



Preliminary Environmental Information Report Appendix 9.9.1: Habitat Regulations Assessment Report

September 2021

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1 Introduction

1.1 General

1.1.1 This document forms Appendix 9.9.1 of the Preliminary Environmental Information Report (PEIR) prepared on behalf of Gatwick Airport Limited (GAL). The PEIR presents the preliminary findings of the Environmental Impact Assessment (EIA) process for the proposal to make best use of Gatwick Airport's existing runways (referred to within this report as 'the Project'). The Project proposes alterations to the existing northern runway which, together with the lifting of the current restrictions on its use, would enable dual runway operations. The Project includes the development of a range of infrastructure and facilities which, with the alterations to the northern runway, would enable the airport passenger and aircraft operations to increase. Further details regarding the components of the Project can be found in Chapter 5: Project Description.

1.1.2 This document provides the findings of the Habitat Regulations Assessment (HRA) process undertaken to date for the Project.

1.2 Purpose of this Report

1.2.1 The need for an appropriate assessment/HRA is set out in Regulation 63 of the Conservation of Habitats and Species Regulations 2017, as amended (the 'Habitats Regulations') (Table 1.2.1).

Table 1.2.1: Legislative Basis for a Habitats Regulations Assessment.

The Legislative Basis for Habitat Regulations Assessment	
Habitats Regulations, Regulation 63	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 of the plan or project for the site in view of that site's conservation objectives

1.2.2 The Habitats Regulations apply the precautionary principle to relevant designated areas, in so much as plans and projects can only be permitted where it has been ascertained that there would be no adverse effect on the integrity of a Special Protection Area (SPA) or Special Area of Conservation (SAC), collectively termed Natura 2000 sites.

1.2.3 It is Government policy (as outlined in Section 181 of the National Planning Policy Framework (Ministry of Housing Communities and Local Government, 2021)) for sites designated under the Convention on Wetlands of International Importance (Ramsar sites) to be treated as having equivalent status to Natura 2000 sites. As such, information to inform an appropriate assessment needs to cover features of any relevant Ramsar site. Similarly, in accordance with Government advice, proposed SPAs and SACs (pSPAs/pSACs) should be treated as having protection under the Habitats Regulations.

1.2.4 In undertaking an assessment, competent authorities (in this case the appropriate Secretary of State) must have regard to both direct and indirect effects on an interest feature of the Natura 2000 site, as well as cumulative effects. This may include consideration of features and issues outside the boundary of a Natura 2000 site.

1.2.5 Plans and projects for which it is not possible to conclude that there would be no adverse effect on the integrity of Natura 2000 sites may still be permitted if there are no alternatives and there are Imperative Reasons of Overriding Public Interest (IROPI) as to why they should go ahead. In such cases, any compensation measures necessary to ensure the overall coherence of the site network is protected must also be secured.

1.2.6 Relevant case law on the HRA process includes Case C-323/17, known as People Over Wind; Case C-461/17 *Holohan v. An Bord Pleanála*; High Court judgement EWHC 351 (known as the Wealden Judgement); Case C-127/02 Waddenzee; Case C-258/11 Sweetman v An Bord Pleanála; and C293/17, C294/17 *Cooperatie Mobilisation for the Environment and others v College van gedeputeerde staten van Limburg*, known as the Dutch Nitrogen case.

1.3 Objectives

1.3.1 The objective of this report is to collate and provide an assessment of potential effects of the Project on the Natura 2000 network for the purposes of informing the PEIR for the Project. This assessment will be refined and updated where necessary to inform the shadow HRA presented as part of the ES. It draws upon information within the PEIR, notably Chapter 9: Ecology and Nature Conservation, but purposely does not repeat the detail contained in that chapter. Instead, it provides sufficient standalone information, with references to other more detailed sections where necessary to be able to make a preliminary

decision on the potential effects of the Project on Natura 2000 sites.

1.4 Scope

1.4.1 Key activities in the Project programme that are considered within this report are:

- site preparation and enabling works;
- construction phase;
- commissioning; and
- operation.

1.4.2 No Natura 2000 sites or Ramsar sites lie wholly or partly within the Project site boundary.

1.4.3 The scope of sites included in the assessment is based on whether there is a known pathway for a potential effect. Such pathways are principally in relation to species the site is designated for or where the site is near to a road that may encounter increases in traffic flow as a result of the Project. The findings of the technical chapters of the PEIR (specifically Chapters 9 Ecology, 13 Air Quality and 12 Traffic and Transport) and consultation with Natural England have been taken into account. This includes with respect to designated sites that are within 200 metres of major roads and those designated for the presence of mobile species such as bats. Taking the above into account, the following seven Natura 2000 sites require consideration as to whether they could be affected (distance/direction from Project site boundary provided in parenthesis):

- Mole Gap to Reigate Escarpment SAC (9.22 km north west);
- Ashdown Forest SAC (11.96 km south west);
- Ashdown Forest SPA (11.96 km south west);
- The Mens SAC (25.09 km south west);
- Ebernoe Common SAC (29.00 km south west);
- Thames Basin Heaths SPA (Ockham and Wisley SSSI and Chobham Common SSSI components only) (23.6 km north west); and
- Thursley, Ash, Pirbright and Chobham SAC (Chobham Common SSSI component only) (33.8 km north west).

1.4.4 Citation details for the above sites are provided in Annex 1.

1.4.5 Note that where it passes by the M3, the Chobham Common SSSI is a component of both the Thursley, Ash, Pirbright and Chobham SAC and Thames Basin Heaths SPA.

1.4.6 There is no potential for transboundary effects (see Appendix 6.2.3 Transboundary Screening Matrix). The site does not support migratory bird species that may be associated with Natura 2000 sites in other EU States and whilst there is some evidence of bat migration to and from the UK for some species (Nathusius' pipistrelle, for example (PTES, 2020)), the presence of SACs in the surrounding landscape designated for bats are already in the scope of assessment.

2 Methodology

2.1 Key Principles

2.1.1 The key principles adopted during the collation and analysis of information are set out in Table 2.1.1.

Table 2.1.1: Key Principles Underpinning the Assessment Methodology.

Key Principles Underpinning the Assessment Methodology	
Principle	Rationale
Use of best available existing information	The best available existing information has been used to inform the assessment. This includes ecological information gathered on behalf of Gatwick Airport Limited (GAL) and information made available through production of the PEIR and information from other sources, including Natural England, British Trust for Ornithology, and others.
Proportionality	The level of detail provided in the assessment reflects the level of detail available, which may increase during the EIA process prior to the application for development consent (ie that the assessment is proportionate).
Consultation	Continued consultation with Natural England and other stakeholders during the ongoing EIA process will be undertaken including ensuring that their comments are taken on board.
Transparency in the assessment process	The process will be kept as open, transparent and simple as possible while ensuring an objective and rigorous assessment in compliance with the Habitats Directive, Habitats Regulations and emerging best practice.

Key Principles Underpinning the Assessment Methodology	
Audit trail	The process will be followed, and the conclusions reached are clearly documented to ensure there is a clear audit trail.

2.2 Process

2.2.1 The stages of HRA are described below, adapted from Government guidance (MHCLG, 2021, PINS, 2017). The stages are essentially iterative, being revisited as necessary in response to more detailed information, recommendations and any relevant changes to the plan until it is possible to conclude the Project will cause no adverse effect on the integrity of the protected site(s) in question.

Stage 1 – Qualifying Interest Features

2.2.2 Stage 1 is to collect information on identified Natura 2000 and Ramsar sites and their conservation objectives.

2.2.3 The qualifying interest features for the sites assessed in this report have been obtained via the citation details on the Joint Nature Conservation Committee (JNCC)/Natural England websites. The conservation objectives provide the basis for determining what is currently causing, or may cause, a significant effect, and for informing the scope of appropriate assessments.

2.2.4 In addition to qualifying interest features, it is necessary to explore the environmental features and conditions required to maintain the integrity of the Natura 2000 sites, as well as both current condition and trends in environmental processes.

Stage 2 – Likely Significant Effect

2.2.5 The second stage is to determine whether there are any Likely Significant Effects (LSEs) on Natura 2000 sites as a result of the Project in the absence of mitigation/avoidance measures. This is essentially a risk assessment to decide whether a more detailed assessment is required and, if so, the scope of the issues and features to be addressed. This involves identifying the potential pathways through which the Project could affect the interest features of relevant Natura 2000 sites and then assessing, in broad terms, the magnitude of each impact to determine whether a significant effect is likely. In making this determination, the risk of an effect has been taken into account, not just on those sites within the administrative boundary of Crawley Borough Council (within which the airport sits), but, in line with best practice,

considering potential ways in which the Project could impact upon other relevant Natura 2000 or Ramsar sites.

