

10. BIODIVERSITY

Introduction

- 10.1 This Chapter of the ES assesses the likely significant effects of the Proposed Development with respect to biodiversity, particularly the effects on notable or protected species/habitats and the Thames Basin Heaths Special Protection Area (SPA). This Chapter also describes the legislative and policy framework; the methods used to assess the effects; the baseline conditions currently existing at the Application Site; the mitigation measures required to prevent, reduce or offset any significant negative effects; and the likely residual effects after these measures have been adopted.
- 10.2 The biodiversity assessment is based on a range of ecological surveys which were undertaken. The Technical Reports relating to the Lightwood Strategic application, Nicholas King Homes application and joint Nicholas King Homes and Lightwood Planning applications are provided in **Appendices 10.1 – 10.3**. The full results of the surveys which are summarised within this Chapter to inform the discussion are provided in **Appendices 10.4 – 10.8**.
- 10.3 This Chapter has been prepared by Katie Munday MSc BSc (Hons), Ecologist at Ethos Environmental Planning and Qualifying Member of CIEEM. The Chapter has been reviewed and approved by Jim Phillips MSc BSc (Hons) MCIEEM, Managing Director of Ethos Environmental Planning.

Legislation, Planning Policy and Guidance

Legislation

Conservation of Species and Habitat Regulations 2017

- 10.4 The Habitats Directive (together with the Birds Directive) forms the cornerstone of Europe's nature conservation policy. It is built around two pillars: the Natura 2000 network of protected sites and the strict system of species protection. All in all, the Directive protects over 1,000 animals and plant species and over 200 "habitat types" (e.g. special types of forests, meadows, wetlands, etc.), which are of European importance. The Habitats Directive and parts of the Birds Directive are transposed into legislation by the Conservation of Species and Habitat Regulations 2017 (as amended).

Wildlife and Countryside Act 1981

- 10.5 The Wildlife and Countryside Act 1981 (as amended, including the Countryside and Rights of Way Act 2000) provides legislative protection for certain species. The Act also prohibits the spread of invasive plant species, as well as providing the mechanism for the designation and protection of Sites of Special Scientific Interest (SSSI).

Protection of Badgers Act 1992

- 10.6 Badgers and their setts are protected under the Protection of Badgers Act 1992 as amended by the Hunting Act 2004.

Natural Environment and Rural Communities Act 2006

- 10.7 The NERC act places a duty on all public authorities, including local planning authorities, to consider biodiversity in their work. Local planning authorities are to ensure that there is no net loss of biodiversity on a site, no net loss in habitat connectivity and aims to enhance biodiversity.

Hedgerows Regulations 1997

- 10.8 The Hedgerows Regulations 1997 protect 'important hedgerows' from being removed (uprooted or destroyed). Hedgerows are protected if they are at least 30 years old and meet at least one of the criteria listed in part II of schedule 1.

Planning Policy**National Planning Policy Framework (NPPF)**

- 10.9 The NPPF sets out national planning policy, including policies of relevance to conserving and enhancing the natural environment. Policies of relevance to the Proposed Development (parts of paragraphs 186 and 191) have been summarised below:
- 10.10 Para 186: When determining planning applications, local planning authorities should apply the following principles:
- a. if significant harm to biodiversity resulting from a development cannot be avoided (through locating on an alternative site with less harmful impacts), adequately mitigated, or, as a last resort, compensated for, then planning permission should be refused;
 - b. development whose primary objective is to conserve or enhance biodiversity should be supported; while opportunities to improve biodiversity in and around developments should be integrated as part of their design, especially where this can secure measurable net gains for biodiversity or enhance public access to nature where this is appropriate.
- 10.11 Para 191: Planning policies and decisions should also ensure that new development is appropriate for its location taking into account the likely effects (including cumulative effects) of pollution on health, living conditions and the natural environment, as well as the potential sensitivity of the site or the wider area to impacts that could arise from the development. In doing so they should:
- c. limit the impact of light pollution from artificial light on local amenity, intrinsically dark landscapes and nature conservation.

Wokingham Borough Core Strategy DPD (January 2010)*Policy CP3 – General Principles for development*

- 10.12 Planning permission will be granted for proposals that:
- a. Have no detrimental impact upon important ecological, heritage, landscape (including river valleys) or geological features or water courses.
 - b. Maintain or enhance the ability of the site to support fauna and flora including protected species.

Policy CP7 – Biodiversity

- 10.13 Sites designated as of importance for nature conservation at an international or national level will be conserved and enhanced and inappropriate development will be resisted. The degree of protection given will be appropriate to the status of the site in terms of its international or national importance. Development:
- a. Which may harm county designated sites (Local Wildlife Sites in Berkshire), whether directly or indirectly, or
 - b. Which may harm habitats or, species of principle importance in England for nature conservation, veteran trees or features of the landscape that are of major importance for wild flora and fauna (including wildlife and river corridors), whether directly or indirectly, or
 - c. That compromises the implementation of the national, regional, county and local biodiversity action plans
- 10.14 Will be only permitted if it has been clearly demonstrated that the need for the proposal outweighs the need to safeguard the nature conservation importance, that no alternative site that would result in less or no harm is available which will meet the need, and:
- i. Mitigation measures can be put in place to prevent damaging impacts; or
 - ii. Appropriate compensation measures to offset the scale and kind of losses are provided.

Policy CP8 – Thames Basin Heaths Special Protection Area

- 10.15 Development which alone or in combination is likely to have a significant effect on the Thames Basin Heaths Special Protection Area will be required to demonstrate that adequate measures to avoid and mitigate any potential adverse effects are delivered.

Managing Development Delivery Local Plan (February 2014)*Policy CC03 – Green Infrastructure, Trees and Landscaping*

- 10.16 Development proposals should demonstrate how they have considered and achieved the following criteria within scheme proposals:
- d. Protect and retain existing trees, hedges and other landscape features.
 - e. Incorporate high quality, ideally, native planting and landscaping as an integral part of the scheme.

Policy TB23 – Biodiversity and Development

- 10.17 Sites of national or international importance are shown and sites of local importance are defined on the Policies Map. Planning permission for development proposals will only be granted where they comply with policy CP7 – Biodiversity of the Core Strategy and also demonstrate how they:
- a. Provide opportunities, including through design, layout and landscaping to incorporate new biodiversity features or enhance existing.

- b. Provide appropriate buffer zones between development proposals and designated sites as well as habitats and species of principle importance for nature conservation.
- c. Ensure that all existing and new developments are ecologically permeable through the protection of existing and the provision of new continuous wildlife corridors, which shall be integrated and linked to the wider green infrastructure network.

The South East Plan (2010)

Policy NRM6 – Thames Basin Heaths Special Protection Area

- 10.18 New residential development which is likely to have a significant effect on the ecological integrity of Thames Basin Heaths Special Protection Area (SPA) will be required to demonstrate that adequate measures are put in place to avoid or mitigate any potential adverse effects. Such measures must be agreed with Natural England.
- 10.19 Priority should be given to directing development to those areas where potential adverse effects can be avoided without the need for mitigation measures. Where mitigation measures are required, local planning authorities, as Competent Authorities, should work in partnership to set out clearly and deliver a consistent approach to mitigation, based on the following principles:
- i. a zone of influence set at 5km linear distance from the SPA boundary will be established where measures must be taken to ensure that the integrity of the SPA is protected
 - ii. within this zone of influence, there will be a 400m "exclusion zone" where mitigation measures are unlikely to be capable of protecting the integrity of the SPA. In exceptional circumstances, this may vary with the provision of evidence that demonstrates the extent of the area within which it is considered that mitigation measures will be capable of protecting the integrity of the SPA. These small locally determined zones will be set out in local development frameworks (LDFs) and SPA avoidance strategies and agreed with Natural England
 - iii. where development is proposed outside the exclusion zone but within the zone of influence, mitigation measures will be delivered prior to occupation and in perpetuity. Measures will be based on a combination of access management, and the provision of Suitable Accessible Natural Greenspace (SANG).
- 10.20 Where mitigation takes the form of provision of SANG the following standards and arrangements will apply:
- i. a minimum of 8 hectares of SANG land (after discounting to account for current access and capacity) should be provided per 1,000 new occupants
 - ii. developments of fewer than 10 dwellings should not be required to be within a specified distance of SANG land provided it is ensured that a sufficient quantity of SANG land is in place to cater for the consequent increase in residents prior to occupation of the dwellings

- iii. access management measures will be provided strategically to ensure that adverse impacts on the SPA are avoided and that SANG functions effectively
 - iv. authorities should co-operate and work jointly to implement mitigation measures. These may include, inter alia, assistance to those authorities with insufficient SANG land within their own boundaries, co-operation on access management and joint development plan documents
 - v. relevant parties will co-operate with Natural England and landowners and stakeholders in monitoring the effectiveness of avoidance and mitigation measures and monitoring visitor pressure on the SPA and review/amend the approach set out in this policy, as necessary
 - vi. local authorities will collect developer contributions towards mitigation measures, including the provision of SANG land and joint contributions to the funding of access management and monitoring the effects of mitigation measures across the SPA
 - vii. large developments may be expected to provide bespoke mitigation that provides a combination of benefits including SANG, biodiversity enhancement, green infrastructure and, potentially, new recreational facilities.
- 10.21 Where further evidence demonstrates that the integrity of the SPA can be protected using different linear thresholds or with alternative mitigation measures (including standards of SANG provision different to those set out in this policy) these must be agreed with Natural England.

Guidance

- 10.22 Key guidance relevant to the overall assessment includes 'Guidelines for Ecological Impact Assessment in the UK and Ireland' (CIEEM, 2018¹) and 'Biodiversity – Code of practice for planning and development' (The British Standards Institution, 2013²).
- 10.23 Species-specific guidance used to inform the survey methodologies and assessments are described in the subsequent sections of this Chapter.

Assessment Methodology

Scope of Assessment

- 10.24 The overall assessment was undertaken following the approach set out in 'Guidelines for Ecological Impact Assessment in the UK and Ireland' (CIEEM, 2018).
- 10.25 The assessment has considered ecological receptors, namely 'Important Ecological Features', that are present within the 'Zone of Influence' of the Proposed Development. The Zone of Influence (Zol) is the area over which the Proposed Development could have an influence on ecological features. It comprises the land within the red line boundary,

¹ CIEEM (2018) *Guidelines for Ecological Impact Assessment in the UK and Ireland: Terrestrial, Freshwater, Coastal and Marine* version 1.2. Chartered Institute of Ecology and Environmental Management, Winchester.

² Biodiversity: Code of practice for planning and development (2013) BS 42020:2013 <https://shop.bsigroup.com/ProductDetail?pid=000000000030258704>.

demonstrated in the Project Area Plan (John Simpson Architects Ltd, 2023³), and immediate adjacent habitat features. It also includes features across the wider landscape which may be utilised by more mobile species such as bats, dormice and riparian mammals, and designated nature conservation sites in the surrounding area.

10.26 The relevant Important Ecological Features comprise:

- Designated nature conservation sites;
- Habitats and Species of Principal Importance for the Conservation of Biodiversity in England;
- Legally protected species; and
- Red Listed or rare species (based on Red Data Book lists, Birds of Conservation Concern and species considered to be nationally rare/scarce).

Study Area

10.27 The ecological assessment was undertaken to identify impacts on ecological receptors related to the entire South Wokingham SDL Extension, as described in Chapter 3 and shown in the Project EIA Illustrative Masterplan (John Simpson Architects Ltd, 2023⁴), and within the Zone of Influence for the Site.

10.28 The ecological field surveys were undertaken separately on the areas of land relating to the Lightwood application, the NKH application and the joint NKH and Lightwood application. As such, the survey methodologies provided in this section are separated, as required. Subsequently, the Site is discussed in its entirety (South Wokingham SDL Extension) to allow an overall impact assessment on biodiversity for the Proposed Development.

Establishing Baseline Conditions

10.29 'Ecological walkovers' of the Lightwood Site and joint application Site were undertaken in November 2021. An ecological walkover of the NKH Site was undertaken in April 2022. The purpose of the walkovers was to identify the habitats present, their potential for protected species and to establish the scope of ecological surveys that would be required to inform the planning applications.

10.30 The baseline conditions of the Site were established by undertaking a desk study, UK Habitat Classification surveys, and targeted surveys for protected and notable species, as described below. The surveys were undertaken between 2021 and 2023.

³ John Simpson Architects Ltd (2023) *Project Area Plan, Phase 4b, 4c & 4c(i) of the South Wokingham SDL Extension*. Drawing No: SK014F, Rev F.

⁴ John Simpson Architects Ltd (2023) *Project EIA Illustrative Masterplan, Phase 4B, 4C & 4C(i) of the South Wokingham SDL Extension*. Drawing No: SK02.4.1G.

Desk Study

- 10.31 A background data search was received from Thames Valley Environmental Records Centre in December 2023. The search included records of non-statutory designated sites and protected and notable species within 2km of the Site.
- 10.32 An additional search for designated sites and granted European Protected Species (EPS) licences within 2km of the Site was undertaken using publicly available information (DEFRA MAGIC map).

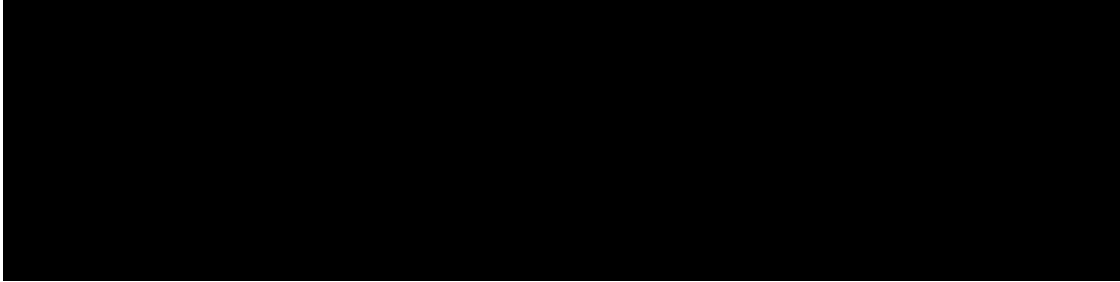
UK Habitat Classification Survey

- 10.33 The habitat surveys drew on guidance provided in 'Handbook for Phase 1 Habitat Survey – a technique for environmental audit' (JNCC, 2010⁵). The classification and mapping of habitats used the UK Habitat (UKHab) Classification. UKHab has its own symbology which has been used when creating maps for the existing habitats.
- 10.34 A UKHab survey was undertaken at the NKH Site in April 2022 and updated in June 2023. UKHab surveys were undertaken at the Lightwood Site and joint application Site in November 2021 and updated in both April 2022 and July 2023.
- 10.35 The surveys incorporated detailed assessment of the Sites, including a description and mapping of all key features and habitat types. The surveys were carried out to identify the range of habitats within the Sites and the predominant and notable species of flora.
- 10.36 Grasslands were surveyed using professional judgement and random sampling. A minimum of three 1x1m² quadrats were undertaken for each grassland parcel. Information collected within each quadrat included aspect, slope, average ground cover, sward variation, species and their percentage cover. Where the grassland differed to a certain extent, or was divided by a field boundary, it was considered that the grassland was a different habitat parcel and another assessment was undertaken.

NERC S.41 Mammals

- 10.37 The survey included an assessment of the habitats on Site for their potential to support NERC Section 41 species such as hedgehog (*Erinaceus europaeus*), polecat (*Mustela putorius*), harvest mouse (*Micromys minutus*) and brown hare (*Lepus europaeus*). This included a search for nests, runs, latrines, paw prints, and live specimens.

10.38



⁵ JNCC, (2010) *Handbook for Phase 1 habitat survey – a technique for environmental audit*. JNCC, Peterborough. ISBN 0 86139 636 7.

⁶ Harris, S., Cresswell, P. and Jefferies, D. (1989) *Surveying Badgers*. The Mammal Society, London. ISBN 0 906282 06 3.

10.39

**Hazel Dormouse**

- 10.40 The survey included an assessment of the potential of the Site for hazel dormouse (*Muscardinus avellanarius*), focusing on the connectivity and suitability of the habitats present.
- 10.41 A total of 155 dormouse tubes were deployed in suitable habitat across the Site in April 2022, at roughly 20 metre intervals. The locations of the tubes are shown in **Figure 10.1**. The tubes were checked once a month between June and November 2022. **Table 10.1** below, based on Table 5 of the Dormouse Conservation Handbook (Bright, Morris and Mitchell-Jones, 2006⁷) shows the index of probability of finding evidence of dormouse in nest tubes. The scores in the table are based on 50 tubes deployed and a minimum score of 20 must be reached to determine presence/likely absence. As the tubes were deployed between May and November, the total score achieved was 24 and the threshold was therefore met.

⁷ Bright, P., Morris, P. and Mitchell-Jones, T. (2006) *The Dormouse Conservation Handbook*, second edition. English Nature, Peterborough. ISBN 1 85716 219 6.

Figure 10.1 – Dormouse nest tube locations**Table 10.1** – Index of probability of finding dormice present in nest tubes

Month	Index of probability
April	1
May	4
June	2
July	2
August	5
September	7
October	2
November	2
Total score	24

Otter

10.42 Detailed otter surveys were undertaken on 14th April 2022, 19th July 2022 and 5th October 2022. The surveys involved searching the banks of the Emm Brook tributary on the Lightwood Site for evidence of otter. The methodology was informed by 'Monitoring the Otter *Lutra lutra*' (Chanin, 2003⁸).

10.43 The following signs and evidence of otter were searched for:

- 
- Couches - lying up places above ground. Often found in long grasses, dense vegetation or rushes near watercourses or in wetland areas.
- Feeding sites - where food remains are found, mainly fish, shellfish or amphibians.
- Spraints - faeces left by the otter, showing food remains. Typically, in prominent positions on rocks, trees or tree roots, beneath bridges, at crossing points of fences or walls, or confluence of river systems.
- Tracks - otter tracks (typically footprints) are highly distinctive and diagnostic and clearly differentiated from mink tracks by both size and shape.

Water Vole

10.44 Detailed water vole surveys were undertaken on 14th April 2022, 19th July 2022 and 5th October 2022. The surveys covered the two halves of the breeding season and were undertaken at least two months apart, in line with guidance (Dean *et al.*, 2016⁹).

10.45 The surveys involved searching the banks of the Emm Brook tributary on the Lightwood Site for evidence of water vole. The following signs and evidence of water vole were searched for: sightings, footprints, run-ways in vegetation, burrows, lawns, nests, feeding stations, and faeces and latrines.

Bats

10.46 The methodology for the bat surveys was informed by the 'Bat Surveys for Professional Ecologists Good Practice Guidelines 3rd Edition' (Collins, 2016¹⁰). Surveys undertaken across the Lightwood Site, NKH Site and joint application Site included habitat assessments, preliminary roost assessments, activity surveys, static detector surveys and emergence surveys.

⁸ Chanin, P. (2003) *Monitoring the Otter* *Lutra lutra*. Conserving Natura 2000 Rivers Monitoring Series No. 10. English Nature, Peterborough. ISBN 1 85716 724 4.

⁹ Dean, M., Strachan, R., Gow, D. and Andrews, R. (2016) *The Water Vole Mitigation Handbook (The Mammal Society Mitigation Guidance Series)*. Eds. Fiona Mathews and Paul Chanin. The Mammal Society, London.

