11 Ecology

11.1 Introduction

11.1.1 This chapter of the ES assess the likely significant effects of the Proposed Development on the environment in respect of biodiversity and ecology. It is supported by the following Technical Appendices:

- Appendix 11.1: Relevant Legislation and Planning Policy
- Appendix 11.2: Ecological Impact Assessment Methodology
- Appendix 11.3: Habitats and Landscape
- Appendix 11.4: River Corridor Survey
- Appendix 11.5: Flora and Vegetation
- Appendix 11.6: Veteran Trees
- Appendix 11.7: Invertebrates
- Appendix 11.8: Freshwater Fish
- Appendix 11.9: Great Crested Newt
- Appendix 11.10: Breeding Birds
- Appendix 11.11: Wintering Birds
- Appendix 11.12: Bats
- Appendix 11.13: Hazel Dormice
- Appendix 11.14: Water Vole & Otter
- [redacted]
- Appendix 11.16: Ecological Mitigation and Enhancement Strategy
- Appendix 11.17 Information for Habitats Regulations Assessment
- Appendix 11.18 Suitable Alternative Natural Greenspace Delivery Plan
- Appendix 11.19 Biodiversity Net Gain

11.1.2 This chapter describes the assessment methodology, the baseline conditions, the likely significant ecological impacts of the Proposed Development, the mitigation measures required to prevent, reduce or offset any significant negative effects after these measures have been employed and the resulting residual likely significant effects.

Legislative and Planning Context

Planning Context

11.1.3 Planning policy and key guidance documents of relevance to biodiversity and nature conservation are summarised in **Appendix 11.1**, with their specific implications in respect of

individual ecological features discussed throughout this ES Chapter. The outcomes of the Ecological Impact Assessment (EcIA) assessed against the requirements of applicable planning policy are set out within the Summary section at the end of this Chapter.

11.1.4 Planning policy documents of primary relevance to this Chapter are:

- The National Planning Policy Framework (NPPF)(2024), in particular Section 15 which provides National Policy on conserving and enhancing the natural environment through the planning process;
- Wokingham Borough Adopted Core Strategy Development Plan Document (January 2010), in particular Policies CP7 – Biodiversity and CP8 – Thames Basin Heaths Special Protection Area ;
- Wokingham Borough Local Plan Update 2023-2040 (2025), in particular Policies NE1: Biodiversity and Geodiversity and NE2: Biodiversity Net Gain;
- Shinfield Parish Neighbourhood Plan (2017), in particular Policy 7: Biodiversity; and,
- Arborfield and Barkham Neighbourhood Plan 2019-2036 (2020), in particular Policy IRS3: Protection and Enhancement of the Natural Environment and Green Spaces.

Legislative Context

11.1.5 The following legislation of primary relevance has been referred to whilst compiling this Chapter, and is outlined more comprehensively in **Appendix 11.1**:

- The Environment Act 2021;
- The Conservation of Habitats and Species Regulations 2017 (as amended);
- The Wildlife and Countryside Act 1981 (as amended);
- The Countryside and Rights of Way (CROW) Act 2006;
- The Natural Environment and Rural Communities (NERC) Act 2006 (as amended);
- [redacted]
- The Salmon and Freshwater Fisheries Act 1975;
- The Eels (England and Wales) Regulations 2009 (as amended); and
- The Water Environment Regulations 2017.

Biodiversity Plans and Strategies

11.1.6 The following biodiversity plans and strategies have informed the design of the Proposed Development and the preparation of this Chapter:

- DEFRA (2011) Biodiversity 2020: A Strategy for England's Wildlife and Ecosystem Services;
- DEFRA (2019) A Green Future: Our 25 Year Plan to Improve the Environment Plan;
- DEFRA (2018) 25 Year Environment Plan; and

- DEFRA (2023) Environmental Improvement Plan;
- Royal Borough of Windsor and Maidenhead (2025) Berkshire Local Nature Recovery Strategy (Draft).

Guidance

11.1.7 Subject-specific guidance (for example in relation to species-specific survey effort and methodology) has been referred to as appropriate and is described in the relevant sections of this Chapter. Further details can be found in the **Appendix 11.2**.

11.2 Assessment methodology

Scope

11.2.1 The proposed scope for the impact assessment was set out at Chapter 11: Ecology of the Environmental Statement Scoping Report (2024). The EIA Scoping Opinion provided by Wokingham Borough Council 'broadly' agreed with the potential impacts and effects identified.

11.2.2 Following comments provided by Wokingham Borough Council in February 2025, the scope of the assessment can be confirmed to cover the ecological features as set out in **Table 11.1** below.

Table 11.1 Ecological Impact Assessment Scope

Ecological Feature	Effect	Scoped In
Internationally Designated Sites	• Damage to retained habitats • Disturbance (visual, noise, vibration, lighting) • Hydrological change and pollution (dust generation, pollution of habitats, change in surface and groundwater quality and quantity) • Changes in air quality • Recreational pressure (disturbance, trampling) • Increased levels of predation	Y
Nationally Designated Sites		Y
Locally Designated Sites		Y
Habitats/Botany	• Damage to retained habitats • Disturbance (visual, noise, vibration, lighting) • Hydrological change and pollution (dust generation, pollution of habitats, change in surface and groundwater quality and quantity) • Changes in air quality • Recreational pressure (disturbance, trampling) • Habitat creation	Y
Invertebrates		Y
White-clawed Crayfish		Y
Freshwater Fish		Y
Great Crested Newt		Y

Breeding Bird Assemblage	• Direct harm to protected/notable species • Increased risk of road traffic mortality • Implementation of habitat management and monitoring plans • Increased levels of predation	Y
Winter Bird Assemblage		Y
Bat Assemblage		Y
Hazel Dormouse		N
Water Vole		N
Otter		Y
Reptiles		N
[redacted]		[redacted]

Ecological Impact Assessment

11.2.3 The approach to Ecological Impact Assessment (EcIA) taken in this report accords with guidance set out in the Chartered Institute of Ecology and Environmental Management (CIEEM) Guidelines for Ecological Impact Assessment in the United Kingdom and Ireland version 1.3 (2018).

11.2.4 Further details of the methodology used for the EcIA in this Chapter are included within **Appendix 11.2**. In summary, the following step-wise approach to EcIA has been used:

- Prediction of the activities associated with a proposed scheme that are likely to generate biophysical changes which may lead to significant effects (either positive or negative) upon Important Ecological Features (IEFs);
- Identification of the likely Zone of Influence (ZoI) of these activities;
- Scoping to select the ecological features (habitats, species, ecosystems and their functions/processes) that are likely to fall within the predicted ZoIs and be affected by the activities – both negatively and positively;
- Evaluation of the IEFs likely to be affected using geographic frame of reference;
- Identification of likely impacts (positive and negative) on IEFs, together with an assessment of the geographic level at which effects are likely to be significant;
- Refinement of the proposed scheme to incorporate mitigation for negative effects on IEFs, and enhancements in order to deliver net gains;
- Assessment of the significant of residual effects and identification of any policy drivers for additional mitigation or compensation in the event residual significant negative effects; and
- Advice on conformance with policy.

Determining the Importance of Ecological Features

11.2.5 To inform the assessment of likely significant effects arising from the Proposed Development on ecological features currently present on the Site and within the immediately surrounding area, an evaluation of their importance in nature conservation terms is required. The CIEEM EcIA Guidelines promote the use of professional judgment in determining the importance of the feature being considered within a geographical context, and this has therefore been defined in this assessment as follows:

- International/European;
- National;
- Regional;
- County;
- Local; and
- Within ZoI only.

11.2.6 The following assessment considers IEFs, which are considered to be those features deemed to be importance at the Local level or above only. Those features considered to be important at the ZoI level only have been scoped out of the assessment.

Significance Criteria

11.2.7 The criteria used by CIEEM to define a 'significant' effect are slightly different to those set out in **Chapter 5** of this ES, however they are based on the same general principles that take into account the importance of a feature or receptor, its sensitivity to change, and the magnitude, duration and reversibility of the predicted impact.

11.2.8 The CIEEM EcIA Guidelines, which are the industry standard and best practices guidelines for EcIA state that:

"Significance is a concept related to the weight that should be attached to effects when decisions are made. For the purpose of EcIA, 'significant effect' is an effect that either supports or undermines biodiversity conservation objectives for 'important ecological features' (explained in Chapter 4) or for biodiversity in general. Conservation objectives may be specific (e.g. for a designated site) or broad (e.g. national/local nature conservation policy) or more wide-ranging (enhancement of biodiversity). Effects can be considered significant at a wide range of scales from international to local."

11.2.9 An effect is therefore considered significant if it is likely to change the structure and function of a defined site and ecosystem, or the conservation status of habitats and/or species. In this Chapter, once a significant effect is identified, it is then characterised as either positive or negative, and assigned a geographic level of importance.

Likely Biophysical Changes and the Zone of Influence

11.2.10 The activities associated with the Proposed Development which are likely to lead to biophysical changes and could accordingly give rise to ecological impacts are summarised in **Table 11.2** below, which is drawn from Box 9 of the EcIA Guidelines (CIEEM, 2018).

11.2.11 The Zone of Influence (ZoI) of a proposed development is defined by the EcIA Guidelines as:

"… the area(s) over which ecological features may be affected by the biophysical changes caused by the proposed project and associated activities.".

11.2.12 A ZoI can encompass different areas, and thus potentially impact upon different ecological receptors depending upon the spatial extent of the relevant biophysical changes. The ZoI relevant to this assessment are summarised in **Table 11.2** below.

Table 11.2 Activities, potential impacts, and associated Zone(s) of Influence

Activity	Potential Impacts	Zone of Influence
Construction Phase		
Access and travel to/from and within the Site	Temporary dust, waterborne, noise and light pollution; soil compaction and damage to habitats; disturbance of vulnerable species	Site, immediate surroundings and hydrologically linked watercourses
Assembly and storage areas for machines and materials; construction compounds	Temporary loss and fragmentation of habitats; temporary noise, dust, visual, lighting disturbance to vulnerable species; potential for environmental accidents and waterborne pollution to cause permanent damage to vulnerable habitats or harm to species.	Site, immediate surroundings and hydrologically linked watercourses
Removal of vegetation and soil Groundworks and excavations	Temporary or permanent habitat loss and fragmentation; direct harm to species; dust and waterborne pollution; hydrological changes; loss and compactions of soil; temporary disturbance (noise, visual, vibration, lighting) to vulnerable species	Site, immediate surroundings and hydrologically linked watercourses
Construction of new buildings, structures and laying of hard surfacing	Permanent loss of habitats, creation of new habitats and resources for wildlife; changes to ground and surface water flows and quality; changes to vulnerable habitats fed by these flows.	Site, immediate surroundings and hydrologically linked watercourses
Soft landscaping; implementation of habitat creation plan	Creation of new wildlife habitats	Site
Operational Phase		
Access and travel to/from and within the Site	Noise, light and air pollution resulting in changes to local habitats	Within 200m of affected roads
Drainage	Hydrological changes to existing habitats within and beyond the Site boundary (drying, flooding, levels of pollution)	Site and hydrologically linked watercourses
Occupation of new houses	Noise / visual / lighting disturbance to vulnerable species; damage, degradation, loss and/or fragmentation of habitats (e.g. through trampling, fouling, fly-tipping, introduction of non-native species, arson);	Site and up to 7km radius

	recreational disturbance of vulnerable species	
Increased presence of domestic pets	Disturbance and predation of vulnerable species	Site and up to 400m radius
Implementation of landscape and habitat management plans	Enhancement of existing habitat and creation of new habitats and resources for wildlife	Site

Geographic Scope

11.2.13 The ZoI of the Proposed Development will encompass different areas in respect of each ecological receptor depending upon its location and sensitivity. The ZoI specific to each feature is described in more detail in each of the relevant sections of this Chapter.

11.2.14 Many of the biophysical changes predicted to be generated by the Proposed Development have the potential to impact IEFs within the Site and its immediate environs. The exceptions to this are potential air quality effects arising from changes traffic levels and changes in recreational pressure arising as a result of recreational behaviours of new residents, both of which have the potential to impact upon designated sites within a wider radius. Hydrological changes may also impact upon hydrologically linked watercourses downstream.

Temporal Scope

11.2.15 The temporal scope of the EcIA covers the construction and occupation phases of the Proposed Development.

Consultation

11.2.16 Consultation has been undertaken with Wokingham Borough Council, regarding the scope of ecological surveys and approach to Biodiversity Net Gain (BNG) including a workshop on 3rd April 2025 and Site visit on 9th April 2025.

11.2.17 The scope of ecological surveys has taken into account advice provided by Wokingham Borough Council. Advanced bat surveys are being undertaken to provide further information on the local assemblage, and additional survey work has been undertaken in respect of White-clawed Crayfish.

11.2.18 The approach to BNG follows the advice provided by the council, including the approach to wetlands and Coastal Floodplain Grazing March.

11.2.19 Natural England have been consulted on the mitigation strategy for the Thames Basin Heaths Special Protection Area (SPA), specifically in relation to the design of the Suitable Alternative Natural Greenspace (SANG). A Site visit was undertaken on 10th March 2025, followed by a virtual meeting on 29th April 2025. Further to these Site visits, the SANG strategy was amended in line with recommendations received from Natural England.

Assumptions and Limitations

11.2.20 Great Crested Newt (GCN) *Triturus cristatus* surveys could not be completed in off-Site ponds due to access constraints and therefore, based on desktop information and personal

communications, GCN have been assumed to be present. Adopting a precautionary approach GCN are therefore included in this impact assessment.

11.2.21 A limited amount of ecological survey work is still ongoing, including update and advanced surveys for bats. Impact assessments have been undertaken using available survey data, and where necessary using a precautionary approach. The results of these surveys, and any implications for the impact assessment, will be set out in an addendum to this Chapter.

Limitations

11.2.22 Beyond access constraints relating to GCN (as outlined above), no significant limitations were encountered during the course of the completed ecological survey work that was considered to impact the overall findings of the surveys.

11.2.23 Where minor constraints and limitations were encountered during individual surveys, these are outlined in the relevant Technical Appendices.

11.3 Baseline conditions

Current Baseline

Desktop Study

11.3.1 A desktop study was undertaken in 2024 to collect the details of local nature conservation sites and records of protected and/or notable species within a 2km radius of the Site, extending to 5km for European Protected Species. A review of published information was also reviewed to provide additional context for the Site and the habitats/species it may support.

11.3.2 Baseline information has been obtained from the following sources:

- Thames Valley Environmental Record Centre (TVERC);
- The Multi-Agency Geographic Information for the Countryside (MAGIC);
- The British Geological Survey;
- The Soil Survey of England and Wales;
- The Environment Agency;
- Open-source LiDAR imagery published by DEFRA;
- Ordnance Survey Drawing 126, dated 1806;
- OS 1 inch to the mile OS map, Sheets 7 and 12, published 1817;
- The 6" and 25" to the Mile Ordnance Survey Maps (c. 1880-1930s); and
- Aerial imagery from the 1940s onwards.

Ecological Surveys

11.3.3 EPR has carried out an extensive programme of field surveys across the Site since 2022, which are outlined in **Table 11.3** below. Survey methods are described in the relevant sections of this Chapter and **Appendices 11.3 to 11.15**.