2.2.6 The main purpose of this stage is to screen out those aspects of the Project which would not be likely to give rise to significant effects and to screen out features of each relevant Natura 2000 site that are not likely to be significantly affected. Judgements have been based on sound reasoning and within the context of best available knowledge of the various ways in which development of the nature proposed could impact on the interest features of the relevant Natura 2000 sites. Judgements are made in the absence of mitigation/avoidance measures. If likely significant effects cannot be excluded beyond reasonable scientific doubt under the precautionary principle then it is assumed that the issue requires more detailed consideration.

Stage 3 – Appropriate Assessment

2.2.7 The appropriate assessment stage assesses the likely significant effects of the Project on the conservation objectives of relevant Natura 2000 and Ramsar sites and determines whether a conclusion of no adverse effect can be reached for the Project alone and in-combination with other plans or projects.

2.2.8 When a plan or project cannot be 'screened out' as being unlikely to have a significant effect on a Natura 2000 site, it is necessary to explore whether there are any adverse effects and, if so, devise suitable avoidance and mitigation measures to be able to conclude no adverse effect. There is no formal screening stage under the Habitats Regulations, but for convenience the term is used here to refer to the consideration of whether the need for appropriate assessment under the Regulations has been triggered according to the application of the precautionary principle summarised above. Experience suggests that the best approach to addressing this is on a site by site basis, with avoidance/mitigation measures focused on the environmental conditions needed to maintain site integrity.

2.2.9 Government guidance (MHCLG, 2019b) defines integrity as '*...the coherence of its ecological structure and function, across its whole area, that enables it to sustain the habitat, complex of habitats and/or the levels of populations of the species for which it was designated*'.

Stage 4 – In-combination Assessment

2.2.10 The Habitats Regulations require that a decision to grant permission can only be made once the Competent Authority is satisfied that no adverse effects on the integrity of the Natura 2000 sites in question are likely, either alone and in-combination

with other plans and projects. Therefore, Stage 4 of the HRA process requires the identification of other plans and projects that might affect the interest features of the relevant Natura 2000 sites in combination with the Project and a decision as to whether there any adverse effects that might occur in-combination (collectively) that would not occur when considered alone.

3 Stage 1 – Qualifying Interest Features

3.1 Mole Gap to Reigate Escarpment Special Area of Conservation

3.1.1 SACs are protected sites designated under the European Council Directive 92/43/EEC on the Conservation of natural habitats and of wild fauna and flora (known as the Habitats Directive). The Habitats Directive is implemented into UK law through the Habitats Regulations, which refer to the Annexes of the Habitats Directive.

3.1.2 Article 3 of the Habitats Directive requires the establishment of a European network of important high-quality conservation sites that will make a significant contribution to conserving the habitat types and species identified in Annexes I and II of the Habitats Directive.

3.1.3 A sub-set of the Annex I habitat types are defined as being 'priority' because they are considered to be particularly vulnerable.

3.1.4 The Mole Gap to Reigate Escarpment (MGRE) SAC stretches for eight miles between Leatherhead and Reigate and includes land in the district of Mole Valley. It covers approximately 892 hectares.

3.1.5 The citation for the site provides the following description of the SAC (Natural England, 2014a):

'Woodland, chalk grassland, chalk scrub and heathland form an interrelated mosaic at this site on the North Downs.

On the generally acidic plateau deposits of the crest of the Downs, the woodland is dominated by beech Fagus sylvatica, pedunculate oak Quercus robur, ash Fraxinus excelsior and yew Taxus baccata. On the lime-rich chalk slopes, the dominant trees are beech, ash and yew, together with field maple Acer campestre and common whitebeam Sorbus aria agg. and occasional

large-leaved lime Tilia platyphyllos. Yew woodland has been formed both by invasion of chalk grassland and from development within beech woodland following destruction of the beech over-storey. Yew occurs in extensive stands, with, in places, an understorey of box Buxus sempervirens. This site supports the only area of stable box scrub in the UK, on steep chalk slopes where the River Mole has cut into the North Downs Escarpment, creating the Mole Gap. Here natural erosion maintains the open conditions required for the survival of this habitat type.

The site supports a range of species-rich chalk grassland types on steep slopes, dominated by red fescue Festuca rubra, sheep's-fescue F. ovina, quaking-grass Briza media and, in taller areas, upright brome Bromopsis erecta, tor-grass Brachypodium pinnatum and slender falsebrome grass Brachypodium sylvaticum. Typical herbs include salad burnet Sanguisorba minor, yellow-wort Blackstonia perfoliata and field scabious Knautia arvensis. The site supports important populations of the nationally scarce musk orchid Herminium monorchis and man orchid Aceras anthropophorum, the former occurring in areas of shorter turf. A range of more widespread but local orchids are also present, including autumn lady's-tresses Spiranthes spiralis and green-winged orchid Orchis morio, as well as commoner species, such as pyramidal orchid Anacamptis pyramidalis, fragrant orchid Gymnadenia conopsea and bee orchid Ophrys apifera.

The acidic plateau deposits on Headley Heath support acidic heathland, dominated by heather Calluna vulgaris, bell heather Erica cinerea and dwarf gorse Ulex minor, often mixed with grasses such as wavy hair-grass Deschampsia flexuosa and common bent Agrostis capillaris. Chalk heath occurs on a small area of Headley Heath where the special conditions allow both acid and lime-loving plants to grow side by side.

An old chalk mine is used as a winter roost by several species of bats.'

3.1.6 Qualifying features include a range of both habitats and species. Habitats include:

- *Taxus baccata* woods of the British Isles (Yew-dominated woodland)*;

- *Asperulo-Fagetum* beech forests (Beech forests on neutral to rich soils);
- European dry heaths;
- Semi-natural dry grasslands and scrubland facies: on calcareous substrates (*Festuco-Brometalia*) (Dry grasslands and scrublands on chalk or limestone);
- Semi-natural dry grasslands and scrubland facies: on calcareous substrates (*Festuco-Brometalia*) (* important orchid sites). (Dry grasslands and scrublands on chalk or limestone, including important orchid sites); and
- Stable xerothermophilous formations with *Buxus sempervirens* on rock slopes (*Berberidion* p.p.) (Natural box scrub).

3.1.7 The natural habitats and species denoted with an asterisk (*) above are 'priority habitats' in Annex I of the Directive as described above. The term 'priority' is also used in other contexts, for example with reference to particular habitats or species that are prioritised in UK Biodiversity Action Plans. It is important to note, however, that these are not necessarily the priority natural habitats or species within the meaning of the Habitats Directive or the Habitats Regulations.

3.1.8 The site is also designated for qualifying species, which include:

- Bechstein's bat *Myotis bechsteinii*; and
- great crested newt *Triturus cristatus*.

European Site Conservation Objectives for Mole Gap to Reigate Escarpment Special Area of Conservation (Natural England, 2014a)

3.1.9 The Conservation Objectives for a designated site set out the goals that are considered necessary to maintain or restore the qualifying features of a site to Favourable Conservation Status. Subject to natural change, the Conservation Objectives for the MGRE, are to maintain or restore:

- 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.

Site Improvement Plan – Mole Gap to Reigate Escarpment (Natural England, 2014b)

3.1.10 The Site Improvement Plan (SIP) is drafted by Natural England and provides a high-level overview of the issues (both current and predicted) affecting the condition of the Natura 2000 features on the site and outlines the priority measures required to maintain/improve the condition of the features.

3.1.11 The current priority issues for the MGRE SAC are:

- disease of natural box scrub;
- inappropriate scrub control;
- change in land management;
- public access/disturbance; and
- air pollution: risk of atmospheric nitrogen deposition.

3.1.12 There are several proposed actions to address the above priority issues.

3.1.13 The current position on site with regard to this is as follows (as described in the SIP with respect to these issues):

'The current situation for the SAC is that nitrogen deposition currently exceeds the site relevant critical load for ecosystem protection and therefore is a risk of harmful effects. However, the sensitive features are currently considered to be in a favourable condition on the site.'

3.1.14 The following actions are proposed in the SIP to address this issue:

- further investigation of the potential atmospheric impacts on the site; and
- monitoring the indicators of increased nitrogen deposition, such as increased vigorous grass growth, increase in tor-grass and other grasses and a decrease in orchid species through the use of fixed-point quadrat surveys over five years.