¹⁰ Collins, J. (ed.) (2016) *Bat Surveys for Professional Ecologists: Good Practice Guidelines* (3rd edn). The Bat Conservation Trust, London. ISBN-13 978-1-872745-96-1.

Habitat Assessment

- 10.47 The habitats on Site were assessed for their suitability to support foraging and commuting bats. This assessment was also contextualised through examination of suitable habitat and features in the wider landscape and possible flight-lines across the Site following natural linear features such as hedgerows.
- 10.48 An assessment of the trees to support roosting bats was undertaken. Potential roosting features on trees were identified as any feature within a tree that could provide shelter for a roosting bat. These features result from the following three mechanisms: disease and decay, damage, and associations.

Preliminary Roost Assessment

- 10.49 Physical external and internal inspections of the buildings located across the Lightwood and NKH Sites were undertaken on 14th April and 1st June 2022. The physical searches included a search for live animals and a search for other signs that give an indication of past or present occupancy as outlined below. In the case of bats, typical indicators include droppings (which are characteristic and can often be speciated or at least be indicative of species type), signs of staining, urine splashing, characteristic odours, and accumulations of discarded prey remains. Approximately 20 hours of search effort were expended.
- 10.50 Where required, the search included an endoscope search of features with potential for bats. Equipment included a Rigid micro-CA-350 Inspection Camera with micro 6mm extension, camera, laser measure, and binoculars.

DNA Analysis

- 10.51 Bat droppings were collected from the loft void of building B3 during the preliminary roost assessment. These droppings were sent to The University of Warwick for DNA analysis to identify the species of bat.

Emergence Surveys

- 10.52 The emergence surveys were informed by the results of the preliminary roost assessment. In line with guidance (Collins, 2016), building B3 located within the NKH Ste was assessed as being of 'high' suitability for roosting bats.
- 10.53 Two emergence surveys were undertaken on building B3 on 23rd June and 28th July 2022. Limitations and assumptions regarding the number of emergence surveys undertaken is provided in Section 10.9.
- 10.54 The emergence surveys commenced 15 minutes before sunset and finished approximately an hour and a half after sunset. The surveys involved one surveyor positioned adjacent to the identified potential roosting feature on B3, as shown in **Figure 10.2**. Echo Meter Touch (EMT) bat detectors were used for both surveys. All calls recorded were analysed using the EMT app software. All calls recorded were cross referenced to a call reference collection library of known bat species to confirm species presence.
- 10.55 One thermal imaging camera was used as a survey aid, as demonstrated in **Figure 10.3**. The thermal imaging surveys were led by Matt Attrill, a licensed bat surveyor who has

attended two Wildlifetek training courses on the use of thermal imaging cameras for bat surveys and considered to be 'suitably qualified' in the use of the cameras as both a survey aid and method. For these surveys, thermal imaging was used as a 'survey aid' in accordance with the 'Thermal Imaging: Bat Survey Guidelines' (Fawcett Williams, 2021¹¹).

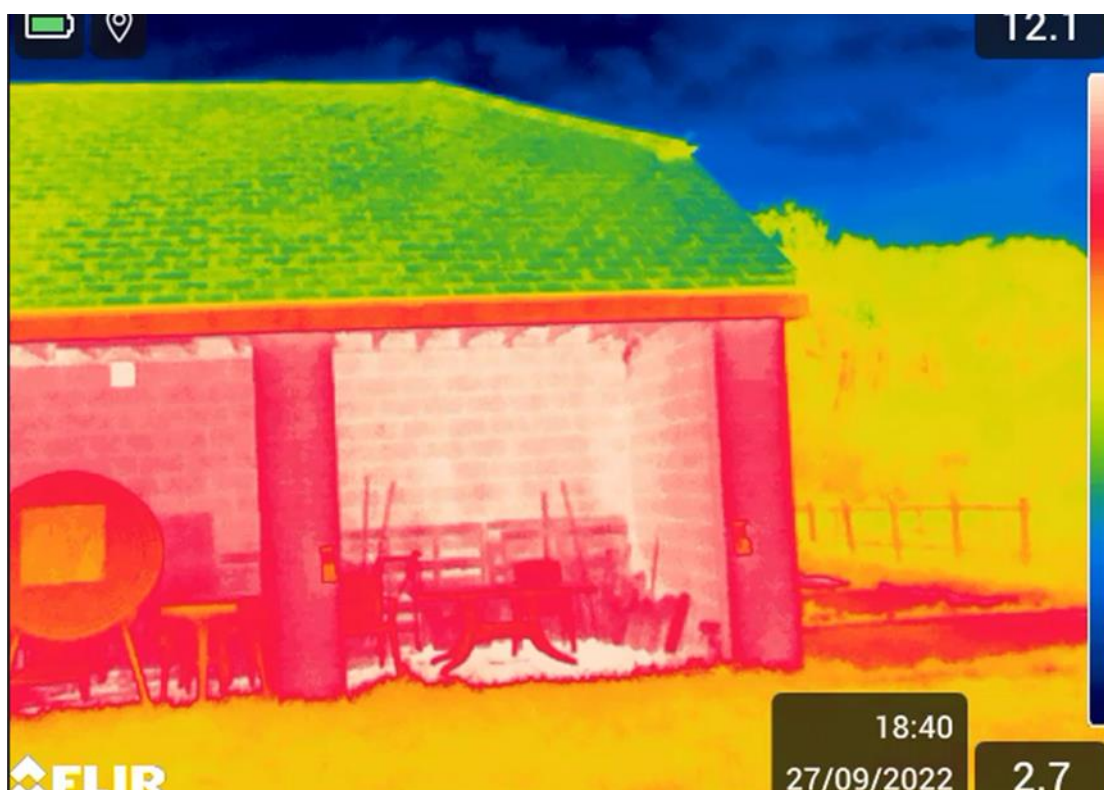
- 10.56 The thermal imaging surveys used a Flir T540 thermal imaging camera. Videos were recorded as non-radiometric files. This camera has a thermal resolution of 464×348 with a 42° lens which allows for the detection of bats up to a distance of 51m. The video files were transferred into standard video analysis software for later analysis.
- 10.57 The observations and recordings made by the surveyor and thermal cameras were cross-referenced with the calls recorded on the EMT bat detectors to confirm species identification and support the overall assessment.

Figure 10.2 – Buildings in NKH Site and emergence surveyor position



Figure 10.3 – Eastern elevation of B3

¹¹ Fawcett Williams, K. (2021) *Thermal Imaging: Bat Survey Guidelines*. The Bat Conservation Trust, London.



Activity Surveys

- 10.58 Seven dusk activity surveys were undertaken at the Site on 14th April, 16th May, 23rd June, 19th July, 30th August, 27th September and 20th October 2022. The surveys involved six surveyors walking specific transects for at least two hours after sunset. The Site was split into three separate transects, as shown in **Figure 10.4**, to ensure each was a sufficient size. The routes of the transects were chosen to cover the boundary hedgerows, which are likely to be used by commuting and foraging bats, and to investigate if or how bats are utilising the central areas of the grassland parcels. The transects did not cover the cropland field in the south of the Site as this area is proposed for SANG and the valuable bat habitat present within that area, namely the hedgerows and brook, will be retained. In addition, whilst the transects covered the hedgerows along the byway between the NKH and Lightwood Sites, activity surveys did not explore specific commuting along, or crossing over of, the byway due to this area not initially being included within the application area.
- 10.59 The surveys included identifying species on Site, recording areas or features with specific levels of bat activity and identifying key areas for foraging and commuting bats. Surveyors stopped at listening points (shown on **Figure 10.4**) for five minutes to record activity at repeatable locations, but all bat records made during the survey have been included within the results and assessment.
- 10.60 EMT bat detectors were used for all the surveys. All calls recorded were analysed using the EMT app software and were cross referenced to a call reference collection library of known bat species to confirm species presence.

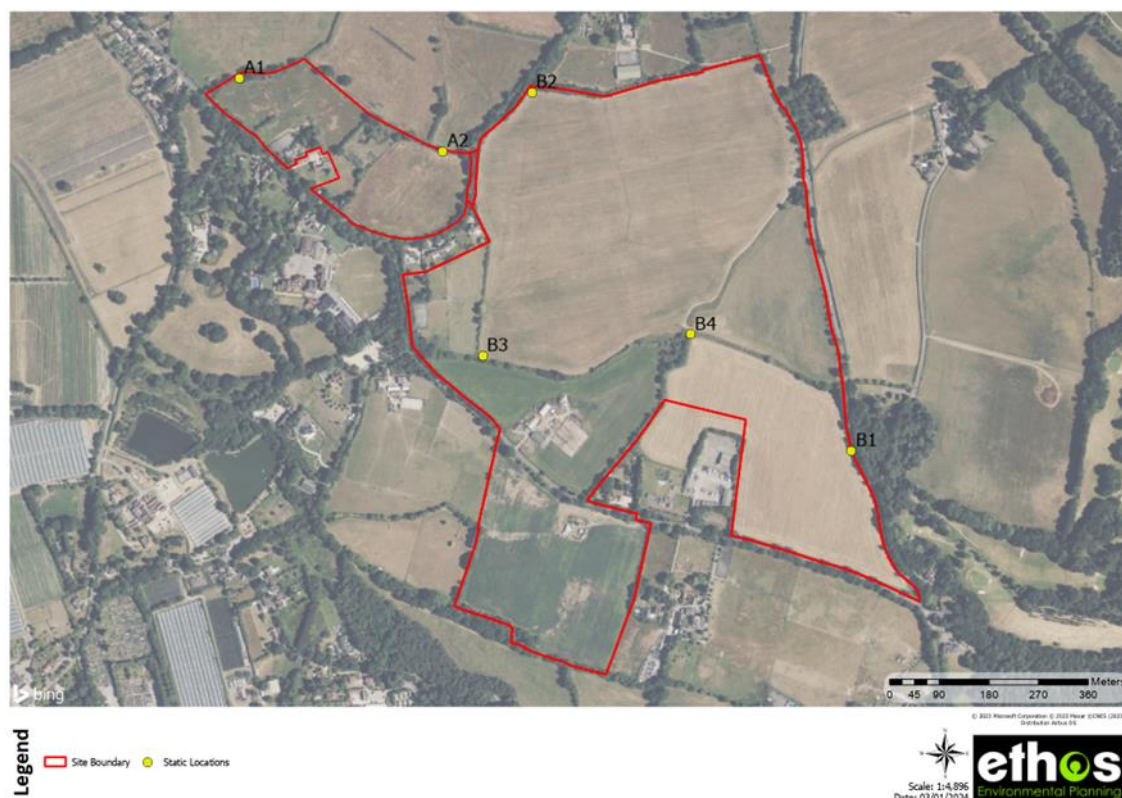
Figure 10.4 – Activity survey transects and listening points



Static Detector Surveys

- 10.61 Passive bat detector surveys were used to identify levels of bat activity on the Site, as recommended in BCT Survey Guidelines (Collins, 2016). Passive bat detectors can provide a greater understanding of the bat species using the Site and identify patterns in bat activity over long periods of time.
- 10.62 Six static bat detectors were deployed over a five-day period each month between April and October 2022. The detectors were deployed at the same locations during each of the monitoring periods to enable comparison of bat activity during the different periods (shown on **Figure 10.5**). Limitations relating to the static detector surveys are outlined in Section 10.9.
- 10.63 The locations for the static detectors were selected to compare activity levels along the Site boundaries, including the boundary hedgerows and watercourse which were considered likely to provide commuting and foraging opportunities for bats. The results of this comparison were used to help determine the likely impacts on bats of the Proposed Development and to inform the mitigation strategy.
- 10.64 The detectors used were Full Spectrum Wildlife Acoustics Song Meter 4 (SM4) passive bat detectors. Each call was assigned a species using the BTO Acoustic Pipeline. The final data analysis was carried out using Microsoft Excel.

Figure 10.5 – Static detector locations



Birds

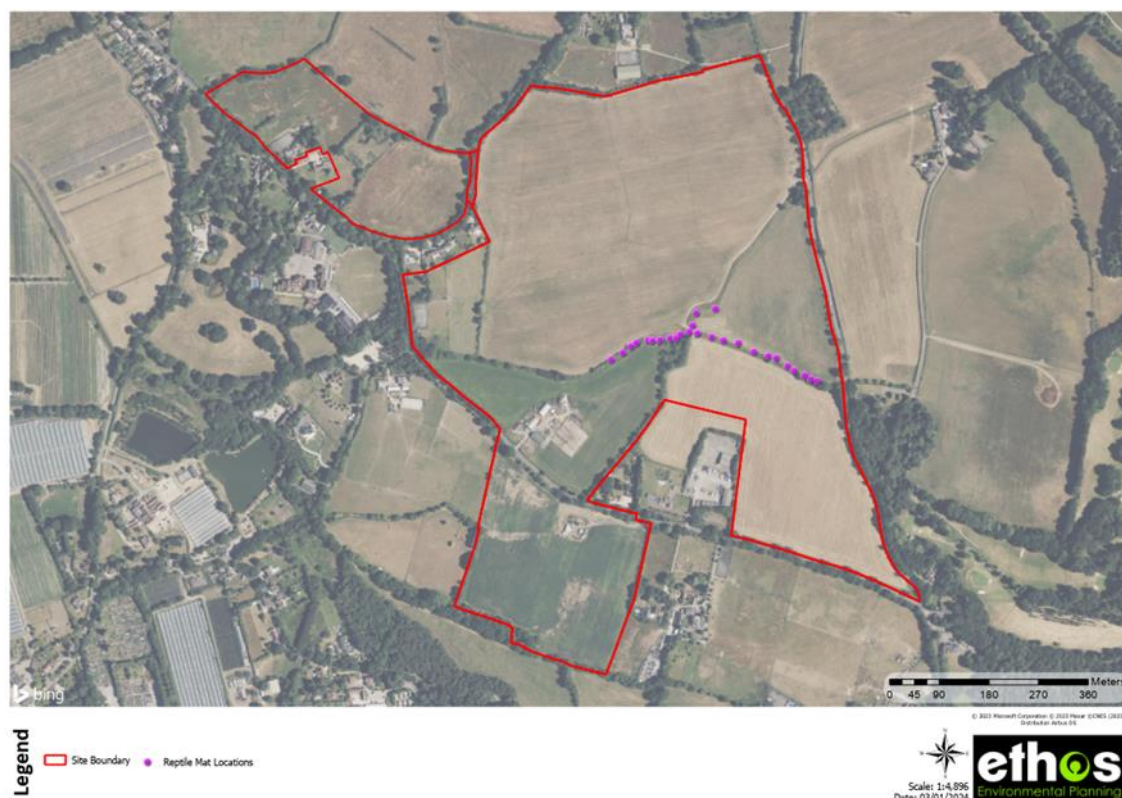
- 10.65 The bird survey included an assessment of the habitats on Site for their potential to support protected and notable species of bird as well as their potential to support breeding birds.

Reptiles

- 10.66 The potential presence of reptiles on Site was assessed considering the habitats present (availability of refugia and basking areas) and suitability of surrounding environment.
- 10.67 Seven presence/absence surveys were undertaken between May and October 2022. The methodology was based on 'Reptile Survey' (Froglife, 1999¹²). The surveys were targeted to areas most likely to contain reptile habitats, shown in **Figure 10.6**. Searches were undertaken when the air temperature was between 9°C and 18°C with intermittent or hazy sunshine, little or no wind, and no rainfall.

Figure 10.6 – Reptile mat locations

¹² Froglife (1999) *Reptile survey: an introduction to planning, conducting and interpreting surveys for snake and lizard conservation*. Froglife Advice Sheet 10. Froglife, Halesworth.



Amphibians

Habitat Assessment

- 10.68 The Site was examined for suitable waterbodies and for breeding terrestrial habitat. Terrestrial habitats providing sufficiently structured vegetation in which amphibians may forage or hibernate over winter were also surveyed for.
- 10.69 In addition to the on-site assessment, 'Great Crested Newt Mitigation Guidelines' (English Nature, 2001¹³) recommend that a desktop analysis of ponds within 500m of the Site be undertaken to identify any potential breeding ponds which may require further survey. Ponds within 500m of the Site were mapped on GIS with an OS OpenData base map at 1:10,000 resolution.

HSI Scoring

- 10.70 Habitat Suitability Indices (HSI) were calculated for ponds P1, P2, P3 and P4, shown in **Figure 10.7**. The HSI was developed by Oldham *et al.* (2000¹⁴) as a means of evaluating habitat quality and quantity. Ten suitability indices are assessed visually for each pond resulting in a numerical index between 0 (unsuitable) and 1 (highly suitable). As stated in

¹³ English Nature (2001) *Great crested newt mitigation guidelines*. English Nature, Peterborough. ISBN 1 85716 568 3.

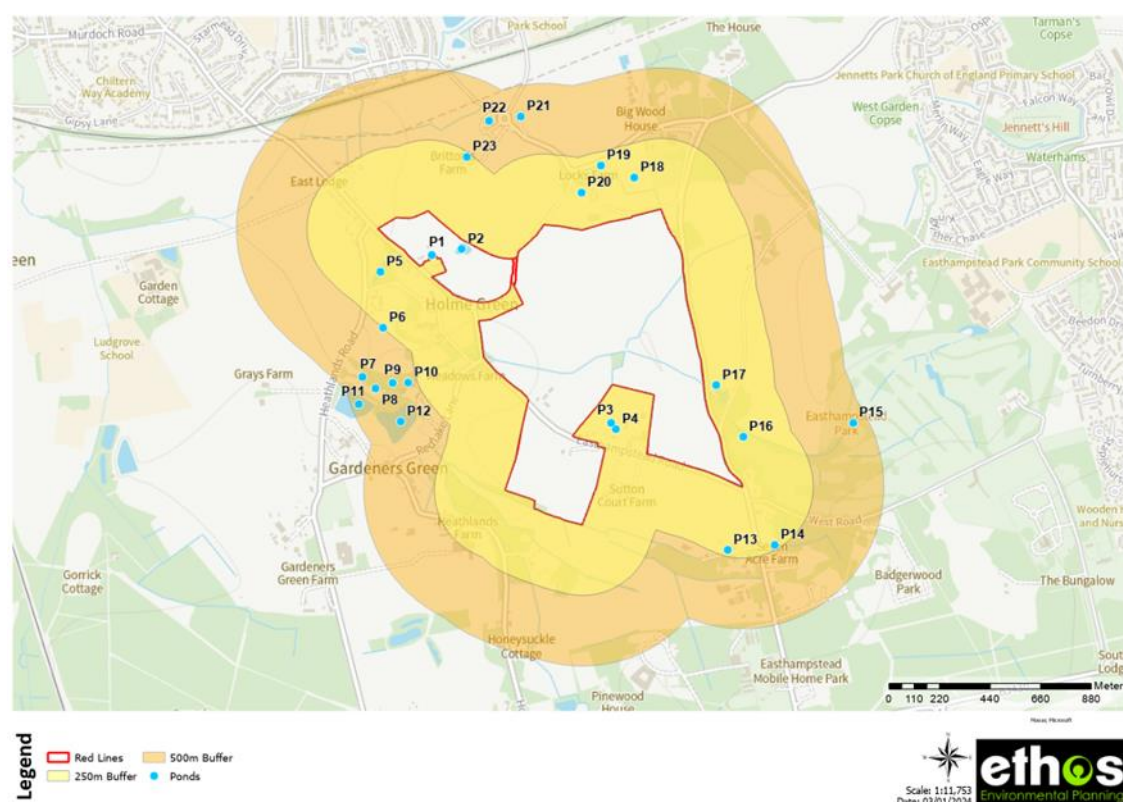
¹⁴ Oldham, R.S., Keeble, J., Swan, M.J.S. and Jeffcote, M. (2000) *Evaluating the suitability of habitat for the Great Crested Newt (Triturus cristatus)*. Herpetological Journal 10 (4), 143-155.