Table 11.3 Overview of ecological surveys undertaken on the Site

Survey Type	Month	Year
Habitat Survey	April	2022
	May – June	2024
Botany Surveys	April – September	2022
	May – June	2024
	April & June	2025
Hazel Dormouse Habitat Assessment	April	2022
[redacted]		
Breeding Bird Survey	April – July	2022
	May – June	2024
	March – May	2025
Bat Static Detector Surveys	April – October	2022
	June - October	2024

	April & May	2025
Bat Activity Surveys	April – October	2022
	June & September	2024
	April	2025
Great Crested Newt eDNA	April	2022
	June	2024
Water Vole Habitat Assessment	June	2022
	June	2024
Water Vole & Otter Surveys	June & September	2022
	June	2024
Emergence/re-entry Surveys for bats	June – September	2022
	April – September	2023
	May – August	2025
Invertebrate Surveys	June – October	2022
	April – June	2023
Hazel Dormouse Presence/Absence Survey	August – November	2022
	April – July	2023
	July – November	2024
River Corridor Survey	September	2022
	June	2024
Winter Bird Surveys	January, February, November & December	2023
Bat Building Inspections	January & February	2023
	March	2025
White-clawed Crayfish eDNA	July	2023
Great Crested Newt Population Assessment	April – May	2023
Veteran Tree Surveys	January – February	2024
Ground Level Tree Assessment for bats	January – February	2024
Freshwater Fish survey	June	2024
White-clawed Crayfish Habitat Assessment	May	2025
Aquatic botany survey	July	2025

Other Ecological Surveys

11.3.4 Ecological surveys have been carried out on various sites in the surrounding Shinfield area since 1999. Between 2008 to the present, extensive survey work has been undertaken in association with development associated with the South of the M4 Strategic Development Location (SDL), the Shinfield Eastern Relief Road (SERR), the Thames Valley Science Park (TVSP) and the developments at 'Cutbush Lane' and the 'Manor'. Knowledge gained during previous ecological surveys for these developments has been used to inform the assessment of the Development.

Description of Baseline

11.3.5 This section describes the ecological baseline of the Site and identifies 'Important Ecological Features' (i.e. features considered to be ecologically valuable at 'Local' level or above) at the time of the surveys and considered to be within the ZoI due to being vulnerable to the Development's effects during its construction and operational phases.

Internationally Designated Statutory Sites

11.3.6 One Internationally Designated Site is located within the ZoI of the Proposed Development - the Thames Basin Heaths SPA. The Thames Basin Heaths is a network of lowland heathland sites, designated as an SPA in March 2005 for its internationally important populations of three heathland bird species: Dartford Warbler *Sylvia undata*, Woodlark *Lullula arborea* and Nightjar *Caprimulgus europaeus*. Its location in relation to the Site is shown on **Figure 11.1.**

11.3.7 The SPA designation was originally created by the Birds Directive and later drawn into the "Natura 2000" network of protected areas by European Directive 92/43/EEC (the 'Habitats Directive'). The Habitats Directive was originally transposed into UK law by the Conservation of Habitats and Species Regulations 2017 (as amended); also referred to as the 'Habitats Regulations'. Minor amendments were introduced to the Habitats Regulations through the Conservation of Habitats and Species Amendments (EU Exit) Regulations 2019, which came into force on 31st December 2020.

11.3.8 The Wokingham Borough Council Local Plan Update has identified that recreational pressure and atmospheric pollution as potential impact pathways which may result in adverse impacts on the Thames Basin Heaths SPA and the features for which it is designated.

11.3.9 Designated under European legislation, the Thames Basin Heaths SPA is of International importance. Due to the specific requirements of the Habitats Regulations, the potential for the Proposed Development to affect the qualifying features of the Thames Basin Heaths SPA is therefore assessed in detail in the separate Information for Habitats Regulations Assessment report, which is briefly summarised in this Chapter.

Nationally Designated Statutory Sites

11.3.10 Four Sites of Special Scientific Interest (SSSI) are located within 5km of the Site. The SSSIs and their reason for designation are shown in **Table 11.4** below.

Table 11.4 Sites of Special Scientific Interest within 5km of the Site

Site Name and Designation	Distance from Site	Description
Longmoor Bog SSSI	3.00km	Supports base-poor valley mire, resulting in carr woodlands, wet heathlands and secondary woodlands. Supports an important assemblage of invertebrates, breeding birds and fungi.
Stanford End Mill and River Loddon SSSI	3.28km	Comprises traditionally managed waterlogged hay meadows and supports two nationally important plant species - Snake's Head Fritillary *Fritillary meleagris* and Loddon Pondweed.
Lodge Wood and Sandford Mill SSSI	3.35km	Comprises wet woodlands which support large populations of Loddon Lily *Leucojum aestivum.*
Bramshill SSSI	4.35km	Comprises conifer plantation with relic wet heathland and acid ponds with associated mire which support varied dragonfly and

		damselfly assemblage. Supports populations of Annex I bird species.

11.3.11 The Site lies within a number of SSSI Impact Risk Zones, however due to the distance of the Site none of these impact zones consider residential development to present a risk. A number of commercial uses, however, particularly those associated with combustion and pollution, are considered a likely to risk to nearby SSSI's.

11.3.12 Whilst the SSSI Impact Risk Zones do not consider increases in recreational pressure likely to cause an impact, based on the proximity of the Site and the increase in numbers of new residents, publicly accessible SSSI's are considered to be potentially sensitive to impacts arising from increased recreational pressure.

11.3.13 Of the designated sites listed above, Longmoor Bog SSSI and Bramshill SSSI are considered to be located within the ZoI of the Proposed Development due to their proximity, public access and/or sensitivity to particular impact pathways.

11.3.14 Bramshill SSSI is currently in a favourable and stable condition, whilst Longmoor Bog SSSI is unfavourable and recovering.

11.3.15 Due to the protection afforded to these sites under national legislation, they are of National importance.

Non-Statutory Designated Sites

11.3.16 Twenty-nine Berkshire Local Wildlife Sites (LWS) are located within a 2km radius of the Site. These are shown on **Figure 11.2**. Of these, five are located directly within the Site boundary and are detailed further below, whilst an additional three are located immediately adjacent. These eight LWS are therefore considered to fall within the ZoI of the Proposed Development due to their proximity and/or likely sensitivity to particular impact pathways.

St Johns Copse LWS

11.3.17 St Johns Copse LWS is a lowland mixed deciduous woodland listed on Natural England's Provisional Ancient Woodland Inventory which supports a number of ancient woodland indicator species including extensive Bluebell *Hyacinthoides non-scripta* cover. It also supports a small population of Wild Service Tree *Sorbus torminalis*.

11.3.18 St John's Copse is currently considered to be in favourable condition, and as a result of commited management arising from the nearby British Museum development, it is likely to remain as stable. St Johns Copse LWS is of County level importance.

Hall Farm Woodland Triangle LWS

11.3.19 Hall Farm Woodland Triangle LWS is designated as a broadleaved wet woodland, whilst the recently included extension is a mixed plantation woodland with a discrete area of Lowland Fen – swamp.

11.3.20 The wet woodland section of the LWS lies on a historic boundary, with a bank and mature trees delineating this area on the ground. Historic maps show that the land was not historically wooded, and once formed part of the wider Lord's Meadow, having likely been abandoned as grazing sometime post-war.

11.3.21 Not currently benefitting from a consistent management regime, Hall Farm Woodland Triangle LWS is considered to be unfavourable and declining. It is of County level importance.

Rushy Mead LWS

11.3.22 Rushy Mead LWS is another woodland, including components of lowland mixed deciduous woodland and wet woodland. Based on habitat surveys undertaken by EPR, the areas of wet woodland are restricted to peripheries of the southern and western boundaries of the LWS. The bulk of the woodland is considered to be comprised of other lowland mixed deciduous woodland.

11.3.23 The LWS was extended to the north in 2024. Although included within the designation due to the presence of 'similar woodlands', surveys undertaken by EPR have identified that the Rushy Mead LWS extension area is an assemblage of historic features including an old lane, abandoned fields, ditches, and other watercourses. Each of these have been abandoned at different stages, which have subsequently developed into the habitats present today, including grassland, mixed scrub and relatively recently developed woodland.

11.3.24 Not currently included in a consistent management regime, Rushy Mead LWS is considered to be unfavourable and declining. It is of County level importance.

River Loddon LWS

11.3.25 Part of the wider River Loddon LWS falls within the Site, covering the entire length of the river within the Site boundary. The river is designated due to the diversity of features supported, including adjacent habitats such as marsh. Protected and notable species are also supported by the River Loddon, including Water Vole *Arvicola amphibius* and Loddon Pondweed.

11.3.26 The wider River Loddon LWS is influenced by factors both upstream and downstream, and these may influence the conservation status of the section of the LWS within the Site. The River Loddon LWS within the Site is subject to maintenance in line with the responsibilities of a watercourse owner. It is currently considered to be favourable and stable as a result of the ongoing management. The River Loddon LWS is of County level importance.

Loader's Copse LWS

11.3.27 Loader's Copse LWS is an area of provisional ancient woodland, located to the south of the M4 motorway. The designation includes both wet woodland and lowland mixed deciduous woodland, as a result of the high-water table. However surveys undertaken by EPR have found that the LWS is comprised of entirely other lowland mixed deciduous woodland, with a localised area of Greater Pond Sedge *Carex riparia* in the centre. Although a few young Alder *Alnus glutinosa* were recorded in the shrub layer, it was not found to support wet woodland habitats.

11.3.28 Not currently benefitting from a consistent management regime, Loaders Copse LWS is considered to be unfavourable and declining. It is of County level importance.

Gravel Pit Wood, The Holt LWS

11.3.29 Gravel Pit Wood, The Holt LWS does not fall within the Site, but is located immediately on the boundary, and would be surrounded by the Proposed Development on multiple sides. The LWS comprises of lowland mixed deciduous woodland. Although likely planted in the last c.100 years, it features extensive Bluebell coverage. The Barkham Brook, a tributary of the River Loddon runs through the LWS, with the woodland along its stretch including elements of wet woodland, including species such as Alder. Although not ancient woodland, eight ancient woodland indicator species have been recorded by TVERC, and a number of likely veteran trees are present.

11.3.30 The management regime of Gravel Pit Wood LWS is currently unknown and it is precautionarily considered to be favourable and stable. It is of County level importance.

Additional LWS

11.3.31 Whilst the remaining LWS could potentially fall within the ZoI in respect of recreational pressure, a potential impact pathway ranging over larger distances, such effects are likely to decrease in likelihood and magnitude with increased distance from the Proposed Development. As such, the impact assessment and mitigation measures as set out in this Chapter for the above six LWS are by extension considered to cover the remaining non-statutory sites.

River Loddon

11.3.32 The River Loddon runs through the Site, entering at the south and running north where it exits under the M4 motorway bridge. Classified as a main river, the River Loddon is a tributary of the River Thames with the confluence approximately 11.6km downstream of the Site.

11.3.33 A River Corridor Survey (RCS) was undertaken in September 2022, with an update survey completed in June 2024, following the methodologies outlined in the *National Rivers Authority, Conservation Technical Handbook 1: River Corridor Surveys* (National Rivers Authority, 1992). Full details of the survey, methodologies and results can be found in **Appendix 11.4**.

11.3.34 The stretch of the River Loddon within the Site boundary provides a dynamic and varied river system, with differing habitat conditions influenced by channel morphology, riparian structure and adjacent land use. The channel width varies between 3m at the southern end of the Site, to 15m at the northern end.

11.3.35 At the southern end of the Site the river includes narrow and shallower profiles including gravel beds which provide potential spawning and feeding grounds for freshwater fish species. Weirs and culverts are present which could act as a mitigation barrier for migratory fish species, restricting natural fish movement and population dispersal.

11.3.36 The downstream sections of the River Loddon, at the north of the Site, are wider and deeper than the upstream sections. Riparian habitats in this section are dominated by woodland cover, contributing to better bank stability, increased shading, and more consistent flow conditions.

11.3.37 The final 230m of the River Loddon located within the Site do not follow the natural course of the river, having been straightened during the construction of the M4 motorway. The 25” to the Mile Ordnance Survey map shows the original course of the river which included a gentle meander to the east.

11.3.38 As well as providing an important ecosystem in itself, the River Loddon has the potential to support a host of protected and/or notable species including Water Vole, Otter *Lutra lutra*, White-clawed Crayfish *Austropotamobius pallipes* and freshwater fish.

11.3.39 Based on the reach of the River Loddon, its catchment and the habitats and species it supports, the River Loddon is considered to be of County Importance, and its conservation status is favourable and stable.

Habitats

11.3.40 The Site has been subject to multiple walkover surveys by experienced botanists between 2022 and 2025, whereby all areas of the Site have been visited at least once. Each parcel/feature was then characterised and mapped to the most detailed level possible under the UK Habitat Classification System (UKHab), including all applicable essential secondary codes. A list of the

vascular plant species present was recorded from each parcel/feature. Further details, including detailed methodologies and results can be found in **Appendix 11.3.**

11.3.41 A wide variety of habitat types are found at the Site including cereal crops, agricultural grasslands, semi-improved neutral grasslands, scrub, rush pasture, reedbeds, swamps, wet and dry woodland, ditches, hedgerows, tree lines, veteran trees, urban land, standing water, streams and the River Loddon itself. A habitat map is provided at **Figure 11.3**.

11.3.42 Several habitats mapped on Natural England's Priority Habitat Inventory (PHI) are present within the Site, mainly to the west of the Loddon and north of the M4. These include areas of Lowland Mixed Deciduous Woodland, Coastal and Floodplain Grazing Marsh, "Good Quality Semi-Improved Grassland", a small area of Traditional Orchard within the Hall Farm complex, and an area of Lowland Fen located outside of the Site boundary, between the western and eastern halves of the Site.

11.3.43 **Table 11.5** below provides a summary of the relative coverage of the different habitat types found across the Site.

Table 11.5 Summary of habitat types on-Site

Habitat Type	Approximate coverage – whole Site	Approximate coverage – east of Loddon (proposed development area)
Cropland (cereal, grassland leys)	31%	43%
Ditches	9km	2km
Floodplain wetland mosaic (overlaps with other habitat types)	18%	4%
Hedgerows	16km	8km
Lines of trees	4km	2km
Modified grassland	37%	37%
Other neutral grassland (including committed Lowland Meadow)	12%	6%
Rivers and Streams (excl. Loddon)	6km	1km
Standing water (floodplain ditches, ponds)	<1%	-
Scrub (mixed, Bramble)	2%	1%
Wetland (rush pasture, reedbeds/swamps, other)	2%	2%
Woodland (including wet woodland)	10%	7%
Urban	4%	3%

Coastal and Floodplain Grazing Marsh

11.3.44 A large proportion of the Site (mostly to the west of the Loddon, but also some to the east) has been mapped as its primary habitat type with the secondary codes 19 (Coastal and Floodplain Grazing Marsh (CFGM)) and 55 (Floodplain Wetland Mosaic (FWM)).

11.3.45 The CFGM areas of the Site cover the majority of the habitats within the Loddon floodplain, and comprise a mixture of Modified Grassland, various types of Other Neutral Grassland, Other Standing Water (i.e. ditches and ponds), Other Wetland (swamps and tall wetland forbs), and Purple Moor-grass and Rush Pasture.

11.3.46 The Loddon floodplain within the Site is a good example of CFGM in the structural sense, although it does not support other features mentioned in the original S41 description, such as breeding wading birds, ditches that are rich in plant and invertebrate species, or extensive areas of semi-natural grassland with a high diversity of native plant species.

11.3.47 FWM is not in itself a Priority habitat, but it overlaps to a large extent with CFGM. The Loddon floodplain within the Site is a good example of FWM in the sense that it contains a diverse mixture of habitats and near-natural hydrological function (the ditches present are not maintained and there are no other artificial structures controlling water levels or movement). However, a large proportion of its component habitat comprises herb-poor permanent pasture (mapped as Modified Grassland), limiting its ability to support species of ecological importance.

11.3.48 The areas of FWM/CFGM at the Site would be eligible for consideration as a Berkshire LWS on account of their S41 Priority Habitat status, collective size and function as a wildlife corridor. They are therefore considered to be of County level importance with their conservation status is considered to be unfavourable and stable as a result of the ongoing farming practices.

Hedgerows and Tree Lines

11.3.49 Over 90 hedgerows covering approximately 16km have been mapped within the Site, shown on **Figure 11.4**. These range from species-poor roadside hedgerows (typically Hawthorn *Crataegus monogyna*) to species-rich native hedgerows with trees, sometimes associated with banks or ditches.

11.3.50 The majority of the hedgerows mark field boundaries and lanes, many of which are present on historic maps from the late 1800s. Their current condition varies and some have become sparse and gappy due to lack of management, but several include mature and/or veteran trees (see **Appendix 11.6**). Others, notably east of the Loddon, are more modern straight-line hedgerows that are regularly flailed.