3.2 Ashdown Forest Special Area of Conservation

3.2.1 The Ashdown Forest SAC was designated in 2005 and covers approximately 2,700 hectares.

3.2.2 The SAC is one of the largest single continuous blocks of lowland heath in the south east of England. The site supports important assemblages of invertebrates, including nationally rare species

and birds of European importance. The qualifying habitats for the Ashdown Forest SAC include:

- Northern Atlantic wet heaths with *Erica tetralix*; and
- European dry heaths.

3.2.3 This site is not designated for any Annex 1 priority habitats.

European Site Conservation Objectives for Ashdown Forest Special Area of Conservation (Natural England, 2018a)

3.2.4 Subject to natural change, the Conservation Objectives for Ashdown Forest SAC are, to maintain or restore:

- 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 habitats of qualifying species rely;
- the populations of qualifying species; and
- the distribution of qualifying species within the SAC.

3.3 Ashdown Forest Special Protection Area

3.3.1 The Ashdown Forest SPA forms part of a complex of heathlands in southern England that support breeding bird populations of European importance. It was classified in 1996 and covers approximately 3,200 hectares comprising lowland heathland and woodland. It has a different boundary to the SAC, but the two designations overlap.

3.3.2 The SPA qualifies under by supporting populations of European importance of the following species during the breeding season:

- Dartford Warbler *Sylvia undata*, 29 pairs representing at least 1.8% of the breeding population in Great Britain (Count as at 1994); and
- Nightjar *Caprimulgus europaeus*, 35 pairs representing at least 1.0% of the breeding population in Great Britain (Two-year mean, 1991 & 1992).

European Site Conservation Objectives for Ashdown Forest Special Protection Area (Natural England, 2019a)

3.3.3 Subject to natural change, the Conservation Objectives for Ashdown Forest SPA are, to maintain or restore:

- 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 populations of each of the qualifying features; and
- the distribution of the qualifying features within the SPA.

3.4 The Mens Special Area of Conservation

3.4.1 The Mens SAC is situated within the South Downs National Park and covers an area of 204.69 hectares.

3.4.2 It comprises an extensive area of mature beech *Fagus sylvatica* woodland that is rich in lichens, bryophytes, fungi and saproxylic invertebrates. It is one of the largest areas of Atlantic acidophilous beech forests in the south-eastern portion of this habitat's UK range. In addition, the woodland habitat supports a significant population of Barbastelle *Barbastella barbastellus* bats.

3.4.3 Qualifying interest features include:

- Atlantic acidophilous beech forests with Ilex and sometimes also Taxus in the shrub layer (*Quercion robori-petraeae* or *Ilici-Fagenion*); and
- Barbastelle *Barbastella barbastellus*.

European Site Conservation Objectives for The Mens SAC (Natural England, 2018b)

3.4.4 Subject to natural change, the Conservation Objectives for the Mens SAC, are to maintain or restore:

- 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 SAC.

Site Improvement Plan – The Mens SAC (Natural England, 2015a)

3.4.5 The SIP for the site includes the following priority issues:

- forestry and woodland management;
- habitat connectivity;
- invasive species;
- change in land management;
- air pollution: risk of atmospheric nitrogen deposition; and
- public access/disturbance.

3.5 Ebernoe Common Special Area of Conservation

3.5.1 Ebernoe Common SAC is located within the South Downs National Park and covers 234.93 hectares.

3.5.2 The citation for the site provides the following description of the SAC (Natural England, 2019b):

'Ebernoe Common is a complex of ancient woodland blocks largely derived from ancient wood pasture. The northern and southern sections of the site contain woodland managed as high forest in more recent times. The site also contains 78 of the 100 ancient woodland indicator plants for south-eastern England.'

Ebernoe Common is of national importance for colonies of barbastelle and Bechstein's bats, which use trees as summer maternity roosts where the female bats gather to give birth and rear their young. The bats also use the site as a foraging area and as flight paths for dispersal to their foraging territories both within and outside of the SSSI.

*In addition to the reasons for notification, thirty three species of butterfly have been recorded from the across the site, including purple emperor *Apatura iris*, brown hairstreak *Thecla betulae*, grizzled skipper *Pyrgus malvae*, and dingy skipper *Erynnis tages*. Stag beetles *Lucanus cervus* have also been recorded and their presence is indicative of a significant wood pasture invertebrate interest. A total of eleven other bat species have been recorded from the site, including Brandt's bat *Myotis brandtii*, whiskered bat *Myotis mystacinus*, Leisler's bat *Nyctalus leisleri*, and grey long-eared bat *P. austriacus*.'*

3.5.3 Qualifying interest features include:

- Atlantic acidophilous beech forests with *Ilex* and sometimes also *Taxus* in the shrub layer (*Quercion roburi-petraeae* or *Ilici-Fagenion*);
- Barbastelle *Barbastella barbastellus*; and
- Bechstein's bat *Myotis bechsteinii*.

European Site Conservation Objectives for Ebernoe Common Special Area of Conservation (Natural England, 2018c)

3.5.4 Subject to natural change, the Conservation Objectives for Ebernoe Common, are to maintain or restore:

- 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 SAC.

Site Improvement Plan – Ebernoe Common (Natural England, 2015b)

3.5.5 The SIP for the site includes the following priority issues:

- forestry and woodland management;
- off site habitat availability/management;
- habitat fragmentation;
- change in land management;
- hydrological changes;
- air pollution: risk of atmospheric nitrogen deposition; and
- public access/disturbance.

3.6 Thames Basin Heaths Special Protection Area

3.6.1 The Thames Basin Heaths SPA was designated in 2005 and covers an area of 8,311.06 hectares. It comprises a range of remnant heathland and woodland sites across northern Hampshire, Berkshire and Surrey that were once continuous but are now fragmented into separate blocks by development and farmland. The open heathland and mire habitats are interspersed by woodland (both coniferous and broadleaved) and dense scrub. The area of the SPA is also covered by 14 Sites of Special Scientific Interest (SSSI).

3.6.2 The SPA was designated under Article 4.1 of the Birds Directive (2009/147/EC) by supporting populations of European importance of the following species listed on Annex I of the Directive:

- Dartford Warbler *Sylvia undata*, 445 pairs representing at least 27.8 % of the breeding population in Great Britain (Count as at 1999);
- Nightjar *Caprimulgus europaeus*, 264 pairs representing at least 7.8 % of the breeding population in Great Britain (Count mean (1998-99); and
- Woodlark *Lullula arborea*, 149 pairs representing at least 9.9 % of the breeding population in Great Britain (Count as at 1997).

3.6.3 The Conservation Objectives for the SPA (Natural England, 2014d) are to 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 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 SPA.

3.6.4 The Supplementary Advice on Conserving and Restoring Site Features for the Thames Basin Heaths SPA (Natural England 2014d) provides additional guidance on *'the range of ecological attributes on which the qualifying features will depend and which are most likely to contribute to a site's overall integrity'*.

3.7 Thursley, Ash, Pirbright and Chobham Special Area of Conservation

3.7.1 The Thursley, Ash, Pirbright and Chobham SAC (TAPC SAC) covers an area of 5,138 hectares. It covers the same geographical area as part of the Thames Basin Heaths SPA and comprises a range of remnant heathland and wetland transition sites across northern Hampshire and Surrey. In addition to its designation as an SAC, the same geographic area is covered by the Thames Basin Heaths SAC with the qualifying habitats of the SAC providing supporting habitat for the interest feature birds of the SPA.

- 3.7.2 The qualifying habitats for the TAPC SAC include:
- Depressions on peat substrates of the *Rhynchosporion*;
 - Northern Atlantic wet heaths with *Erica tetralix*; and
 - European dry heaths.
- 3.7.3 The Conservation Objectives for the SAC (Natural England 2018d) are to ensure that, subject to natural change, the integrity of the site is maintained or restored as appropriate, and ensure that the site contributes to achieving the Favourable Conservation Status of its Qualifying Features, by maintaining or restoring:
- the extent and distribution of the qualifying natural habitats;
 - the structure and function (including typical species) of qualifying natural habitats; and
 - the supporting processes on which qualifying natural habitats rely.
- 3.7.4 The Supplementary Advice on Conserving and Restoring Site Features (Natural England, 2016) provides additional detail regarding the interest features and what help contribute to overall integrity.

4 Stage 2 - Likely Significant Effect

- 4.1.1 This section deals with the screening of likely significant adverse effects on the qualifying features of the relevant Natura 2000 as a result of the construction and operation of the Project. The environmental pathways that could lead to a significant effect may be summarised as:
- direct injury/killing of an interest feature species, loss or damage of habitats within a designated site or of nearby areas used by interest species, including functionally linked land;
 - change in management regimes (eg grazing/mowing) of habitats within a designated site or of nearby areas used by interest species;
 - urbanisation that results in over shadowing, reduction of sight lines or which hinders flight paths;
 - air quality;
 - water quality;
 - hydrological changes, including in the balance of saline and non-saline conditions;
 - disturbance (activity, recreation, noise and lighting); and
 - introduction or spread of non-native invasive species.