'ARG UK Advice Note 5' (ARG UK, 2010¹⁵), "in general, ponds with high HSI scores are more likely to support great crested newts than those with low scores. However, the system is not sufficiently precise to conclude that any pond with a high score will support newts, or that any pond with a low score will not do so."

eDNA Surveys

- 10.71 Ponds P1, P2, P3 and P4, shown in **Figure 10.7**, were subject to eDNA surveys on 28th April 2022. The surveys comprised the collection of 40ml samples from 20 locations around the edge of each pond. Samples were mixed together in a bag and six 15ml samples were extracted and stored within preserving fluid. These samples were then sent to ADAS, who analyse the samples for great crested newt (GCN) DNA. This technique has been tested by DEFRA and found to have a reliability of 99.3%. Sampling methodology followed best practice guidance within 'Analytical and Methodological Development for Improved Surveillance of the Great Crested Newt' (Briggs *et al.*, 2014¹⁶).

Figure 10.7 – Ponds within 500m



¹⁵ ARG UK (2010). *ARG UK Advice Note 5: Great Crested Newt Habitat Suitability Index*. Amphibian and Reptile Groups of the United Kingdom

¹⁶ Biggs, J., Ewald, N., Valentini, A., Gaboriaud, C., Griffiths, R.A., Foster, J., Wilkinson, J., Arnett, A., Williams, P. and Dunn, F. (2014) *Analytical and methodological development for improved surveillance of the Great Crested Newt*. Appendix 5. Technical advice note for field and laboratory sampling of great crested newt (*Triturus cristatus*) environmental DNA. Freshwater Habitats Trust, Oxford.

Invertebrates

- 10.72 Due to the many invertebrate taxonomic groups that exist, the often-large differences in invertebrate diversity between habitats and the many survey techniques available, invertebrate surveys are highly specific to individual sites. Therefore, an assessment of the Site's potential for invertebrates was undertaken, including the need for targeted surveys, as recommended in 'Considering Terrestrial Invertebrates in Preliminary Ecological Appraisals' (Jukes, 2021¹⁷).

Significance Criteria

Ecological Features

- 10.73 The CIEEM guidance (2018) was used to assign value and sensitivity to each of the ecological features within the Zol. Value is expressed according to five levels on a geographic scale, as described in **Table 10.2**. The justification for selecting the level of value is given for each feature in the assessment

Table 10.2 – Value/sensitivity of Important Ecological Features

Value of ecological feature	Sensitivity of ecological	Description of importance
International	High	Of importance in England and Europe and protected through international legislation
National	High	Of importance in England and protected through national legislation
Regional	Medium	Of importance to the region (Southern England and the Thames Valley) but not sufficiently important to warrant 'National' scale of importance
District	Medium	Of importance within the context of the Planning Authority's administrative boundary
Local	Low	Of importance to the local area, largely contained within, or close to, the Site itself

Assessment of Effects

- 10.74 Ecological mitigation measures are necessary to address likely significant adverse environmental effects. The significance of an environmental effect has been established by way of reference to the value and sensitivity of affected resources; the extent and magnitude of the impact; the impact duration; and the impact type.
- 10.75 The significance matrix shown in **Table 10.3** was informed by CIEEM guidance (2018) and has been applied across the Important Ecological Features to ensure the identified ecological effects are assessed in a comparable manner.

¹⁷ Jukes, A. (2021) 'Considering Terrestrial Invertebrates in Preliminary Ecological Appraisals', *InPractice*, (111), pp. 40-45.

Table 10.3 – Significance matrix

Significance		Sensitivity of receptor		
		High	Medium	Low
Impact magnitude	Major	Major	Major	Moderate
	Moderate	Major	Moderate	Minor
	Minor	Moderate	Minor	Minor
	Negligible	Negligible	Negligible	Negligible

- 10.76 The effects of the Proposed Development during construction and operation on ecological receptors are identified by comparing 'with' and 'without' development scenarios. To determine the significance of an effect, the value/sensitivity of the receptor is first determined (**Table 10.2**), followed by the magnitude of impact (**Table 10.3**). If the resulting degree of effect is moderate or above then the effect is considered to be significant and mitigation must be considered.
- 10.77 In addition to determining the significance of the effect, the assessment process also includes a qualitative description regarding the nature and duration of the effect. The nature of the impact is described as being either 'adverse', 'negligible' or 'beneficial' and the 7-point scale of significance, shown in **Table 10.4** below, is applied.
- 10.78 The duration of effects is described utilising the following timescales:
- Short term – impact is measurable for 0-5 years.
 - Medium term – impact is measurable between 5 and 15 years.
 - Long term – impact is measurable greater than 15 years.

Table 10.4 – Significance criteria

Significance Criteria – the 7-point scale
Major beneficial
Moderate beneficial
Minor beneficial
Negligible
Minor adverse
Moderate adverse
Major adverse

- 10.79 Measures to avoid and reduce the identified ecological impacts will be identified; this will follow the 'avoid, mitigate, compensate' hierarchy. A strategy for the mitigation of any residual significant ecological effects will be presented. The identification of residual effects should assume only mitigation measures that are incorporated in scheme design and/or can be readily (cost effectively) applied; these being the measures for which delivery and implementation can be secured (tertiary measures).

Baseline Conditions

- 10.80 Descriptions of the habitats on Site and the nearby designated sites of nature conservation value are provided in the following section. Full details of the baseline conditions on the Lightwood Site, the NKH Site and the joint NKH and Lightwood Site are provided in the Technical **Appendices 10.1-10.3**. Photos referred to in this section can be found in **Appendix 10.4**.

Designated Sites of Nature Conservation Value

Statutory Designated Sites

- 10.81 The desk study identified one Local Nature Reserve (LNR), three Sites of Special Scientific Interest (SSSI) and one Special Protection Area (SPA) within 2km of the Proposed Development, as shown in **Figure 10.8**.

Heath Lake (LNR, SSSI)

- 10.82 Heath Lake is designated as a LNR and a SSSI and is located approximately 1.2km south-west of the Site. It consists of a small, shallow lake, surrounded by birch and pine woodland with areas of relict heathland. Heath Lake is a long-established open water habitat supporting specialist communities of native plants and animals. Of particular interest are populations of some uncommon and rare aquatic plant species.
- 10.83 Heath Lake LNR and SSSI is assessed to be of National importance for nature conservation, in line with its designation.

Wykery Copse (SSSI)

- 10.84 Wykery Copse is located approximately 1.7km north-east of the Site. It is a SSSI which comprises a fragment of ancient broadleaved woodland of a kind now drastically reduced in Berkshire, situated on London Clay on the fringe of Bracknell. It is exceptionally diverse for its size, in terms of both woodland stand-types and herbaceous flora, and it contains several rarities. Its interest is enhanced still further by the small stream which flows through it.
- 10.85 Wykery Copse SSSI is assessed to be of National importance for nature conservation, in line with its designation.
- 10.86 Wykery Copse SSSI and Heath Lake LNR and SSSI are relatively small nature conservation sites located in proximity to urban development. Given their size, location and distance from the Site, and the abundance of more extensive recreational opportunities in the wider area, it is assessed that significant direct and indirect impacts on Wykery Copse SSSI and Heath Lake LNR and SSSI will be avoided, and they are scoped out of this assessment.

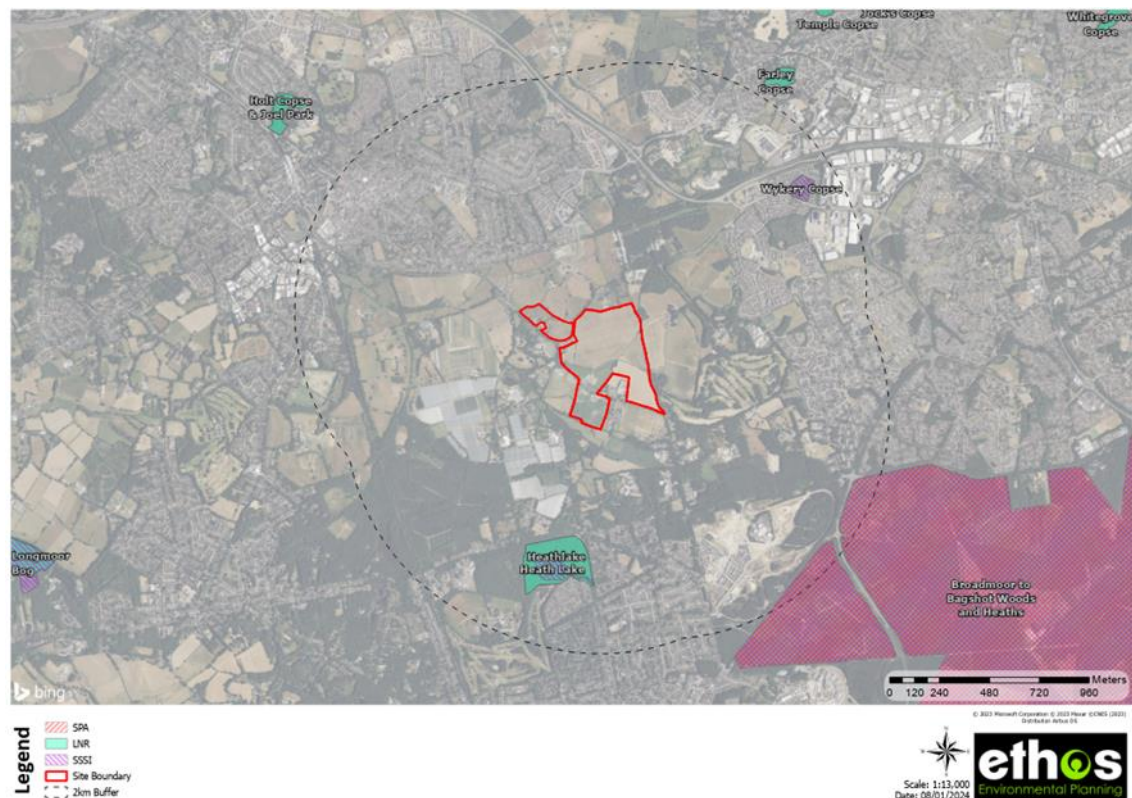
Broadmoor to Bagshot Woods and Heaths (SSSI)

- 10.87 Broadmoor to Bagshot Woods and Heaths, located approximately 1.8km south-east of the Site, is a SSSI that has an extensive mosaic of broadleaved woodland, coniferous plantation, dry and wet heathland, valley mire, a series of base-poor ponds and a scarce breeding invertebrate assemblage. In particular, the heathland and coniferous plantation supports internationally important populations of woodlark, nightjar and Dartford warbler, and have a nationally important dragonfly and damselfly population. The site includes the valley bogs of Broadmoor Bottom and Wishmoor Bottom which form the most important remaining examples of this type of habitat in the area.
- 10.88 Broadmoor to Bagshot Woods and Heaths SSSI forms part of the Thames Basin Heath SPA, as described below, and is therefore assessed to be of International importance for nature conservation, in line with the designation for the SPA.

Thames Basin Heath (SPA)

- 10.89 The Thames Basin Heath is a SPA that is a composite site that is located across the counties of Surrey, Hampshire and Berkshire in southern England. It encompasses all or parts of Ash to Brookwood Heaths Site of Special Scientific Interest (SSSI), Bourley and Long Valley SSSI, Bramshill SSSI, Broadmoor to Bagshot Woods and Heaths SSSI, Castle Bottom to Yateley and Hawley Commons SSSI, Chobham Common SSSI, Colony Bog and Bagshot Heaths SSSI, Eelmoor Marsh SSSI, Hazeley Heath SSSI, Horsell Common SSSI, Ockham and Wisley Commons SSSI, Sandhurst to Owlsmoor Bogs and Heaths SSSI and Whitmoor Common SSSI. The open heathland habitats overlie sand and gravel sediments which give rise to sandy or peaty acidic soils, supporting dry heathy vegetation on well-drained slopes, wet heath on low-lying shallow slopes and bogs in valleys. The site consists of tracts of heathland, scrub and woodland, once almost continuous, but now fragmented into separate blocks by roads, urban development and farmland. Less open habitats of scrub, acidic woodland and conifer plantations dominate, within which are scattered areas of open heath and mire. The site supports important breeding populations of a number of birds of lowland heathland, especially nightjar (*Caprimulgus europaeus*) and woodlark (*Lullula arborea*), both of which nest on the ground, often at the woodland/heathland edge, and Dartford warbler (*Sylvia undata*), which often nests in gorse (*Ulex sp.*).
- 10.90 Thames Basin Heath SPA is assessed to be of International importance for nature conservation, in line with its designation.
- 10.91 Potential effects on Broadmoor to Bagshot Woods and Heaths SSSI and Thames Basin Heath SPA as a result of the Proposed Development are discussed in Section 10.6.

Figure 10.8 – Statutory designated sites within 2km



Ancient Woodland

- 10.92 There are approximately forty small parcels of ancient woodland within 2km of the Site, as shown in **Figure 10.9**. Whilst the National Planning Policy Framework recognises the value of ancient woodlands, indicating a National level of importance for nature conservation, Berkshire supports fourteen large areas of ancient woodland, between 12 and 1777ha in size, making these nearby parcels only a small proportion of the County's provision. As such, the ancient woodland parcels within 2km of the Site are assessed to be of District importance for nature conservation.
- 10.93 Several of the parcels form Big Wood LWS located to the north-east of the Site, as discussed below. Potential impacts on Big Wood LWS and the associated ancient woodland parcels are discussed in Section 10.6.
- 10.94 Four small parcels of ancient woodland are located within 100m of the Site boundary. These parcels are relatively small and are therefore not expected to experience significant recreational pressure. However, due to their proximity, they may experience direct impacts during the construction phase.

Figure 10.9 – Ancient woodland within 2km



Non-Statutory Designated Sites

- 10.95 The desk study identified eight Berkshire Local Wildlife Sites (LWS) within the 2km search radius, as detailed in **Table 10.5** below.
- 10.96 All of the LWS within 2km are assessed to be of District importance for nature conservation, in line with their designation.

Table 10.5 – Non-statutory designated sites within 2km

Site name and designation	Description	Distance and direction from Site
Adjacent Wokingham Road/Peacock Lane (LWS)	A small area split into two by a footpath. It is partly acidic birch woodland with some wet areas and partly oak woodland with much sycamore and some old lime coppice. Species recorded here include wood anemone, bluebell, bugle, primrose, yellow archangel and Solomon's-seal.	0m east
Peacock Meadows (LWS)	Peacock Meadows is a large area of public open space predominantly composed of recreated wildflower grassland. The grassland creation has been successful, and the site is quite species-rich in places, however as of the 2019 survey the habitat is not currently considered to quite meet the definition of Lowland Meadow priority habitat. The site also incorporates West Garden Copse (formerly an ancient woodland LWS in its own right)	500m north-east

Site name and designation	Description	Distance and direction from Site
	along with areas of newly planted native woodland, scrub and scattered trees.	
Big Wood (LWS)	Big Wood consists of two areas of woodland and an open area along the line of power lines. The site is largely ancient woodland except for the south-western section. The western area is classed in the inventory as replanted and is continuous with similarly classified woodland to the west. The southern woodland is dominated by birch with oak with bracken dominating below. Bluebells and wood sorrel are frequent. In the east oak is dominant and there is a well-developed understorey of hazel coppice with hawthorn, crab apple and field maple. Here bluebells dominate the ground flora. Ash is present at the edge. On the northern edge there is an area with abundant alder. The south western area is a pine plantation with some birch. Here holly is present. The northern woodland and also a small strip between the power lines is birch dominated with some oak and occasional hazel. Bracken dominates the ground flora although there are patches with abundant dog's mercury. Barren strawberry is present here. At the edge of the small strip a wild service tree is present. The open area is mainly dominated by bracken. In the east there is an area of wet grassland with tufted hair-grass, Yorkshire fog and creeping bent and rush pasture with abundant soft rush. Species present indicate the acidic and wet nature of this area. These include locally frequent yellow loosestrife, foxglove, wood sage, marsh thistle, water mint, greater bird's-foot trefoil, tormentil, common century, the rare marsh stitchwort, betony and ragged robin.	550m north-east
Gorrick Plantation (LWS)	This site is largely conifer plantation with some wet alder woodland. The site has remnants of heathland and bog habitat. Grass snake, woodlark, woodcock and nightjar have been recorded here. Plants recorded here include purple moor-grass, cross-leaved heath, bell heather and round leaved sundew.	950m south-west
Woodland near Ludgrove School (LWS)	An area of dense woodland that slopes down to a stream with ditches running north-south through the wood. The wood is hazel coppice with alder, birch, rowan and hawthorn. There are some wet areas and some willow carr. The ground flora has dense nettles and currant (probably redcurrant). The richest areas of ground flora are found along the paths. Species present include moschatel and yellow archangel.	1.2km west
Rigg's Copse (LWS)	A small ancient woodland with stands of oak and birch with hazel coppice, alder with birch and beech with holly. There are two good stands of wild service tree. There is a good varied ground flora including less common species such as common cow-wheat, polyploidy and great wood-rush. Other species present include bluebell,	1.3km north-east

Site name and designation	Description	Distance and direction from Site
	common spotted orchid, pignut, wood anemone, betony and wood sorrel.	
Tarman's Copse (LWS)	Tarman's Copse, on the west edge of Bracknell, is bounded to the north and west by residential estates and industry to the east. To the south is an area of rough grassland, new properties and building site (as at May 2013). It is a mature, outgrown sweet chestnut coppice with ash and scattered oaks and localised alders. The ground flora includes locally abundant broad buckler fern and abundant bluebell. There are indications of its ancient woodland status, notably old ash coppice stools and wood banks, both external and internal with old pollard marker trees. The woodland has a varied 3D-structure and includes deadwood habitats and there is also, at least locally frequent, regeneration of the canopy trees. The habitat has affinities to the calcareous (W8) end of the W10 community. It has high public use.	1.35km north-east
Trench's Bridge (LWS)	An area of woodland and coppice with a stream running from north to south. Oak is the dominant tree in the canopy and there is much birch. In the wetter areas, in the west, alder is abundant. Species present include bluebell, remote sedge, dog's mercury and lady fern. In the wetter areas common marsh bedstraw and bugle can be seen.	1.5km south-west

