12** (Improvements to Transport Routes) identifies several schemes that provide for better connections and accessibility, including East – West pedestrian and cycle links to villages of Three Mile Cross and Spencers Wood, upgrades to the accessibility of Green Park, and general enhancements of the footpath and cycle networks. Importantly, **Policy C8** (Green and Blue Infrastructure and Public Rights of Way) identifies that development projects themselves should also contribute to projects enhancing the residents' ability to access and use greenspaces. The policy states that *'development proposals should improve or contribute towards: a) The establishment of a Loddon / Blackwater riverside footpath and bridleway… b) The establishment of a riverside footpath and cycleway to accommodate dual use for all users along the Emm brook… c) The establishment of a linear 'canal corridor' at Grazeley garden town to integrate the existing Foudry Brook with development to provide informal recreation'*.

Policy HC3 (Open Space, Sports, Recreation and Play Facilities) stipulates that '*existing open space, sports and recreation and play facilities will be protected, maintained and where possible enhanced*'. Furthermore, '*Development proposals for new residential development, will be required to provide or contribute to the provision of open space, sport and recreation and play facilities*', such as 1.1ha of parks and gardens, 2.84ha of natural / semi-natural greenspace, 1.66ha of outdoor sports facilities and 0.98ha of amenity greenspace per 1,000 population. Delivering public outdoor spaces close to new residential development engages people locally and maximises the capacity for the local absorption of recreational pressure. This might further aid in discouraging Wokingham Borough's residents from travelling outside the Borough to visit the SPA. Setting out the types of recreational spaces to be delivered per set amount of population increase, ensures that an appropriate amount of additional recreation space is delivered. Importantly, this play space is delivered **in addition** to any SANG delivered in Wokingham Borough, further increasing the amount of recreational pressure that can be absorbed. **Policy HC4 (Local Green Space)** protects areas designated as Local Green Space (e.g. Barkham Recreation Ground, Fox Hill, Joel Park and Holt Copse) from development, other than where such development is undertaken to enhance its functions, such as improvements to accessibility. The Revised Growth Strategy proposes to designate an additional 80 areas as Local Green Spaces, which are set out in the Local Green Space Topic Paper.

5.1.1.4 Recommendations

It is advised that the Council develop a record of SANG availability, including the key characteristics of size and geographic location, that can be submitted to the Examination process as evidence for the deliverability of the anticipated residential development, to demonstrate that adequate mitigation of recreational pressure in the TBH SPA is provided and that Natural England guidelines are followed. It is to be noted that most Strategic Development Locations (except for Hall Farm / Loddon Valley) are existing commitments deriving from the Core Strategy and are committed or under construction. Individual developers would have already undertaken significant groundwork with the Council and Natural England to devise appropriate SANG provision. Furthermore, if a bespoke SANG provided for Hall Farm / Loddon Valley was also to serve as a strategic SANG for other smaller residential developments, this would have to be agreed with the developer. Any developments that were to be addressed by a SANG could not become occupied until the SANG was functioning.

The specifics relating to the provision of SANG and SAMM, such as the amount and location of SANGs and the per-dwelling SAMM contribution, can be set out in a separate strategic Supplementary Planning Document (SPD), as has been developed for other authorities such as Surrey Heath.

Overall, it is concluded that, given the provision of adequate SANG and SAMM, there will be no adverse effects of the Revised Growth Strategy for Wokingham on the site integrity of the Thames Basin Heaths SPA regarding the impact pathway recreational pressure.

5.1.2 Thursley, Ash, Pirbright & Chobham SAC

The LSEs screening in the 2020 Draft Local Plan Update HRA highlighted that the Thursley, Ash, Pirbright & Chobham SAC is sensitive to recreational pressure. The habitats comprising the SAC, mainly the wet and dry heath habitat elements (which support qualifying breeding birds of the Thames Basin Heaths SPA), are vulnerable to trampling and nutrient enrichment that is associated with dog

walking. Large parts of the SAC are overlapping with the Thames Basin Heaths SPA, including the Lightwater Country Park, Sandpit Hill and the Bagshot Heaths. Therefore, the 2012 / 2013 visitor survey undertaken in the Thames Basin Heaths SPA can be drawn upon for data regarding the in-combination recreational pressure in the SAC. Importantly, while the survey does not cover all component parcels of the SAC, it covers the above listed sites (e.g. the Lightwater Country Park) that are closest to the Borough of Wokingham and are therefore likely to be the most relevant destinations for Wokingham residents.