- 4.1.2 The possibility of the Project having a likely significant effect on any of the designated sites identified in Section 3 is discussed for each of these impact pathways in turn below.
- 4.1.3 Screening matrices for all the sites identified in Section 4 above are provided in Annex 1.
- 4.2 Direct Injury / Killing of an Interest Species, Loss or Damage of Habitats Used by Interest Species**
- 4.2.1 As the Project is a minimum of 9 km away from the nearest Natura 2000 site, it would not result in any direct loss of any designated habitat within any of the designated sites.
- 4.2.2 Bird surveys undertaken during 2018/2019 (Appendix 9.6.2 of the PEIR) demonstrate that the Project site does not support any of the birds listed as interest features for Ashdown Forest SPA or other sites for which SPAs may be selected. As such, there is no risk of collision.
- 4.2.3 With respect to bat interest features at The Mens and Ebernoe Common, Natural England along with other nature conservation organisations, working with local authorities have produced draft guidelines for the assessment of potential effects on the SAC bat populations within Sussex (including The Mens and Ebernoe Common) at a landscape scale, recognising the importance of foraging/commuting habitat out with the formal designated sites (South Downs National Park Authority and Natural England, undated). Based on existing information (Bat Conservation Trust (BCT), 2018), this requires that development up to 12 km from the SAC consider the potential for effects on the bats.
- 4.2.4 This distance mainly relates to Barbastelle bats, which have been recorded foraging up to 15 km from a roost (South Downs National Park Authority & Natural England undated). Bechstein's bats forage in/close to woodland within which they roost, travelling usually no more than 1-3 km (Schofield and Morris, 2000; Fitzsimons *et.al.*, 2002; Dietz, 2009). Recent work on the HS2 development radio tracking this species also found the majority of foraging activity within 3 km of a roost, with a single male recorded foraging at 5 km (HS2, 2013).
- 4.2.5 Given the above and in view of the distance of the Project from their boundaries, the potential for a likely significant effect on the bat populations of the MGRE, The Mens and Ebernoe Common SACs is considered to be limited. However, during consultation, Natural England requested that consideration was given to the potential for effects on these interest features from the Project.

- 4.2.6 Surveys with respect to bats have been undertaken for the Project site during 2019, 2020 and 2021 and are presented in Appendix 9.6.3 of the PEIR. Barbastelle activity across the site was very low. Therefore, the Project site is considered unlikely to provide a key area of habitat for the local population, including any bats from MGRE/The Mens/Ebernoe Common SACs. As such, no impact due to loss of habitat used by Barbastelle but outwith the SACs is considered likely to cause any significant effect and can be screened out on that basis.
- 4.2.7 Data with respect to Bechstein's bats show that the Project site is used by this species, with foraging/commuting areas focused along the River Mole corridor, Brockley Wood, Museum Field and a number of other woodland parcels. Whilst current surveys suggest this species is relatively widespread around Gatwick, particularly to the west, all bats were male/non-breeding females with the trapping/radio tracking later in the year picking up younger bats, probably dispersing from a maternity colony in the nearby wider landscape.
- 4.2.8 The landscape-scale study completed in 2020/21 confirmed the presence of a number of maternity colonies in blocks of ancient woodland within 5 km of Gatwick, particularly to the west (Glover's Wood and Ifield Wood).
- 4.2.9 Therefore, the radio tracking data show that bats using the airport are associated with these colonies rather than those present within the surrounding SACs. As such, given the current evidence, any short-term effects due to habitat loss on the Gatwick bat population would not constitute a likely significant effect on the SACs.
- 4.2.10 Consequently, it is concluded that the effects of direct injury/killing and habitat loss on qualifying features of any nearby designated sites can be screened out.
- 4.3 Change in Habitat Management Regimes**
- 4.3.1 The majority of the existing land use immediately surrounding, and in the vicinity of, the Project site is agricultural land to the east and west with the towns of Horley and Crawley to the north and south, respectively.
- 4.3.2 The current management regimes for the Natura 2000 sites focus on maintaining the habitats for the qualifying interest features.
- 4.3.3 Given the distance from the Project site boundary to the Natura 2000 sites (the Project is a minimum of 9 km away from the

nearest Natura 2000 site), the Project would result in no change to current management regimes of any feature of a SPA or SAC.

4.3.4 Therefore, impacts occurring from a change in habitat management regimes can be screened out.

4.4 Urbanisation

4.4.1 Industrial development has the potential to overshadow areas of habitat within designated sites, or areas used by the interest features of such sites, as well as obstructing flight paths and lines of sight, reducing the appeal of the habitat or increasing the risk of fatalities through collisions.

4.4.2 The Project site is over 9 km from the nearest Natura 2000 site. Therefore, no part of such sites would be visible from within the Project site such that there could be an increase in overshadowing of habitats within the Natura 2000 sites or that support interest features for such sites. There is no potential for the Project to overshadow any of the habitats for which the Natura 2000 sites considered here have been designated.

4.5 Air Quality

4.5.1 The two air quality issues that could arise during construction are dust and increased traffic emissions, while those that could arise during operation are increased traffic and emissions from the airport operations.

4.5.2 Levels of understanding of air quality effects on semi-natural habitats and qualifying interest species of Natura 2000 sites are relatively in their infancy. The Air Pollution Information System (APIS) is a publicly available support tool for UK conservation and regulatory agencies, industry and local authorities to help assess the potential effects of air pollutants on habitats and species. It aims to enable a consistent approach to air pollution assessment across the UK. This specifically includes informing assessments required under the Habitats Regulations. Consequently, reference has been made to the information contained within the APIS website where relevant.

Construction Dust

4.5.3 The potential for dust release exists during the construction phase, with potential sources including site clearance, earthworks and vehicle movements.

4.5.4 For sensitive ecological receptors, the Institute of Air Quality Management (IAQM) guidance on the assessment of dust from demolition and construction sets out 50 metres as the distance

from the site boundary and from the site traffic route(s) within which there could potentially be nuisance dust and PM₁₀ effects.

4.5.5 The boundary of the closest Natura 2000 site is over 9 km away from the Project site; therefore, there is no pathway for construction dust to reach any of the designated sites.

4.5.6 As such, the impact of construction dust on the designated sites can be screened out, as no likely significant effects are anticipated.

Traffic - Operational and Construction

4.5.7 The major impacts of air pollutants on habitats in the UK as a result of traffic are increases in nitrogen deposition and acidification. According to the Highways Agency's Design Manual for Roads and Bridges (DMRB), the contribution of vehicle emissions from the roadside to local pollution levels is not significant beyond 200 metres from a road (Highways England *et al*, 2019). This is therefore the distance that has been used to determine whether Natura 2000 sites are likely to be significantly affected by traffic emissions associated with the Project.

4.5.8 As set out in Chapter 12 Traffic and Transport, no quantifiable traffic increases on roads within 200 metres of the sites are anticipated during construction. Therefore, the effect from traffic-related pollution during construction is screened out from further assessment as it can be concluded that it would not have a likely significant effect on any of the designated sites.

4.5.9 Similarly, both The Mens and Ebernoe Common SACs are located more than 20 km from the Project site with no major road that may be used to travel to Gatwick nearby. As such, there is no potential for changes to vehicle emissions resulting from the operation of the Project due to increases in traffic within 200 metres of these sites.

4.5.10 Modelling of emissions to air from changes in traffic flows associated with the Project have been completed and are reported in Chapter 13: Air Quality of the PEIR. These have considered changes to both the aerial concentration of nitrous oxide NO_x and the rate of deposition of nutrient nitrogen. Two scenarios have then been considered:

- the Project only, ie only those changes in Annual Average Daily Traffic (AADT) associated with the Project (a 'do something' scenario), when compared to a future baseline in the absence of the Project ('do nothing' scenario); and
- a cumulative scenario that compares a future baseline 'do nothing' scenario in the absence of anticipated growth due to

major infrastructure and local plans (see Chapter 19 for full details of the plans/projects considered) and a 'do something' scenario that includes these plans and projects alongside the contribution from the Project.