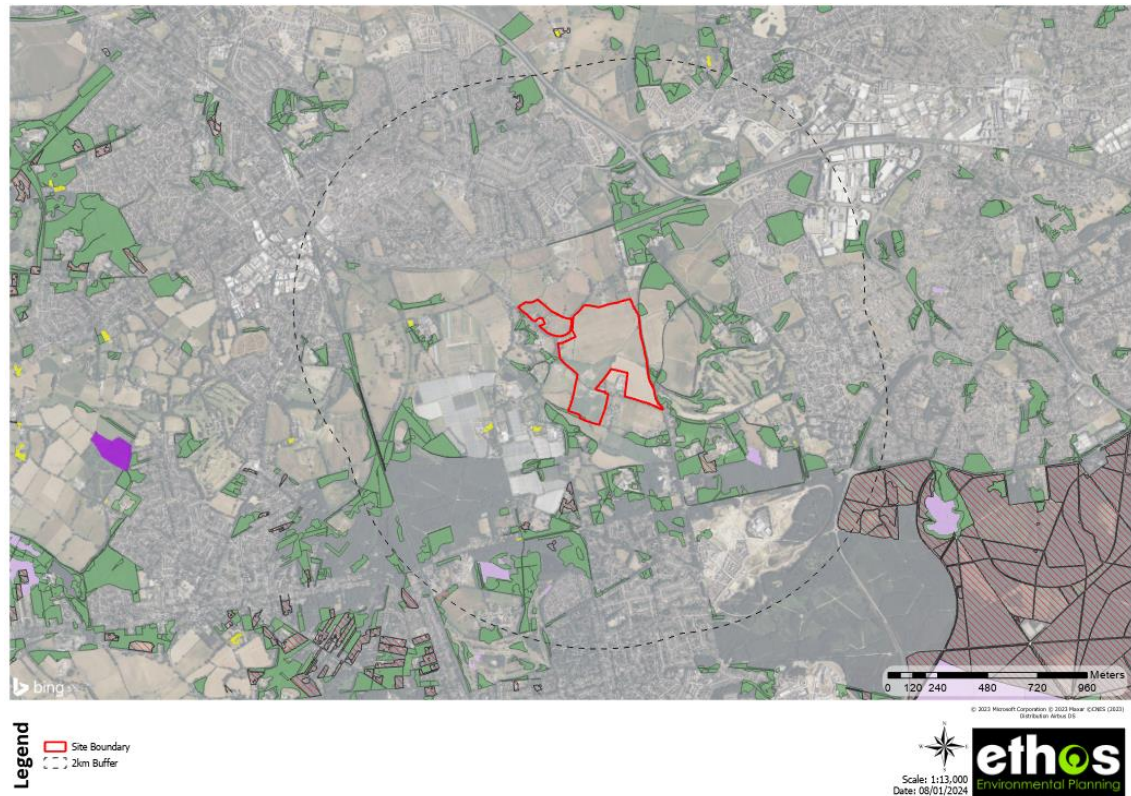
- 10.97 Adjacent Wokingham Road/Peacock Lane LWS is located adjacent to the Site, on the opposite side of Old Wokingham Road, and may experience impacts as a result of the Proposed Development. Potential impacts are discussed further in Section 10.6.
- 10.98 Big Wood, Peacock Meadows and Gorrick Plantation LWS are publicly accessible nature conservation Sites of a size which is considered likely to attract recreational visitors. Potential impacts on Big Wood, Peacock Meadows and Gorrick Plantation LWS as a result of the Proposed Development are discussed in Section 10.6.
- 10.99 Woodland near Ludgrove School, Rigg's Copse, Tarman's Copse and Trench's Bridge LWS are relatively small nature conservation sites located in proximity to urban development. Given their size, location and distance from the Site, and the abundance of more extensive recreational opportunities in the wider area, it is assessed that significant direct and indirect impacts on Woodland near Ludgrove School, Rigg's Copse, Tarman's Copse and Trench's Bridge LWS will be avoided, and they are scoped out of this assessment.

Priority Habitats

- 10.100 There are parcels of deciduous woodland within 2km of the Site, including several which are located adjacent to the Site boundary, as shown in **Figure 10.10**.
- 10.101 Deciduous woodland is a UK BAP Priority Habitat. However, given the abundance of deciduous woodland across the wider area and the relatively small size of the parcels in

proximity to the Site, the nearby deciduous woodland is assessed to be of Local importance for nature conservation. Potential impacts on the deciduous woodland adjacent to the Site boundary are discussed in Section 10.6.

Figure 10.10 – Priority Habitats within 2km

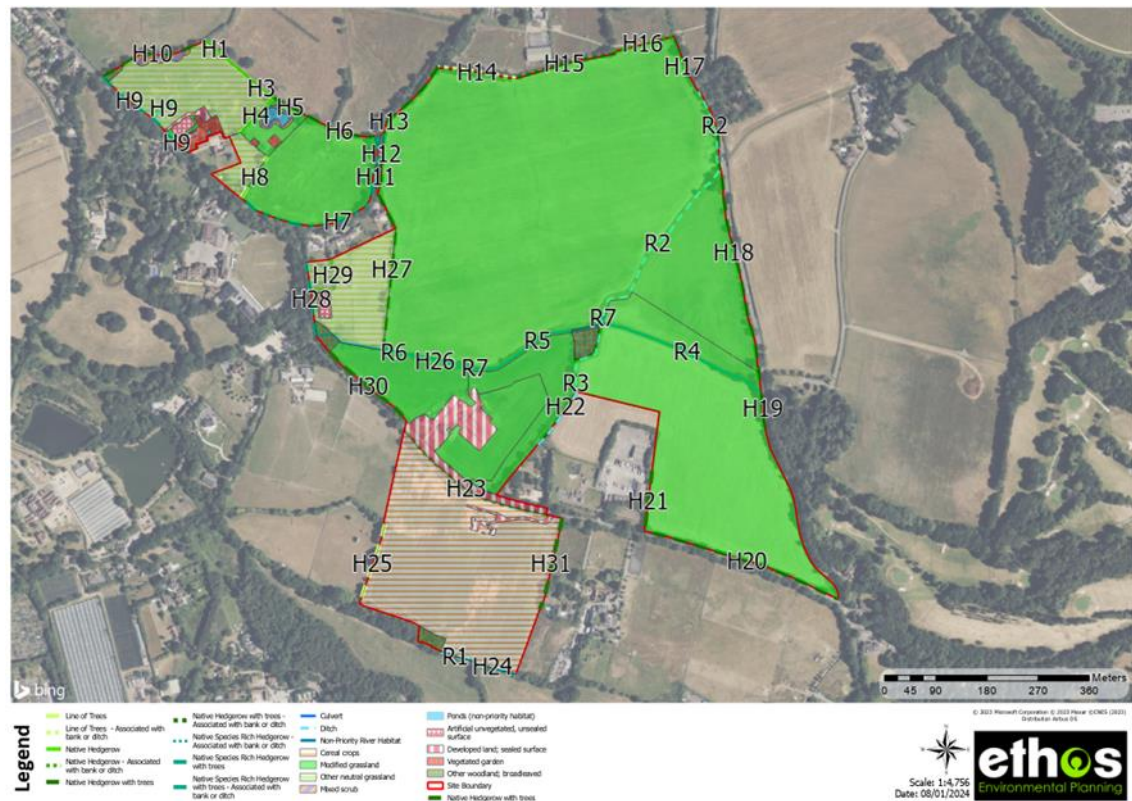


Habitats

General Description

- 10.102 The Site comprises grassland fields with boundary hedgerows, as shown in **Figure 10.11**. There is a tributary of Emm Brook running east to west across the Site which is intersected by an ephemerally wet ditch which runs north to south. There is a parcel of cropland in the south and several small parcels of woodland and mixed scrub scattered across the Site. There are two ponds located in the north-west of the Site.
- 10.103 The habitats surrounding the Site are predominantly arable fields with parcels of woodland and intersecting hedgerows. The wider area supports a mixture of arable and urban habitats, with the town of Wokingham located approximately 500m north of the Site.

Figure 10.11 – Baseline habitats



Modified Grassland

- 10.104 The majority of the Site comprises modified grassland parcels, all dominated by perennial rye-grass (*Lolium perenne*) with an abundance of other fast-growing species such as Yorkshire fog (*Holcus lanatus*), false oat grass (*Arrhenatherum elatius*), cock's-foot (*Dactylis glomerata*) and creeping buttercup (*Ranunculus repens*). Other species recorded across all the grassland parcels include creeping bent (*Agrostis stolonifera*), creeping thistle (*Cirsium arvense*), ragwort (*Jacobaea vulgaris*), broadleaved dock (*Rumex obtusifolius*), curled dock (*Rumex crispus*), dandelion (*Taraxacum spp.*), field buttercup (*Ranunculus arvensis*) and rough meadow grass (*Poa trivialis*).
- 10.105 The large modified grassland fields in the centre of the Site are maintained to a homogenous sward height (Photos 1-3). The modified grassland field in the north-west of the Site appears to be less managed and has a tussock-forming structure which supports a variety of sward heights (Photo 4).
- 10.106 The modified grassland on Site is species-poor and the majority appears to be regularly managed. It is not considered to be a habitat of particular nature conservation importance and it is only discussed further in relation to its potential to support protected species.

Other Neutral Grassland

- 10.107 The other neutral grassland in the north-west of the Site was previously horse-grazed and comprises several small paddocks (Photo 5). The parcel of other neutral grassland in the west of the Site has been recently horse-grazed and demonstrates minor poaching (Photo 6).
- 10.108 Species present across the parcels of other neutral grassland include red clover (*Trifolium pratense*), white clover (*Trifolium repens*), bird's-foot trefoil (*Lotus corniculatus*), meadow buttercup (*Ranunculus acris*), perennial rye-grass, ribwort plantain (*Plantago lanceolata*), dandelion, ragwort, Yorkshire fog, creeping bent, sweet vernal (*Anthoxanthum odoratum*), meadow foxtail (*Alopecurus pratensis*), bush vetch (*Vicia sepium*), common cats ear (*Hypochaeris radicata*), black knapweed (*Centaurea nigra*), cock's-foot, black medick (*Medicago lupulina*), bush vetch (*Vicia sepium*), primrose (*Primula vulgaris*), cuckoo flower (*Cardamine pratensis*), creeping thistle, kidney vetch (*Anthyllis vulneraria*), common daisy (*Bellis perennis*), common nettle (*Urtica dioica*), chickweed (*Stellaria media*), water purslane (*Ludwigia palustris*), common yarrow (*Achillea millefolium*), hard rush (*Juncus inflexus*), broadleaved dock (*Rumex obtusifolius*), sedge spp. (*Cyperaceae spp.*), lesser celandine (*Ficaria verna*), cleaver (*Galium aparine*) and common hogweed (*Heracleum sphondylium*).
- 10.109 The other neutral grassland on Site is not considered to be of particular nature conservation importance. It is only considered further in this assessment in relation to its potential to support protected species.

Mixed Scrub

- 10.110 There are two small areas of mixed scrub on Site; one area surrounds the larger of the two ponds in the north-western part of the Site (Photo 7) and the other is located along the north-western Site boundary (Photo 8).
- 10.111 The mixed scrub surrounding the pond comprises goat willow (*Salix caprea*), silver birch (*Betula pendula*), blackthorn (*Prunus spinosa*) and bramble (*Rubus fruticosus*). The mixed scrub along the north-western Site boundary comprises goat willow, common gorse (*Ulex europaeus*), hawthorn (*Crataegus monogyna*) and bramble, with high concentrations of common nettle due to the storage of manure in close proximity to the scrub.
- 10.112 Mixed scrub is not a Habitat of Principal Importance and is not considered to be of particular nature conservation importance. It is therefore only considered further in this assessment in relation to its potential to support protected species.

Other Woodland; Broadleaved

- 10.113 There are several small parcels of other woodland; broadleaved scattered across the Site (Photos 9 and 10). Species present within the woodland include goat willow, pedunculate oak (*Quercus robur*), hazel (*Corylus avellana*), silver birch, dogwood (*Cornus sanguinea*), blackthorn, field maple (*Acer campestre*), horse chestnut (*Aesculus hippocastanum*), holly (*Ilex aquifolium*) and ash (*Fraxinus excelsior*). Ground flora recorded across the parcels include lesser stitchwort (*Stellaria graminea*), bluebell (*Hyacinthoides non-scripta*), ivy (*Hedera helix*) and bramble (*Rubus fruticosus*).

- 10.114 Woodlands provide habitat for a range of species and are considered to be of nature conservation importance. However, there are extensive areas of woodland in the local area, with the parcels of woodland on Site forming only a small percentage of the local resource. On this basis, it is considered that the other woodland; broadleaved is of Local importance for nature conservation.

Cereal Crops

- 10.115 There is a parcel of cropland in the south of the Site (Photo 11) which has been ploughed and planted with maize (*Zea mays*). The cropland is not considered to be of particular nature conservation importance.

Artificial Unvegetated, Unsealed Surface

- 10.116 There are parcels of artificial unvegetated, unsealed surface on the Site in the form of horse training areas (Photo 12). The areas of artificial unvegetated, unsealed surface are not considered to be of particular nature conservation importance.

Developed Land; Sealed Surface

- 10.117 The Site supports relatively small areas of developed land; sealed surface with agricultural barns and sealed access tracks (Photos 13 and 14). This habitat is of negligible ecological value and is not considered further in this assessment.

Vegetated Garden

- 10.118 There are small areas of vegetated garden in the north-west of the Site (Photos 15 and 16). The gardens are species-poor and dominated by non-native species. This habitat is not assessed to be of particular nature conservation importance and is not discussed further.

Non-Priority River Habitat

- 10.119 A tributary of Emm Brook runs east to west across the centre of the Site (Photo 17). The watercourse has been heavily shaded and overgrown throughout the course of the surveys undertaken at the Site and approximately 10m of the watercourse is culverted; 5m near the confluence point of the tributary and ditch and 5m further west. A small section of Emm Brook runs along the southern boundary of the Site (Photo 18). Both watercourses are assessed to be over-deepened as a result of artificial alterations to the banks.
- 10.120 The brook and tributary do not meet the criteria for Habitats of Principal Importance. However, the watercourses provide habitat for a range of species and are therefore considered to be of nature conservation importance. As such, the non-priority river habitats on Site are assessed to be of Local importance for nature conservation.

Ditch

- 10.121 The ditch on Site runs from north to south and intersects with the tributary of Emm Brook (Photos 19 and 20). The ditch is ephemerally wet and heavily vegetated with terrestrial species, with an abundance of ruderal vegetation along the banks. Approximately 5m of the ditch is culverted near the confluence point of the ditch and tributary of the Emm Brook.

10.122 Whilst the ditch is only ephemeral and heavily overgrown with terrestrial vegetation, it is linked with the Emm Brook network and is therefore assessed to be of Local importance for nature conservation.

Non-Priority Pond Habitat

10.123 There are two ponds in the north-west of the Site. The smaller pond is an ornamental pond with associated formal planting (Photo 21). The larger pond is an artificial folly pond which is bordered by mixed scrub and is sometimes dry (Photo 22).

10.124 The ponds were not observed to support any protected and notable species over the course of the field surveys on Site and they do not meet the criteria for Habitats of Principal Importance. As such, the non-priority ponds are not considered to be of particular nature conservation importance and they are not discussed further.

Hedgerows

10.125 The Site supports a range of hedgerows and lines of trees which are described in **Table 10.6** below.

Table 10.6 – Hedgerows

Hedgerow number	Habitat classification	Description	Photo reference (Appendix 10.1)
H1	Native hedgerow with trees	Comprises newly planted hawthorn, established but still young, with two mature oak trees	23
H2	Native hedgerow	Comprises newly planted and established hawthorn. Other species include bramble and dog rose, with a high concentration of nettles along the base	24
H3	Native hedgerow	Newly planted with two established hawthorn trees. All planted hawthorns have tree guards	25
H4	Native hedgerow	Hedge extends into the centre of the Site from the northern boundary. Species include oak and hawthorn with elder (<i>Sambucus nigra</i>), bramble and ivy. Ground flora of nettle and garlic mustard (<i>Alliaria petiolata</i>)	26
H5	Native hedgerow with trees	Hedgerow largely unmanaged with trees to the northern end only, not along full length. Species present were oak, hawthorn, elm (<i>Ulmus procera</i>), holly and birch spp.	27
H6	Native species-rich hedgerow with trees	Mature hedge with occasional mature trees. Species present include mature oak, hawthorn, blackthorn, elder, ash and English bluebell	28
H7	Native hedgerow with trees	Hedge contains mature trees and has an associated ditch for the	29

Hedgerow number	Habitat classification	Description	Photo reference (Appendix 16)
	associated with ditch	majority of its length. Species present include oak, field maple, blackthorn, hawthorn, holly, elder, dog rose, elm, English bluebell, lesser stitchwort and honey suckle (<i>Lonicera periclymenus</i>)	
H8	Line of trees	Species present include copper plum (<i>Prunus cerasifera</i>) which have bracket fungus (<i>Basidiomycete</i>), horse chestnut, hazel, hawthorn, elder and bramble	30
H9	Native species-rich hedgerow with trees	Unmanaged hedgerow with abundant growth of bramble at the base. Species present include sycamore (<i>Acer pseudoplatanus</i>), ash, holly, hawthorn, elm, dog rose and blackthorn	31
H10	Native hedgerow with trees	Unmanaged hedgerow with large gaps evident. There are mature oak trees present with hawthorn and ivy	32
H11	Native species-rich hedgerow with trees	Comprises oak, field maple, blackthorn, holly, hawthorn, elder, dog rose and elm. H11 is functionally linked to hedgerow H7 due to its proximity	33
H12	Native species-rich hedgerow with trees associated with ditch	Comprises pedunculate oak, blackthorn, field maple, ash, elder, hawthorn and dog rose. H12 is functionally linked to H13 due to its proximity	34
H13	Native hedgerow with trees	Contains mature/veteran oak trees along a double corridor along the byway. Hedgerow is underplanted with a blackthorn hedge. Species include pedunculate oak, field maple, ash, elder, hawthorn and dog rose	35
H14	Line of trees associated with bank or ditch	Grown out previous hedge now forming line of trees with minimal understory. Species include pedunculate oak, ash, cherry (<i>Prunus spp.</i>), hawthorn, field maple, dog rose and blackthorn	36
H15	Native hedgerow with trees associated with ditch	Hedgerow with large volumes of bramble filling in gaps. Regular trees present throughout and a dry ditch running along the hedge. Species include ash, pedunculate oak, elm, hawthorn, blackthorn, dog rose and elder	37

Hedgerow number	Habitat classification	Description	Photo reference (Appendix 16)
H16	Native hedgerow associated with ditch	Hedgerow with a dry ditch running alongside it. Species included blackthorn, pedunculate oak, dog rose, hawthorn, dogwood and goat willow	38
H17	Native hedgerow with trees associated with ditch	Hedgerow with a ditch running alongside it that includes goat willow, hawthorn, honeysuckle, pedunculate oak, blackthorn, field maple and dog rose	39
H18	Native hedgerow with trees	Hedgerow dominated by blackthorn with mature and semi mature oak trees present throughout. Hedgerow runs along Old Wokingham Road	40
H19	Native hedgerow with trees	Hedgerow dominated by field maple and English oak. Hedgerow runs along Old Wokingham Road.	41
H20	Native hedgerow with trees	Hedgerow dominated by hawthorn and blackthorn. Hedgerow runs along Easthampstead road.	42
H21	Native hedgerow with trees	Hedgerow comprising English oak, goat willow, hawthorn, hazel, ivy and field maple	43
H22	Native hedgerow with trees	Hedgerow with high bramble occurrence, filling in gaps. Dead elm trees occurring throughout. Species include ash, pedunculate oak, blackthorn, hawthorn and elm	44
H23	Native hedgerow with trees associated with bank or ditch	Hedgerow comprising ash, blackthorn, hawthorn, hazel, elm, English oak, field maple, maple, sycamore and goat willow. The hedgerow runs along Easthampstead road.	45
H24	Line of trees associated with ditch	Overgrown hedgerow with minimal understory running alongside ditch. Bramble and nettle comprise the majority of the ground flora. Species include alder (<i>Alnus glutinosa</i>) with oak, hazel and blackthorn	46
H25	Line of trees	Line of trees comprising oak and hawthorn.	47
H26	Native hedgerow with trees associated with ditch	Hedgerow with dense woody vegetation at length of base. Comprises blackthorn, bramble, oak, field maple and ash saplings. Dock and nettle form majority of vegetation adjacent to the ditch.	48
H27	Native hedgerow with trees	Blackthorn and hawthorn hedge with occasional trees. The hedge has gaps and large spaces	49

Hedgerow number	Habitat classification	Description	Photo reference (Appendix 10.126)
		between trees. Species include blackthorn, hawthorn, ash and dog rose	
H28	Native species-rich hedgerow with trees	Ash, alder, blackthorn, common hawthorn, common hazel, English oak and field maple present	50
H29	Native hedgerow with trees	Hedgerow comprising hawthorn, birch, English oak and pine	51
H30	Native hedgerow with trees	Hedgerow comprising alder, ash, common hazel and English oak. The hedgerow runs along Easthampstead road.	52
H31	Native hedgerow with trees	Hedgerow comprising English oak, hawthorn and field maple	53

10.126 All of the hedgerows and lines of trees on Site qualify as Habitats of Principle Importance in England and they are assessed to be of Local importance for nature conservation.