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

The most relevant access points to the SAC for Wokingham Borough's residents that were covered by the visitor surveys are the following:

- Lightwater Country Park, Ockham & Wisley Commons (survey location 14), which lies approx. 6.9km to the south-east of Wokingham Borough (in Surrey Heath)
- Sandpit Hill, Colony Bog & Bagshot Heaths (survey location 15), which lies approx. 7.4km to the south-east of Wokingham Borough (in Surrey Heath)

It is noted that these component sites of the SAC lie beyond typical core recreational catchments for European sites (approx. 5km), so the SAC is discussed here as a precautionary measure. This particularly applies to Sandpit Hill, which is a recreational hotspot in the area. It is considered that any of the SAC's other parcels, which lie well beyond 7km from Wokingham Borough, are unlikely to be important destinations for residents from the authority. Given that the SAC covers the same types of scenery and habitats than the SPA, there is no reason to expect that the SAC's core visitor catchment will significantly differ. The SAC parcels listed above (i.e. survey locations 14 and 15 in the visitor survey) are the only ones within approx. 7km of the Wokingham Borough boundary and are therefore considered further below.

The 2012 tally counts indicate that Lightwater Country Park (survey location 14) is moderately busy with 99 adults and 119 dogs entering over two survey days (one weekday and one weekend day). In contrast, Sandpit Hill (survey location 15) was much busier with 238 adults and 238 dogs entering over a similar timeframe. The high number of dogs counted at each of the survey locations was corroborated by the fact that most interviewees gave dog walking as their activity (71% of interviewees in Lightwater Country Park and 85% at Sandpit Hill). Notably, a significant proportion of visitors to both survey points travel to the site by car (48% in Lightwater Country Park and 61% at Sandpit Hill). This is important because visitors coming by car are likely to travel further from home and could be originating from Wokingham Borough. Most importantly, the visitor survey also assessed the linear distance to home postcodes of visitors that travelled to Lightwater Country Park and Sandpit Hill by car. At Lightwater Country Park, the linear distance to home postcodes for 75% of car visitors was 3.5km. At Sandpit Hill the linear distance to home for 75% of car visitors was 3.8km, slightly further than for the Country Park. This is significant because the 75th percentile of visitor data is usually defined as the core recreational catchment for European sites. These data indicate that the allocated residential sites in Wokingham Borough lie relatively far beyond the core recreational catchments that have been identified for the component parcels of the SAC closest to the authority (and that are most likely to be visited).

5.1.2.2 Implications & Conclusions

The geographic location of the Thursley, Ash, Pirbright & Chobham SAC in relation to the Borough of Wokingham also needs to be set into the context of the agreed mitigation zones surrounding the Thames Basin Heaths SPA. Given the overlap between these European sites and identical habitats being present, it would be reasonable to assume a similar draw and mitigation requirement for the sites. The closest parcel of the SAC (Lightwater Country Park) lies 6.9km from Wokingham Borough and would therefore be beyond a 5km core mitigation zone. Only a very small proportion of Wokingham Borough would fall within the 5-7km extended mitigation zone (in which large residential developments over 50 dwellings require mitigation). The new residential sites allocated in the Revised Growth Strategy, in addition to the sites already allocated in the preceding iterations of the Plan (and assessed in accompanying HRAs), are primarily located in the west, south-west and central area of Wokingham Borough. Hall Farm / Loddon Valley, the largest strategic housing development delivering 2,200 new

dwellings in the Plan period, is in the south-west of the Borough and also located outside the extended 7km mitigation zone.

Furthermore, the SANG and SAMM that will be delivered to mitigate the recreational pressure in the Thames Basin Heaths SPA would also help to address recreational pressure in the Thursley, Ash, Pirbright & Chobham SAC. While the overall contribution of Wokingham Borough to the recreational footprint in the SAC is demonstrably low (see above and previous section on the TBH SPA), these measures would also further reduce the number of recreational visits to and visitor impacts in the SAC. Due regard must also be given to the protective policy framework that is already contained within the Revised Growth Strategy. **Policy NE1** (Biodiversity and Nature Conservation) states that '*Sites designated as of importance for nature conservation at an international or national level… will be maintained, conserved and enhanced and inappropriate development will be resisted*'. This protective policy wording provides high-level protection for all European sites, including SPAs, SACs and Ramsars, including the Thursley, Ash, Pirbright & Chobham SAC. Furthermore, other policies already discussed in relation to the Thames Basin Heaths SPA would also work towards mitigating recreational pressure in the SAC. This includes **Policy HC3** (Open Space, Sports, Recreation and Play Facilities), which identifies open space and recreational facility standards for new residential development and **Policy HC4 (Local Green Space)**, which provides for the protection and enhancement of Local Green Spaces.