4.5.11 The cumulative scenario is considered in Section 5 below.

4.5.12 The modelling assumes a reduction in background nitrogen deposition due to the effect of general improvements to air quality of 1.12% per annum (derived from JNCC, 2020). Such a reduction was included in the modelling with respect to the Teesmouth Combined Cycle Power Plant DCO. In granting development consent for that project, the Secretary of State concluded that there would be no in-combination effect on the SPA/Ramsar site due to air quality (BEIS, 2019), despite that project predicting a small increase in nutrient nitrogen deposition on the site. In reaching this conclusion, on the advice of Natural England, the Secretary of State cited evidence provided by the applicant of the continued improvement to air quality both nationally (as a result of the implementation of various policy measures) and locally (due to the expected continued decline in background levels from pollution sources no longer in operation).

4.5.13 Similar reductions have been used in several similar assessments with respect to local plan Habitats Regulations Assessments, eg Bracknell Forest Council (WSP, 2021) and Guildford Borough Council (AECOM, 2019). The latter included an assessment of the modelled fall in oxidised nitrogen deposition (ie that derived from NO_x) presented on APIS over time. This showed a circa 3% per annum improvement between 2005 and 2014 (the years for which data were available at the time of the report). Current data on APIS (APIS 2021) show that whilst the rate of background improvement has slowed since 2016, the overall trend is still towards improvement. Therefore, for the purposes of this assessment, a lower rate of reduction (1.12%) has been assumed. Further work will ascertain the potential for a higher reduction to be applied, if appropriate.

4.5.14 The threshold for the consideration of a potential effect on a designated site is two-fold (adapted from Natural England's guidance (Natural England, 2018f)):

- a threshold of a change in AADT of >1,000; and
- where that occurs, a change between the 'do nothing' and 'do something' scenarios of >1% of the relevant critical level/load.

4.5.15 The 1% of the critical level/load threshold is the point at which a more detailed assessment of the potential for effects should be

- undertaken; it does not automatically imply that an adverse effect will occur. That judgement requires more detailed assessment based on available scientific research and consideration of the conservation objectives of the site. The relevant lower critical load for the habitats within the SPA is 10 kgN.ha⁻¹.yr⁻¹ (APIS, 2021).
- 4.5.16 Although the potential effects of NO_x-derived nitrogen deposition are an established basis for assessment, there is no current guidance on how to include nitrogen deposition derived from ammonia (NH₃). Discussions are ongoing with Natural England and other stakeholders, such as Highways England, on this issue and (if necessary) the approach to any appropriate modelling of potential effects and any relevant input assumptions to include. The assessment below shows the potential effects of NO_x derived nitrogen deposition only; however, following these further discussions with key stakeholders, the assessment may be refined and updated where required to consider ammonia as part of the shadow HRA submitted as part of the ES in support of the application for development consent.
- 4.5.17 Traffic modelling shows that at all locations within Ashdown Forest SAC/SPA and TAPC SAC/Chobham Common SSSI component of the Thames Basin Heaths SPA, there are no changes in AADT levels that are greater than 1,000 (Figure 4.5.1 and 4.5.2, respectively). As such, effects from emissions to air from changes in traffic flow arising from the Project by itself at these sites can be screened out as not having a significant effect.
- 4.5.18 With respect to the MGRE SAC (Figure 4.5.3), traffic modelling shows a single location where the change in AADT due to the Project is predicted to exceed 1,000, on the M25 between Junctions 8 and 9. The modelling of aerial emissions shows that the changes in air quality between the future baseline scenario and the with Project scenario (the 'do nothing' and the 'do something' scenarios) in this location is <1% of the relevant critical level for NO_x (Figure 4.5.5) and of the critical load for nutrient nitrogen deposition (15 kgN.ha⁻¹.yr⁻¹) (Figure 4.5.7).
- 4.5.19 On this basis, therefore, effects on the MGRE SAC due to changes in emissions from traffic arising from the Project by itself can be screened out as not having a significant effect.
- 4.5.20 Similarly, the change in AADT at Junction 10 along the M25 adjacent to the Ockham and Wisley Commons SSSI component of the Thames Basin Heaths SPA is greater than 1,000 (Figure 4.5.4). Further modelling of the changes in air quality show that the change in NO_x concentration between the 'do nothing' and 'do something' scenario is 0.3 µg.m⁻³ (i.e. <1% of the critical level of 30 µg.m⁻³) (Figure 4.5.6), the maximum nitrogen deposition rate is also <1% of the relevant critical load (10 kgN.ha⁻¹.yr⁻¹) (Figure 4.5.8).
- 4.5.21 On this basis, therefore, effects on the Thames Basin Heaths SPA due to changes in emissions from traffic arising from the Project by itself can be screened out as not having a significant effect.
- 4.6 Water Quality/Hydrological Changes**
- 4.6.1 The quality of the water entering Natura 2000 and Ramsar sites is an important determinant of habitat condition and hence the species they support. Poor water quality can have a range of ecological impacts.
- 4.6.2 There are no hydrological links between the Natura 2000 sites considered here and the Project site, with the exception of the MGRE SAC.
- 4.6.3 A section of the River Mole runs through GAL land and is to be diverted in order to facilitate the proposed works. The River Mole then runs north west, where it eventually reaches the MGRE SAC. A 140 metre section runs through the SAC, before continuing to run adjacent to (but outwith) the MGRE SAC.
- 4.6.4 The MGRE SAC in this location is designated for its chalk grassland escarpment habitats, specifically, the *Semi-natural dry grasslands and scrubland facies: on calcareous substrates (Festuco-Brometalia) (*important orchid sites)*. As the River Mole sits at the bottom of the escarpment, there is no ecological pathway for the water to influence the chalk habitats on site.
- 4.6.5 As such, there is no potential for likely significant effects due to changes to the water environment from the Project on any SAC and this issue can therefore be screened out on this basis.
- 4.7 Disturbance**
- 4.7.1 Disturbance can be caused by activity, recreation, noise and lighting. The Project site is more than 9 km from the nearest Natura 2000 site. As such, there is no potential for any direct disturbance on such sites and all such effects can be screened out as not significant.
- 4.7.2 With respect to indirect effects on bats using the site that might be associated with the surrounding SACs, data collected in 2019, 2020 and 2021 suggest that bats of all species are using the wider airport site, despite the degree of existing lighting/disturbance; Bechstein's bat, for example, have been radio-tracked moving over the airfield.
- 4.7.3 As described above, the population of Bechstein's present is considered highly unlikely to be linked to the SACs, given the distance from the Project site. As such, any minor effects on the Bechstein's as a result of the Project are addressed within the PEIR and will be subject to appropriate avoidance measures. However, for the purposes of this Habitats Regulations Assessment, no likely significant effects on the bats associated with the SACs are considered likely and so the potential for indirect disturbance on such sites and all such effects can be screened out on that basis.
- 4.8 Introduction or Spread of Non-native Invasive Species**
- 4.8.1 The movement of people and traffic, as well as importation of material and plants to a site, can result in the introduction of non-native species to a site. While several non-native species are currently known to be present on site, given the distance to the nearest Natura 2000 site, there is no pathway by which such species could be spread into such sites.
- 4.8.2 Given this, the issue of introduction and spread of non-native species is therefore screened out from further consideration in this assessment on the grounds of not likely to have a significant effect on any of the designated sites.
- 4.9 Conclusion**
- 4.9.1 At this stage, following the screening, no likely significant effects have been identified for any sites or interest features with respect to the issues direct killing/injury, loss of/damage to habitat, of change in habitat management, changes in air quality during construction (from both vehicle movement and dust generation) and operation, water quality/hydrology, disturbance and introduction or spread of non-native invasive species.
- 4.9.2 These conclusions will be refined as the Project evolves with a final updated conclusion to be submitted with the ES.
- 5 Stage 4 - In-combination Assessment**
- 5.1 Introduction**
- 5.1.1 Regulation 63 of the Habitats Regulations requires that, prior to granting consent, a competent authority has to be satisfied that a plan or project will not have an adverse effect on the integrity of