Protected and Notable Species

NERC S.41 Mammals

10.127 Over fifty records of hedgehog within 2km of the Site were returned by the data search. The records were dated from between 2012 and 2022. Whilst no records were from within the Site itself, one record related to Old Wokingham Road adjacent to the northern boundary. The other records were scattered throughout the local area, with the majority being located within residential areas approximately 1km to the north-east and north-west of the site.

10.128 The Site is dominated by modified grassland with several parcels of other neutral grassland, both of which provide commuting and foraging opportunities for hedgehog. The hedgerows on Site provide connectivity to other suitable hedgehog habitats in the wider environment. During an ecological walkover undertaken in April 2022, a single hedgehog dropping was identified within the north-western area of the Site (Photo 54). It is therefore considered likely that hedgehogs are present on Site and utilising the hedgerows, mixed scrub, woodland parcels and grassland for foraging and commuting purposes.

10.129 Brown hare favour areas of open farmland with patches of long grass to 'lay-up' during the day. Whilst there are large areas of open grassland and a parcel of cropland on Site, they are generally maintained to a homogenous sward height, offering limited cover for brown hare. In addition, no evidence of brown hare was identified on Site and the data search did not return any records of them within proximity to the Site. As such, they are not considered further in this assessment.

10.130 Polecat are found in many habitats, including hedgerows, woodland and riverine habitats. Whilst these habitats are present on site, distribution records from the Vincent Wildlife Trust

(Croose, 2016¹⁸) suggest that polecats are sparsely distributed across the county, with only two records received as part of the 2014-2015 study to the area immediately west of Reading. Due to a lack of records of the species, it is considered unlikely that polecats are present on Site and they are scoped out of this assessment.

10.131 It assessed that the Site does not support any habitats suitable for harvest mouse. Given the lack of suitable habitat and the lack of records of harvest mouse within 2km of the Site, it is considered that they are absent and they are not discussed further.

10.132 Hedgehogs are listed as Species of Principal Importance for the conservation of biodiversity in England. Any animals using the site are likely to form part of a wider population within the local area, which would be of Local importance to nature conservation.

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Hazel Dormouse

10.136 Two records of hazel dormice within 2km of the Site were returned by the data search. Records included field signs, as well as individuals, and were located in Big Wood, Bracknell, approximately 300m north of the Site. The Site has connectivity with Big Wood via parcels of woodland and intersecting hedgerows.

10.137 The Site supports a range of native hedgerows and several parcels of woodland which offer foraging opportunities for hazel dormouse and connectivity with other suitable habitat in the wider area, such as Big Wood to the north.

¹⁸ Croose, E. (2016) *The Distribution and Status of the Polecat (Mustela putorius) in Britain 2014-2015*. The Vincent Wildlife Trust, Herefordshire.

10.138 Targeted hazel dormouse surveys were undertaken across the Site in 2022. Several wood mouse (*Apodemus sylvaticus*) and old bird nests were recorded within the nest tubes during the surveys (Photos 58 and 59), but no evidence of hazel dormouse was observed.

10.139 Whilst there is suitable hazel dormouse habitat in the wider area, and the Site has connectivity with these habitats, the results of the targeted surveys demonstrate that hazel dormice are not present on Site and they are scoped out of this assessment.

Riparian Mammals

10.140 The data search did not identify any records of otter or water vole within 2km of the Site.

10.141 There are watercourses on the Site in the form of Emm Brook, one of its tributaries, and an ephemeral wet ditch. These watercourses form part of the Emm Brook network and therefore have connectivity with the wider area. The banks of the watercourses are overgrown, resulting in significant shading of the bed. The terrestrial habitats on Site are of poor suitability for riparian mammals, offering limited cover for commuting animals.

10.142 The targeted surveys for otter and water vole did not identify any evidence of these species. Evidence of bank vole (*Clethrionomys glareolus*) was recorded in the form of droppings (Photo 60).

10.143 Given the poor suitability of the habitats on Site, the lack of evidence of otter and water vole, and the lack of records returned by the data search, it is assessed that they are absent from the Site and they are scoped out of this assessment.

Bats

10.144 Over four hundred records of bats within 2km of the Site were returned by the data search, none of which were located within the boundaries of the Site. Species included brown long eared bat (*Plecotus auritus*), common pipistrelle (*Pipistrellus pipistrellus*), Daubenton's bat (*Myotis daubentonii*), Leisler's bat (*Nyctalus leisleri*), Nathusius's pipistrelle (*Pipistrellus nathusii*), Natterer's bat (*Myotis nattereri*), noctule (*Nyctalus noctule*), serotine (*Eptesicus serotinus*), and soprano pipistrelle (*Pipistrellus pygmaeus*), as well as unidentified *Plecotus*, *Myotis* and *Pipistrellus* species. Records also included two individual records of the Annex II species Bechstein's bats (*Myotis bechsteinii*) and barbastelle bats (*Barbastella barbastellus*), both of which were located over 1.2km from the Site boundary.

10.145 Fifty-five of the records related to bat roosts within 2km. Due to the sensitivity of these records, their locations have only been provided with an accuracy of 1km and their precise locations are therefore unknown.

10.146 There were three EPS licences recorded within 2km of the Site relating to bats:

- 2014-4527-EPS-MIT granted for Brandt's, brown long-eared, common pipistrelle, soprano pipistrelle and whiskered bats in 2014 located 400m south;
- 2018-34805-EPS-MIT granted for brown long-eared and common pipistrelle in 2018 located 1.2km north-west; and

- EPSM2009-993 granted for common pipistrelle in 2009 located 1.9km north-east.

Habitat Assessment

- 10.147 The majority of the Site's area comprises modified grassland which is of low suitability for bats. However, the Site supports a variety of linear features, including hedgerows, lines of trees and watercourses, which are considered to provide valuable foraging and commuting opportunities for bats. These linear features provide connectivity with other valuable bat habitats in the wider area, namely the parcels of woodland within proximity to the Site. The two ponds in the north-west of the Site provide an additional foraging resource for bats. Overall, the Site was assessed to be of 'moderate' suitability for bats, in line with guidance (Collins, 2016).
- 10.148 During the habitat assessment, several of the mature trees on Site were observed to support low numbers of potential roosting features for bats. Given the retention and buffering of the boundary hedgerows and mature trees as part of the Proposed Development, it is assessed that direct impacts on bats potentially roosting within the trees will be avoided. Lighting impacts will be discussed within the Reserved Matters Application which will need to detail a maximum of 0.5 lux along the retained hedgerows to ensure that bats can continue to utilise potential roosting features.

Preliminary Roost Assessment

- 10.149 There are seventeen structures on Site, which are shown in **Figure 10.12**. One of the structures in the north-west of the Site is a residential dwelling which is in active use and six are associated outbuildings with a variety of uses. The remaining ten buildings are agricultural structures located towards the centre and south of the Site. Descriptions of the buildings on Site are provided in **Table 10.7** below, along with their suitability for roosting bats.

Figure 10.12 – Buildings on Site



Table 10.7 – Results of preliminary roost assessment

Building number	Description of structure and evidence of roosting bats	Suitability for roosting	Photo reference (Appendix
B1	A residential bungalow with an intersecting hip roof with stone and composite tiles, wooden barge boards, soffits and fascia. Tiles and roof structure are mostly in good condition, with only a few missing tiles noted. No corresponding gaps were observed from within the loft void. The structure has one brick chimney. The walls are constructed of painted brick and are in good condition with no potential features seen. The internal loft void comprises an A-frame of timber beams with sarking. Holes were seen in the sarking, but no light was observed coming through. It was therefore assessed that there were no potential access points for bats. Mouse droppings were found. No evidence of roosting bats observed.	Negligible	61 – 64

Building number	Description of structure and evidence of roosting bats	Suitability for roosting	Photo reference (Appendix)
B2	A single storey brick construction with a gable ended pitched roof structure. The roof has a timber frame with slate tiles and uPVC soffits. There are hanging wall tiles on the southern elevation, all in good condition apart from one that's missing. The northern elevation is timber clad. The roof has recently been fitted with new sparking. Internal inspection revealed no obvious access from the missing hanging wall tile. No evidence of roosting bats observed.	Negligible	65 – 67
B3	A brick open access barn with wooden beams and concrete floor. No obvious potential features seen externally on the structure for bats, however structure allows constant open access to the loft void inside. The body of the building is split into two sections, but the loft void spans both sections. The loft void is an open space with a timber A-frame. An open hatch leads directly from the loft void space into the barn below. Two clustered piles of dropping under the ridge beam in the loft void and scattered throughout the void. Eight live bats were seen, one was identified as a brown long-eared bat. Droppings were sent off for DNA analysis with a positive result for BLE received.	High	68 – 72
B4	A single storey shed of timber construction with corrugated asbestos cladding and a flat timber roof with felt cladding. The structure was open-sided on one side. No internal inspection was carried out for health and safety reasons, due to the presence of degraded asbestos. However, it was assessed to be of negligible suitability for bats due to amount of light entering the structure from the open side. No evidence of roosting bats observed.	Negligible	73
B5	A dilapidated timber shed with a once flat roof which is used for storage. It is open-sided and light inside. The structure does not have an internal loft void. No evidence of roosting bats observed.	Negligible	74 – 75

Building number	Description of structure and evidence of roosting bats	Suitability for roosting	Photo reference (Appendix
B6	A single storey timber shed with a slightly pitched felt roof. It is newly constructed and in active use. Looks clean and well-sealed with no suitable features for bats. The structure does not have an internal loft void. No evidence of roosting bats observed.	Negligible	76 – 77
B7	Timber clad, single skin, open-fronted structure with tiled, pitched roof. The internal structure is a timber frame with tiles directly attached and no separated loft void. There is no sarking and no evidence of suitable crevices for bats. No evidence of roosting bats observed.	Negligible	78 – 79
B8	Timber residential structure with cross gable felt tiled roof with breathable roofing membrane. The remaining externals are well sealed with no suitable access points or features for bats. There are small gaps below the ridge tiles and vents on western elevation and there is a split in the timber panelling on the northern elevation providing potentially suitable crevices for bats. However, these are of limited suitability and the adjacent habitats are of negligible to low value for bats. No evidence of roosting bats observed.	Negligible	80 – 83
B9	Open vaulted and open fronted cow shed. The western aspect is timber panelled and the remaining aspects are open. A breeze block and brick lower wall supports the timber panels on the western aspect. The roof is supported by timber roof joists. The roof is made of corrugated asbestos with plastic skylights. The structure comprises unsuitable materials for bats and is open and exposed. No evidence of roosting bats observed.	Negligible	84 – 85
B10	Same construction materials and design as B9. No evidence of roosting bats observed.	Negligible	86
B11	Agricultural barn which was in construction at the time of survey and therefore had no roof and sides. It is considered that the completed structure will be of the same construction and design as B9 and B10.	Negligible	87

Building number	Description of structure and evidence of roosting bats	Suitability for roosting	Photo reference (Appendix)
B12	Open sided and fronted prefab agricultural barn. It has a steel corrugated roof over steel frames and half height concrete blocks. There is no internal loft void and the interior is light, exposed and thermally unstable. No evidence of roosting bats observed.	Negligible	88 – 90
B13	Open fronted and vaulted, corrugated metal and asbestos agricultural barn with a breeze block and brick lower wall. The structure comprises unsuitable materials for bats and is open and exposed. No evidence of roosting bats observed.	Negligible	91 – 92
B14	Open, metal panelled agricultural storage structure with a breeze block and brick lower wall. The structure comprises unsuitable materials for bats and is open and exposed. No evidence of roosting bats observed.	Negligible	91 – 92
B15	Open fronted and vaulted, corrugated metal and asbestos agricultural barn with a breeze block and brick lower wall. The structure comprises unsuitable materials for bats and is open and exposed. No evidence of roosting bats observed.	Negligible	91 – 92
B16	Open access block, wood panel and corrugated metal structure, potential pigsty usage. The structure comprises unsuitable materials for bats and is open and exposed. No evidence of roosting bats observed.	Negligible	91 – 92
B17	Corrugated metal, single-storey metal storage container. The structure comprises unsuitable materials for bats. No evidence of roosting bats observed.	Negligible	91 – 92

DNA Analysis

10.150 Droppings obtained from the loft void of building B3 were sent to the University of Warwick for analysis. The results demonstrated that the droppings belong to brown long-eared bats. The results of the analysis can be found in **Appendix 10.5**.

Emergence Surveys

10.151 Emergence surveys were carried out on building B3 which was already confirmed as an active roost due to the presence of bat droppings and the sighting of eight live bats roosting

within the loft void. The detailed results of the emergence surveys are provided in **Appendix 10.2** and a summary is provided below:

- Brown long-eared (BLE) bats were observed emerging from building B3 during both emergence surveys in June and July 2022.
- On 23rd June 2022 a BLE was identified exiting the structure through the open front on the eastern elevation (Photo 93), re-entering the structure one minute later and continuing to exit and re-enter the building over a period of three minutes. Three other BLE were identified exiting and re-entering the structure via the same access point later during the survey.
- On 28th July 2022, a BLE was identified emerging from the structure through the open front on the eastern elevation and re-entering the structure shortly after to forage in the open barn.
- During both surveys, it was confirmed that the bats had exited B3 via the open hatch (Photo 73), found towards the centre of the structure, which opens into the loft void space. The bats scattered on exit with no regular commuting route away from the roost.

10.152 The observations made during the emergence surveys were supported by thermal imaging to increase confidence in the results

Activity Surveys

10.153 Seven activity transect surveys were undertaken between April and October 2022 with eight species recorded, namely common pipistrelle, soprano pipistrelle, noctule, serotine, brown long-eared bat, Natterer's bat, Daubenton's bat and unidentified *Myotis* species.

10.154 Detailed results of the activity surveys are provided in the corresponding Technical Appendices for the Lightwood Site, NKH Site and joint NKH and Lightwood Site (**Appendices 10.1 – 10.3**). A summary of the activity survey results is provided below:

- The highest levels of activity were recorded between May and July 2022.
- Activity levels were highest along the northern boundary (hedgerows H1 – H6 and H13 – H17) and along the Emm Brook tributary, although activity was fairly consistent along all of the Site boundaries.
- Common pipistrelle was the most frequently recorded species for each survey undertaken. Low numbers of noctule, soprano pipistrelle, brown long-eared bat and *Myotis* species were also recorded.
- *Myotis* species were only recorded during the surveys undertaken in May, August and October 2022.
- Brown long-eared bat were only recorded during the surveys undertaken in May, June and August 2022.

- Common pipistrelles were frequently observed foraging around the mature oak trees within the Site's boundary hedgerows.
- Overall, activity at the Site was assessed to be low.

Static Detector Surveys

10.155 Twelve species were recorded during the static detector surveys, as demonstrated in **Table 10.8** below. Species included barbastelle, Bechstein's bat, Brandt's/whiskered bat, brown long-eared bat, common pipistrelle, Daubenton's bat, Leisler's bat, Nathusius's pipistrelle, Natterer's bat, noctule, serotine and soprano pipistrelle.

10.156 Detailed results of the static detector surveys are provided in **Appendix 10.6**. A summary of the static detector surveys is provided below:

- The highest number of calls were recorded during the June and July 2022 survey periods.
- Common pipistrelle comprised 71% of total calls recorded, followed by soprano pipistrelle (24%). Low numbers of barbastelle (0.25%) and Bechstein's bat (0.01%) were recorded across the Site. Brown long-eared bat calls made up 1.24% of the total calls recorded.
- The highest numbers of calls were recorded by the static detectors located at location B2, within the small parcel of woodland adjacent to the confluence of the ditch and Emm Brook tributary, and A1 and A2 located along the northern boundary of the north-western part of the Site.
- The highest number of brown long-eared bat calls were recorded during the June and August survey periods, with activity focused in the north-western part of the Site.
- Between 1 and 50 barbastelle bat calls were recorded each month, whereas Bechstein's bats were only recorded during the April, May and October surveys periods, with a maximum of 3 calls per month.

Table 10.8 – Static detector survey results

Species	Number of calls recorded	Percentage of total calls recorded	Importance (species 2022) ¹⁹
Barbastelle	138	0.25	4
Bechstein's Bat	8	0.01	4
Brandt's/Whiskered Bat	426	0.76	2
Brown Long-eared Bat	694	1.24	4
Common Pipistrelle	39524	70.68	1

¹⁹ Reason, P.F. and Wray, S. (2023) *UK Bat Mitigation Guidelines: a guide to impact assessment, mitigation and compensation for developments affecting bats*. Chartered Institute of Ecology and Environmental Management, Ampfield.

Species	Number of calls recorded	Percentage of total calls recorded	Importance (species 2023 ²⁰)
Daubenton's Bat	209	0.37	2
Leisler's Bat	17	0.03	3
Nathusius' Pipistrelle	84	0.15	3
Natterer's Bat	468	0.84	2
Noctule	1100	1.97	2
Serotine	72	0.13	3
Soprano Pipistrelle	13182	23.57	1
Total	55922		31

Assessment

- 10.157 The results of the targeted bat surveys demonstrate the presence of a brown long-eared maternity roost within building B3, with a maximum count of eight bats. In line with guidance (Reason and Wray, 2023²⁰), this roost is assessed to be of District importance for nature conservation.
- 10.158 The results of the targeted surveys demonstrate that the key features for bats are the boundary hedgerows, particularly in the north-west of the Site, and Emm Brook tributary. These features are assessed to be utilised for both foraging and commuting purposes, and the north-western hedgerows are assessed to be utilised by brown long-eared bats emerging from the maternity roost within building B3.
- 10.159 The results of the static detector and activity transect surveys demonstrate that the assemblage of bats is dominated by common pipistrelle bats. Whilst common pipistrelle bats are abundant across the UK, the Site provides valuable foraging resources for this species and connectivity with other suitable habitat in the wider area.
- 10.160 In addition, the Site provides foraging and commuting habitat for low numbers Annex II species of bats, namely Barbastelle and Bechstein's bats, and foraging and commuting opportunities for brown long-eared bats utilising the maternity roost on Site. As such, the overall assemblage of bats utilising the Site is assessed to be of District importance for nature conservation, in line with the guidance (Reason and Wray, 2023) on the species present and functional habitat associated with a brown long-eared maternity roost.