11.3.51 Hedgerows considered 'historic' often coincide with the location of veteran trees. These hedgerows were identified with reference to historic maps and the Veteran Tree survey report found at **Appendix 11.6** of this Chapter. The historic networks of hedgerows and lines of trees at the Site are considered to be of County level importance. This is due to the fact that their layout remains largely unchanged since at least the late 1800s, and they therefore represent considerable ecological continuity, as well as being relicts of an historic pattern of land use that has been lost from much of the lowlands due to urban sprawl and agricultural intensification.

11.3.52 As a Habitat of Principal Importance, the remaining hedgerows are of Local level importance.

11.3.53 The hedgerows and treelines on Site are largely considered to be unfavourable and declining as a result, either due to a lack of management or inappropriate management.

11.3.54 For the purposes of the impact assessment, all hedgerows and treelines will be considered together as impacts and mitigation will remain relevant for both Important Ecological Features.

Historic Floodplain Ditches and Modified Watercourses

11.3.55 Three main categories of ditches are present within the Site: ditches associated with hedgerows and/or lines of trees; natural watercourses issuing from springs or flushes that have been straightened and/or diverted to function as ditches; and man-made floodplain ditches designed to carry water off the floodplain. These are shown on **Figure 11.5**.

11.3.56 The network of old floodplain ditches and modified watercourses at the Site (mostly west of the Loddon but also including the Barkham Brook) are considered to be of County level importance,

due to their considerable ecological continuity and their value as a cultural/landscape feature. Due to a lack of suitable management, and surrounding agricultural land uses they are considered to be in an unfavourable and declining condition.

Rush Pasture

11.3.57 Two areas of Purple Moor-grass and Rush Pasture are present within the Site. Both are relatively poor examples of this habitat type, lacking many of the typical indicator species. However, they are differentiated from Holcus-Juncus Rush Pasture (categorised as a grassland) by the frequency of Jointed Rush *Juncus articulatus* and overall higher species diversity. These rush pastures also have a more varied sward structure than the Holcus-Juncus Rush Pasture, and as such are of value to a range of species of ecological importance.

11.3.58 The areas of Purple Moor-grass and Rush Pasture are considered to be of County importance with their conservation status unfavourable and stable.

Swamp & Reedbed

11.3.59 Two small parcels of reedbed dominated by Common Reed *Phragmites australis* are present within the floodplain areas of the Site. One forms part of the wet woodland/swamp/ditch complex to the west of the Loddon, and the other comprises two separate small stands of Common Reed that have colonised an old ditch to the east of the river.

11.3.60 Areas of swamps are also present within the Site. These swamps are comprised of uniform stands of vegetation dominated by a single species. In most cases this is either Greater Pond Sedge, Lesser Pond Sedge *Carex acutiformis*, Reed Sweet Grass *Glyceria maxima* or Reed Canary Grass *Phalaris arundinacea.*

11.3.61 The swamp and reedbed communities make an important contribution to the overall diversity of floodplain communities at the Site and are considered to be of Local importance. Their conservation status is considered to be unfavourable and stable.

Other Lowland Mixed Deciduous Woodlands

11.3.62 The areas of lowland mixed deciduous woodland at the Site are typically dominated either Oak *Quercus sp* or Ash *Fraxinus excelsior* in the canopy over an understorey of Hawthorn, Blackthorn *Prunus spinosa*, Field Maple *Acer campestre*, Elm *Ulmus procera* and/or Hazel *Corylus avellana*. Some are listed on the Provisional Ancient Woodland Inventory (**see Table 11.6**) and have a species-rich ground flora including Bluebell, Wood Anemone *Anemone nemorosa*, Pignut *Conopodium majus* and Moschatel *Adoxa moschatellina*, while others are dominated by species such as Dog's Mercury *Mercurialis perennis*, Ground Ivy *Glechoma hederacea*, Hedge Garlic *Alliaria petiolata*, Rough Meadow-grass *Poa trivialis*, nettles and brambles. Further details of specific woodlands can be found in **Appendix 11.3 and 11.5**.

Table 11.6 Provisional Ancient Woodlands located on-Site

Woodland Name	Location	Comments
St John's Copse	West of the Loddon	Present on maps from the mid-1700s.
Loader's Copse	On-site, east of the Loddon	Present on maps from the early 1800s.
The Gorse/ Newbury's Copse	On-site, east of the Loddon	Labelled as 'gorse' or 'brushwood' on maps from late 1800s, unlikely

		to have been wooded in AD 1600
Brick Kiln Coppice	On-site, east of the Loddon	Mixed plantation, present on maps from the early 1800s.

11.3.63 Where lowland mixed deciduous woodlands benefit from designations which influence their importance (e.g. as an LWS), these are discussed in the relevant sections. These include St Johns Copse LWS, Hall Farm Woodland Triangle LWS and Loader's Copse.

11.3.64 The remaining lowland mixed deciduous woodlands are considered to be of Local importance only. Due to the lack of suitable management they are considered to be unfavourable and declining.

Wet Woodland

11.3.65 Several strips and fragments of wet woodland are present on the Loddon floodplain, dominated by a combination of Alder, Crack Willow *Salix x fragilis* and Goat Willow *Salix capre*a. All are S41 Priority Habitat of varying age and quality. The wet woodlands have either developed naturally over abandoned floodplain meadows or have spread out from lines of riparian trees and scrub.

11.3.66 Where wet woodlands benefit from designations which influence their importance (e.g. as an LWS), these are discussed in the relevant sections. These include Rushy Mead LWS and Hall Farm Woodland Triangle LWS.

11.3.67 The remaining parcels of Wet Woodland are of Local importance. Due to the lack of suitable management they are considered to be unfavourable and declining.

Grasslands

11.3.68 The Site supports a variety of grassland type including other neutral grasslands; Arrhenatherum neutral grassland; Deschampsia neutral grassland; Holcus-Juncus neutral grassland; and modified grasslands.

11.3.69 Several areas of Other Neutral Grassland are scattered around the Site. The main areas of other neutral grassland are located west of the River Loddon. The majority are mostly located on localised gravel terrace deposits south of the M4 and form a mosaic with the more extensive areas of modified grassland on the floodplain, described below. These grasslands have developed more diversity than their floodplain counterparts, likely due to being better-drained and therefore less nutrient-rich. More diverse other neutral grasslands are present on the land to the north of the M4 motorway.

11.3.70 Scattered areas of Arrhenatherum Neutral Grassland can be found around the Site. These are associated with abandoned arable fields/corners which are now unmanaged and have been colonised by tall ruderal species such as False Oat Grass *Arrhenatherum elatius*, Yorkshire Fog, Creeping Bent *Agrostis stolonifera*, Creeping Thistle *Cirsium arvense*, Spear Thistle *Cirsium vulgare*, Common Ragwort, Burdock Arctium spp., Fleabane *Conyza spp*., Mugwort *Artemisia vulgaris* and Broadleaved Dock *Rumex obtusifolius*.

11.3.71 A few areas of tussocky grassland dominated by Tufted Hair Grass *Deschampsia cespitosa* are present on both sides of the Loddon floodplain. The majority of these grasslands are ungrazed and rank, with robust species persisting among the Deschampsia such as Yorkshire Fog *Holcus*

lanatus, Meadow Foxtail *Alopecurus pratensis*, Hairy Sedge *Carex hirta*, Water Mint *Mentha aquatica*, Comfrey *Symphytum officinalis* and Clustered Dock *Rumex conglomeratus*.

11.3.72 As with the *Deschampsia* grassland, a few areas of Holcus-Juncus Neutral Grassland are present within the overall Floodplain Wetland Mosaic on both sides of the Loddon. These grasslands are characterized by abundant Yorkshire Fog, Creeping Bent *Agrostis stolonifera* and Soft Rush *Juncus effusus,* often with frequent Hard Rush *Juncus inflexus* and Creeping Buttercup *Ranunculus repens*.

11.3.73 The modified grasslands can be separated into two categories, the high-input pasture and the low-input pasture. The high-input pastures are managed for maximum productivity and are regularly sprayed off and re-sown. It is also likely that they are treated with fertiliser and/or herbicide.

11.3.74 The low-input pastures are grazed at a lower intensity and are not artificially fertilised, but their uniformity and lack of forbs indicate that they have been sown and treated with a broad-leaved herbicide in the past. They are typically dominated by one or more of Meadow Foxtail, Yorkshire Fog and Creeping Bent, with occasional Perennial Rye-grass, Timothy *Phleum pratense*, Common Couch *Elymus repens* and Rough-stalked Meadow Grass *Poa trivialis*. Forbs are generally limited to Creeping Thistle *Cirsium arvense*, Creeping Buttercup and Greater Plantain *Plantago major*.

11.3.75 The grasslands on Site have been further distinguished and evaluated by their community type, and this is discussed in more detail in **Technical Appendix 11.5** and below.

Flora & Vegetation

11.3.76 The Site has been subject to multiple walkover surveys by experienced botanists between 2022 and 2025, whereby all areas of the Site have been visited at least once. During the course of these surveys, a list of vascular plant species was recorded for each habitat parcel, with particular attention given to searching for species of conservation interest, habitat quality indicator species and invasive non-native species. Where possible, the vegetation within the Site was classified to the National Vegetation Classification (NVC) community descriptions. Further details, including detailed methodologies and results can be found in **Appendix 11.5.**

Flora

11.3.77 Thirteen species of conservation interest have been recorded on the Site during the course of the surveys. These are: Tubular Water-dropwort *Oenanthe fistulosa;* Snake's-head Fritillary *Fritillaria meleagris;* Touch-me-not Balsam *Impatiens noli-tangere;* Lesser Spearwort *Ranunculus flammula;* Crosswort *Cruciata laevipes;* Brown Sedge *Carex disticha;* Wild Daffodil *Narcissus pseudonarcissus ssp. pseudonarcissus;* Short-styled Field Rose *Rosa stylosa;* Round-leaved Dog Rose *Rosa tomentella*; Loddon Pondweed *Potamogeton nodosus;* Broad-leaved Pondweed *Potamogeton natans,* Fennel Pondweed *Potamogeton pectinatus and* Flowering Rush *Butomus umbellatus*

11.3.78 The locations of these species are shown on **Figure 11.6.**

11.3.79 In addition, four invasive non-native species were recorded from within the Site and immediate surroundings: Giant Hogweed *Heracleum mantegazzianum;* Himalayan Balsam *Impatiens glandulifera;* Virginia Creeper *Parthenocissus quinquefolia* and Japanese Knotweed *Reynoutria japonica.*

11.3.80 The population of Loddon Pondweed within the Site is considered to be of National importance.

11.3.81 The other four species of conservation importance at the national level (Tubular Water dropwort, Snake's-head Fritillary, Touch-me-not Balsam and Lesser Spearwort) are small, localised populations (and in the case of Touch-me-not Balsam, may have been confused with the much more common Small Balsam *Impatiens parviflora* by the third-party recorder). The populations of Tubular Water-dropwort and Snake's-head Fritillary are not considered to be sustainable as they have not been recorded again since they were first seen in 2022.

11.3.82 Due to the size of the Site, and the limited distribution of the flora of conservation interest the species have been assessed on a parcel-by-parcel basis. With the exception of Lesser Spearwort, the floral species of conservation interest (Touch-me-not Balsam; Crosswort; Brown Sedge; Wild Daffodil; Short-styled Field Rose; and Round-leaved Dog Rose) are considered to be of County importance within discrete locations, the details of which can be found in **Appendix 11.5**.

11.3.83 The population of Lesser Spearwort is considered to be of Local importance only.

11.3.84 Given their mostly continuous presence across multiple survey years, the populations of flora of conservation interest are considered to be favourable and stable.

Vegetation

11.3.85 Further to the grassland habitats which are outlined above, **Table 11.7** below lists the grassland communities which are considered to be represented within the Site, all of which are mesotrophic grasslands.

Table 11.7 Grassland communities recorded on-Site

Community (closest fit)	Description
MG1 *Arrhenatherum elatius* grassland	Rank ungrazed grasslands with a high frequency of False Oat-grass. Typically found in abandoned arable or pasture on more freely-draining ground above the floodplain.
MG6a *Lolium perenne-Cynosurus cristatus* grassland – typical subcommunity	The reasonably diverse (but lacking lowland meadow indicators) neutral grasslands on more freely-draining ground above the floodplain have affinities to MG6a. The most extensive areas are associated with the horse-grazed fields north of the M4.
MG7a *Lolium perenne-Trifolium repens* leys	This community is found in the majority of the modified grasslands around the CEDAR dairy east of the Loddon, and in some of the floodplain grasslands that are likely to have been re-

Community (closest fit)	Description
	sown relatively recently with Perennial Rye-grass, such as EV27 and EV28.
MG7d *Lolium perenne-Alopecurus pratensis* grassland	Many of the improved floodplain grasslands in EcoValley have affinities to this community. They are generally dominated by Meadow Foxtail in spring, followed by varying amounts of Creeping Bent, Yorkshire Fog and Perennial Rye-grass. Forbs are few and far between, and generally limited to thistles, docks, Dandelion and Creeping Buttercup.
MG9 *Holcus lanatus-Deschampsia cespitosa* grassland	Grasslands with frequent to abundant Tufted Hair-grass are found in areas of the floodplain with impeded drainage where seasonal floodwaters sit for longer and nutrients accumulate. Often in transition to MG7d or swamp communities (see below).
MG10 *Holcus lanatus-Juncus effusus* rush pasture	A small number of grasslands on the floodplain are dominated by Yorkshire Fog and Soft/Hard Rush, typically in areas with a permanently high water table, and have affinities to MG10.
MG13 *Agrostis stolonifera-Alopecurus geniculatus* grassland*	This inundation community dominated by Marsh Foxtail *Alopecurus geniculatus* and Creeping Bent is found mostly in damp channels, hollows and low-lying corners within MG7d floodplain grasslands which hold water for longer than the rest of the field.
No clear grassland community	Some of the grasslands around the Site do not

Community (closest fit)	Description
	readily fit a described NVC community, or categorisation is not possible. This includes the committed future baseline grasslands associated with Shinfield Studios, and some small verges and paddocks which had been recently mown at the time of survey.

11.3.86 Of these, communities MG6a, MG7d and MG9 are all considered to be of Local importance. With the ongoing farming management, these grasslands are considered to be unfavourable and stable.

11.3.87 The remaining grassland communities are very common, widespread and/or species poor and are considered to be of importance within the Zone of Influence only in respect of their vegetation and are therefore not considered further within this assessment.

Veteran Trees

11.3.88 Of the mature trees surveyed, a total of 188 trees have been characterised as Veteran Trees and a further 135 as Other Trees of Ecological Interest (OTEI). All 188 veteran trees are referrable to the description of veteran trees in The Biodiversity Gain Requirements (Irreplaceable Habitat) Regulations 2024, and of these 17 are referable to the description in the NPPF. Further details, including the methodology for defining a veteran tree, can be found in Technical Appendix 11.6.

11.3.89 The veteran tree and OTEI resource within the ZoI is dominated by Pedunculate Oak and Ash, largely associated with field boundaries, and many generations of these species are likely to have been present in this landscape over the centuries, forming considerable ecological continuity.

11.3.90 The assemblage of veteran trees on the Site is considered to be of County importance and are considered to be favourable and stable.

Invertebrates

11.3.91 There are no records returned from TVERC for the Site itself, but those within 2km include relatively few records except from one of two locations. For example, there is a cluster of records from Dinton Pastures to the northeast and Whiteknights Campus to the north of the Site. The exception to this is records of Stag Beetle *Lucanus cervus* which are numerous.

11.3.92 There are records of two species of mollusc within close proximity to the Site. These are Fine-lined Pea Mussel *Pisidium tenuilineatum* from 2000/1 within 1km to the northeast and Lagoon Spire Snail *Eupaludestrina stagnorum* from 2008 within 500m to the southwest. Both are Species of Principle Importance under the NERC Act 2006 (as amended).