- Natura 2000 sites either alone or in combination with other plans or projects. Therefore, this section of the HRA considers the potential for such in combination effects with other plans or projects in the area.
- 5.1.2 This section assesses the cumulative effects of the Project, with other proposed developments near the Project site that are currently in the planning process or have been approved but are not yet constructed. These have been reviewed for relevance with respect to European designated sites with the following considered further.
- 5.1.3 The process of identifying other consented or proposed developments and screening to create a shortlist of those having potential for cumulative effects with the Project is described in Chapter 19 of the PEIR. Appendix 19.4.1 lists the shortlisted cumulative developments and the tier they have been assigned (reflecting the level of certainty regarding each development's likelihood of being realised) in accordance with Planning Inspectorate Advice Note 17 (Planning Inspectorate, 2019).
- 5.2 Cumulative Screening of Likely Significant Effects**
- 5.2.1 An assessment of the ecological impacts of the Project is set out in Chapter 9: Ecology and Nature Conservation of the PEIR. The list of other projects and plans (with planning application reference) is provided within the cumulative effects assessment (CEA) section of that chapter. However, most of these developments do not have potential direct or indirect effects on the Natura 2000 designated sites, given the distance to such sites from the Project site.
- 5.2.2 Bechstein's bat was not confirmed to be present on any Tier 1 or 3 site. However, bats from the *Myotis* family were recorded and there is potential for some of those to be Bechstein's bat.
- 5.2.3 The majority of the Tier 1 and 3 developments are associated with existing built up areas within Gatwick, Horley and Crawley which comprise urban habitats unlikely to be of value to Bechstein's bats. Based on the landscape scale study completed in 2020/21, the Bechstein's bats recorded on the Project site are considered to be part of a population centred around higher value habitat to the west of Gatwick. There are few developments proposed in the area between and those that are proposed are small and unlikely to significantly affect Bechstein's bat habitat. As such, cumulative effects on the wider population of this species from the Project and other proposed developments are considered unlikely.
- 5.2.4 Barbastelle bats were recorded at one development, Forge Wood, a large residential lead development approximately 1.6 km south of the Project site boundary. The low detection rate of barbastelle both within the Project site and the Tier 1 and 3 developments suggests they do not frequently utilise habitats in close proximity to urban areas, or that the population in the area is very small. Larger areas of woodland within the surrounding landscape are predominantly not affected by proposed developments. As such, cumulative effects on barbastelle are also considered unlikely.
- 5.2.5 Potential effects on Natura 2000 sites could also occur through cumulative changes in operational traffic flows. Therefore, as described in paragraph 4.5.10 above, a detailed strategic traffic model has been created that includes the change in traffic flows due to local plans within 10 km of the designated sites and passive growth beyond this. This allows for a comparison between a 'do nothing' scenario without this growth and a 'do something' with the growth included, as required by Natural England's guidelines with respect to the assessment of air quality impacts arising from cumulative traffic growth (Natural England 2018e).
- 5.2.6 Cumulative traffic data are presented in Chapter 12 Traffic.
- 5.2.7 Data show that there are no cumulative increases in AADT levels greater than 1,000 on any road link through the Ashdown Forest SAC/SPA (Figure 4.5.1). As such, no cumulative effects from changes in traffic emissions are predicted.
- 5.2.8 With respect to the MGRE SAC, cumulative traffic flow increases are predicted to exceed 1,000 AADT in several locations (Figure 4.5.3). Therefore, further modelling of changes in air quality has been completed. The results predict no exceedance of the critical level for NO_x at any location (Figure 5.2.1). As such, no cumulative effects from NO_x emissions are predicted.
- 5.2.9 With respect to the corresponding nitrogen deposition, this is also predicted to be <1% of the critical load at all locations (Figure 5.2.4). As such, no cumulative effects from nitrogen deposition are predicted.
- 5.2.10 For the TAPC SAC/Chobham Common SSSI component of the Thames Basin Heaths SPA, the only location where the change in cumulative AADT is predicted to exceed 1,000 is along the M3 (Figure 4.5.2); the resulting cumulative NO_x concentration (Figure 5.2.2) is >1% of the relevant critical level. This issue is therefore taken through for appropriate assessment below. The resulting cumulative nitrogen deposition is <1% of the relevant critical load (Figure 5.2.5) and, as such, no cumulative effects are predicted.
- 5.2.11 Data for the Ockham and Wisley Commons SSSI component of the Thames Basin Heaths SPA at Junction 10 of the M25 show cumulative increases in AADT of up to 16,747 on the M25 and 14,455 on the A3 at the Wisley Interchange (Figure 4.5.4). Consequent air quality modelling shows the predicted change in NO_x concentration (Figure 5.2.3) and nitrogen deposition (Figure 5.2.6) are both >1% of the relevant critical load/level up to circa 100 metres from the roads. Therefore, this issue is taken through for appropriate assessment.
- 5.2.12 To note, the assessment does not include NH₃-derived nitrogen deposition at this stage. As set out above, the assessment may be refined and updated to consider ammonia (where necessary) as part of the shadow HRA submitted as part of the ES in support of the application for development consent.
- 5.2.13 No other pathways for cumulative impacts exist and, as such, no other cumulative effects are considered likely.
- 5.3 Cumulative Appropriate Assessment**
- 5.3.1 The Habitats Regulations set out that where a significant effect cannot be ruled out, the Competent Authority should make an appropriate assessment of the implications of the plan or project in view of the conservation objectives of the designated site.
- 5.3.2 The following analysis therefore makes reference to the conservation objectives of the sites, as necessary, and considers whether an adverse effect on integrity is possible.
- Air Quality and Thursley, Ash, Pirbright and Chobham SAC**
- 5.3.3 Data from air quality modelling with respect to the cumulative scenario for the TABC SAC shows that the NO_x concentration is predicted to exceed 1% of the relevant critical level at five locations directly adjacent to the M3. In this location, the site comprises a mown grass embankment, probably created when the M3 was built. On this basis, therefore, the habitats for which the SAC is designated will not occur in this location and as such, no adverse effect on integrity is likely.

Air Quality and Chobham Common SSSI Component of the Thames Basin Heaths SPA

5.3.4 As set out previously, the Thames Basin Heaths SPA was designated for supporting populations of European importance of the following species:

- Dartford warbler;
- Nightjar; and
- Woodlark.

5.3.5 Dartford warbler are small, insectivorous birds, resident in Britain and associated exclusively with heathland, favouring gorse with heather understorey for nesting (Bibby & Tubbs, 1975). Being dependant on invertebrates as prey, they are strongly associated with heathland areas that provide year-round sources of such food, ie where there is sufficient habitat variation to do so. Dartford warbler have therefore been shown to have a strong affinity for heathland (Bibby, 1979) and a negative association with woodland (van der Berg *et al.*, 2001).

5.3.6 Nightjar are summer visitors to the UK, arriving to breed around May and typically departing around August. They are also insectivorous, feeding on flying insects such as moths. They breed in open heathland and typically forage across heathland and early stage plantation but require such foraging to be close to their nesting territories and will actively avoid foraging in established woodland (Sharps *et al.*, 2015).

5.3.7 Woodlark are associated with short vegetation for foraging (feeding mainly on spiders and beetles), interspersed with taller, dense vegetation for nesting, frequently tall heather or grass (Mallord *et al.*, 2007).

5.3.8 Breeding bird surveys undertaken in 2016, 2017 and 2018 to inform the M25 J10/A3 Wisley Interchange Development Consent Order (DCO) (HE, 2019) did not record any of the interest feature species within the woodland that borders the A3/M25, only within the heathland. This is consistent with previous survey work undertaken both on the Ockham and Wisley Commons SSSI and elsewhere across the wider SPA. For example, a review of bird survey data for the Ockham and Wisley Commons SSSI to inform nearby development (EPR, 2015) found that the nearest SPA bird territories to either the A3 or M25 were approximately 300 metres from the roadside. Similar patterns in bird distribution data have been observed at Chobham Common SSSI along the M3 corridor (2Js Ecology monitoring data, as reported in Jacobs 2019).

5.3.9 As such, the habitats present in the area directly adjacent to the M3 where the exceedance occurs are not considered to support the interest feature birds either breeding or foraging and therefore, no adverse effect on the integrity of the SPA is considered likely.

Air Quality and Ockham and Wisley Common SSSI Component of the Thames Basin Heaths SPA

5.3.10 Given the exceedance of the 1% threshold, in particular for nitrogen deposition, at the Ockham and Wisley SSSI component of the Thames Basin Heaths SPA, a detailed assessment of effects is necessary before any conclusion with respect to whether such effects may be adverse to integrity is required.

5.3.11 The Ockham and Wisley Commons SSSI component of the Thames Basin Heaths comprises areas of open heathland (circa 78 hectares) and Scots pine-dominated mixed woodland/plantation woodland (around 143 hectares). The woodland occurs in linear strips alongside both the A3 and M25. All three interest feature species have historically been recorded within the SSSI.

5.3.12 In the cumulative 'do something' scenario, nitrogen deposition derived only from NO_x would exceed 1% of the relevant lower critical load for the habitats within the SPA (10 kgN.ha⁻¹.yr⁻¹ – taken from APIS) across an area of circa 100 metres to the west of the A3 and slightly less elsewhere (Figure 5.2.6).