Birds

- 10.161 The data search returned over one thousand records of birds within 2km of the Site. Records of species listed within Schedule 1 of the Wildlife and Countryside Act 1981 included black redstart (*Phoenicurus ochruros*), brambling (*Fringilla montifringilla*), crossbill (*Loxia*

²⁰ Reason, P.F. and Wray, S. (2023) *UK Bat Mitigation Guidelines: a guide to impact assessment, mitigation and compensation for developments affecting bats*. Chartered Institute of Ecology and Environmental Management, Ampfield.

curvirostra), fieldfare (*Turdus pilaris*), firecrest (*Regulus ignicapilla*), green sandpiper (*Tringa ochropus*), hobby (*Falco subbuteo*), kingfisher (*Alcedo atthis*), peregrine (*Falco peregrinus*), red kite (*Milvus milvus*), redwing (*Turdus iliacus*), and wood lark (*Lullula arborea*).

- 10.162 Records of species listed on the Birds of Conservation Concern (BoCC) Red and Amber lists included barnacle goose (*Branta leucopsis*), black-headed gull (*Chroicocephalus ridibundus*), bullfinch (*Pyrrhula pyrrhula*), common gull (*Larus canus*), common redpoll (*Acanthis flammea*), common sandpiper (*Actitis hypoleucos*), common tern (*Sterna hirundo*), cuckoo (*Cuculus canorus*), dunnoek (*Prunella modularis*), gadwall (*Mareca strepera*), greenfinch (*Chloris chloris*), grey wagtail (*Motacilla cinerea*), greylag goose (*Anser anser*), hawfinch (*Coccothraustes coccothraustes*), herring gull (*Larus argentatus*), house martin (*Delichon urbicum*), house martin (*Passer domesticus*), kestrel (*Falco tinnunculus*), lapwing (*Vanellus vanellus*), lesser black-backed gull (*Larus fuscus*), lesser spotted woodpecker (*Dryobates minor*), linnet (*Linaria cannabina*), mallard (*Anas platyrhynchos*), meadow pipit (*Anthus pratensis*), mistle thrush (*Turdus viscivorus*), moorhen (*Gallinula chloropus*), nightjar (*Caprimulgus europaeus*), pochard (*Aythya farina*), redstart (*Phoenicurus phoenicurus*), reed bunting (*Emberiza schoeniclus*), ring ouzel (*Turdus torquatus*), rook (*Corvus frugilegus*), sedge warbler (*Acrocephalus schoenobaenus*), shoveler (*Spatula clypeata*), skylark (*Alda arvensis*), snipe (*Gallinago gallinago*), song thrush (*Turdus philomelos*), sparrowhawk (*Accipiter nisus*), spotted flycatcher (*Muscicapa striata*), starling (*Sturnus vulgaris*), stock dove (*Columba oenas*), swift (*Apus apus*), tawny owl (*Strix aluco*), teal (*Anas crecca*), tree pipit (*Anthus trivialis*), turtle dove (*Streptopelia turtur*), wheatear (*Oenanthe oenanthe*), whinchat (*Saxicola rubetra*), whitethroat (*Curruca communis*), widgeon (*Mareca penelope*), willow warbler (*Phylloscopus trochilus*), woodcock (*Scolopax rusticola*), woodpigeon (*Columba palumbus*), and wren (*Troglodytes troglodytes*).
- 10.163 The habitats on Site are dominated by large parcels of open modified grassland which provides some opportunities for ground nesting birds. Whilst many of the parcels appear to be regularly managed, it is assessed that there is suitability for ground nesting birds due to the scale and open nature of the habitat.
- 10.164 The boundary hedgerows, areas of scrub and woodland could provide potential breeding habitats for common and widespread species of birds.
- 10.165 It is considered that the watercourses and ponds on Site may provide some potential habitat for common species of waterfowl. However, as the water levels were observed to be low within the watercourses, and the larger of the ponds was observed to sometimes dry out, the suitability for waterfowl was assessed to be poor.
- 10.166 During the bat surveys undertaken in July and August 2022, a single barn owl (*Tyto alba*) was seen foraging in the north-western part of the Site. There are no suitable roosting features on Site for breeding barn owls, however, the unmanaged parcel of modified grassland in the north-west of the Site could provide suitable foraging habitat for barn owls.
- 10.167 Tawny owl was heard along hedgerow H7, which runs adjacent to the byway in the north-west of the Site, during a bat survey undertaken in July 2022. Tawny owl may utilise the

mature hedgerows on Site to hunt and will likely be nesting in woodland within 1km of the Site.

- 10.168 During the preliminary roost assessment for bats, several bird nests were identified within the buildings in the north-west of the Site. One nest was recorded on the north-east gable end of building B1 (Photo 94), one nest was observed behind a missing tile within the loft space of building B2 (Photo 95), ten house martin nests were recorded inside building B3 (Photo 96) and a blackbird nest was found within hedgerow H7 (Photo 97).
- 10.169 Overall, the desk study identified several Red List and Amber List species found within a 2km radius of the Site, including several records of ground nesting species. Nests for house martin, a Red List species, were found on Site, giving evidence of the Site's importance for breeding. Due to the mix of favourable habitats on Site for breeding birds, it is considered that the likely assemblage of birds present within the hedgerows, woodland and potentially nesting on the ground, is of Local importance for nature conservation.

Reptiles

- 10.170 The data search returned one hundred and seventeen records of reptiles within 2km of the Site. The records were dated from between 1995 and 2023 and included records of adder (*Vipera berus*), common lizard (*Zootoca vivipara*), grass snake (*Natrix helvetica*) and slow worm (*Anguis fragilis*).
- 10.171 Slow worm accounted for ninety of the reptile records. None of the records were located within the Site boundaries. The majority were located approximately 600m to the north and south-east. The closest record was located 520m to the south-east of the Site.
- 10.172 There were eight records of grass snake, the closest of which was located approximately 590m east of the Site. The remaining records were located between 1.25km and 1.45km from the Site boundary.
- 10.173 There were seventeen records of common lizard, the closest of which was approximately 620m north of the Site. The most recent record, from 2023, was located in the Gorick plantation, approximately 1.4km to the south-west of the Site.
- 10.174 Only two records of adder were returned by the data search, one of which was an historical record. The more recent record, dated from 2018, was located in Beaufort Park 1km to the south-east of the Site.
- 10.175 The Site is dominated by grassland parcels which offer limited suitability for reptiles due to their management regime. The brook tributary is bordered by unmanaged habitats and provides foraging opportunities for reptiles, particularly grass snakes. The boundary hedgerows provide connectivity with the suitable reptile habitat on Site and within the wider area.
- 10.176 Targeted reptile surveys were undertaken in 2022, the results of which are provided in **Table 10.9**. The maximum count recorded throughout the surveys was seven grass snakes. One slow worm was also recorded on Site.

Table 10.9 – Reptile survey results

Survey number	Date	Temp (°C)	Wind (m/s)	Humidity (%)	Cloud cover (oktas)	Results
1	05/05/2022	15	8	63	5	None
2	12/05/2022	18	4	45	6	5 grass snakes
3	16/05/2022	18	1.6	61	5	7 grass snakes
4	01/06/2022	17	0.8	56	7	1 grass snake and 1 slow worm
5	23/08/2022	19	0.9	73	3	None
6	27/09/2022	16	0	70	6	None
7	05/10/2022	17	7	83	8	None

10.177 Overall, the results of the reptile surveys demonstrate that the Site supports a 'low' population of slow worms and a 'good' population of grass snakes. The suitable reptile habitat on Site is restricted to the bank tops of the tributary which runs across the centre of the Site.

10.178 Both slow worm and grass snake are Species of Principal Importance in England and the reptiles utilising the Site are assessed to be of Local importance for nature conservation.

Amphibians

10.179 Eighty-nine amphibian records within 2km of the Site were identified by the data search. Records related to great crested newt (*Triturus cristatus*), palmate newt (*Lissotriton helveticus*), smooth newt (*Lissotriton vulgaris*), common frog (*Rana temporaria*) and common toad (*Bufo bufo*). They were dated from between 1998 and 2023.

10.180 Twenty-four of the records related to GCN, of which two were in close proximity to the Site. One was located within a residential garden approximately 60m beyond the northern Site boundary and the other was located within a residential garden approximately 90m beyond the western boundary.

10.181 UK BAP species common toad accounted for fifteen of the records, with records dated from between 1998 and 2021. The closest of these was located approximately 375m west of the Site within fishing ponds.

Habitat Assessment

10.182 The Site is dominated by modified grassland fields which offer some suitable terrestrial habitat for amphibians. However, many of the parcels are regularly managed, reducing the suitability. The key terrestrial habitats are assessed to be the unmanaged grassland field in the north-west of the Site, the fringe habitats adjacent to the watercourses on Site, and the hedgerows which provide cover for commuting amphibians.

- 10.183 The Site has good connectivity with suitable GCN habitat in the wider area due to the abundance of hedgerows which border the grassland fields. However, the parcels of arable land adjacent to the Site are terrestrial habitats of low value for GCN due to a lack of cover opportunities.
- 10.184 The desk study identified twenty-three ponds within 500m of the Site, two of which are located in the north-western part of the Site (ponds P1 and P2 in **Figure 10.7**). As described previously, P1 is an ornamental pond with associated formal planting (Photo 21) and P2 is an artificial folly pond which has been observed to dry-out and is bordered by mixed scrub (Photo 22). Whilst the scrub around P2 offers suitable cover for GCN, the pond itself is densely vegetated (Photo 98), reducing the suitability for breeding GCN.
- 10.185 Of the off-Site ponds, the only two which were accessible for surveying were ponds P3 and P4, located in close proximity to the southern boundary of the Site (Photos 99 and 100). Both ponds are private fishing ponds stocked with fish, making them unsuitable for breeding GCN.
- 10.186 Ponds P5 – P17 to the south-east and the south-west could not be accessed for assessment. However, they are all separated from the Site by roads which are considered to be barriers to amphibian dispersal.
- 10.187 Ponds P18 – P20 are located approximately 150m north of the Site and appear to be located within suitable terrestrial habitat for GCN. The data search identified GCN records in proximity to the Site and the GPS location provided indicates that the record was located in one of these ponds.
- 10.188 Ponds P21 and P22 are recently created (post-2020) road drainage ponds which are assessed as unsuitable for breeding GCN. Pond P23 is surrounded by unsuitable terrestrial habitats for GCN, namely urban and arable habitats, and therefore does not have connectivity with the Site.

HSI Scoring

- 10.189 Pond P1 had an HSI score of 0.627 and is therefore assessed to be of 'average' suitability for GCN. Pond P2 had a score of 0.52 which equates to 'below average' suitability.
- 10.190 HSI scores were also calculated for the off-Site ponds, P3 and P4. Pond P3 had a score of 0.299 and was assessed to be of 'poor' suitability for GCN. Pond P4 was also assessed to be of 'poor' suitability, with an HSI score of 0.250.
- 10.191 The full HSI scoring can be found in **Appendix 10.7**.

eDNA Surveys

- 10.192 eDNA surveys were undertaken on ponds P1 – P4. Each of the ponds were negative for GCN DNA.
- 10.193 The results of the eDNA surveys are provided in **Appendix 10.8**.

Assessment

- 10.194 Based on the results of the targeted GCN surveys, it is confirmed that the ponds on Site do not support breeding GCN. The majority of the terrestrial habitats on Site are of limited suitability for commuting GCN, with the hedgerows providing some connectivity with the wider area. However, most of the potentially suitable breeding waterbodies in proximity to the Site are separated by ecological barriers, namely roads.
- 10.195 Whilst the data search identified records of GCN in close proximity to the northern boundary of the Site, it is assessed as unlikely that they are commuting or foraging across the Site due to the limited suitability of the terrestrial habitats and the presence of ecological barriers separating the habitats on Site from the potentially suitable breeding habitats within 500m. GCN are therefore considered absent from the Site and are scoped out of this assessment.
- 10.196 It is considered that the Site supports suitable habitat for common amphibian species, such as common frog and common toad, but that it is not of particular nature conservation importance for these species. As such, amphibians are not discussed further in this assessment.

Invertebrates

- 10.197 The data search returned over one hundred records of invertebrates which were dated between 1993 and 2023. Ninety-eight of the records related to the nationally scarce stag beetle (*Lucanus cervus*), all of which were located beyond the Site boundary. The closest record was located within residential gardens at Holme Green just beyond the western boundary of the Site. The remaining records were scattered around the local area with the majority coming from residential gardens approximately 1km to the north-west.
- 10.198 Other notable species records included the Schedule 41 species small heath (*Coenonympha pamphilus pamphilus*), blood vein moth (*Timandra comae*), cinnabar moth (*Tyria jacobaeae*), dot moth (*Melanchra persicariae*), forester moth (*Adscita statices*), knot grass moth (*Acrionicta rumicis*), olive crescent moth (*Trisateles emortualis*), rustic moth (*Hoplodrina blanda*), shaded broad-bar moth (*Scotopteryx chenopodiata*), and white ermine moth (*Spilosoma lubricipeda*), none of which were located within the Site boundary.
- 10.199 The Site is dominated by species-poor modified grassland which is a low value habitat for invertebrates. The key features for invertebrates are assessed to be the Emm Brook tributary and the trees present within the parcels of woodland and boundary hedgerows. In particular, there are several mature oak trees present in the boundary hedgerows which provide suitable habitat for nationally scarce stag beetles, which were identified in the data search.
- 10.200 Whilst nationally scarce, stag beetles are more widely distributed across the south and south-east of the UK than other regions. As such, any stag beetles utilising the mature trees within the site boundaries are considered to be of Local importance for nature conservation.
- 10.201 Given the limited value of the dominant habitats on Site, it is assessed that the remaining assemblage of invertebrates is unlikely to be of particular importance for nature conservation and they are not discussed further.

Summary of Important Ecological Features

10.202 The important ecological features listed in **Table 10.10** below have the potential to be affected by impacts arising from the Proposed Development. Potential effects on the important ecological features are discussed in Section 10.6.

Table 10.10 – Important Ecological Features

Ecological feature	Value of ecological feature	Sensitivity of receptor
Thames Basin Heath SPA, including Broadmoor to Bagshot Woods and Heaths	International	High
Ancient woodland	District	Medium
Adjacent Wokingham Road/Peacock Lane LWS	District	Medium
Big Wood LWS, Peacock Meadows LWS and Gorrick Plantation LWS	District	Medium
Deciduous woodland	Local	Low
Other woodland; broadleaved	Local	Low
Emm Brook tributary and Emm Brook (non-priority river)	Local	Low
Ditch	Local	Low
Hedgerows	Local	Low
Hedgehog	Local	Low
Brown long-eared bat maternity roost	District	Medium
Bats	District	Medium
Birds	Local	Low
Reptiles	Local	Low
Stag beetles	Local	Low

Future Baseline Conditions

10.203 Given the current function and management of the Site for a mixture of agricultural, residential and equestrian uses, it is expected that the future baseline conditions of the Site would be the same as, or very similar to, those outlined in Section 10.5 in the absence of the Proposed Development.

Assessment of Effects

Assessment of Effects During Construction

Designated Sites

Thames Basin Heath SPA and Broadmoor to Bagshot Woods and Heaths SSSI

- 10.204 The Site is located at a sufficient distance from Thames Basin Heath SPA and Broadmoor to Bagshot Woods and Heaths SSSI that indirect impacts during the construction phase are expected to be avoided. It is therefore considered that the effects on Thames Basin Heath SPA and Broadmoor to Bagshot Woods and Heaths SSSI during construction will be **negligible**.

Ancient Woodland

- 10.205 There are four small parcels of ancient woodland within 100m of the Site boundary. In the absence of mitigation, indirect impacts could include damage from construction pollution. This would result in a **short-term minor adverse effect** on the ancient woodland within proximity to the Site.

Adjacent Wokingham Road/Peacock Lane LWS

- 10.206 Adjacent Wokingham Road/Peacock Lane LWS is located adjacent to the Site boundary on the opposite side of Old Wokingham Road. In the absence of mitigation, impacts could include damage from construction pollution. This would result in a **short-term minor adverse effect** on Adjacent Wokingham Road/Peacock Lane LWS.

Big Wood LWS, Peacock Meadows LWS and Gorrick Plantation LWS

- 10.207 The Site is located at a sufficient distance from Big Wood LWS, Peacock Meadows LWS and Gorrick Plantation LWS that indirect impacts during the construction phase are expected to be avoided. It is therefore considered that the effects on Big Wood LWS, Peacock Meadows LWS and Gorrick Plantation LWS during construction will be **negligible**.

Habitats

Deciduous Woodland (Off-Site)

- 10.208 In the absence of mitigation, indirect impacts on the nearby parcels of deciduous woodland could include damage from construction pollution. This would result in a **short-term minor adverse effect** on the deciduous woodland within proximity to the Site.

Other Woodland; Broadleaved

- 10.209 The broadleaved woodland on Site is due to be retained as part of the Proposed Development. In the absence of mitigation, the woodland could experience direct and indirect impacts during construction. This includes damage to Root Protection Zones (RPZ) and damage from construction pollution. This would result in a **short-term minor adverse effect** on the woodland on Site.

Emm Brook Tributary and Emm Brook

- 10.210 The Proposed Development includes the creation of one 10m long culvert and four footbridges over the Emm Brook tributary. The footprint of each bridge will be approximately

5m in width. Proposals also include reshaping of the tributary banks to reduce the over-deepening which was identified throughout the watercourse.

10.211 In the absence of mitigation, indirect impacts on the Emm Brook tributary and Emm Brook include changes in water quality due to construction pollution. In addition, potential direct impacts on the Emm Brook tributary include damage from heavy machinery to the retained sections of bank, resulting in changes to the structure and flow of the watercourse. The creation of culverts and footbridges will also result in the permanent loss of natural bank features and works to reshape the bank will result in a short-term loss of bank vegetation.

10.212 In the absence of mitigation, the potential impacts would result in a **long-term minor adverse effect** on the Emm Brook tributary, with Emm Brook experiencing only **short-term minor adverse effects during the construction phase**.

Ditch

10.213 The Proposed Development includes the creation of two new culverts along the ditch, totalling approximately 27m in length, and the addition of three footbridges over the ditch. The footprint of each bridge will be approximately 5m in width.

10.214 Impacts on the ditch on Site could include damage from heavy machinery to the retained sections of bank adjacent to the new culverts and changes in water quality due to construction pollution. The Proposed Development will also result in the long-term loss of natural bank features due to increased culverting and the addition of footbridges. These impacts would result in a **long-term minor adverse effect** on the ditch.

Hedgerows

10.215 The Proposed Development includes the removal of a total of approximately 110m of hedgerow to provide access points across the Site. The sections of hedgerow being removed vary in size from between approximately 10m and 50m and the access points have been selected to incorporate existing gaps between mature trees. Potential impacts on protected and notable species in relation to this hedgerow loss are discussed in the relevant sections.

10.216 The remaining hedgerows on Site are due to be retained as part of the Proposed Development. Impacts on the retained hedgerows could include damage to RPZ and damage from construction pollution.

10.217 In the absence of mitigation, the loss of hedgerow would result in a **long-term minor adverse effect** on the hedgerows on Site.

Protected and Notable Species

Hedgehog

10.218 The Site supports hedgehog and in the absence of mitigation, impacts on hedgehog could occur during Site clearance, comprising injury or mortality of hedgehogs foraging and commuting over the Site. Impacts could also include disruption to any hedgehog commuting across the Site during the construction phase due to insensitive construction lighting. These

potential impacts would result in a **short-term minor to moderate adverse effect** on hedgehogs.