11.3.93 An assessment of the Site's value for terrestrial and aquatic invertebrates was carried out via a series of invertebrate survey visits undertaken between June to October 2022 and April to June 2023. Due to the impracticality of surveying all invertebrates within a site, only specific groups of species were examined during fieldwork. These groups are sufficiently well known as to allow

meaningful comparisons to be made with other sites, both locally and nationally. Further details can be found in **Appendix 11.7**.

11.3.94 A total of 852 species of invertebrate were recorded across the Site, which included 25 species with a conservation designation. The pockets of floodplain fen supported a diverse assemblage with nationally scarce taxa including the sedge feeding leafhopper *Cicadula flori*. Yellow Loosestrife *Lysimachia vulgaris* was host to the Loosestrife Bee *Macropis europaea* and the flea beetle *Lythraria salicariae.* The ray spider *Theridiosoma gemmosum* and the beautiful and very local *Araneus marmoreus var pyramidatus* were frequent in the sedge beds. Comfrey *Symphytum officinale* supported the scarce flea beetle *Longitarsis symphyti* and the flowers were home to *Meligethes symphyti*; both recently discovered species in Britain.

11.3.95 Standing shaded water yielded the Carabid beetle *Bembidion octomaculatum* which may be the first for Berkshire of a species extinct in UK for over a century which his now spreading back: presumably from a new wave of immigration.

11.3.96 The surveys also identified habitats of value to invertebrates. These are shown on **Figure 11.7**, which shows the habitats of highest value to invertebrates within the local landscape, alongside those areas where the greatest invertebrate interest was recorded. These are shown as 'hotspots'.

11.3.97 Overall, the invertebrate assemblage within the ZoI is judged to be of no more than Local importance.

11.3.98 In the absence of the Proposals, it is likely that the conservation status of the invertebrate assemblage within the potential ZoI would remain unfavourable and declining. Unfavourable, since it is likely that the invertebrate assemblage will continue to be supported by the unfavourably managed habitats within the intensively managed farmland, both of which do not benefit invertebrates; and Declining, since species diversity and population abundance is likely to continue to decline in line with national and regional trends. Even in the absence of the Proposals the trends are likely to continue.

White-clawed Crayfish

11.3.99 The records from TVERC identified a single record of White-clawed Crayfish (WCC), in an upstream section of Barkham Brook approximately 1.62km from the Site boundary. The record was a physical specimen found in 2020.

11.3.100 WCC prefer shallow, fast-flowing waterbodies which are well oxygenated and calcium-rich. Submerged shelters, such as tree roots and overhanging vegetation further improve the suitability of habitats. The southern sections of the River Loddon therefore provide good opportunities for WCC. Sections of the Barkham Brook provide these habitats, most notably in the upstream sections.

11.3.101 A habitat assessment of Barkham Brook was undertaken in May 2025. The assessment found that the upper sections of the brook contained extensive root tangles trailing into the water and good water quality creating habitats of high suitability to support WCC. The suitability decreases downstream due to increased dense emergent vegetation and deep silty substrate. Further details of the habitat assessment can be found in **Appendix 11.7**.

11.3.102 Given the known population located upstream of the Site, surveys were undertaken to confirm presence or likely absence. Due to the access difficulties caused by dense vegetation and unstable banks, Environmental DNA (eDNA) surveys were considered to be the safest and most thorough method of survey.

11.3.103 eDNA surveys were undertaken on stretches of the Barkham Brook and the River Loddon within the Site boundary in 2023. Given the size and flow of the River Loddon, advice was sought from SureScreen Scientific to ensure sufficient samples was collected. Details of sample collection and methodologies are included within **Appendix 11.7**.

11.3.104 Water samples were collected from two locations in Barkham Brook, where it enters the Site, and downstream near where the brook leaves the Site before flowing under the M4.

11.3.105 Three locations were sampled on the River Loddon, including the upstream where the river enters the site, in a central section and downstream where the river exits the Site. Sample locations are shown on **Figure 11.8**.

11.3.106 All samples came back as negative for the presence of WCC. The results can be found in **Appendix 11.7**.

11.3.107 The absence of WCC within the River Loddon is expected, given the known populations of invasive Signal Crayfish *Pacifastacus leniusculus* which inhabit the river. Evidence of Signal Crayfish is present along the stretch of the river within the Site boundary, including burrows in the bank. A Signal Crayfish was also found in shallow water during the course of river surveys undertaken in September 2022. Signal Crayfish outcompete WCC and may also introduce Crayfish plague *Aphanomyces astaci*, which disproportionally impacts native WCC. As such these species do not cohabit, the presence of Signal Crayfish within the River Loddon therefore eliminates the possibility of WCC presence.

11.3.108 Although WCC are considered as likely absent from the Site, given their known population within the local watercourse network they are included within this impact assessment on a precautionary basis. The WCC population is of Local importance, whilst the conservation status is considered to be unfavourable and declining given the numerous challenges facing the species.

Freshwater Fish

11.3.109 The desktop study returned records of five species of freshwater fish within a 2km radius of the Site. These comprised:

- Barbel *Barbus barbus*;
- Brown Trout *Salmo trutta*;
- Bullhead *Cottus gobio*;
- European Eel *Anguilla anguilla*; and
- Brook Lamprey *Lampetra planeri*.

11.3.110 Of these, all were found exclusively within the River Loddon, with the exception of Bullhead, which have also been recorded within Barkham Brook and around Dinton Pastures. All five species have been found within the stretch of the River Loddon located within the Site.

11.3.111 Electrofishing surveys were undertaken in June 2024 to assess fish populations within the River Loddon, following standard protocols to ensure efficient, non-lethal sampling while minimising stress and harm to fish. Full details of the survey methodologies, approach and results are set out in **Appendix 11.8**.

11.3.112 A total of 515 fish were counted during the surveys, comprising of 13 species. These included the critically endangered European Eel, Brown Trout and Bullhead. The freshwater fish assemblage within the on-Site stretch of the River Loddon is primarily composed of small-bodied species such as Minnow *Phoxinus phoxinus*, Perch *Perca fluviatilis*, and Roach *Rutilus rutilus,* all of which are adaptable to a variety of environmental conditions. Predatory species, including Pike *Esox lucius*, were recorded but in low numbers, suggesting limited top-down predation pressure within the surveyed stretch.

11.3.113 The assemblage reflects a moderately functional aquatic ecosystem with distinct spatial variation in species richness and abundance. The stretch of river at the centre of the Site, located around the angling club, supported the highest species richness (nine species) and overall abundance (203 individuals), indicative of high-quality habitat features such as gravel substrate, flow heterogeneity, and marginal cover. In contrast, channels in proximity to the historic Arborfield Mill showed the lowest fish diversity and density, likely due to habitat degradation, poor structural diversity, or water quality limitations.

11.3.114 Based on the diversity and notable species recorded, the freshwater fish assemblage is considered to be of County level importance. Their conservation status is favourable and stable.

Great Crested Newt

11.3.115 Records of Great Crested Newt (GCN) *Triturus cristatus* gathered during the course of the desktop study were largely focused to the north-east of the Site, with substantial numbers of records recorded around Winnersh and Dinton Pastures Country Park. The closest known record of GCN come from Nirvana Spa, located approximately 650m to the north-east of the Site.

11.3.116 Twenty-five waterbodies were identified within the ZoI, and these are shown on **Figure 11.9**.

11.3.117 Anecdotal evidence suggests that GCN are present in off-site waterbodies (ID's 14, 15 and 16) directly to the south of the Site, as shown on **Figure 11.9**, although it has not been possible to gather any quantitative data to corroborate this.

11.3.118 The closest on-site waterbody to the presumed GCN populations in Waterbodies 14, 15 and 16 is Waterbody 12. This waterbody is located approximately 280m from the off-site waterbodies and is hydrologically connected via the Arborfield Cut. Terrestrial habitats within the immediate vicinity of these waterbodies largely comprise of arable crops which are considered to provide sub-optimal habitats for GCN. There are discrete patches of optimal habitats in the immediate area, including dense scrub associated with the Arborfield Cut ditch, and woodland habitats to the east.

11.3.119 Of the 25 water bodies identified, 12 fall within the Site boundary and could be directly accessed for Habitat Suitability Index (HSI) assessments in 2022 and 2024. In 2024, two additional waterbodies were subject to a HSI assessment from public footpaths running within proximity of off-site waterbodies. The results of the HSI assessment can be found in **Table 11.8** below. Detailed results of the HSI assessment can be found in **Appendix 11.9**.

Table 11.8 HSI scores of on-Site ponds

Waterbody ID	HSI score	Pond Suitability
1	0.44	Poor
2	0.68	Average
3	0.70	Good

4	0.32	Poor
5	0.48	Poor
6	0.77	Good
7	0.47	Poor
8	0.42	Poor
9	0.59	Average
10	0.34	Poor
11	0.67	Average
12	0.34	Poor
13	0.57	Below Average

11.3.120 Following the HSI assessment, waterbodies which still carried water were subject to water sampling for environmental DNA (eDNA) analysis. In 2022 and 2024 seven waterbodies were tested for eDNA. These waterbodies are shown on **Figure 11.9**. All results came back as negative for the presence of GCN.

11.3.121 Waterbody 12 was dry at the time of both eDNA surveys and therefore could not be analysed for the presence of eDNA. Given that the waterbody does not hold consistently hold water during the GCN breeding season it is unlikely to support GCN.

11.3.122 As a result of the on-Site surveying, GCN are considered likely absent from waterbodies within the Site.

11.3.123 However, as there is no evidence to support likely absence in Waterbodies 14, 15 and 16, and based on the anecdotal evidence available, GCN will be considered as present in these waterbodies on a precautionary basis for the purposes of this impact assessment. As there are suitable terrestrial habitat within 250m of these waterbodies which may support GCN during the terrestrial phases of their lifecycle, GCN are may be present within terrestrial habitats on the Site.

11.3.124 Without a population assessment, it is difficult to accurately determine the level of importance which can be attributed to the off-site GCN population. However, given the lack of optimal GCN habitats on-Site, and the lack of connecting waterbodies to the wider landscape from these populations, GCN are considered to be of at least Local importance and their conservation status is considered likely to be favourable and stable.

Breeding Birds

11.3.125 The desktop study returned a number of species of Conservation Concern which may be utilising the Site and the Zone of Influence. This included farmland birds, such as Yellowhammer *Emberiza citrinella*, Skylark *Alauda arvensis* and Grey Partridge *Perdix perdix*, alongside wetland specialists including Snipe *Gallinago gallinago*, Bittern *Botaurus stellaris* and Oystercatcher *Haematopus ostralegus.*

11.3.126 The Site offers a variety of suitable nesting and foraging habitats for breeding birds with a range of foraging and breeding requirements. Scrub and hedgerows of varying ages provide cover for nesting, whilst the extensive number of mature and veteran trees provide opportunities for cavity dwelling species such as Blue Tit *Cyanistes caeruleus*.

11.3.127 Arable habitats provide limited opportunities for breeding birds, with minimal arable margins further reducing their value. Crops recorded during the course of the surveys include winter wheat and oats which do provide valuable nesting habitats for Skylark throughout the

breeding season. The majority of grasslands are improved, species-poor and tightly grazed. As such minimal invertebrate activity is associated with these habitats reducing their value to the breeding bird assemblage.

11.3.128 The River Loddon provides diverse and valuable habitats for breeding birds, including riparian and water species. The abundance of invertebrates associated with the wetland habitats, and fish populations provide a variety of food sources.

11.3.129 Six breeding bird surveys were undertaken between March and July 2022, in line with the Bird Survey Guidelines. Full details of the survey methodologies, approach and results are set out in **Appendix 11.10**. Update surveys were undertaken between May – July 2024, and March – May 2025.

11.3.130 Across all surveys, a total of 94 species were recorded, which included 27 species Amber-listed Birds of Conservation Concern (BoCC), 16 Red-listed BoCC and 12 Species of Principle Importance under the NERC Act (2006) (as amended). These comprised:

- 27 Amber-listed BoCC (Greylag Goose *Anser anser;* Mallard *Anas platyrhynchos;* Teal *Anas crecca;* Sparrowhawk *Accipiter nisus;* Moorhen *Gallinula chloropus*; Oystercatcher *Haematopus ostralegus;* Snipe *Gallinago gallinago*; Black-headed Gull *Chroicocepha-lus ridibundus*; Common Gull *Larus canus*; Lesser Black-backed Gull *Larus fuscus;* Stock Dove *Columba oenas*; Woodpigeon *Columba palumbus*; Tawny Owl *Strix aluco*; Kestrel *Falco tinnunculus;* Rook *Corvus frugilegus*; Willow Warbler *Phylloscopus trochilus*; Sedge Warbler *Acrocephalus schoeno-baenus*; Whitethroat *Sylvia communis*; Wren *Troglodytes troglodytes*; Redwing *Turdus iliacus*; Song Thrush *Turdus philomelos*; Redstart *Phoenicurus phoenicurus*; Dunnock *Prunella modularis*; Grey Wagtail *Motacilla cinerea*; Meadow Pipit *Anthus pratensis;* Bullfinch *Pyrrhula pyrrhula*; and Reed Bunting *Emberiza schoeniclus*).
- 16 Red-listed BoCC (Grey Partridge *Perdix perdix;* Lapwing *Vanellus Vanellus;* Herring Gull *Larus argentatus*; Cuckoo *Cuculus canorus*; Swift *Apus apus*; Skylark *Alauda arvensis*; House Martin *Delichon urbicum*; Spotted Flycatcher *Muscicapa striata*; Starling *Sturnus vulgaris*; Fieldfare *Turdus pilaris;* Mistle Thrush *Turdus viscivorus;* Nightingale *Luscinia megarhynchos*; House Sparrow *Passer domesticus*; Greenfinch *Carduelis chloris*; Linnet *Linaria cannabina*; and Yellowhammer *Emberiza citronella).*
- 13 Species of Principle Importance (Lapwing; Herring Gull; Cuckoo; Woodlark; Skylark; Starling; Song Thrush; House Sparrow; Dunnock; Bullfinch; Linnet; Yellowhammer; and Reed Bunting).
- 10 Species listed on the Berkshire Local Nature Recovery Strategy ‘Species Priorities list’ (Grey Partridge; Lapwing; Linnet; Skylark; Yellowhammer; Nightingale; Starling; House Marting; Swift; and House Sparrow).

11.3.131 Of those 94 species recorded, 73 are considered to be ‘breeding’ species. This included 14 Red-listed and 20 Amber-listed breeding species.

11.3.132 Species composition between survey years was consistent, with differences largely revolving around incidental observations of migrant and uncommon species. The results demonstrate that the Site supports a varied assemblage of breeding birds which is reflective of the diverse habitats available.

11.3.133 Despite the extensive areas of agricultural land, farmland birds such as Linnet, Yellowhammer and Bullfinch were recorded in relatively low numbers and inconsistently

between years. Skylark populations were strong on the eastern side of the River Loddon where the majority of arable crops are located.

11.3.134 The Site currently supports 10 Skylark plots which are delivered as part of Skylark mitigation strategies for nearby development, which increases the carrying capacity of the Site for this species. A total of 14 probable Skylark territories were recorded across the Site during the course of the 2022 breeding bird surveys, with 12 probably territories recorded in 2024.

11.3.135 Grey Partridge were recorded on individual occasions in both 2022 and 2025. This demonstrates that they are present within the local landscape, however the lack of consistent observations indicates that the Site does not support a sustainable population.

11.3.136 Along the River Loddon and its associated habitats a number of riparian species were recorded holding territories in all years, including Sedge Warbler *Acrocephalus schoenobaenus*, Reed Warbler *Acrocephalus scirpaceus*, Reed Bunting *Emberiza schoeniclus* and Cetti's Warbler *Cettia cetti.*

11.3.137 In terms of the general distribution of the bird assemblage, the highest levels of activity were generally recorded along the River Loddon corridor, including its associated woodland and wetland habitats, Barkham Brook, woodland parcels and mature hedgerows throughout the Site. As a reflection of the habitats available, higher levels of activity were recorded within EcoValley.