Overall, it is considered that the SAC is unlikely to be a major destination for recreational activities for Wokingham Borough residents, mainly due to its relatively long distance from the Borough. The closest component parts of the SAC lie approx. 7km from the authority boundary, with most parcels lying beyond 10km. Several parcels of the Thames Basin Heaths SPA lie much closer to the Borough boundary and are easily reachable through the available road network. The Thames Basin Heaths SPA comprises similar habitats, wildlife, sceneries and nature feel to the Thursley, Ash, Pirbright & Chobham SAC. Therefore, it is very unlikely that new residents will undertake the longer journeys to the SAC. It is concluded that the Revised Growth Strategy for Wokingham will not result in adverse effects on the integrity of the SAC, either alone or in-combination. Specific mitigation measures (in the form of policy wording) for the site are therefore not required.

5.2 Atmospheric Pollution

Note that this section is preliminary and will be updated and expanded upon following completion of the Air Quality Impact Assessment being undertaken for the Pre-Submission Local Plan Update and its HRA.

The HRA has identified several policies in the Revised Growth Strategy that provide for new residential and employment development within Wokingham Borough, which is likely to result in more car travel within the Borough. The following policies need to be considered in relation to the impact pathway atmospheric pollution:

- Policy SS1 – Spatial Strategy: Provides for 15,513 net additional dwellings over the plan period 2018-2038
- Policy SS3 – Hall Farm / Loddon Valley: Provides for at least 2,200 net new dwellings within the Plan period, and 4,500 in total
- Policy SS5 – South of the M4 Strategic Development Location: Provides for an additional 366 net new dwellings and 18,500m^2 of new employment space
- Policy SS6 – North Wokingham Strategic Development Location: Provides for an additional 33 net new dwellings and a care home
- Policy SS7 – South Wokingham Strategic Development Location: Provides for an additional 889 net new dwellings (see Table 2)
- Policy H1 – Housing Provision: Provides for a minimum of 15,513 net new dwellings in the Plan period between 2018 and 2038
- Policy H2 – Sites allocated for residential / mixed use development: Lists 24 proposed residential sites retained from the 2020 Wokingham Draft Local Plan Update and proposes to allocate an additional 19 new sites as part of the Revised Growth Strategy (totalling 967 dwellings)

Several policies retained in the Revised Growth Strategy are not being consulted upon, but need to be considered in the context of recreational pressure:

- Policy SS2 – Settlement Hierarchy: Identifies the location of major development throughout Wokingham Borough
- Policy ER10 – Whiteknights Campus: Provides for additional student accommodation
- Policy H11 – Gypsies and Travellers and Travelling Showpeople provision: Provides for 24 net new gypsy and traveller pitches

5.2.1 Thames Basin Heaths SPA

As identified in the screening section of the 2020 Wokingham Draft Local Plan Update, LSEs of the Plan on the Thames Basin Heaths SPA regarding atmospheric pollution could not be excluded and the site was screened in for Appropriate Assessment. The SPA is designated for several bird species that depend on heathland habitats, which are sensitive to atmospheric pollution (critical nitrogen load of 10-20 kg N/ha/yr). Given the development allocated in the Revised Growth Strategy for Wokingham (expecting an additional 15,513 net new dwellings and an unspecified amount of net new employment space) and the growth to be delivered by surrounding districts over this time scale, the Plan might have significant air quality impacts alone and 'in-combination' with other Local Plans. This is because all development allocations will increase the local population and accordingly the need for motorised travel within the Borough. While it is to be noted that the Revised Growth Strategy increases the housing development compared to the 2020 Draft Local Plan Update (15,513 compared to 13,901 dwellings, noting the extension of the plan period to 2038), atmospheric pollution is an in-combination pathway, which inherently takes changes in the quanta and distribution of development into account. Therefore, the remainder of this section replicates the analysis that was undertaken in the previous HRA.

5.2.1.1 General Setting of the SPA

When assessing the potential atmospheric pollution impact of a Plan on a designated site, an initial assessment of the location of the site in relation to the major traffic infrastructure should be undertaken. In relation to Wokingham Borough the most important component parcels of the Thames Basin Heaths SPA lie along the A327 and the A30 in the Hart District just south of Wokingham Borough. Both of these are major roads with relatively high traffic flow.