Brown Long-Eared Bat Maternity Roost

- 10.219 A brown long-eared bat maternity roost was identified within the loft void of building B3 in the north-west of the Site. Building B3 is due to be demolished as part of the Proposed Development.
- 10.220 The north-western hedgerows provide foraging and commuting opportunities for the brown long-eared bats emerging from building B3. The proposed works to provide access to the byway in the north-west of the Site and a connection between the NKH Site and Lightwood Site will result in the creation of gaps approximately 10m in width in hedgerows H11 and H12 along with new artificial lighting to the proposed road. Hedgerows H11 and H12 provide connectivity between the north-western part of the Site and Emm Brook tributary, which was assessed to be another key feature for bats. Gaps of approximately 10m are considered sufficient to impede commuting and foraging activity (Entwistle *et al.*, 2001²¹). In addition, this is a light sensitive species and the required lighting to meet road requirements are likely to reduce the commuting and foraging suitability of this area.
- 10.221 In the absence of mitigation, impacts include the loss of a brown long-eared bat maternity roost which is assessed to be of District importance for nature conservation. This would result in a **long-term major adverse effect** on the breeding success of the District's brown long-eared bat population.

Bats

- 10.222 The Site supports an assemblage of bats dominated by common and widespread species, with low numbers of Annex II species. Bats were found to be utilising the boundary hedgerows and Emm Brook tributary for both foraging and commuting purposes.
- 10.223 In the absence of mitigation, the Proposed Development will result in the total loss of approximately 110m of hedgerows, which were assessed to be key features for bats. Whilst this will therefore result in a loss of foraging and commuting habitat for bats, the overall loss comprises only a small proportion of the hedgerow provision on Site (110m of approximately 5.3km, equating to 2%) and any related adverse effects on bats are therefore expected to be **negligible**.
- 10.224 Creation of gaps within linear features can lead to disruption of foraging and commuting activity through habitat fragmentation. The gaps being created within the hedgerows vary in size from between approximately 10m and 50m, focusing on existing gaps between mature trees. The large access gap of 50m will be located along hedgerow H18 on the eastern boundary of the Site and it is considered that a gap of this size would impede foraging and commuting activity. However, this section of hedgerow was not identified as an area of high

²¹ Entwistle, A.C., Harris, S., Hutson, A.M., Racey, P.A., Walsh, A., Gibson, S.D., Hepburn, I. and Johnston, J. (2001) *Habitat management for bats - a guide for land managers, land owners and their advisors*. Joint Nature Conservation Committee, Peterborough.

activity for bats and the overall connectivity of the Site with the wider area will be retained along the northern and western boundaries.

- 10.225 The proposed works to provide access to the byway in the north-west of the Site and a connection between the NKH Site and Lightwood Site will result in the creation of gaps approximately 10m in width in hedgerows H11 and H12. The northern hedgerows (H1-H6 and H13-H17) were assessed to support higher levels of foraging and commuting activity compared to the other boundary hedgerows, and these are directly connected to hedgerows H11 and H12. In addition, hedgerows H11 and H12 provide connectivity between the north-western part of the Site and Emm Brook tributary, which was assessed to be another key feature for bats. The proposed gaps are approximately 10m in width and gap of this size is considered sufficient to impede commuting and foraging activity (Entwistle *et al.*, 2001²²).
- 10.226 The assemblage comprises light-sensitive species of bats such as barbastelle, Bechstein's and brown long-eared bats. Potential impacts during the construction phase could therefore include disruption of commuting and foraging activity due to insensitive construction lighting. In addition, potential impacts to commuting and foraging bats could occur through damage to retained suitable habitat, namely the hedgerows, during construction.
- 10.227 The Proposed Development includes reshaping of the tributary banks during the construction phase. This is expected to result in a short-term loss of vegetation along the tributary which will reduce the value for foraging bats, but not impede its use as a commuting feature.

Overall, in the absence of mitigation, it is expected that the potential construction impacts would result in a **long-term moderate adverse effect** on the Site's assemblage of bats.

Birds

- 10.228 The Site offers potential for both ground nesting birds and more common and widespread species of garden and woodland birds. In the absence of mitigation, impacts on birds could occur during Site clearance. Impacts could include damage or destruction of bird nests, or disturbance of nesting birds.
- 10.229 The majority of the valuable habitat for garden and woodland birds, such as the boundary hedgerows and woodland parcels, will be retained. However, the Proposed Development will result in the loss of approximately 37ha of ground nesting bird habitat from the Site, namely the parcels of open grassland, the loss of foraging habitat for barn owls, and the destruction of buildings which were found to support birds nests.
- 10.230 In the absence of mitigation, these impacts would result in a **long-term moderate adverse effect** on birds.

Reptiles

- 10.231 The Site supports a low population of slow worms and a good population of grass snakes. The suitable reptile habitat on Site is restricted to the bank tops of the Emm Brook tributary.

²² Entwistle, A.C., Harris, S., Hutson, A.M., Racey, P.A., Walsh, A., Gibson, S.D., Hepburn, I. and Johnston, J. (2001) *Habitat management for bats - a guide for land managers, land owners and their advisors*. Joint Nature Conservation Committee, Peterborough.

In the absence of mitigation, impacts on reptiles could occur during clearance of vegetation in proximity to the tributary, during creation of new culverts and footbridges, and during reshaping of the watercourse. Potential impacts comprise injury or mortality of reptiles from machinery.

10.232 Due to the increase in culverting and the addition of footbridges along the tributary, the Proposed Development would result in the loss of suitable reptile habitat during the construction phase.

10.233 In the absence of mitigation, these potential impacts would result in a **long-term minor to moderate adverse effect** on reptiles.

Stag Beetles

10.234 The mature trees within the boundary hedgerows provide suitable habitat for stag beetles. The Proposed Development includes the retention of the majority of the trees on Site, with the new access points focusing on existing gaps between mature trees to minimise loss. Given the negligible habitat loss expected, it is assessed that the effects on stag beetles during construction will be **negligible**.

Assessment of Effects During Operation

Designated Sites

Thames Basin Heath SPA and Broadmoor to Bagshot Woods and Heaths SSSI

10.235 The Proposed Development will result in an increase in residential dwellings within the 5km buffer zone for Thames Basin Heath SPA. The Proposed Development therefore has the potential to impact the integrity of Thames Basin Heath SPA and Broadmoor to Bagshot Woods and Heaths SSSI through increased residential pressure. Potential impacts include disturbance to ground nesting birds such as Dartford warbler, nightjar and woodlark for which the SPA is designated. Disturbance can arise from recreational activities such as walking, dog-walking, and cycling, and can impact the breeding success of these species. Potential impacts could also include degradation of habitats due to an increase in traffic pollution from visitors, nitrification of habitats, and contamination through litter, dog fouling and introduction of invasive species.

10.236 In the absence of mitigation, the completed development would result in a **long-term moderate adverse effect** on Thames Basin Heath SPA and Broadmoor to Bagshot Woods and Heaths SSSI.

Ancient Woodland

10.237 Most of the ancient woodland parcels within 2km of the Site are relatively small in size compared to the abundance of recreational spaces in the wider area and they are therefore not expected to attract a significant number of visitors. However, several of the parcels form Big Wood LWS which is assessed to have the potential to experience an increase in recreational pressure.

10.238 In the absence of mitigation, potential impacts on the ancient woodland within Big Wood LWS could include damage to the understorey from trampling and damage to vegetation

through increased traffic pollution associated with an increase in visitors (Ryan, 2012²³). It could also include a variety of other direct and indirect impacts associated with an increase in visitors, including nitrification, contamination (e.g. litter, dog fouling, invasives), harvesting, health and safety, and visitor expectations (Carr, 2021²⁴). These potential impacts would result in a **long-term minor adverse impact** on ancient woodland.

Adjacent Wokingham Road/Peacock Lane LWS

- 10.239 Whilst Adjacent Wokingham Road/Peacock Lane LWS lies adjacent to the Site, it is not expected to experience a significant increase in residential pressure due to its small size. As such, it is expected that Adjacent Wokingham Road/Peacock Lane LWS **will not experience any significant operational effects**.

Big Wood LWS, Peacock Meadows LWS and Gorrick Plantation LWS

- 10.240 Big Wood LWS, Peacock Meadows LWS and Gorrick Plantation LWS are all publicly accessible and it is assessed that the Proposed Development could result in an increase in residential pressure on these LWS. In the absence of mitigation, potential impacts could include damage to habitats via trampling from recreational users and damage to vegetation through increased traffic pollution associated with an increase in visitors. It could also include a variety of other direct and indirect impacts associated with an increase in visitors, including nitrification and contamination. This would result in a **long-term minor adverse impact** on Big Wood LWS, Peacock Meadows LWS and Gorrick Plantation LWS.

Habitats

Deciduous Woodland (Off-Site)

- 10.241 In the absence of mitigation, impacts on the nearby parcels of deciduous woodland could include damage due to increased recreational pressure and damage to vegetation through an associated increase in traffic pollution. These potential impacts would result in a **long-term minor adverse impact** on the nearby deciduous woodland.

Other Woodland; Broadleaved

- 10.242 Following the completion of the Proposed Development and in the absence of mitigation, impacts to the woodland on Site could include residential damage from fly-tipping and damage from increased disturbance e.g. dogs scent-marking on trees resulting in nitrification. This would result in a **long-term minor adverse impact** on the woodland on Site.

Emm Brook Tributary and Emm Brook

- 10.243 In the absence of mitigation, impacts on the Emm Brook tributary and Emm Brook include damage to the structure and changes in water quality due to residential fly-tipping and damage to bank top vegetation through trampling. These potential impacts would result in a **long-term minor adverse effect** on the Emm Brook tributary and Emm Brook.

²³ Ryan, L. (2012) *Impacts of nearby development on ancient woodland – addendum*. The Woodland Trust, Grantham.

²⁴ Carr, A. (2021) *Impacts of development on ancient woodland and trees: evidence review 2012 – 2021. A report for the Woodland Trust*. Carr Ecology, United Kingdom.

Ditch

- 10.244 In the absence of mitigation, potential impacts on the ditch include damage to the structure and changes in water quality due to residential fly-tipping and damage to bank top vegetation through trampling. These potential impacts would result in a **long-term minor adverse effect** on the ditch.

Hedgerows

- 10.245 In the absence of mitigation, potential impacts on the retained hedgerows on Site could include damage from excessive residential management. This would result in a **long-term minor adverse effect** on the hedgerows on Site.

Protected and Notable Species*Hedgehog*

- 10.246 Residential gardens provide valuable foraging resources for hedgehogs. As such, the Proposed Development will result in the loss of the existing suitable hedgehog habitat on Site, but the creation of new alternative habitat. In the absence of mitigation, the presence of close-boarded fencing between the residential gardens would result in disruption to commuting and foraging hedgehogs. This would impose a **long-term minor adverse effect** on hedgehogs.

Brown Long-Eared Bat Maternity Roost

- 10.247 The Proposed Development will result in the destruction of the brown long-eared maternity roost on Site. Therefore, in the absence of mitigation, the completed development is expected to result in a **long-term major adverse effect** on the breeding success of the District's brown long-eared bat population.

Bats

- 10.248 Potential impacts during operation include disruption of commuting and foraging activity due to light spill from the proposed dwellings or insensitive security/safety lighting across the Site, particularly along the boundary hedgerows and Emm Brook tributary. As the byway link in the north-west of the Site is likely to become an adopted byway, any required lighting at the crossing point will need to meet Highway Regulations. Without mitigation these impacts would result in a **long-term moderate adverse effect** on foraging and commuting bats.

Birds

- 10.249 The Proposed Development will result in the creation of new ground nesting bird habitat within a publicly accessible area in the south and south-east of the Site. In the absence of mitigation, potential impacts on ground nesting birds include disturbance from recreational users, damage to habitat through trampling and an increase in predation from domestic cats.
- 10.250 This newly created habitat will also provide foraging opportunities for barn owls. Potential impacts on foraging barn owls include disruption due to light spill from the proposed dwellings or insensitive security/safety lighting across the Site.

10.251 Potential impacts on garden and woodland species of bird include increased predation from domestic cats and disturbance/damage of nests or nesting birds through excessive residential management of hedgerows.

10.252 These potential impacts would result in a **long-term minor adverse effect** on birds.

Reptiles

10.253 Potential impacts on reptiles during the operational phase include damage to retained reptile habitat through trampling. This would result in a **long-term minor adverse effect** on reptiles.

Stag Beetles

10.254 In the absence of mitigation, there is a risk of habitat loss through over-management of the retained mature trees and unnecessary removal of deadwood. This would result in a **long-term minor adverse effect** on stag beetles.

Mitigation

Mitigation for Construction Effects

Designated Sites

Thames Basin Heath SPA and Broadmoor to Bagshot Woods and Heaths SSSI

10.255 As there are no expected impacts linked to Thames Basin Heath SPA and Broadmoor to Bagshot Woods and Heaths SSSI during the construction phase of the development, no mitigation is required.

Ancient Woodland

10.256 To avoid impacts on the ancient woodland within 100m of the Site, pollution prevention controls will be required during the construction phase. These measures will be set out within the CEMP.

Adjacent Wokingham Road/Peacock Lane LWS

10.257 To avoid impacts on Adjacent Wokingham Road/Peacock Lane LWS, pollution prevention controls will be required during the construction phase. These measures will be set out within the CEMP.

Big Wood LWS, Peacock Meadows LWS and Gorrick Plantation LWS

10.258 As there are no expected impacts linked to Big Wood LWS, Peacock Meadows LWS and Gorrick Plantation LWS during the construction phase of the development, no mitigation is required.

Habitats

Deciduous Woodland (Off-Site)

10.259 To avoid impacts on the nearby parcels of deciduous woodland, pollution prevention controls will be required during the construction phase. These measures will be set out within the CEMP.

Other Woodland; Broadleaved

- 10.260 To avoid impacts on the retained woodland on Site, suitable tree protection fencing will be installed encompassing the RPZ of the trees within woodland parcels to protect them during the construction phase. Pollution prevention controls will also be required during the construction phase. These measures will be set out within the CEMP.

Emm Brook Tributary and Emm Brook

- 10.261 To reduce adverse effects on Emm Brook and Emm Brook tributary, pollution prevention controls will be required to minimise alterations to the water quality, to be detailed within a CEMP. Further mitigation to protect Emm Brook during the construction phase will include the provision of a 10m ecological buffer along the brook in which no works will take place.

Ditch

- 10.262 To reduce adverse effects on the ditch, pollution prevention controls will be required to minimise alterations to the water quality, to be detailed within a CEMP.

Hedgerows

- 10.263 The Proposed Development includes the removal of a total of approximately 110m of hedgerow to provide access points across the Site. This hedgerow loss comprises only a small proportion of the hedgerow provision on Site (110m of approximately 5.3km, equating to 2%) and will be compensated by new native hedgerow planting exceeding 110m within the Proposed Development.
- 10.264 Mitigation to avoid impacts on the retained hedgerows include suitable tree protection fencing to protect the RPZ of the hedgerows and pollution prevention controls. In addition, there will be a buffer of approximately 10m along the majority of the retained hedgerows in which no works will take place during the construction phase. These measures will be set out within the CEMP.

Protected and Notable Species*Hedgehog*

- 10.265 Good practice measures to avoid impacts on hedgehog will comprise the addition of escape ramps in any trenches left open overnight to prevent animals from becoming trapped, appropriate storage of materials to avoid creating refugia and a sensitive construction lighting plan. These measures will be set out within the CEMP.

Brown Long-Eared Bat Maternity Roost

- 10.266 Building B3 supports a brown long-eared bat maternity roost and, as such, an EPS licence will be required from Natural England to allow the lawful demolition of building B3 and associated destruction of the roost. In order to secure a licence, the Proposed Development must demonstrate that the 'three legal tests' are met, these are:
- 10.267 The activity must be for a certain purpose - for example, for scientific research or in the public interest.
- 10.268 There must be no satisfactory alternative that will cause less harm to the species.

10.269 The activity must not harm the long-term conservation status of the species – you may need to create new habitats to offset any damage.

10.270 In the case of the Proposed Development, the three legal tests are being met in the following ways:

1. *The works proposed are deemed to fall into the category of “in the public interest”, in this case the creation of housing to meet local housing needs. Whilst the roost being impacted is assessed to be of District importance for nature conservation, it is considered that the scale of new housing and infrastructure being created provides significant public benefits to the district.*

10.271 Completion of the Proposed Development would either cause more harm or not be viable without the destruction of the roost. As such, there is no satisfactory alternative available. To retain the roost in situ, would likely cause more harm as functionality would likely be lost.

10.272 Suitable compensation will be incorporated for the loss of the brown long-eared maternity roost. As such, the Proposed Development is not expected to harm the long-term conservation status of the species.

10.273 Specific mitigation requirements during the construction phase will be detailed within the bat licence application, but these are likely to include timing of works, namely destruction of the roost between September and the end of April to avoid the maternity period for bats, supervised destruction of the roost by a licenced bat ecologist, and creation of a like-for-like compensation roost.

Bats

10.274 To reduce adverse effects on commuting and foraging bats during the construction phase, the retained hedgerows will be protected using tree protection fencing. The retention of the Emm Brook tributary will allow the continued use of the watercourse as a commuting feature. A sensitive construction lighting plan will be produced which will demonstrate that lighting will not be used overnight along the boundary hedgerows and Emm Brook tributary. These measures will be set out within the CEMP.

Birds

10.275 Nesting birds are protected under the Wildlife and Countryside Act 1981 (as amended), so it will be necessary to avoid damage or destruction of nests, or disturbance of nesting birds, during the construction phase.

10.276 In order to mitigate impacts to breeding birds, removal of any suitable bird nesting habitat, namely the grassland fields, the sections of hedgerow for access, the mixed scrub, and buildings B1, B2 and B3, will either be undertaken outside of the nesting season (March-August inclusive) or be subject to a pre-works check by a suitably qualified ecologist. The method statement for ensuring the protection of nesting birds will be detailed within the CEMP.

10.277 A sensitive construction lighting plan will be produced to avoid impacts on foraging barn owls.

10.278 The Proposed Development will result in the loss of approximately 37ha of ground nesting bird habitat from the Site. It will not be possible to compensate for this loss as part of the Proposed Development.

Reptiles

10.279 The Proposed Development will result in the loss of suitable reptile habitat to allow the creation of a new culvert and four footbridges across the Emm Brook tributary. It is expected that suitable habitat will also be lost during reshaping of the watercourse on a short-term basis.

10.280 To avoid injury or mortality of reptiles during the construction phase, mitigation will comprise translocation of reptiles to suitable habitat within the SANG areas to the south and south-east of the Site prior to removal of vegetation along the tributary. The method statement for the translocation of reptiles will be detailed within the CEMP.