11.3.138 When considering the overall species diversity supported by the Site, the number of Conservation Priority species recorded and the abundance of a number of notable species the breeding bird assemblage is considered to be of County level importance. The conservation status is favourable and stable.

Wintering Birds

11.3.139 The desktop study returned a number of species of BoCC which may be utilising the Site and the ZoI. This included overwintering waders, such as Lapwing and Golden Plover *Pluvialis apricaria*, alongside migratory waterfowl such as Wigeon *Anas penelope*, Teal and Shoveler *Anas clypeata*.

11.3.140 Fields on the western side of the River Loddon fall within the floodplain and are therefore regularly inundated during the winter. The soft ground can provide important foraging opportunities for waders, although the grasslands present limit the diversity of foraging opportunities currently present. The extensive pasture grasslands present throughout the Site also provide foraging habitats for geese.

11.3.141 Four wintering bird surveys were undertaken across 2023 in line with the Bird Survey Guidelines. In addition three nocturnal surveys were undertaken, with two visits completed in January 2023, with a further visit in January 2024. Full details of the survey methodologies, approach and results are set out in **Appendix 11.11.**

11.3.142 During the course of the wintering bird surveys, a total of 65 species were recorded across the Site. This included 24 species Amber-listed species of conservation concern, eight Red-listed species and nine Species of Principle Importance under the NERC Act (2006) (as amended). These comprised:

- 23 Amber-listed BoCC (Greylag Goose*;* Shoveler *Spatula clypeata*; Gadwall *Anas strepera*; Wigeon *Mareca penelope*; Mallard; Teal; Sparrowhawk; Moorhen; Snipe; Black-headed Gull; Common Gull; Lesser Black-backed Gull; Stock Dove;

Woodpigeon; Rook; Wren; Redwing; Song Thrush; Dunnock; Grey Wagtail; Meadow Pipit; Bullfinch; Reed Bunting; and Redstart *Phoenicurus phoenicurus).*

- Eight Red-listed BoCC (Herring Gull; Skylark; Starling; Fieldfare; Mistle Thrust; House Sparrow; Greenfinch; and Linnet).
- Nine Species of Principle Importance (Herring Gull; Skylark; Starling; Song Thrush; House Sparrow; Dunnock; Bullfinch; Linnet; and Reed Bunting.)
- Five Species listed on the Berkshire Local Nature Recovery Strategy 'Species Priorities list' (Linnet; Skylark; Yellowhammer; Starling; and House Sparrow).

11.3.143 The results of the survey show that the Site supports notable wintering bird assemblages along the River Loddon, where Widgeon, Shoveller and Gadwall were frequently recorded with peak counts of 63, 40 and 60 respectively. Large numbers of geese were also observed with flocks of approximately 300 Greylag Geese and Canada Geese *Branta canadensis* recorded in January 2023.

11.3.144 The assemblage of wintering bird species within the ZoI of the Site is therefore considered to be of County level importance whilst the conservation status is considered to be favourable and stable.

Bats

11.3.145 A desktop study identified fourteen species of bat within a 5km radius of the Site. These comprised:

- Barbastelle *Barbastella barbastellus*.
- Brown Long-eared bat *Plecotus auratus*;
- Common Pipistrelle *Pipistrellus pipistrellus*;
- Daubenton's bat *Myotis daubentoniid*;
- Leisler's bat *Nyctalus leisleri*;
- Long-eared bat species *Plecotus sp*;
- Myotis species *Myotis sp*;
- Nathusius *Pipistrellus nathusii*;
- Noctule *Nyctalus noctula*;
- Pipistrelle species *Pipistrellus sp*;
- Serotine *Eptesicus serotinus*; and
- Soprano Pipistrelle *Pipistrellus pygmaeus*.

11.3.146 Previous survey work undertaken by EPR in the wider Shinfield area has identified assemblages that largely match that as identified in the desktop study, including low numbers of Barbastelle.

Bat Activity Surveys

11.3.147 Bat activity surveys were undertaken between April and October 2022, in line with best practice guidelines in force at the time of the surveys (Collins, 2016). Each transect route was walked once a month from April to October 2022. In July and August 2022 transect routes

comprised of a dusk and pre-dawn transect survey within one 24-hour period. A summary of results can be seen on **Figures 11.10a-11.10j.**

11.3.148 Update surveys were undertaken in the summer and autumn of 2024 in line with the updated guidelines (Collins, 2023). A summary of results can be seen on **Figures 11.11a-11.11h.**

11.3.149 A total of seven bat species or genus were recorded during the course of all bat activity surveys, including:

- Long-eared bat;
- Common Pipistrelle;
- Myotis sp.;
- Noctule;
- Serotine;
- Soprano Pipistrelle; and
- Barbastelle.

11.3.150 High numbers of bat passes were recorded within the woodlands across the Site, particularly the ancient woodlands such as St Johns Copse and surrounding woodlands in the western side of the Site. The data also shows a pattern of dispersal from these woodlands with bats recorded utilising the network of hedgerows that connect these pockets of woodland to the west of the Site (northwest of the River Loddon). Long eared bats were recorded predominately in a patch of woodland towards the north-east of the Site.

11.3.151 The northwest of the River Loddon is more densely vegetated with woodland and linking hedgerows around arable field margins than that of eastern side of the River Loddon which contains larger fields utilised for dairy cattle with limited connecting green canopy in the form of hedgerows that bats can utilise as linear corridors for commuting.

11.3.152 Myotis bats were mostly record south of the river Loddon utilising the woodland pockets closely connected to the river as well as boundary features, particularly the larger lines of trees within the southern extent of the Site.

11.3.153 Serotine bats were recorded towards the centre of the Dairy Centre suggesting a potential roost nearby. Activity was then recorded in the woodlands and hedgerows, including the public footpath, surrounding this central point of the Dairy Centre.

11.3.154 Noctule and Pipistrelle bats (including Common and Soprano) were more widespread across the Site with key activity recorded around the hedgerows extending west to east from the River Loddon and woodlands surrounding the river.

11.3.155 Bat activity appears to be congregated towards the peripheries of the Site in the eastern extent around the woodlands and lines of trees that form the boundary of the Site. As expected, minimal bat activity was recorded within the arable fields themselves partially where those fields lack suitable boundary canopy or species diversity to provide suitable forage.

11.3.156 At least nine species of bat were recorded by the automated static detectors during the 2022 active bat survey period including:

- Long-eared bat;

- Common Pipistrelle;
- Leisler's bat;
- *Myotis* species;
- Nathusius' Pipistrelle;
- Noctule;
- Serotine;
- Soprano Pipistrelle; and
- Barbastelle.

11.3.157 In total 146,499 bat passes were recorded across the entire survey period. Of those passes recorded a total of 137,508 were either Common or Soprano Pipistrelle (not including unidentified Pipistrelle species) making up 94% of all bat passes recorded across all detector locations. Low numbers of passes by Serotine, Nathusius Pipistrelle, Noctule, Leisler's bat, Myotis species and Barbastelle were also recorded.

11.3.158 Throughout the active bat season most static locations showed a consistent level of activity through the season showing sustained commuting and/or foraging. This suggests the habitats sampled across the Site are likely to support bats with suitable forage and commuting routes throughout the year as part of the wider Loddon Valley resource available to bats.

11.3.159 The results of the update static detector surveys undertaken between June and October 2024 largely aligned with the 2022 results, with the same nine species recorded.

11.3.160 Common and Soprano Pipistrelle were again the most frequently recorded species, with low numbers of passes of Serotine, Nathusius Pipistrelle, Noctule, Leisler's bat, *Myotis* species and Barbastelle also recorded.

11.3.161 The static located on the central treeline of the proposed development area (static detector location 24) showed a clear peak in bat activity in July 2024, which might suggest a maternity roost nearby. A second peak was recorded in September 2024 suggesting the habitats present within the vicinity may provide ample foraging resource for bats prior to hibernation. Given that the location is surrounded by grazed pasture on both sides would suggest that the treeline itself is a key feature for bats at this time of year, or a discrete event in the vicinity (such as storage of manure) was providing a valuable resource for a period of time.

11.3.162 The majority of the remaining location showed a sustained level of activity across much of the months suggesting regular commuting/foraging across the landscape with no definitive peaks at a particular time of year.

11.3.163 Overall, the bat assemblage is mostly comprised of predominantly common and widespread species, particularly Common Pipistrelle, Soprano Pipistrelle and Brown Long-eared bats mainly using the boundary habitats for foraging or commuting, and low numbers of less common species such as Myotis species and Noctule. Low numbers of rarer bats including Barbastelle, Leisler's, Nathusius Pipistrelle and Serotine were also picked up during static bat detector surveys, but the levels of recorded calls indicate only very infrequent transient use likely utilising the linear corridors within the Site to pass through to suitable habitats such as ancient woodlands.

11.3.164 The bat assemblage is therefore considered to be of Regional importance, with the conservation status favourable and stable.

Preliminary Building Roost Assessments for Bats

11.3.165 A total 58 buildings present within the Site were assessed for their suitability to support roosting bats (**Figure 11.12)**. In summary:

- Seven buildings were confirmed as supporting roosting bats;
- Six buildings were assessed as having high suitability to support roosting bats'
- Ten buildings were assessed as having moderate suitability to support roosting bats;
- Thirteen buildings were assessed as having low suitability to support roosting bats; and
- Twenty-two buildings were assessed as being of negligible suitability to support roosting bats.

Ground Level Tree Assessment

11.3.166 A survey of trees within the Site was completed between July 2023 and March 2024. The surveys comprised a search from ground level, with the aid of binoculars, for features with suitability to support bats, including woodpecker holes, loose bark, cracks and crevices, broken off limbs and dense Ivy *Hedera helix*, as well as signs of bats, such as scratching and staining.

11.3.167 The Bat Surveys – Good Practice Guidelines 3rd edition (Collins, 2016) was the most up to date version of the guidance when the Ground Level Tree Assessment (GLTA) surveys began on-site however this has now been superseded by Bat Surveys – Good Practice Guidelines 4th edition (Collins, 2023) which was released in September 2023. Consequently, completion of the GLTA spanned the transition from the 3rd to the 4th edition bat survey guidelines and as such trees were assessed under one or other of these sets of guidelines.

11.3.168 A total of 378 individual trees and 34 groups of trees were considered to be suitable to support roosting bats. **Table 11.9** below sets out the total numbers of trees falling into each of the categories, depending on the guideline methodology.

Table 11.9 Trees and suitability to support roosting bats

Bat Roosting Suitability	Total Number of Trees	Total Number of Tree Groups
High	44	0
Moderate	48	1
Low	64	20
Negligible	8	-
PRF-I	103	13
PRF-M	111	-

Emergence/Re-entry Surveys for Bats

11.3.169 Bat dusk emergence and dawn re-entry surveys were undertaken of buildings assessed as having suitability to support roosting bats and considered likely to be directly

impacted by the Proposed Development between August and September 2022 and July and September 2023.

11.3.170 Bat emergences or re-entries were recorded at nine of the buildings surveyed. Further details can be found in **Appendix 11.12**.

11.3.171 In summary, between the roost assessments and emergence/re-entry surveys, 12 buildings have been confirmed as supporting roosting bats. These are outlined in **Table 11.10** below.

Table 11.10 Bat roosts identified on-Site

Building Reference	Roosts supported
12	Brown Long-eared Day Roost
15	Brown Long-eared Day Roost
17	Brown Long-eared Day Roost Common Pipistrelle Day Roost Soprano Pipistrelle Day Roost
18	Soprano Pipistrelle Day Roost *Myotis* Species Day Roost
18a	Soprano Pipistrelle Day Roost
22	Brown Long-eared Day Roost Common Pipistrelle Day Roost Soprano Pipistrelle Day Roost
24	Brown Long-eared Day Roost Soprano Pipistrelle Day Roost
26	Common Pipistrelle Day Roost
27	Brown Long-eared Maternity Roost Soprano Pipistrelle Day Roost
35	Soprano Pipistrelle Day Roost Unknown Pipistrelle species Day Roost
35a	Common Pipistrelle Day Roost Soprano Pipistrelle Day Roost

11.3.172 Non-breeding day roosts for Common Pipistrelle, Soprano Pipistrelle, Myotis species and Brown Long-eared bats are of zone of influence important only. However, the presence of maternity roosts for Brown Long-eared bats increases this to County level importance. Therefore, the Site is considered up to County Level Importance for roosting bats and their conservation status is favourable and stable.

Hazel Dormice

11.3.173 The desktop study identified a single record of Hazel Dormice *Muscardinus avellanarius* . The record, from 2011, is located approximately 2.3 km to the north of the Site. The record is separated from the Site by significant development on the outskirts of Reading, as well as the M4 motorway which is acts as a major (though not impenetrable) barrier to Dormouse movement.

11.3.174 The Site contains a range of hedgerows, treelines, scrub and woodland pockets of varying suitability to support Dormice. The majority of habitats on Site were assessed to have sub-optimal suitability to support Dormice, primarily including hedgerows which exhibited gaps or showed signs of regular management, or woodlands that lacks a widely dense understorey.

11.3.175 The majority of optimal hedgerow and woodland habitat was present on the western side of the River Loddon, whilst the eastern side predominantly contained sub-optimal or negligible habitat.

11.3.176 Habitats classified as having optimal suitability to support Dormice, including woodland, treelines and boundary hedgerows often contained fruit, nut and nectar producing species such as Hazel, Blackthorn and Hawthorn. Dormice use these species as important sources of food as well as for constructing their characteristic nests.

11.3.177 The structure of the optimal habitat is also suitable for Dormice, with good canopy cover and an understorey which is important to allow for aerial connectivity and avoidance of movement across open ground.

11.3.178 Following the habitat assessment, presence/likely absence surveys were undertaken across 2022 and 2024, whilst the parcel of land to the north of the M4 was surveyed across 2024 and 2025. The nest tube survey methodology followed the Dormouse Conservation Handbook 2nd Edition (Bright *et al*, 2006). Dormouse tubes and boxes were focussed on well-connected optimal habitats where it was considered likely that presence would be most likely. A total of 375 tubes were deployed across the Site and wider allocation land (**Figure 11.13**). Further details can be found in **Appendix 11.13**.

11.3.179 Across the course of the surveys, one potential Dormouse nest was identified off-site within the wider Loddon Garden Village allocation land during the first survey visit to the Site in September 2022. The location is shown on **Figure 11.13**. The potential nest, composed primarily of leaves, was not fully constructed, thereby making definitive identification difficult.

11.3.180 The remaining surveys visits did not identify any confirmed, or potential evidence of Dormice. Given this lack of wider evidence on any subsequent surveys the likelihood of the potential nest being a Dormouse nest is very low.

11.3.181 Based on the evidence, Hazel Dormice are considered to be likely absent from Site and are not considered further within this assessment. Opportunities to improve the Site for Dormice are considered within the Ecological Mitigation and Enhancement Strategy (EMES) set out in **Appendix 11.16**.

Water Vole

11.3.182 Four records of Water Vole were returned within a 2km radius of the Site. Three of these records were from Dinton Pastures, whist the fourth was located at Maiden Erlegh Local Nature Reserve. The most recent of these records was from 1997.

11.3.183 A habitat assessment was undertaken by EPR in 2022 of all watercourses on the Site. This was updated in 2024. Full details of the survey methodologies, approach and results are set out in **Appendix 11.14**.

11.3.184 Neither of the surveys undertaken in 2022, or 2024 recorded any evidence of Water Vole activity. No field signs, including latrines, feeding remains, burrows, or footprints were identified in any of the surveyed sections. During the survey, burrows were identified along sections of the banks of the River Loddon; however, these were assessed as being likely created and utilised by the invasive Signal Crayfish rather than Water Vole. The burrows exhibited characteristics consistent with crayfish activity, including their size, shape, and positioning relative to the waterline.

11.3.185 Water Vole are therefore considered as likely absent from the Site and will not be considered further within this assessment. Opportunities to improve the Site for Water Vole are

considered within the Ecological Mitigation and Enhancement Strategy set out in **Appendix 11.16**.