5.3.13 The Conservation Objectives for the SPA are detailed in Section 3.6.3 above.

5.3.14 Figure 5.2.6 shows that the increases in NO_x-derived nitrogen deposition associated with the cumulative 'do something' scenario only exceeds 1% of the minimum critical load within areas of woodland (within 100 metres of the edge of the carriageways).

5.3.15 It is understood that the role of the woodland surrounding the SSSI in supporting the function of the SPA was discussed at the Examination of the M25 J10/A3 Wisley Interchange DCO. Natural England's response to Second Written questions from the Examining Authority (ExA) (Natural England, 2020) set out that the achievement of favourable condition for the Ockham and Wisley Commons component of the Thames Basin Heaths is dependent on the improvement of the conditions of the existing heathland and not the expansion of heathland through large-scale felling of woodland. Further, Natural England provided advice to retain the woodland buffers as evidence existed that the

presence of the trees dispersed vehicle emissions away from sensitive habitats.

5.3.16 In addition, the Statement of Common Ground with Natural England for this DCO (Highways England, 2020) recognises that whilst the woodland buffer may contribute to the invertebrate resource within the SPA, it does not support the qualifying bird species.

5.3.17 Therefore, on the basis that the role of the woodland is as a buffer between the heathland and the M25/A3, rather than as a supporting habitat of interest feature birds within the SPA, adverse effects on the integrity of the SPA from additional NO_x-derived nutrient nitrogen deposition within the woodland would not occur.

6 References

Legislation

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Term	Description
SSSI	Site of Special Scientific Interest

7 Glossary

7.1 Glossary of terms

Table 7.1.1: Glossary of Terms

Term	Description
APIS	Air Pollution Information System
AADT	Average Annual Daily Traffic
CEA	Cumulative Effects Assessment
CJEU	Court of Justice of the European Union
DCLG	Department for Communities and Local Government
DMRB	Design Manual for Roads and Bridges
EIA	Environmental Impact Assessment
ES	Environmental Statement
GAL	Gatwick Airport Limited
HRA	Habitats Regulations Assessment
IAQM	Institute of Air Quality Management
JNCC	Joint Nature Conservation Committee
LSE	Likely Significant Effect
MGRE	Mole Gap to Reigate Escarpment
PEIR	Preliminary Environmental Information Report
pSAC	Proposed Special Area of Conservation
pSPA	Proposed Special Protection Area
SAC	Special Area of Conservation
SIP	Site Improvement Plan
SPA	Special Protection Areas

Annex 1
Screening Matrices

Evidence for likely significant effects on their qualifying features is detailed within the footnotes to the screening matrices below.

Matrix Key:

✓ = Likely significant effect cannot be excluded until further studies carried out

✗ = Likely significant effect can be excluded

C = construction

O = operation

Ebernoe Common SAC (29.00 km south west).

Where effects are not applicable to a particular feature they are greyed out.

Stage 1 Matrix A: Mole Gap to Reigate Escarpment SAC

Name of European Site	Mole Gap to Reigate Escarpment SAC													
Distance to Project site boundary	9 km													
European site features	Land Take		Habitat Fragmentation		Aerial Emissions – Surface Access		Aerial Emissions – Airport Operations		Aqueous Emissions/Discharges		Noise and Vibration		Lighting	
	C	O	C	O	C	O	C	O	C	O	C	O	C	O
Stable xerothermophilous formations with <i>Buxus sempervirens</i> on rock slopes (Berberidion p.p.)	✗a	✗a	✗b	✗b	✗e	✗f	✗	✗g	✗h	✗h	✗i	✗i	✗j	✗j
Semi-natural dry grasslands and scrubland facies on calcareous substrates (<i>Festuco-Brometalia</i>)	✗a	✗a	✗b	✗b	✗e	✗f	✗	✗g	✗h	✗h	✗i	✗i	✗j	✗j

Name of European Site	Mole Gap to Reigate Escarpment SAC													
*important orchid sites														
<i>Taxus baccata</i> woods of the British Isles *priority feature	x a	x a	x b	x b	x e	x f	x	x g	x h	x h	x i	x i	x j	x j
European dry heaths	x a	x a	x b	x b	x e	x f	x	x g	x h	x h	x i	x i	x j	x j
Asperulo-fagetum beech forests	x a	x a	x b	x b	x e	x f	x	x g	x h	x h	x i	x i	x j	x j
Great crested newt	x a	x a	x c	x c	x e	x f	x	x g	x h	x h	x i	x i	x j	x j
Bechstein's bat	x a	x a	x d	x d	x e	x f	x	x g	x h	x h	x i	x i	x j	x j

Evidence Supporting Conclusions

a.	Nearest element of the Project is >9 km from site; unlike some other bat species, Bechstein's bat have been recorded foraging relatively close to roosts (usually between 1 and 3 km) (Schofield & Morris, 2000; Fitzsimons et.al., 2002; Dietz, 2009).; recent work on the HS2 development radio tracking this species found the majority of foraging activity within 3 km of a roost with a single male recorded foraging at 5 km (HS2, 2013). On this basis, there is no evidence to suggest that Bechstein's bats from the SAC would be foraging in any habitat to be lost and therefore no potential for effects of habitat fragmentation on this species.
b.	Nearest element of the Project is >9 km from site; no potential for fragmentation to affect habitats.
c.	Nearest element of the Project is >9 km from site; no potential for effects on species populations within the SAC.
d.	Nearest element of the Project is >9 km from site; unlike some other bat species, Bechstein's bat have been recorded foraging relatively close to roosts (usually between 1 and 3 km) (Schofield & Morris, 2000; Fitzsimons et.al., 2002; Dietz, 2009).; recent work on the HS2 development radio tracking this species found the majority of foraging activity within 3 km of a roost with a single male recorded foraging at 5 km (HS2, 2013). On this basis, there is no evidence to suggest that Bechstein's bats from the SAC would be foraging in any habitat to be lost and therefore no potential for effects of habitat fragmentation on this species.
e.	Site >9 km from Project; no potential for aerial emissions during construction work on site to affect habitats within SAC. Any generators etc. would be small scale and therefore, the potential zone of influence would be considerably smaller than this.
f.	Potential effects on habitats screened out as unlikely on the basis that no change in any pollutant predicted to be >1% of relevant critical load/level.
g.	Nearest element of the Project is >9 km from site; no changes in air quality associated with airport operations.
h.	Nearest element of the Project is >9 km from site; no potential for effects from aqueous emissions/discharges.
i.	Nearest element of the Project is >9 km from site; no potential for noise / vibration effects on species populations within SAC (including on flight lines to/from SAC as Bechstein's not known to travel such distances from roosts).
j.	Nearest element of the Project is >9 km from site; therefore, no potential for lighting effects on species/habitats within SAC.

Stage 1 Matrix B: Ashdown Forest SAC

Name of European Site	Ashdown Forest SAC													
Distance to Project site boundary	12 km													
European site features	Land take		Habitat fragmentation		Aerial emissions – Surface access		Aerial emissions – Airport operations		Aqueous emissions		Noise & Vibration		Lighting	
	C	O	C	O	C	O	C	O	C	O	C	O	C	O
Northern Atlantic wet heaths with <i>Erica tetralix</i>	x a	x a	x b	x b	x d	x e	x c	x f	x g	x g	x h	x h	x h	x h
European dry heaths	x a	x a	x b	x b	x d	x e	x c	x f	x g	x g	x h	x h	x h	x h
Great crested newt	x a	x a	x c	x c	x d	x e	x c	x c	x c	x c	x c	x c	x c	x c

Evidence Supporting Conclusions

a.	Site 12 km from Project; no potential for direct habitat loss.
b.	Site 12 km from Project; no potential for fragmentation to affect habitats.
c.	Site 12 km from Project in direct line; no potential for effects on species populations within SAC.
d.	Nearest element of the Project is 12 km from site; no potential for effects from aerial emissions during construction work on site to affect habitats within SAC.
e.	Potential effects on habitats screened out as unlikely on the basis that no change in any pollutant predicted to be >1% of relevant critical load/level.
f.	Site 12 km from Project; no changes in air quality associated with airport operations.
g.	Site 12 km from Project; no potential for aqueous discharges to affect habitats within SAC.
h.	Site is 12 km from Project; no potential for noise / vibration / lighting effects on species populations or habitats within SAC.