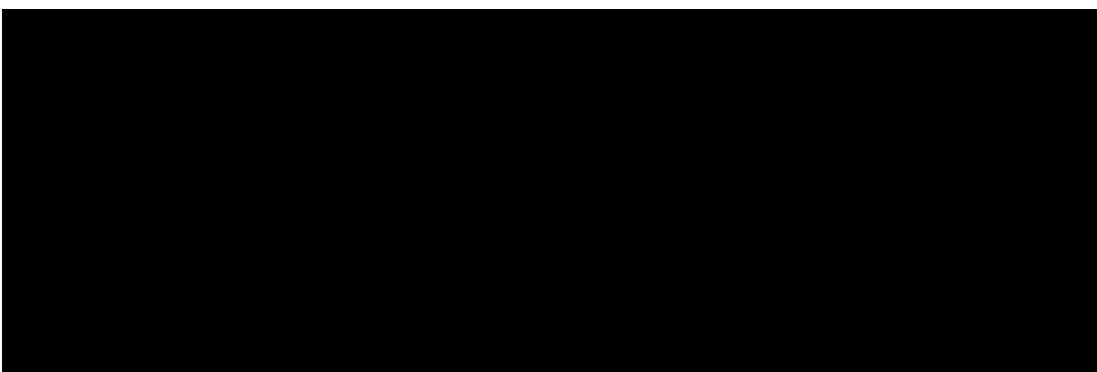
10.281 The Proposed Development includes the creation of a 10m ecological buffer along each bank of the tributary following reshaping of the watercourse and creation of the culvert and footbridges. The habitats within the buffer will be enhanced for reptiles and will include planting of native shrub and wildflower mixes, and creation of five ponds. It is assessed that this will compensate for the loss of reptile habitat to allow the creation of the culvert and bridges.

Stag Beetles

10.282 As there are no expected impacts on stag beetles during the construction phase of the development, no mitigation is required.

10.283

10.284



Mitigation for Operation Effects

Designated Sites

Thames Basin Heath SPA and Broadmoor to Bagshot Woods and Heaths SSSI

10.285 To mitigate any potential operational impacts on Thames Basin Heath SPA and Broadmoor to Bagshot Woods and Heaths SSSI, SANG will be created in the south and south-east of the Site, which will allow residents to access an alternative location for recreational activities.

The details of the SANG, including habitat creation and management measures, will be set out within the SANG Management Plan.

Ancient Woodland

- 10.286 To mitigate any potential operational impacts on ancient woodland, SANG will be created in the south and south-east of the Site, which will allow residents to access an alternative location for recreational activities. The details of the SANG, including habitat creation and management measures, will be set out within the SANG Management Plan.

Adjacent Wokingham Road/Peacock Lane LWS

- 10.287 As there are no expected impacts linked to Adjacent Wokingham Road/Peacock Lane LWS during the operation phase of the development, no mitigation is required.

Big Wood LWS, Peacock Meadows LWS and Gorrick Plantation LWS

- 10.288 To mitigate any potential operational impacts on Big Wood LWS, Peacock Meadows LWS and Gorrick Plantation LWS, SANG will be created in the south and south-east of the Site, which will allow residents to access an alternative location for recreational activities. The details of the SANG, including habitat creation and management measures, will be set out within the SANG Management Plan.

Habitats

Deciduous Woodland (Off-Site)

- 10.289 To mitigate any potential operational impacts on the off-Site deciduous woodland, SANG will be created in the south and south-east of the Site, which will allow residents to access an alternative location for recreational activities. The details of the SANG, including habitat creation and management measures, will be set out within the SANG Management Plan.

Other Woodland; Broadleaved

- 10.290 The central parcel of retained woodland on Site will contribute towards the SANG on Site. The SANG also includes creation of new broadleaved woodland. The details of the SANG, including management measures, will be set out within the SANG Management Plan, to be secured by condition. The SANG Management Plan will include suitable monitoring and remedial measures required for the woodland in the case that impacts from residential pressure are observed.

Emm Brook Tributary and Emm Brook

- 10.291 To minimise potential impacts on the Emm Brook tributary and Emm Brook resulting from residential pressure, a buffer of 10m will be implemented along the bank tops. The buffer for the tributary will comprise wildflower grassland, scrub and ponds and the buffer for the brook will comprise woodland and scrub. To deter residents from using the buffer zones for recreational purposes, clear footpaths will lead people to the designated SANG areas in the south and south-east of the Site.
- 10.292 The buffers will be managed and monitored for impacts associated with residential pressure. The management and monitoring measures will be set out within a LEMP.

Ditch

- 10.293 To minimise potential impacts on the ditch resulting from residential pressure, a buffer of 5m will be implemented along the bank tops. To deter residents from using the buffer zone for recreational purposes, clear footpaths will lead people to the designated SANG areas in the south and south-east of the Site.
- 10.294 The buffer will be managed and monitored for impacts associated with residential pressure. The management and monitoring measures will be set out within a LEMP.

Hedgerows

- 10.295 To mitigate impacts during operation, the retained hedgerows will be located outside of private ownership and will therefore be managed and maintained by a management company, which will be set out within a LEMP. In addition, the majority of the boundary hedgerows will be protected by the implementation of 10m buffers between the development footprint and the hedgerows.

Protected and Notable Species*Hedgehog*

- 10.296 To ensure the Site remains permeable to hedgehog post-construction, any non-permeable fencing (e.g. close-boarded fencing between residential gardens) will contain suitable holes at the base to ensure hedgehog can continue to commute and forage across the Site.

Brown Long-Eared Bat Maternity Roost

- 10.297 Mitigation during the construction phase includes the creation of a like-for-like compensation roost for the brown long-eared bat maternity colony within building B3. Mitigation during the operation phase will therefore include implementation of a Lighting Plan which will be created as part of the Reserved Matters Application to demonstrate that light spill onto the compensation roost will not exceed 0.5 lux, thereby avoiding impacts on the brown long-eared bats entering and emerging from the roost. Implementation of detailed landscaping proposals, also be agreed under a Reserved Matters Application, will retain and protect connectivity to bat habitat and include appropriate planting if necessary, around the new roost.

Bats

- 10.298 Mitigation for potential impacts on foraging and commuting bats will comprise a Lighting Plan which will be created as part of the Reserved Matters Application to demonstrate that the boundary hedgerows and Emm Brook tributary will not experience light spill above 0.5 lux. Any security/safety lighting required in proximity to these features should comprise low-level downlighting so as not to impede foraging and commuting common pipistrelle bats.
- 10.299 As lighting at the byway crossing point is likely to need to meet Highway Regulations, no mitigation has been recommended.

Birds

- 10.300 To mitigate recreational impacts on ground nesting birds potentially utilising the newly created habitat, the SANG will include clear designated footpaths to direct users and avoid suitable ground nesting habitat.
- 10.301 To minimise the impacts of increased predation on nesting birds, it is recommended that a high density of thorny plant species be planted within the new areas of scrub and woodland across the SANG area and within the hedgerow buffers where possible, to deter cats from entering those habitats. The thorny species should be planted away from the footpaths so as not to disrupt recreational users.
- 10.302 To avoid impacts on foraging barn owls, a Lighting Plan will be produced as part of the Reserved Matters Application which will demonstrate that the SANG areas will not experience light spill over 0.5 lux. Any safety/security lighting within these areas should comprise low-level downlighting.

Reptiles

- 10.303 To avoid potential impacts on reptiles resulting from residential pressure, a buffer of 10m will be implemented along the bank tops of the Emm Brook tributary. To deter residents from using the buffer zone for recreational purposes, clear footpaths will lead people to the designated SANG areas in the south and south-east of the Site.

Stag Beetles

- 10.304 To avoid impacts on stag beetles during the operation phase, the retained mature trees will be located outside of public ownership and will therefore be managed and maintained by a management company. Any deadwood removed from the trees during long-term management will be retained and partially buried within the SANG area in the south and south-east of the Site to provide egg-laying opportunities for stag beetles. These measures will be provided in a LEMP.

Residual Effects and Monitoring**Residual Effects**

- 10.305 Residual effects are those that are predicted to remain after implementation of the mitigation measures described above. The residual effects of the Proposed Development are summarised in **Table 10.11** below. Only significant residual effects, namely those with at least a moderate degree of effect, are considered.
- 10.306 In the case of the Proposed Development, significant residual effects are expected on ground nesting birds due to a loss of suitable habitat which is not being compensated and the brown long-eared bat maternity roost due to impacts to hedgerows.

Table 10.11 – Significant residual biodiversity effects

Residual effect	Receptor sensitivity	Impact magnitude	Nature	Duration	Degree of effect
Birds	Low	Major	Adverse	Long-term	Moderate
Brown long-eared bat maternity roost	Medium	Moderate	Adverse	Long-term	Moderate

Monitoring

- 10.307 A SANG Management Plan will be created which will include suitable monitoring and remedial measures to keep the footpaths clear and accessible, to allow long-term recreational use and mitigation of potential impacts on Thames Basin Heath SPA.
- 10.308 Monitoring will be required to ensure the effectiveness of the mitigation provided for the brown long-eared bat maternity roost. The monitoring plan will be detailed and provided as part of the Natural England EPS licence application.

Cumulative Effects

- 10.309 An assessment of the effects of the Proposed Development with other schemes that are operational/constructed, consented, or for which planning permissions are currently being sought, was undertaken. The effects of the cumulative impacts of these developments could result in the loss of significant areas of habitat across the wider environment, making the effects of the loss of the habitats on Site more significant than if they were to occur in isolation.
- 10.310 Seven development schemes have been consulted in terms of cumulative impacts, and these are referenced in **Chapter 15**.
- 10.311 Several of the schemes, including Land at Phase 2, South Wokingham SDL (Planning Ref: 190914) and Land South of Waterloo Road (Planning Ref: 211033), identified potential recreational impacts on Thames Basin SPA and other nearby Designated Nature Conservation Sites. The seven nearby development schemes, along with the Proposed Development, will result in the creation of over 2000 new residential dwellings and this is likely to result in indirect adverse cumulative effects on Thames Basin SPA. However, the Proposed Development comprises approximately half of this new residential provision and it is assessed that suitable mitigation measures have been incorporated for the SPA and other Designated Sites, including creation of SANG. It is therefore considered that the **Site will not contribute to indirect adverse cumulative effects** on Thames Basin Heath SPA and other nearby Designated Sites.
- 10.312 The Proposed Development supports three watercourses which form part of the brook network. Four of the nearby schemes support small watercourses, one of which supports a tributary of Emm Brook. The majority of the watercourses are being retained, but some reprofiling and culverting has been recommended. Mitigation during construction comprises

pollution control measures to avoid changes in water quality. The Proposed Development will require increased culverting on Site but enhancements to the retained habitat will result in negligible effects overall. As such, there are expected to be **no adverse cumulative impacts** on the Emm Brook network as a result of the Proposed Development.

- 10.313 The schemes involve the retention and protection of the majority of hedgerows. Small gaps will be created within the hedgerows to provide access to each of the developments. However, this is expected to comprise a small percentage of the total provision. In addition, the schemes provide compensation for this loss as well as enhancement measures to provide overall gains for biodiversity. As such, there is expected to be **a long-term minor positive cumulative effect** on hedgerows as a result of the schemes.
- 10.314 Suitable hedgehog habitat will be lost during the construction phases at Land at Phase 2, South Wokingham SDL (Planning Ref: 190914), North Wokingham SDL - Toutley East Land adjacent to Toutley Depot (Planning Ref: 223778) and the Proposed Development. However, in all cases, new hedgehog habitat will be created to allow the species to continue commuting and foraging across the area. Mitigation has been provided for each of the schemes to avoid direct harm to individuals and to ensure permeability following completion of the developments. Overall, it is assessed that the schemes will result in a **long-term minor beneficial cumulative effect on hedgehogs**.
- 10.315 The Proposed Development will result in the loss and compensation of a brown long-eared maternity roost. North Wokingham SDL – Ashridge Farm, Warren House Road (Planning Ref: 201515) identified eighteen trees which supported confirmed day roosts for common and soprano pipistrelle bats and a single brown long-eared bat day roost was also identified. These trees are being retained and protected as part of the works. As suitable mitigation recommendations have been provided for bat roosts across the nearby schemes, namely avoidance at North Wokingham SDL – Ashridge Farm, Warren House Road (Planning Ref: 201515) and compensation for the Proposed Development, it is considered that there will be **no significant adverse cumulative effects** on bat roosts.
- 10.316 The Site provides foraging and commuting opportunities for bats and there are expected to be long-term minor adverse effects on bats as a result of the Proposed Development through habitat fragmentation and lighting at the proposed byway crossing. Mitigation for foraging and commuting bats across the schemes includes retention and protection of valuable linear features and sensitive lighting strategies to avoid disturbance to bat activity. It is therefore assessed that the Proposed Development **will not contribute towards any adverse cumulative effects** on foraging and commuting bats.
- 10.317 None of the nearby schemes will involve adverse effects on ground nesting birds due to habitat loss. As such, the habitat loss associated with the Proposed Development will not contribute towards adverse cumulative effects on ground nesting birds. In addition, the schemes all recommend the retention of the majority of boundary hedgerows and precautionary mitigation measures to avoid impacts on garden and woodland species of nesting birds. **No adverse cumulative effects** on nesting birds are therefore expected on nesting birds as a result of the Proposed Development.

- 10.318 Reptiles were confirmed as present, or considered present, on all but one of the schemes (Land South of Waterloo Road, Planning Ref: 211033), with one of the schemes identified as a Key Reptile Site due to the 'exceptional' population of slow worms it supports. The schemes involve the short-term loss of reptile habitat, with mitigation recommended to avoid direct harm to reptiles during vegetation removal. The schemes also incorporate creation of new reptile habitat and protection of hedgerows to retain connectivity of reptile habitat across the area. The Proposed Development is the only scheme which supports a 'good' population of grass snakes and, whilst the SANG areas and ecological buffer along Emm Brook tributary will incorporate creation and enhancement of reptile habitat, there are expected to be short-term minor adverse effects on reptiles during the construction phase. Given the scale of habitat manipulation across the schemes during the construction phase, the Proposed Development is assessed to contribute towards a **short-term moderate adverse cumulative effect** on reptiles.
- 10.319 The Site and North Wokingham SDL – Ashridge Farm, Warren House Road (Planning Ref: 201515) support mature trees with deadwood which provide suitable habitat for stag beetle. Mitigation primarily involves avoidance via the retention of mature trees and the on-Site retention of any removed deadwood. There are therefore expected to be **no adverse cumulative effects** on stag beetles as a result of the Proposed Development.
- 10.320 Based on the above assessment, the only significant cumulative effect for the schemes is considered to be a **short-term moderate adverse effect** on reptiles.

Limitations and Assumptions

- 10.321 Over the course of the static detector surveys, several of the static detectors failed to record any data due to technical failures. The periods missing are as follows: April data from the static detector positioned at B3, May data from the detectors at B1-B4, August data from the detectors at B3 and B4, and September data from the detectors at A2 and B2. Whilst there are gaps in the dataset, the Site was subject to a full season of activity transect surveys which provided a robust dataset relating to how bats are utilising the Site, and which species. In addition, data analysis from the static detectors demonstrated that activity levels across the Site were low. As such, it is not assessed that this is a significant limitation to the assessment.
- 10.322 Bat surveys undertaken at the Site did not specifically target the proposed byway crossing (joint NKH and Lightwood Site) as this area was not initially included within the application area. However, activity survey transects covered both hedgerows running along the byway and a static bat detector was located along a linked hedgerow to the north-west. It is therefore considered that sufficient data was obtained to assess how bats are utilising this part of the Site and to discuss the potential impacts associated with the proposed works there. This is therefore not assessed to be a significant limitation.
- 10.323 Two emergence surveys were undertaken on building B3. These surveys were used to confirm that the building was a maternity roost for brown long-eared bats and to confirm the number of bats using the building. Although this is less than the usual three surveys required

for a building of 'high' suitability for roosting bats, with the use of thermal cameras and suitable building inspection beforehand, it is assessed that sufficient data has been collected to inform the compensation/mitigation required for this roost.

- 10.324 Building B4 could not be accessed internally during the preliminary roost assessment. However, there were no external features present for roosting bats and the interior was considered likely to be too thermally unstable to support bats as it was open to the elements. It is therefore considered that this structure is of 'negligible' suitability for roosting bats and this is not a significant limitation of the assessment.
- 10.325 Building B11 was being constructed at the time of the preliminary roost assessment and a complete assessment of the suitability of the structure could therefore not be undertaken. However, it is assumed that the structure will be the same as that of the two nearby agricultural buildings (B9 and B10) which are both of 'negligible' suitability for bats. This is therefore not considered to be a significant limitation to the assessment.
- 10.326 Nineteen of the offsite ponds identified in the desktop search were on private land and not accessible for surveying. The majority of the ponds were separated from the Site by significant barriers to dispersal and the ponds on Site were negative for GCN DNA. It was therefore considered that this did not constitute a significant limitation to the assessment.

Summary of Impacts

- 10.327 A summary of the residual effects for the construction and operation phases of the Proposed Development are provided in **Table 10.12** below. The only significant residual effects are expected on birds and the brown long-eared bat maternity roost.

Table 10.12 – Summary of residual biodiversity effects

Residual effect	Receptor sensitivity	Impact magnitude	Nature	Duration	Degree of effect
Construction Phase					
Thames Basin Heath SPA and Broadmoor to Bagshot Woods and Heaths SSSI	High	Negligible	Negligible	Short-term	Negligible
Ancient woodland	Medium	Negligible	Negligible	Short-term	Negligible
Adjacent Wokingham Road/Peacock Lane LWS	Medium	Negligible	Negligible	Short-term	Negligible
Big Wood LWS, Peacock Meadows LWS and Gorrick Plantation LWS	Medium	Negligible	Negligible	Short-term	Negligible
Deciduous woodland	Low	Negligible	Negligible	Short-term	Negligible
Other woodland; broadleaved	Low	Negligible	Negligible	Short-term	Negligible

Residual effect	Receptor sensitivity	Impact magnitude	Nature	Duration	Degree of effect
Emm Brook tributary	Low	Moderate	Adverse	Short-term	Minor
Ditch	Low	Moderate	Adverse	Short-term	Minor
Hedgerows	Low	Minor	Beneficial	Long-term	Minor
Hedgehog	Low	Negligible	Negligible	Short-term	Negligible
Brown long-eared bat maternity roost	Medium	Moderate	Adverse	Long-term	Moderate
Bats	Medium	Moderate	Adverse	Long-term	Moderate
Birds	Low	Major	Adverse	Long-term	Moderate
Reptiles	Low	Moderate	Adverse	Short-term	Minor
Stag beetles	Low	Negligible	Negligible	Short-term	Negligible
Operation Phase					
Thames Basin Heath SPA and Broadmoor to Bagshot Woods and Heaths SSSI	High	Negligible	Negligible	Long-term	Negligible
Ancient woodland	Medium	Negligible	Negligible	Long-term	Negligible
Adjacent Wokingham Road/Peacock Lane LWS	Medium	Negligible	Negligible	Long-term	Negligible
Big Wood LWS, Peacock Meadows LWS and Gorrick Plantation LWS	Medium	Negligible	Negligible	Long-term	Negligible
Deciduous woodland	Low	Negligible	Negligible	Long-term	Negligible
Other woodland; broadleaved	Low	Negligible	Negligible	Long-term	Negligible
Emm Brook tributary	Low	Negligible	Negligible	Long-term	Negligible
Ditch	Low	Negligible	Negligible	Long-term	Negligible
Hedgerows	Low	Negligible	Negligible	Long-term	Negligible
Hedgehog	Low	Minor	Beneficial	Long-term	Minor
Brown long-eared bat maternity roost	Medium	Moderate	Adverse	Long-term	Moderate
Bats	Low	Moderate	Adverse	Long-term	Minor
Birds	Low	Negligible	Negligible	Long-term	Negligible
Reptiles	Low	Negligible	Negligible	Long-term	Negligible
Stag beetles	Low	Negligible	Negligible	Long-term	Negligible