Otter

11.3.186 Sixteen records of Otter *Lutra lutra* from six locations were returned during the desktop study. The majority of these were located approximately 950m downstream of the Site on the River Loddon.

11.3.187 Furthermore, there are a number of anecdotal records of Otter using the River Loddon and surrounding habitats, provided by members of farm staff. This includes a sighting of two Otter crossing from the river to Rushy Mead LWS through the adjoining grassland field.

11.3.188 Otter surveys were undertaken on the River Loddon in June and September 2022 and were updated in June 2024. Full details of the survey methodologies, approach and results are set out in Appendix 11.14.

11.3.189 In 2022, an Otter spraint was found on the banks of the River Loddon, whilst likely feeding remains were found further downstream. The locations of these are shown on **Figure 11.14**.

11.3.190 In 2024, old Otter spraint and feeding remains were found in a similar location to the evidence found in 2022. The results of the 2024 survey are shown on **Figure 11.14**.

11.3.191 No evidence of Otter holts or resting sites were identified in either year.

11.3.192 The size of an Otter's territory is heavily influenced by a number of factors, including resource availability, competition and the type/availability of waterbodies/watercourses within the area. As such territory sizes may vary from 3km to 50km (Kruuk et al, 1993). Given that the stretch of the River Loddon within the Site boundary measures approximately 2.3km, even at the lower end of the territory range it would only form supporting habitats as part of a larger territory.

11.3.193 It is therefore concluded that the Site likely provides foraging and commuting habitats for an Otter territory whose holt is located further upstream or downstream of the Site. Given the low levels of activity recorded, it is likely that the holt is not within close proximity and the Site is used on a transient basis.

11.3.194 The Otter population is therefore of Local level importance, and the conservation status is favourable and stable.

Summary of Baseline Conditions

11.3.197 With reference to the assessment criteria set out above and in **Appendix 11.2**, the Important Ecological Features to be taken forward for detailed impact assessment are summarised in **Table 11.11** below.

Table 11.11 Summary of Important Ecological Features

Feature	Importance
Thames Basin Heaths SPA	International
Bramshill SSSI	National
Longmoor Bog SSSI	National
St Johns Copse LWS	County
Hall Farm Woodland Triangle LWS	County
Rushy Mead LWS	County
Loader's Copse LWS	County
Gravel Pit Wood, The Holt LWS	County
River Loddon (and LWS)	County
Coastal Floodplain Grazing Marsh	County
Historic Hedgerows/Treelines	County
Hedgerows/Treelines	Local
Historic Floodplain Ditches and Modified Watercourses	County
Rush Pasture	County
Swamp & Reedbed	Local
Other Lowland Mixed Deciduous Woodlands (non-LWS)	Local
Wet Woodlands (non-LWS)	Local
Flora of Conservation Interest	County
Flora of Conservation Interest (Loddon Pondweed)	National
Flora of Conservation Interest (Lesser Spearwort)	Local
Vegetation (Grasslands)	Local
Veteran Trees	County
Invertebrate Assemblage	Local
White-clawed Crayfish	Local
Freshwater Fish Assemblage	County
Great Crested Newt	Local
Breeding Bird Assemblage	County
Wintering Bird Assemblage	County
Bat Assemblage	Regional
Roosting Bats	County
Otter	Local
[redacted]	

Future Baseline

Thames Basin Heaths SPA

11.3.198 In the absence of the Proposed Development, there would be no associated increases in trips on the local road network, or additional visits to the Thames Basin Heaths SPA generated from the Proposed Development.

11.3.199 Increases in recreational pressure and changes in air quality may still occur as a result of other residential development within the vicinity of the SPA. However, these developments would be required to demonstrate that they will not adversely affect the integrity of the SPA via a Habitats Regulation Assessment (HRA) and as such it is expected that the Thames Basin Heaths SPA would remain in a favourable and stable condition.

Sites of Special Scientific Interest

11.3.200 In the absence of the Proposed Development, there would be no additional visits to the SSSI's generated, and as such no associated increases in recreational pressure.

11.3.201 Other development within the vicinity of the SSSI's would have the potential to increase recreational pressures on the sites and the features for which they are designated.

11.3.202 As a component SSSI of the Thames Basin Heaths SPA, Bramshill SSSI would benefit from impact avoidance and mitigation measures implemented for the SPA, and would therefore be expected to remain in a favourable and stable condition

11.3.203 Longmoor Bog SSSI is currently recovering in condition due to the ongoing suitable management implemented and would therefore be expected to continue to recover into a favourable condition.

St Johns Copse LWS

11.3.204 In the absence of Proposed Development, St Johns Copse will remain under an appropriate management regime and the conservation status will therefore remain favourable and stable.

Hall Farm Woodland Triangle LWS

11.3.205 In the absence of the Proposed Development, Hall Farm Woodland Triangle LWS would remain unmanaged and the conservation status would therefore remain unfavourable and declining.

Rushy Mead LWS

11.3.206 In the absence of the Proposed Development, Rushy Mead LWS would remain unmanaged and the conservation status would therefore remain unfavourable and declining.

Loader's Copse LWS

11.3.207 In the absence of the Proposed Development, Loader's Copse LWS would remain unmanaged and the conservation status would therefore remain unfavourable and declining.

Gravel Pit Wood, The Holt LWS

11.3.208 In the absence of the Proposed Development, Gravel Pit Wood, The Holt LWS will remain under its current management regime and the conservation status will therefore remain favourable and stable.

River Loddon (and LWS)

11.3.209 In the absence of the Proposed Development, the River Loddon would remain under its current management and maintenance regime and would therefore likely remain favourable and stable.

11.3.210 However the section of the River Loddon is reliant on upstream conditions, and the conservation status of the river would therefore be subject to unpredictable fluctuations depending on changes to the upstream catchment.

Coastal Floodplain Grazing Marsh (CFGM)

11.3.211 In the absence of the Proposed Development, the CFGM would remain in agricultural use and would therefore remain in an unfavourable and stable condition.

Hedgerows and Treelines

11.3.212 In the absence of the Proposed Development the hedgerows and treelines would remain in their current management regime and would therefore remain in an unfavourable and declining condition.

Historic Floodplain Ditches and Modified Watercourses

11.3.213 In the absence of the Proposed Development, the ditches and watercourses would remain under their current management regime, within an agricultural landscape and would therefore remain in an unfavourable and declining condition.

Rush Pasture

11.3.214 In the absence of the Proposed Development the rush pasture would remain in their current management regime and would therefore remain in an unfavourable and declining condition.

Swamp and Reedbed

11.3.215 In the absence of the Proposed Development the swamp and reedbeds would remain in their current management regime and would therefore remain in an unfavourable and declining condition.

Other Lowland Mixed Deciduous woodland

11.3.216 In the absence of the Proposed Development the other lowland mixed deciduous woodlands (which are not covered by a LWS designation) would remain in their current management regime and would therefore remain in an unfavourable and declining condition.

Wet Woodland

11.3.217 In the absence of the Proposed Development the wet woodlands (which are not covered by a LWS designation) would remain in their current management regime and would therefore, remain in an unfavourable and declining condition.

Flora Species of Conservation Interest

11.3.218 In the absence of the Proposed Development, survey data would indicate that flora species of conservation interest populations would remain favourable and stable.

Vegetation - Grasslands

11.3.219 In the absence of the Proposed Development, the grasslands would remain in agricultural use and would therefore remain in an unfavourable and stable condition.

Veteran Trees

11.3.220 In the absence of the Proposed Development, the veteran tree assemblage would remain favourable and stable.

Invertebrates

11.3.221 In the absence of the Proposed Development, the invertebrate assemblage would remain unfavourable and declining as a result of the current habitats on-Site and the declining national and regional trends for the species identified.

White-clawed Crayfish

11.3.222 In the absence of the Proposed Development, it is likely that the White-clawed Crayfish population will remain stable, and as a result its conservation status would remain as unfavourable.

11.3.223 However, Signal Crayfish are known to be present in the River Loddon, and the apparent barrier preventing them from moving up Barkham Brook is currently unknown. Based on current evidence, whilst it is considered unlikely, it is possible that in the absence of interventions, Signal Crayfish could find their way into Barkham Brook which could decimate the known populations of White-clawed Crayfish further upstream.

Freshwater Fish

11.3.224 In the absence of the Proposed Development, the freshwater fish assemblage will remain stable and as a result its conservation status will remain as favourable.

Great Crested Newt

11.3.225 In the absence of the Proposed Development, it is likely that GCN would remain absent from on-Site waterbodies due to a lack of connectivity to known populations.

11.3.226 Terrestrial habitats would be unlikely to increase in suitability, even in the event that the farming regime or management practices were altered as habitats surrounding the known populations would likely remain in arable use and crops would not influence the suitability further. Substantial habitat improvements would be required to improve suitability for GCN, and this would not occur whilst the land remained in agricultural use.

Breeding Birds

11.3.227 In the absence of the Proposed Development, and assuming farming practices remain consistent, the breeding bird assemblage will likely remain stable and as a result its conservation status will remain favourable.

11.3.228 However, the breeding success of Skylark is heavily influence by farming practices, including crop choice. Skylark require two to three successful broods in order to maintain a stable population (RSPB, N.D). Due to their reliance on access to bare ground however, certain crops can limit breeding success of later broods by growing too tall and dense by late spring, therefore, limited Skylark to one successful brood which in the longer-term will result in declining Skylark numbers. The planting of tall fast-growing species such as maize or rapeseed could therefore have a negative impact on the breeding success of the local Skylark population, causing local declines.

Wintering Birds

11.3.229 In the absence of the Proposed Development, and assuming farming practices remain consistent, the wintering bird assemblage would remain stable, and as a result its conservation status would remain as favourable.

11.3.230 However, the ability of the Site to support flocks of overwintering farmland birds will be dependent upon the rotational management of arable crops. In years where fields are left to overwinter as stubble it will provide an important winter food source for farmland specialists. However, if winter wheat or maize were to be sown, foraging opportunities and thus the Site's ability to support such species, would be diminished.

Bat Assemblage

11.3.231 In the absence of the Proposed Development, the bat assemblage will remain stable, and as a result its conservation status will remain as favourable.

Roosting Bats

11.3.232 In the absence of the Proposed Development, roosting bats will remain stable, and as a result their conservation status will remain as favourable.

Hazel Dormice

11.3.233 In the absence of the Proposed Development, it is likely that Hazel Dormice would remain absent from the Site due to the distance from known records and poor connectivity.

11.3.234 There are however habitats suitable to support Dormice available on-Site and in the absence of the Proposed Development, continual management under the current regime means suitable habitats would remain present.

Water Vole

11.3.235 In the absence of the Proposed Development, it is likely that Water Vole would remain absent from the Site due to the current conditions which prevent their current inhabitation.

11.3.236 There are however habitats suitable to support Water Vole available on-Site and in the absence of the Proposed Development, continual management under the current regime means suitable habitats would remain present.

Otter

11.3.237 In the absence of the Proposed Development, it is likely that Otter will continue to utilise the Site for ad-hoc foraging and commuting. It is possible that a holt may be established in the future. The conservation status of the Otter population would therefore remain as favourable.

[redacted]

11.4 Inherent design mitigation

11.4.1 The following section sets out mitigation measures that have been designed into the Proposed Development, as well as measures which are commonly implemented as part of the delivery of a new development in line with best practice, to avoid significant negative effects on IEFs.

Construction Environmental Management Plan

11.4.2 A Construction Environment Management Plan (CEMP) will be implemented during the construction phase for each development parcel, to be secured via a planning condition. The implementation of the CEMP will address impacts commonly arising as a result of construction works that may otherwise have negative impacts on IEFs.

11.4.3 The CEMP will prescribe measures to prevent and mitigate dust, noise, lighting and other forms of pollution. It will ensure compliance with regulatory requirements and good practice protocols relating to storage, transportation and disposal of chemicals, materials and waste. Further details can be found in the Ecological Mitigation and Enhancement Strategy set out at **Appendix 11.16**

11.4.4 Non-standard measures to address specific impacts on IEFs are outlined in the Additional Mitigation section below.

Buffer Zones

11.4.5 All retained habitats identified as IEFs will be appropriately protected through the incorporation of buffer zones providing offsets from built development. This will include the implementation of buffer zones during the construction phase to prevent damage, whilst the Proposed Development has been designed to incorporate semi-natural buffer zones during the operational phase. IEF habitats include Provisional Ancient Woodlands, habitats listed under Section 41 of the NERC Act 2006 (as amended) and watercourses.

11.4.6 Provisional Ancient Woodlands and IEF woodlands will be subject to a buffer zone of no less than 15m to protect root systems and canopies. Other habitats may be subject to lower buffer distances. These will be based upon the advice of a suitably qualified and experienced ecologist and will be determined by the sensitivity of the habitat and likely impacts arising from nearby construction works.

11.4.7 Further details can be found in the Ecological Mitigation and Enhancement Strategy set out at **Appendix 11.16**.

Tree Root Protection Zones

11.4.8 Rootzone compaction and accidental damage to retained trees and hedgerows will be avoided through the implementation of a Tree Protection Plan during the construction phase of each development parcel. The Tree Protection Plan will include prescriptions for the installation and maintenance of fencing to exclude construction from activity within root protection areas.

11.4.9 All Veteran Trees, whether identified via the NPPF or The Biodiversity Gain Requirements (Irreplaceable Habitat) Regulations 2024, shall include a root protection zone, to be as expansive as possible. At a minimum, it should encompass whichever of the following is larger:

- A radius extending 15 times the diameter of the tree (as measured at 1.5m above ground level); or
- An area reaching five meters beyond the tree's outermost canopy.

Drainage Strategy

11.4.10 Adverse effects on hydrology and water quality will be avoided and mitigated during the operational phase of development by the implementation of a detailed Drainage Strategy for each development parcel, to be secured via planning condition. The strategy will ensure that discharges from the Site will maintain or improve the current levels of water quality; prevent the migration of pollutants and sediments off-Site; and maintain the volume of discharge at current greenfield runoff rates.

Lighting Strategy

11.4.11 During the construction phase of the Proposed Development, the impacts of artificial lighting will be controlled through measures to be implemented as part of the CEMP, as outlined above.

11.4.12 Each development parcel of the Proposed Development will be accompanied by a Lighting Strategy (to be secured via planning condition), to minimise impacts of lighting during the operational phase. The lighting strategy will take into consideration ecologically sensitive features to be identified through existing and updated ecological surveys, with a particular focus on nocturnal and crepuscular species, including bats, [redacted] and Otter.

11.4.13 Further details of ecological considerations for the lighting strategy can be found in the Ecological Mitigation and Enhancement Strategy set out at **Appendix 11.16.**

Road Network

11.4.14 Wildlife tunnels have been included within the designs of the primary road network to provide opportunities for wildlife to cross the road unimpeded, reducing the risk of injury and death as a result of road traffic collisions. Species such as [redacted] amphibians and small mammals will all be able to utilise the tunnels to bypass the busiest roads.

Access Management

Suitable Alternative Natural Greenspace

11.4.15 The Proposed Development includes the delivery of 40.27ha of Suitable Alternative Natural Greenspace (SANG) to avoid adverse impacts on the Thames Basin Heaths SPA in line with local planning policy and Natural England Guidelines (2021). Further details on the impact avoidance strategy is set out in **Appendix 11.7**, whilst details of SANG delivery can be found in **Appendix 11.18**.

11.4.16 The two areas of SANG to be provided are to be connected by approximately 18ha of SANG Link. Whilst the SANG Link in itself does not meet the criteria to deliver SANG, it provides open greenspace connecting the two proposed SANG, allowing visitors to visit the two sites as a single entity.

11.4.17 Both the two SANGs and the SANG Link will be secured in perpetuity via a S106 agreement. This will protect these areas as accessible greenspace for members of the public and ensure their continued management.

11.4.18 These areas will seek to provide attractive alternative recreational spaces for new and existing residents in the local area, thereby drawing visitors away from potentially sensitive sites, including the Thames Basin Heaths SPA, accessible SSSI's and LWS's.