Review of detailed habitat mapping within these SPA parcels shows that there is heathland within 200m at various points along these roads. For example, on Warren Heath, heathland habitat lies within 140m of the A327 (near Wood Farm). Furthermore, there are multiple locations where heathland directly borders on to the A30, such as east of Blackbushe Airport and in Yateley Common Country Park. Another major parcel of the SPA that is potentially relevant to the Revised Growth Strategy lies to the south of Bracknell, immediately adjacent to the A322. However, a review of the heathland distribution within the SPA indicates that there is no sensitive heathland within 200m of the A322, the majority of heathland in this parcel occurring in the south-western part of this parcel. Therefore, it is considered that the SPA parcels to the south of Wokingham Borough (along the A327 and A30) are the only ones to be realistically impacted by traffic resulting from the Plan.

5.2.1.2 Commuter traffic

It is to be noted that this analysis into the pattern of commuter traffic only reflects the current pattern of motorised travel of Wokingham Borough's residents and it is not necessarily the case that future residents will follow the same transport links. However, given that route choice is likely to be based on minimising journey time and that the prevailing road infrastructure is unlikely to change substantially, journey-to-work data is generally a useful starting point for assessing the potential impacts of development plans on the impact pathway atmospheric pollution.

According to Journey to Work data from the 2011 census[63], five of the ten most common destinations for journeys to work arising from Wokingham Borough are Reading (12,616 people, 29.3%), Bracknell Forest (6,371 people, 14.8%), Windsor and Maidenhead (3,124 people, 7.3%), West Berkshire (2,659 people, 6.2%) and Slough (1,767 people, 4.1%). Of these destinations, only commuters travelling to

[63] Available at https://www.nomisweb.co.uk/census/2011/wu03uk [accessed 12/04/2019]

Bracknell Forest are likely to use the A322 in significant numbers. However, given that there is no SPA heathland within 200m of this road (see previous section), an increase in traffic on this road arising from the 2020 Draft Local Plan Update is unlikely to affect the ability of the SPA to meet its Conservation Objectives.

The 2011 census data indicate that Hart District is among the top five authorities contributing to the inflow of commuter traffic into Wokingham Borough (1,235 of the total inflow of 30,855 people, 4%). The journey-to-work routes for Hart residents from the settlements of Fleet, Farnborough and Aldershot, might take commuters into Wokingham Borough along the A30 and A327 trajectory, bringing them within 200m of sensitive heathland habitat. The allocation of new employment development in Wokingham Borough might therefore lead to an increase in the number of car-based commuter journeys along this stretch of the SPA with potential air quality impacts on the adjacent heathland. However, a review of popular navigation systems indicates that local residents have a range of route choices with similar travel times. For example, depending on travel conditions, a journey from Fleet to Wokingham Borough via the A3095 might take a similar amount of time than using a combination of the A30 and A327.

It is to be noted that these data do not include journeys to work that both start and end in Wokingham Borough and the commuter journeys that are carried out on foot, by bike or by public transport. Therefore, the actual proportion of regular commuter journeys that might involve passing within 200m of component sites of the Thames Basin Heaths SPA is likely to be lower than the relative proportions of car travel that are summarised here.

Regarding the impact pathway atmospheric pollution, the Revised Growth Strategy already contains some broad protective policy wording. **Policy HC6 (Air Pollution and Air Quality)** addresses pollution levels by stating that '*Prevailing air quality and potential impacts upon air quality arising from airborne emissions, dust and odour associated with the construction and operation of a proposal (including vehicular traffic) will be considered when determining planning applications*'. The policy also states that an air quality assessment might become necessary for developments. Any further recommendations, such as the incorporation of additional policy wording and specific mitigation initiatives in relation to the Thames Basin Heaths SPA, will depend on the results of the AQIA and will be drawn up in collaboration with Wokingham Borough Council.