Stage 1 Matrix C: Ashdown Forest SPA

Name of European Site	Ashdown Forest SPA													
Distance to Project site boundary	12 km													
European site features	Land take		Habitat fragmentation		Aerial emissions – Surface access		Aerial emissions – Airport operations		Aqueous emissions		Noise & Vibration		Lighting	
	C	O	C	O	C	O	C	O	C	O	C	O	C	O
Dartford Warbler	x _a	x _a	x _b	x _b	x _c	x _d	x	x _e	x _f	x _f	x _g	x _g	x _g	x _g
Nightjar	x _a	x _a	x _b	x _b	x _c	x _d	x	x _e	x _f	x _f	x _g	x _g	x _g	x _g

Evidence Supporting Conclusions

a.	Site 12 km from Project; no potential for direct species habitat loss.
b.	Site 12 km from Project; no potential for fragmentation to affect habitat.
c.	Nearest element of the Project is 12 km from site; no potential for effects from aerial emissions during construction work on site to affect habitats within SPA.
d.	Potential effects on habitats screened out as unlikely on the basis that no change in any pollutant predicted to be >1% of relevant critical load/level.
e.	Site 12 km from Project; no changes in air quality associated with airport operations.
f.	Site 12 km from Project; no potential for aqueous discharges to affect species or habitats within SPA.
g.	Site is 12 km from Project; no potential for noise / vibration / lighting effects on species populations within SPA.

Stage 1 Matrix D: The Mens SAC

Name of European Site	The Mens SAC													
Distance to Project site boundary	25 km													
European site features	Land take		Habitat fragmentation		Aerial emissions – Surface access		Aerial emissions – Airport operations		Aqueous emissions		Noise & Vibration		Lighting	
	C	O	C	O	C	O	C	O	C	O	C	O	C	O
Atlantic acidophilous beech forests with <i>Ilex</i> and sometimes also <i>Taxus</i> in the shrub layer (or <i>Ilici-Fagenion</i>)	x _a	x _a	x _b	x _b	x _c	x _d	x	x _e	x _f	x _f	x _g	x _g	x _g	x _g
Barbastelle <i>Barbastella barbastellus</i>	x _a	x _a	x _b	x _b	x _c	x _d	x	x _e	x _f	x _f	x _g	x _g	x _g	x _g

Evidence Supporting Conclusions

a.	Site 25 km from Project; no potential for direct species habitat loss. No evidence of Barbastelle present on site.
b.	Site 25 km from Project; no potential for fragmentation to affect habitat. No evidence of Barbastelle present on site.
c.	Nearest element of the Project is 25 km from site; no potential for effects from aerial emissions during construction work on site to affect habitats within SAC.
d.	Nearest element of the Project is 25 km from site; no potential for effects from surface access emissions to affect habitats within SAC.
e.	Site 25 km from Project; no changes in air quality associated with airport operations.
f.	Site 25 km from Project; no potential for aqueous discharges to affect species or habitats within SAC.
g.	Site is 25 km from Project; no potential for noise / vibration / lighting effects on species or habitats within SAC.

Stage 1 Matrix E: Ebernoe Common SAC

Name of European Site	Ebernoe Common SAC													
Distance to Project site boundary	29 km													
European site features	Land take		Habitat fragmentation		Aerial emissions – Surface access		Aerial emissions – Airport operations		Aqueous emissions		Noise & Vibration		Lighting	
	C	O	C	O	C	O	C	O	C	O	C	O	C	O
Atlantic acidophilous beech forests with <i>Ilex</i> and sometimes also <i>Taxus</i> in the shrub layer (or <i>Ilici-Fagenion</i>)	x a	x a	x b	x b	x c	x d	x	x e	x f	x f	x g	x g	x g	x g
Barbastelle Barbastella barbastellus	x a	x a	x b	x b	x c	x d	x	x e	x f	x f	x g	x g	x g	x g
Bechstein's Myotis bechsteinii	x a	x a	x b	x b	x c	x d	x	x e	x f	x f	x g	x g	x g	x g

Evidence Supporting Conclusions

a.	Site 29 km from Project; no potential for direct species habitat loss. No evidence of Barbastelle present on site. Nearest element of the Project is >9 km from site; unlike some other bat species, Bechstein's bat have been recorded foraging relatively close to roosts (usually between 1 and 3 km) (Schofield & Morris, 2000; Fitzsimons et.al., 2002; Dietz, 2009).; recent work on the HS2 development radio tracking this species found the majority of foraging activity within 3 km of a roost with a single male recorded foraging at 5 km (HS2, 2013). On this basis, there is no evidence to suggest that Bechstein's bats from the SAC would be foraging in any habitat to be lost and therefore no potential for effects of habitat fragmentation on this species.
b.	Site 29 km from Project; no potential for fragmentation to affect habitat. No evidence of Barbastelle present on site. Nearest element of the Project is >9 km from site; unlike some other bat species, Bechstein's bat have been recorded foraging relatively close to roosts (usually between 1 and 3 km) (Schofield & Morris, 2000; Fitzsimons et.al., 2002; Dietz, 2009).; recent work on the HS2 development radio tracking this species found the majority of foraging activity within 3 km of a roost with a single male recorded foraging at 5 km (HS2, 2013). On this basis, there is no evidence to suggest that Bechstein's bats from the SAC would be foraging in any habitat to be lost and therefore no potential for effects of habitat fragmentation on this species.

c.	Nearest element of the Project is 29 km from site; no potential for effects from aerial emissions during construction work on site to affect habitats within SAC.
d.	Nearest element of the Project is 29 km from site; no potential for effects from surface access emissions to affect habitats within SAC.
e.	Site 29 km from Project; no changes in air quality associated with airport operations.
f.	Site 29 km from Project; no potential for aqueous discharges to affect species or habitats within SAC.
g.	Site is 29 km from Project; no potential for noise / vibration / lighting effects on species or habitats within SAC.

Stage 1 Matrix F: Thames Basin Heaths SPA

Name of European Site	Thames Basin Heaths SPA													
Distance to Project site boundary	23.6 km													
European site features	Land take		Habitat fragmentation		Aerial emissions – Surface access		Aerial emissions – Airport operations		Aqueous emissions		Noise & Vibration		Lighting	
	C	O	C	O	C	O	C	O	C	O	C	O	C	O
Dartford Warbler	x a	x a	x b	x b	x c	x d	x	x e	x f	x f	x g	x g	x g	x g
Nightjar	x a	x a	x b	x b	x c	x d	x	x e	x f	x f	x g	x g	x g	x g
Woodlark	x a	x a	x b	x b	x c	x d	x	x e	x f	x f	x g	x g	x g	x g

Evidence Supporting Conclusions

a.	Site 23.6 km from Project; no potential for direct species habitat loss.
b.	Site 23.6 km from Project; no potential for fragmentation to affect habitat.
c.	Nearest element of the Project is 30.6 km from site; no potential for effects from aerial emissions during construction work on site to affect habitats within SPA.
d.	Potential effects on habitats screened out as unlikely on the basis that no change in any pollutant predicted to be >1% of relevant critical load/level.
e.	Site 23.6 km from Project; no changes in air quality associated with airport operations
f.	Site 23.6 km from Project; no potential for aqueous discharges to affect species or habitats within SPA.
g.	Site is 23.6 km from Project; no potential for noise / vibration / lighting effects on species populations within SPA.

Stage 1 Matrix G: Thursley, Ash Pirbright and Chobham SAC

Name of European Site	Thursley, Ash Pirbright and Chobham SAC													
Distance to Project site boundary	33.8 km													
European site features	Land take		Habitat fragmentation		Aerial emissions – Surface access		Aerial emissions – Airport operations		Aqueous emissions		Noise & Vibration		Lighting	
	C	O	C	O	C	O	C	O	C	O	C	O	C	O

Name of European Site	Thursley, Ash Pirbright and Chobham SAC													
Depressions on peat substrates of the <i>Rhynchosporion</i> ;	x a	x a	x b	x b	x c	x d	x	x e	x f	x f	x g	x g	x g	x g
Northern Atlantic wet heaths with <i>Erica tetralix</i> ;	x a	x a	x b	x b	x c	x d	x	x e	x f	x f	x g	x g	x g	x g
European dry heaths	x a	x a	x b	x b	x c	x d	x	x e	x f	x f	x g	x g	x g	x g

Evidence Supporting Conclusions

a.	Site 33.8 km from Project; no potential for direct species habitat loss.
b.	Site 33.8 km from Project; no potential for fragmentation to affect habitat.
c.	Nearest element of the Project is 33.8 km from site; no potential for effects from aerial emissions during construction work on site to affect habitats within SPA.
d.	Potential effects on habitats screened out as unlikely on the basis that no change in any pollutant predicted to be >1% of relevant critical load/level.
e.	Site 33.8 km from Project; no changes in air quality associated with airport operations
f.	Site 33.8 km from Project; no potential for aqueous discharges to affect species or habitats within SPA.
g.	Site is 33.8 km from Project; no potential for noise / vibration / lighting effects on species populations within SPA.