EcoValley Footpath Network

11.4.19 The footpath network within the wider EcoValley has been, and will be, designed to direct footfall away from sensitive ecological features, including LWS's and overwintering wildfowl.

11.4.20 Mown paths through grassland, and surfaced paths will be used to layout specific routes through EcoValley avoiding habitats at risk of impacts from increased footfall (e.g. ancient woodlands with sensitive ground flora) and species sensitive to disturbance from people and dogs. Whilst it is acknowledged that some visitors will still stray from the paths, the use of surfaced directed routes has been shown to reduce the number of visitors who stray from them (Pearce-Higgins *et al*, 2007).

11.4.21 As shown on plan 'LGV 2025 – Illustrative Landscape Masterplan', footpaths through parts of the floodplain have been left as mown paths to deter access during periods of inundation, providing wintering wildfowl with refuges away from visitors. Alternative locations, such as the western SANG, will include sections of boardwalk to provide dry routes for visitors, whilst areas of EcoValley which are not regularly inundated will include surfaced paths to maintain access. The provision of these surfaced and raised routes will provide more attractive options for visitors to EcoValley and minimise the use of important floodplain habitats.

Provision of Greenspaces

11.4.22 The design of the Proposed Development has incorporated extensive areas of open greenspace, to include:

- EcoValley – areas of semi-natural habitat to provide opportunities for biodiversity, recreation and research.
- Natural greenspace – areas of semi-natural habitats to provide opportunities for biodiversity and recreation.
- Amenity greenspace – areas within the Proposed Development to be managed for recreational development. Planting may include a combination of native and non-native species.
- Parks and gardens – areas within the Proposed Development to be managed for recreational development. Planting may include a combination of native and non-native species.

11.5 Potential effects prior to additional mitigation

11.5.1 This section assesses the likely significant effects of the Proposed Development in the absence of additional mitigation measures whilst taking into consideration the inherent design mitigation measures as outlined above.

Construction Phase

Thames Basin Heaths SPA

11.5.2 Located approximately 4.3km to the south of the Site, due to its distance no impacts are predicted on the Thames Basin Heaths SPA during the construction phase.

Sites of Special Scientific Interest

11.5.3 With the closest SSSI located approximately 3.3km from the Site, no impacts are predicted on SSSI's during the construction phase due to the distance.

Rushy Mead LWS

Loss of Habitats

11.5.4 The creation of the new spine road to access the Proposed Development will result in the loss of 0.04ha of Rushy Mead LWS. Alternative routes have been investigated, but when taking into consideration engineering constraints the loss of a small section of the LWS was considered to represent the least ecologically impactful. Alternative routes would result in the loss of irreplaceable habitats comprising veteran trees as identified under the NPPF.

11.5.5 The habitats to be lost include 0.04ha of other lowland mixed deciduous woodland.

11.5.6 No other LWS will be lost or directly impacted as a result of the Proposed Development during the construction phase.

11.5.7 Given the small amount of area to be impacted (less than 1% of the total woodland area) and the habitats present in this area, the loss of habitats within Rushy Mead LWS is not considered likely to impact upon the wider designation as a LWS or its ability to support the protected/notable habitats and species for which it is designated. In the absence of mitigation, the loss of a part of Rushy Mead LWS will result in a significant negative impact at the Local level only.

Damage to Retained Habitats

11.5.8 Measures to protect Rushy Mead LWS from damage will be detailed within the CEMP, with key measures for inclusion set out within **Appendix 11.16**. Such measures include the pollution prevention, dust control and surface water treatments.

11.5.9 Rushy Mead LWS will benefit from a buffer zone of no less than 15m during the construction phase to prevent accidental damage to trees, and protect root systems.

11.5.10 With the incorporation of inherent mitigation measures, to include the implementation of the CEMP and provision of buffer zones as outlined above, no impacts are predicted as a result of damage to retained habitats within Rushy Mead LWS during the construction phase.

St Johns Copse LWS, Hall Farm Woodland Triangle LWS; Loader's Copse LWS; and Gravel Pit Wood, The Holt LWS

Damage to Retained Habitats

11.5.11 With the incorporation of inherent mitigation measures as outlined above, no impacts are predicted as a result of damage to LWS's during the construction phase.

11.5.12 Measures to protect LWS's from damage will be detailed within the CEMP, with key measures for inclusion set out within **Appendix 11.16**.

River Loddon (and LWS)

Degradation of Habitats

11.5.13 A new river bridge is proposed to be installed over the River Loddon, spanning approximately 46m from bank to bank (Indicative River Loddon Crossing A392-119, ALP).

11.5.14 The section of the River Loddon where the bridge is proposed to cross is approximately 26m wide. The depth could not be determined with available apparatus but is thought to be 'over deep' from observations obtained during separate ecological surveys. The riparian zone includes a mix of tree cover and marginal vegetation, and swamp habitats adjacent to the river could act as seasonal flood storage areas. Areas of sediment deposition and bank erosion were observed, likely influenced by the depth of the river undercutting the banks.

11.5.15 The proposed bridge crossing does not interfere with the channel of the River Loddon, therefore hydrological and morphological impacts will not occur. The bridge will, however, increase levels of shading within the channel.

11.5.16 The section of the river where the bridge crossing is proposed benefits from greater light levels than at other sections nearby due to a lack of dense tree cover along the banks. At the proposed bridge crossing location emergent monocots such as Branched Bur-reed *Sparganium erectum* were recorded, as well as emergence/submerged dicots including Common Club-rush *Schoenoplectus lacustris*. The introduction of a new bridge crossing will therefore introduce shading which could have a negative impact on the aquatic and marginal vegetation of the River Loddon reducing its growth rate and viability and subsequently affect species which rely on these plants and local ecosystems.

11.5.17 In the absence of mitigation, the proposed bridge crossing over the River Loddon could have a significant negative impact at the Local level.

Changes in Water Quality

11.5.18 With the incorporation of inherent mitigation measures as outlined above, no impacts are predicted on the River Loddon as a result of changes to water quality during the construction phase.

11.5.19 Measures to protect the River Loddon from changes in water quality will be detailed within the CEMP, with key measures for inclusion set out within **Appendix 11.16**.

Coastal and Floodplain Grazing Marsh

Damage to Retained Habitats

11.5.20 With the incorporation of inherent mitigation measures as outlined above, no impacts are predicted as a result of damage to CFGM during the construction phase.

11.5.21 Measures to protect retained areas of CFGM from damage will be detailed within the CEMP, with key measures for inclusion set out within **Appendix 11.16**.

Loss of Habitats

11.5.22 As a result of the Proposed Development, approximately 1.35ha of CFGM will be lost to facilitate the proposed River Loddon bridge crossing and associated roads. The loss will encompass 0.85ha of grassland and 0.5ha of wetland habitat. These areas are shown indicatively on **Figure 11.15.**

11.5.23 Given the area and type of habitats to be lost, this is likely to result in a significant negative impact at the Local level.

Changes to Hydrology

11.5.24 The implications of the loss of functional floodplains and the implications for flooding are discussed in Chapter 13 of this ES.

Hedgerow and Treelines

Damage to Retained Habitats

11.5.25 With the incorporation of inherent mitigation measures as outlined above, no impacts are predicted as a result of damage to historic hedgerows and treelines during the construction phase.

11.5.26 Measures to protect retained hedgerows from damage will be detailed within the CEMP, with key measures for inclusion set out within **Appendix 11.16**.

Loss of Habitats

11.5.27 The Proposed Development will result in the loss of 1.25km of hedgerows and/or treelines to facilitate access. This will include the loss of approximately 700m of historic hedgerow. Alongside the loss of the botanical value associated with these habitats, the breaching of linear habitats will have impacts upon local biodiversity which rely on these features to maintain connectivity within the local landscape.

11.5.28 Given the type of habitats to be impacted, and the length to be lost, the loss of hedgerows and treelines is considered to result in a significant negative effect at the Local level.

Historic Floodplain Ditches and Modified Watercourses

Loss of Habitats

11.5.29 To facilitate access through the Site, a number of watercourses will need to be crossed by infrastructure, which will result in the culverting of existing watercourses and therefore loss of habitats. These include the Arborfield Cut (D70), Barkham Brook (D65) and a small number of floodplain ditches. A total of 1.96% of ditches and watercourses will be lost to culverting. The culverting of these watercourses will result in the loss of semi-natural habitats and could result in changes to water flow, affecting habitats downstream.

11.5.30 The inherent mitigation as outlined above, along with the implementation of habitat management plans will reduce the impacts of culverting these watercourses, however the impacts cannot be fully mitigated. Given the proportion of watercourses on Site that are proposed to be culverted, there will be a negative effect at the Zone of Influence level only, and this is therefore, not significant.

11.5.31 Implications of culverting on protected species is outlined in the relevant sections below.

Damage to Retained Habitats

11.5.32 With the incorporation of inherent mitigation measures as outlined above, no impacts are predicted as a result of damage to historic floodplain ditches and modified watercourses during the construction phase.

11.5.33 Measures to protect retained ditches and watercourses from damage will be detailed within the CEMP, with key measures for inclusion set out within **Appendix 11.16**.

Changes in Water Quality

11.5.34 With the incorporation of inherent mitigation measures as outlined above, no impacts are predicted as a result of changes in water quality to historic floodplain ditches and modified watercourses during the construction phase.

11.5.35 Measures to protect retained ditches and watercourses from changes to water quality will be detailed within the CEMP, with key measures for inclusion set out within **Appendix 11.16**.

Rush Pasture

Damage to Retained Habitats

11.5.36 With the incorporation of inherent mitigation measures as outlined above, no impacts are predicted as a result of damage to the Purple Moor Grass and Rush Pasture during the construction phase.

11.5.37 Measures to protect the Purple Moor Grass and Rush Pasture from damage will be detailed within the CEMP, with key measures for inclusion set out within **Appendix 11.16**.

Swamp & Reedbed

11.5.38 The swamp and reedbed areas to be impacted as a result of the Proposed Development fall within the wider CFGM designation, and impacts arising during the construction phase of the Proposed Development are therefore addressed above.

Other Lowland Mixed Deciduous Woodlands

Loss of Habitats

11.5.39 A section of other lowland mixed deciduous woodland, which is not covered by a LWS or ancient woodland designation, is due to be lost to facilitate access through the Site. Approximately 0.17ha of woodland HF53 is currently proposed to be lost.

11.5.40 As a Habitat of Principal Importance, in the absence of mitigation this will result in a significant negative effect at the Local level.

Damage to Retained Habitats

11.5.41 With the incorporation of inherent mitigation measures as outlined above, no impacts are predicted as a result of damage to lowland mixed deciduous woodlands during the construction phase.

11.5.42 Measures to protect retained lowland mixed deciduous woodlands from damage will be detailed within the CEMP, with key measures for inclusion set out within **Appendix 11.16**.

Wet Woodlands

Damage to Retained Habitats

11.5.43 With the incorporation of inherent mitigation measures as outlined above, no impacts are predicted as a result of damage to LWS's during the construction phase.

11.5.44 Measures to protect retained wet woodlands from damage will be detailed within the CEMP, with key measures for inclusion set out within **Appendix 11.16**.

Flora of Conservation Interest

Damage to Retained Flora

11.5.45 With the incorporation of inherent mitigation measures as outlined above, no impacts are predicted as a result of damage to flora of conservation interest during the construction phase.

11.5.46 Measures to protect flora of conservation interest from damage will be detailed within the CEMP, with key measures for inclusion set out within **Appendix 11.16**.

Loss of Flora

11.5.47 The Proposed Development will impact upon some parcels of habitat which support Flora of Conservation Interest resulting in the loss of a small population of Crosswort. Given the size of the population to be lost, and that there are a number of other populations around the Site which are due to be retained, the loss is not considered to be significant.

11.5.48 A Short-styled Field Rose population is located within close proximity of the River Loddon bridge crossing, whilst a Round-leaved Dog Rose is located within proximity of the proposed spine road through the wider allocation site. Due to the presence of other specimens in the wider Site, impacts on this location are considered likely to result in a significant negative impact at the Local level only in the absence of mitigation.

11.5.49 Remaining Flora of Conservation Interest is located within areas of greenspace and will not be lost as a result of the Proposed Development.

Changes in Water Quality

11.5.50 With the incorporation of inherent mitigation measures as outlined above, no impacts are predicted on Flora of Conservation Interest, specifically the populations of Loddon Pondweed, as a result of changes to water quality during the construction phase.

11.5.51 Measures to prevent changes in water quality as a result of construction will be detailed within the CEMP with key measures for inclusion set out within **Appendix 11.16**.

Habitat Degradation

11.5.52 The construction of the proposed River Loddon bridge crossing will result in shading of the river channel at a location where the Berkshire Rare Broad-leaved Pondweed has been observed. This increased level of shading may impact upon the heath of existing plants and limit the ability of new plant growth thereby resulting in the loss of the Broad-leaved Pondweed population in this location.

11.5.53 Broad-leaved Pondweed is described as "Rare" on the 2022 Berkshire Checklist (Crawley, 2022) but was not included in the original 2005 Berkshire Rare Plant Register. It is a common and widespread species in the UK. The loss of this single small population is therefore likely to

result in a significant negative impact at the Zone of Influence level only in the absence of mitigation.

Vegetation - Grasslands

11.5.54 The grasslands of ecological importance to be impacted as a result of the Proposed Development fall within the wider CFGM designation, and impacts arising during the construction phase of the Proposed Development are therefore addressed above.

Veteran Trees

Damage to Retained Trees

11.5.55 With the incorporation of inherent mitigation measures as outlined above, no impacts are predicted on veteran trees during the construction phase.

11.5.56 Measures to protect retained veteran trees from damage will be detailed within a Tree Protection Plan and the CEMP, with key measures for inclusion set out within **Appendix 11.16**.

Loss of Veteran Trees

11.5.57 In order to accommodate the proposals, four veteran trees have currently been identified for removal. All veteran trees proposed for removal are defined as veteran trees under the Biodiversity Net Gain Regulations 2024, as opposed to the NPPF definition. These trees are:

- Ash 2047;
- Ash 3044;
- Alder 2093; and
- Common Lime 6033.

11.5.58 The loss of these veteran trees will not only result in the loss of mature trees from the landscape but will result in the loss of associated biodiversity such as fungi, lichens and invertebrates.

11.5.59 All veteran trees as defined by the NPPF will be retained, although further loss of veterans (as defined by the Biodiversity Net Gain Regulations 2024) at the Reserved Matters stage cannot be ruled out. Any future losses will be compensated following the strategy as set out in **Appendix 11.16**.

11.5.60 Given the number of mature and veteran trees in the local landscape, and the features for which the trees to be lost support, in the absence of mitigation the loss of these veteran trees will have a significant negative impact at the Local level only.

Invertebrates

Habitat Loss/Fragmentation

11.5.61 The majority of high-quality habitats for invertebrates present within the Site will be retained and/or enhanced as a result of the Proposed Development. However, to facilitate the spine road and River Loddon bridge crossing, approximately 0.7ha of high-quality invertebrate habitat will be lost, including woodlands, wetlands and grasslands. In addition, the culverting of Barkham Brook will result in the partial loss of an ‘invertebrate hotspot’ within the Site.

11.5.62 In addition, areas of high-quality invertebrate habitat are present within close proximity of development parcels. This may result in the degradation of habitats through the introduction of urban impacts, including littering and introduction of ornamental/invasive species.

11.5.63 When considered in conjunction with the extensive habitat creation/enhancement proposed throughout the Site, the loss of habitat is unlikely to be significant in the long-term. Existing habitats to be retained will be managed to improve their condition, where possible, and therefore their value to the local invertebrate assemblage will be increased. Habitats to be created include new areas of woodland, species-rich grasslands and wetlands. This will improve the diversity of existing habitats and increase the extent of suitable invertebrate habitats across the Site. These works will aid in increasing invertebrate diversity and biomass across the Site.

11.5.64 As a result no significant negative effects are anticipated on the invertebrate assemblage as a result of habitat loss/fragmentation.