5.2.2 Chilterns Beechwoods SAC

As identified in the screening section of the HRA for the 2020 Wokingham Draft Local Plan Update, LSEs of the Plan on the Chilterns Beechwoods SAC regarding atmospheric pollution could not be excluded and the site was screened in for Appropriate Assessment. The SAC is designated for *Asperulo-Fagetum* beech forest (nitrogen Critical Load of 10-20 kg N/ha/yr) and semi-natural dry grassland (nitrogen Critical Load of 15-25 kg N/ha/yr), both of which are sensitive to atmospheric pollution, and particularly nitrogen deposition. It was also noted that the current deposition rates by far exceed this critical load, indicating that any further increase could result in adverse effects on the SAC's site integrity. Given the development allocated in the Revised Growth Strategy for Wokingham and the growth to be delivered by surrounding districts over this time scale, the strategy might have significant air quality impacts alone and 'in-combination' with these other Local Plans. This is because all development allocations will increase the local population and accordingly the need for motorised travel within the Borough. While it is to be noted that the Revised Growth Strategy increases the housing development compared to the 2020 Draft Local Plan Update (15,513 compared to 13,901 dwellings), atmospheric pollution is an in-combination pathway, which inherently takes changes in the quanta and distribution of development into account. Therefore, the remainder of this section replicates the analysis that was undertaken in the previous HRA.

5.2.2.1 General Setting of the SAC

The Chilterns Beechwoods SAC is a composite with numerous parcels. The only parcel of the SAC that is likely to be relevant to development in Wokingham Borough is Bisham Woods, a component part approx. 4.7km to the north-east of Wokingham Borough along the A404 in the adjoining authority of Windsor and Maidenhead. Detailed mapping of the priority deciduous woodland habitat on MAGIC indicates that the qualifying woodland is distributed across the entire SAC parcel. Therefore, it is considered that the entirety of Bisham Woods is sensitive to atmospheric pollution and could be impacted by an increase in traffic along this section of the A404.

5.2.2.2 Commuter traffic

According to Journey to Work data for Wokingham Borough from the 2011 census[64], Windsor and Maidenhead (the authority in which Bisham Woods lies) is a major contributor to and recipient of commuter traffic into and out of Wokingham Borough. For example, of the 23,329 people that commute into Wokingham Borough on a daily basis, 1,467 people (6.3%) come from Windsor and Maidenhead. Of 32,417 outward commuters from Wokingham Borough, 2,791 people (8.6%) travel to Windsor and Maidenhead. However, the SAC parcel is in the very north of the authority, such that commuters that end their journey in Windsor and Maidenhead, are unlikely to drive within 200m of Bisham Woods. The A404 runs directly on into Wycombe and it is therefore considered that commuter traffic between Wokingham Borough and Wycombe is most likely to affect this part of the SAC.

Census 2011 data highlights that some of Wokingham Borough's residents commute to Wycombe, although this is relatively small proportion of the overall commuter traffic. 574 (2.5%) of all commuters travelling into Wokingham Borough come from Wycombe. Conversely, 971 (3%) of all out-commuters travel into Wycombe. It is to be noted that in comparison to Reading (which accounts for 18.6% of the inflow and 24.8% of the outflow of commuters), this is an exceedingly small proportion. Notwithstanding this, the potential for adverse effects on the air quality within this SAC component requires assessment, particularly in-combination with the growth in the aforementioned Windsor and Maidenhead, and Wycombe (and other nearby authorities).

While Wycombe directly borders the north of the Wokingham Borough, there are no obvious road links between the authorities in this area. It is considered that travelling via Windsor and Maidenhead and using the A404 is the only commuter route between these authorities. This is supported by a review of the road suggestions on Google Maps. Even residents from Wargrave, which is the northernmost large settlement in Wokingham Borough and very close to the authority of Wycombe, travelling to Marlow (the southernmost large settlement in Wycombe) are most likely to commute via the A404, as this is given as the fastest route.

It is to be noted that the data presented here do not include journeys to work that both start and end in Wokingham Borough or commuter journeys that are carried out on foot, by bike or by public transport. Therefore, the actual proportion of regular commuter journeys that might involve passing within 200m of Bisham Woods (component part of the Chilterns Beechwoods SAC) is likely to be lower than the relative proportions of car travel that are summarised here.

Regarding the impact pathway atmospheric pollution, the 2020 Draft Local Plan Update already contains some broad protective policy wording. **Policy HC6 (Air Pollution and Air Quality)** addresses pollution levels by stating that '*Prevailing air quality and potential impacts upon air quality arising from airborne emissions, dust and odour associated with the construction and operation of a proposal (including vehicular traffic) will be considered when determining planning applications*'. The policy also states that an air quality assessment might become necessary for developments. Any further recommendations, such as the incorporation of additional policy wording and specific mitigation initiatives in relation to the Chilterns Beechwoods SAC, will depend on the results of the AQIA and will be drawn up in collaboration with Wokingham Borough Council.

[64] Available at https://www.nomisweb.co.uk/census/2011/wu03uk [accessed 12/04/2019]

6. Conclusions and Recommendations

This HRA assessed the potential impacts of residential and employment growth allocated in the Revised Growth Strategy on the following European sites:

- Thames Basin Heaths SPA;
- Thursley, Ash, Pirbright and Chobham SAC; and
- Chilterns Beechwoods SAC.

The impact pathways that were considered in this HRA include recreational pressure and atmospheric pollution. The impact pathways loss of functionally linked habitat and water quantity, level and flow had been screened out from Appropriate Assessment in the 2020 Wokingham Draft Local Plan Update HRA. The following key conclusions and recommendations derive from the Appropriate Assessment.

6.1 Impact pathway: Recreational pressure

The Revised Growth Strategy proposes to allocate 11,423 net new dwellings requiring mitigation in the 5km and 5-7km mitigation zones surrounding the Thames Basin Heaths SPA (discounting sites within the 5-7km zone that accommodate fewer than 50 dwellings), which would require the delivery of appropriate mitigation measures in the form of Suitable Alternative Greenspace (SANG) and Strategic Access Management & Monitoring (SAMM). An assessment of the policies in the Revised Growth Strategy showed that the document gives appropriate regard to the provision of SANG and SAMM.

However, given the relatively large amount of SANG required (219.32ha were identified in the Appropriate Assessment), it is advised that the Council develop a record of SANG availability, including the key characteristics of size and geographic location, that can be submitted to the Examination process as evidence for the deliverability of the anticipated residential development. This is to demonstrate that adequate mitigation of recreational pressure in the TBH SPA is provided and that Natural England guidelines are followed. It is to be noted that most Strategic Development Locations (except for Hall Farm / Loddon Valley, and the South Wokingham SDL extension) are existing commitments deriving from the Core Strategy and are committed or under construction. Individual developers would have already done significant groundwork with the Council and Natural England to devise appropriate SANG provision. If a bespoke SANG provided for the new SDL at Hall Farm / Loddon Valley was also to serve as a strategic SANG for other smaller residential developments, this would have to be agreed with the developer. Any developments that were to be addressed by a SANG could not become occupied until the SANG was functioning. The specifics relating to the provision of SANG and SAMM, such as the amount and location of SANGs and the per-dwelling SAMM contribution, should be set out in a separate strategic Supplementary Planning Document (SPD), as has been developed for other authorities such as Surrey Heath.

Overall, it is concluded that, given the provision of adequate SANG and SAMM there will be no adverse effects of the Revised Growth Strategy on the site integrity of the Thames Basin Heaths SPA regarding the impact pathway recreational pressure.

6.2 Impact pathway: Atmospheric pollution

The Wokingham Draft Local Plan Update provides for 15,513 dwellings and an unspecified amount of employment space, which is likely to increase the number of car-based commuter journeys adjacent to European sites that are sensitive to atmospheric pollution. The Appropriate Assessment highlighted that two European sites within 10km from Wokingham Borough are sensitive to atmospheric pollution **and** lie within 200m of key commuter routes identified as relevant to the Local Plan Update, namely the Thames Basin Heaths SPA and the Chilterns Beechwoods SAC.

The in-combination atmospheric pollution effects of a Plan document are addressed through Air Quality Impact Assessments (AQIAs), which model the predicted air quality effects of the growth projected in several adjacent authorities. An AQIA in relation to these two European sites has been commissioned but has not yet been completed. Therefore, a firm conclusion regarding potential adverse effects of the Revised Growth Strategy on the two sites cannot be reached, until the air quality data is available.

Therefore, this HRA will be updated (both in terms of results and potential mitigation recommendations) once the AQIAs are available.

7. Appendices

Appendix 1: Map of the European sites in relation to the boundary of Wokingham Borough, and the proposed development allocations provided for in the Revised Growth Strategy for Wokingham. The map also shows the 5km and 7km mitigation zones defined for recreational pressure around the Thames Basin Heaths SPA.

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AECOM

PROJECT

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LEGEND

- Proposed Sites
- Strategic Development Location
- Thames Basin Heaths - 5km, 7km Buffer
- Special Protection Area -Thames Basin Heaths
- Special Areas of Conservation

NOTES

ISSUE PURPOSE

DRAFT

PROJECT NUMBER

60610735

SHEET TITLE

Strategic Development Locations, residential and employment sites allocated in the Revised Growth Strategy in relation to European sites within10km of the Wokingham Borough boundary

SHEET NUMBER

Figure 1