White-clawed Crayfish

Changes in Water Quality

11.5.65 With the incorporation of inherent mitigation measures as outlined above, no impacts are predicted on White-clawed Crayfish (WCC) as a result of changes to water quality during the construction phase.

11.5.66 Measures to prevent changes in water quality as a result of construction will be detailed within the CEMP with key measures for inclusion set out within **Appendix 11.16**.

Habitat Loss/Fragmentation

11.5.67 To allow for the construction of the spine road, it is proposed that a section of Barkham Brook will be culverted. Whilst not confirmed as present in the on-Site stretch of Barkham Brook, the inclusion of the culvert will reduce the extent of habitats for WCC and may impact upon WCC movement.

11.5.68 However, with appropriate design, it has been found that culverts do not inhibit the dispersal of WCC (Louca *et al*, 2014). The culvert will therefore be designed with consideration of the bed height, bed type and water velocity to provide a navigable feature for the local WCC population.

11.5.69 The loss of habitats will be limited to the extent of the road crossing, which would be expected to be in the region of 21m. Given that this section of Barkham Brook provides low suitability habitats for WCC, the loss of these habitats is unlikely to affect the conservation status of the local WCC population. Furthermore, it is considered that enhancement works proposed for the wider Barkham Brook within the Site boundary will result in an overall increase in area of suitable WCC habitats within the Site boundary.

11.5.70 No significant effects on the WCC population are therefore, anticipated in respect of habitats loss and/or fragmentation.

Freshwater Fish

Changes in Water Quality

11.5.71 With the incorporation of inherent mitigation measures as outlined above, no impacts are predicted on freshwater fish as a result of changes to water quality during the construction phase.

11.5.72 Measures to prevent changes in water quality as a result of construction will be detailed within the CEMP with key measures for inclusion set out within **Appendix 11.16**.

Great Crested Newt

Harm to Individuals

11.5.73 Whilst there are no GCN ponds within the Site boundary, suitable terrestrial habitats surrounding known off-Site ponds are present.

11.5.74 Vegetation clearance and groundworks to be undertaken within 500m of the GCN ponds identified to the south of the Site therefore has the potential to result in the killing or injury of GCN occupying terrestrial habitats at the time of construction works.

11.5.75 Deaths to individuals is unlikely to result in a change to the conservation status of the GCN population, so is not considered to be significant. Harm to individual GCN would, however, constitute an offence under the Wildlife and Countryside Act 1981 (as amended) and the Conservation of Habitats and Species Regulations 2017 (as amended).

Habitat Loss/Fragmentation

11.5.76 The Proposed Development will result in the permanent loss of habitats within 500m of the off-Site GCN ponds, almost exclusively comprised of suboptimal arable habitats. Woodland and scrub habitats within proximity of the ponds, which likely provide foraging, resting and hibernation sites, are all located off-Site and as such will not be directly impacted.

11.5.77 The only waterbodies located within 500m of the known GCN ponds were waterbodies 10 and 12, both of which were found to have poor suitability to support GCN during the HSI assessment. Beyond these, no further suitable waterbodies are located within a reasonable distance of the known ponds and the loss of surrounding arable habitats is therefore unlikely to impact upon wider GCN dispersal.

11.5.78 As a result, the loss of habitats is unlikely to result in a significant negative effect on the GCN population but could result in a legal offence under the Wildlife and Countryside Act 1981 (as amended) and the Conservation of Habitats and Species Regulations 2017 (as amended).

Breeding Birds

Harm to Individuals and Damage/Destruction of Nests

11.5.79 Vegetation removal and building demolition undertaken during the construction phase of the Proposed Development has the potential to injure and/or kill birds, and if undertaken during the breeding season (March-August inclusive) damage or destroy nests. This could result in the loss of eggs and injury/death to chicks.

11.5.80 Based on the extent of suitable nesting habitat to be removed, harm to individuals is unlikely to result in a change to the conservation status of the bird assemblage so is not considered to be significant. Harm to birds and their nests would however constitute an offence under the Wildlife and Countryside Act 1981 (as amended). Methods to avoid legal offences are set out in **Appendix 11.16**.

Loss of Foraging and Nesting Habitats

11.5.81 The Proposed Development will result in the loss of arable fields and grazed pasture within the Site, plus a small amount of woodland, scrub and trees. Based on the total amount of habitats to be lost, their value to breeding birds and the remaining habitats available, this is unlikely to result in a significant negative effect for the vast majority of the breeding bird assemblage.

11.5.82 However, the Proposed Development will result in the substantial loss of suitable nesting habitat for Skylark. Based on current survey evidence, the Proposed Development would result in the loss of approximately 12-14 Skylark territories, including the 10 Skylark plots already provided on the Site.

11.5.83 Whilst extensive habitat enhancements and creation are planned as part of the Proposed Development, given the habitats available and the public access anticipated these are unlikely to provide suitable nesting habitats for Skylark.

11.5.84 The loss of the Skylark territories is weighted against the overall lack of significant negative effects on the wider breeding bird assemblage as a result of the Proposed Development and the wider benefits for breeding birds anticipated from habitat creation and enhancements. Given that Skylark are a red-listed BoCC, a Priority Species within the Berkshire Local Nature Recovery Strategy and a nationally declining species, the loss of these territories is considered to represent a significant negative effect on the breeding bird assemblage at the Local level.

Wintering Birds

Disturbance

11.5.85 During the construction phase of the Loddon Bridge crossing and associated road across the floodplain, there will be an element of disturbance to wintering birds using the floodplains for foraging and resting.

11.5.86 Given the close proximity of the works, even with the implementation of the CEMP as outlined above, if works are undertaken between the months of November and February, there will still be a residual level of noise that may cause wintering flocks of waterfowl to take flight. Increased levels of disturbance will decrease time foraging and use additional energy, reducing fitness and survivability.

11.5.87 Disturbance arising from construction works are therefore likely to have a significant negative impact at the Local level, on a temporary basis.

Loss of Foraging and Roosting Habitats

11.5.88 The Proposed Development will result in the loss of 0.85ha of floodplain habitats which are currently utilised by overwintering wildfowl, including amber-listed Widgeon, Gadwall and Shoveler, for foraging and roosting. Furthermore, substantial areas of arable land will be lost which will reduce winter foraging opportunities for farmland specialists such as Skylark and Linnet.

11.5.89 Proposals for habitat creation include extensive habitat creation and/or restoration along the River Loddon floodplains that will seek to improve the quality of habitats available through diversification of flora and structure. It is therefore considered that on balance the loss of the floodplain habitats to accommodate the road will not significantly impact upon the wintering wildfowl assemblage.

11.5.90 However, the loss of winter stubble will negatively impact the wintering farmland bird assemblage. Stubble forms an important foraging resource in the winter months, and this cannot be replicated within the habitats proposed on the Site. Given that this relates specifically to the farmland bird assemblage, rather than the wider wintering bird assemblage, the loss of foraging habitat will likely have a significant negative impact at the Local level.

Bats

Harm to Individuals

11.5.91 During the construction phase of the Proposed Development, existing buildings will be demolished and/or re-developed, and a number of trees will be felled.

11.5.92 In the absence of mitigation, works to buildings and felling of trees with the suitability to support roosting bats has the potential to result in the injury and/or death of individual bats. Given the works to be undertaken on the maternity roost, the death or injury of individual bats could result in a significant negative effect at the Local level.

11.5.93 Harm to individual bats would also constitute an offence under the Wildlife and Countryside Act 1981 (as amended) and the Conservation of Habitats and Species Regulations 2017 (as amended). Methods to avoid legal offences are set out in **Appendix 11.16**.

Damage/Destruction of Roosts

11.5.94 A total of eight buildings which support roosting bats have been identified as due to be demolished or re-developed as part of the current proposals. Roosts to be impacted are:

- B15 – Brown long-eared bat, roost type to be confirmed;
- B17 – Common Pipistrelle, Soprano Pipistrelle and Brown Long-eared day roost;
- B22 - Common Pipistrelle, Soprano Pipistrelle and Brown Long-eared day roost;
- B24 – Soprano Pipistrelle and Brown Long-eared day roost;
- B26 – Common Pipistrelle day roost;
- B27 – Soprano Pipistrelle day roost and Brown Long-eared maternity roost;
- B35 – Pipistrelle species and Soprano Pipistrelle day roost; and
- B35a – Common Pipistrelle and Soprano Pipistrelle day roost.

11.5.95 At present, 26 trees with suitability to support roosting bats have been identified as due to be removed to accommodate the Proposed Development. This includes:

- 8 PRF-M trees;
- 14 PRF-I trees;
- 1 High suitability trees; and
- 3 Low suitability trees.

11.5.96 Additional surveys, including aerial inspections, of these trees are ongoing to confirm whether bat roosts are present, the results of which will be supplied in an addendum to this Chapter.

11.5.97 Further trees with suitability to support bat roosts may be identified for removal at the Reserved Matters stage.

11.5.98 In addition to the known roosts to be lost as outlined above, the demolition of buildings and felling of trees with features that are suitable to support roosting bats will result in the loss of future potential roosting opportunities.

11.5.99 Day roosts are characterised as a place where individual bats, or small groups of males. may rest or shelter in the day. Therefore, in the absence of mitigation, the loss of day roosts would have a significant negative effect at the Local level.

11.5.100 Maternity roosts are used by females to give birth and raise young. The loss of these roosts may therefore impact upon local population dynamics. In the absence of mitigation, the loss of the Brown-long eared maternity roost would have a significant negative effect at the County level.

Loss/Fragmentation of Foraging/Commuting Habitats

11.5.101 The majority of habitats of value to the local bat assemblage will be retained and enhanced through the Proposed Development, maintaining commuting and foraging habitats. Bat activity surveys across the Site have demonstrated that the arable and grazed pasture fields offer limited foraging opportunities for bats, with the bulk of activity around the Site associated with linear features, such as tree lines or hedgerow and woodland edges.

11.5.102 These foraging and commuting routes will be protected in the landscape through the inherent mitigation measures as outlined above, including the use of buffers, semi-natural planting and the implementation of lighting strategies. Nonetheless, there will be a minor loss in foraging and commuting habitats as a result of the Proposed Development.

11.5.103 One of the most notable bat habitats to be impacted as a result of the Proposed Development is the historic Barrett's Lane which runs through the centre of the Site and has recorded high levels of activity at notable points in the season. The lane comprises an old track, with lines of mature trees running along either side. The majority of these trees have been identified as having at least one feature suitable to support roosting bats.

11.5.104 This lane will be bound by development on both sides and breached to accommodate access roads. The Proposed Development has been designed to minimise impacts, including a buffer of between 62-88m which will incorporate semi-natural habitats of value to the local bat assemblage and implementation of a lighting strategy. Furthermore, the majority of bats recorded using this feature have been Pipistrelle bats. Pipistrelle bats are known to be one of the more adaptable species of bat to urban environments, often recorded foraging around street lighting (Hermans *et al*, 2024), however, they still require suitable habitats to maintain landscape connectivity. Common Pipistrelle have been recorded crossing gaps in vegetation of up to 80m, although the distance crossed is correlated to the level of darkness, with greater distances covered in darker settings (Hale *et al*, 2015). Gaps to facilitate roads will be significantly less than 80m, and therefore with appropriate lighting levels, to be set out in relevant lighting strategies as outlined above, in combination with the provision of suitable habitats, the breaches are not considered likely to result in a significant negative effect on Pipistrelle species as the species most frequently utilising the lane.

11.5.105 Similarly, the bat activity surveys identified substantial levels of activity along the extension of Church Lane, running towards the Arborfield Old Church Ruins. This activity is likely associated with commuting from the multiple bat roosts known to be present within the wider Hall Farm complex. As above, the majority of the activity recorded in this area has been by Pipistrelle bats. Despite a maternity roost of Brown Long-eared known to be present in this area, no activity was recorded in this area during the course of the activity surveys. The static detector surveys picked up low levels of inconsistent Long-eared bat activity in these areas, but the data did not indicate substantial or consistent use. Therefore, the implementation of the lighting strategy and use of natural greenspace, as above, will prevent significant negative impacts on the bats utilising this feature.

11.5.106 The River Loddon bridge crossing will impact upon bat species using the river corridor for foraging and commuting. Most notably Daubenton's bats which are known to roost under the M4 motorway crossing and have been frequently recorded foraging along the River Loddon. The bridge has been designed to provide sufficient height underneath to allow movement. Studies have demonstrated that underpasses are an effective method of maintaining connectivity through the landscape for bats and reducing the risk of collision on roads (Davies, 2019 and Berthinussen & Altringham, 2015). Furthermore, extensive modelling work has been undertaken during the design of the lighting strategy to minimise light spill as a result of the bridge, whilst maintaining lighting levels to an acceptable standard for Highways England. As shown in the Lighting Strategy (DFL), lux levels over the edge of the bridge are 0.5 lux or below, which creates levels below that of a moonlit night (BCT, 2018).

11.5.107 Retained commuting and foraging habitats within the development area are included within the proposed Natural Greenspaces. Through the implementation of the inherent mitigation measures as outlined above, no significant impacts on these habitats are anticipated.

11.5.108 The loss of suitable foraging and commuting habitats will be off-set in the long-term through the extensive habitat creation and enhancement works proposed within EcoValley and Natural Greenspaces throughout the Proposed Development. The increase in habitat and floral diversity will increase foraging opportunities for invertebrates, increasing their diversity and abundance, as a result increasing foraging opportunities for the local bat assemblage.

11.5.109 Based on the inherent mitigation measures included within the Proposed Development, no significant negative impacts are anticipated on the bat assemblage as a result of habitat loss or fragmentation.

Otter

Disturbance

11.5.110 With the incorporation of inherent mitigation measures as outlined above, no impacts on the Otter population are predicted during the construction phase as a result of disturbance.

Changes to Water Quality

11.5.111 With the incorporation of inherent mitigation measures as outlined above, no impacts on the Otter population are predicted during the construction phase as a result of changes to water quality.

11.5.112 Measures to prevent changes in water quality as a result of construction will be detailed within the CEMP with key measures for inclusion set out within **Appendix 11.16**.

Operational Phase

Thames Basin Heaths SPA

Increase in Recreational Pressure

11.5.113 The Proposed Development will result in up to 2,800 new residential dwellings within the ZoI of the Thames Basin Heaths SPA. With the increase in residents in the area as a result of the additional residential dwellings, an increase in recreational pressure on the Thames Basin Heaths SPA cannot be ruled out in the absence of mitigation. New residents visiting the SPA could disturb ground-nesting birds and damage habitats, thereby leading to adverse effects on the SPA qualifying features. Further details on likely impacts arising from the Proposed

Development on the Thames Basin Heaths SPA can be found within the Information for HRA report at **Appendix 11.17**.

11.5.114 Alongside the provision of SANG, the Proposed Development will make SAMM contributions to be secured via a S106 Agreement. The total cost to be contributed will be calculated on a per dwelling basis, depending upon the number of bedrooms, in line with the current rates set out by Wokingham Borough Council in their 'Advice for Developers' (Wokingham Borough Council, 2025).

11.5.115 Taking into consideration the inherent design mitigation as outlined above, no significant negative effects are anticipated. The proposed SANG will divert new and existing visitors from the SPA, thereby ensuring no net increase in levels of recreational pressure. Further details of the proposed SANG, to include details of implementation, ongoing management and funding can be found in **Appendix 11.18**.

Changes in Air Quality

11.5.116 Upon completion of the Proposed Development, it is recognised that there will be an increase in the number of trips made by vehicles in the local area, which can contribute towards detrimental effects on local air quality.

11.5.117 Through exhaust emissions, road traffic contributes to the levels of airborne NO_x and NH_3, and subsequent nitrogen deposition on habitats within 200m of a road. Nitrogen deposition may negatively impact heathland habitats by increasing competition from faster growing coarser grasses and shrubs that outcompete the heathland specialists. This can have a negative impact on species that rely on such habitats.

11.5.118 Parts of the Thames Basin Heaths SPA lie within 200m of the road network on which traffic from the Proposed Development may be expected to disperse. A significant increase in traffic on these roads as a result of the Proposed Development therefore has the potential to contribute to air pollution and related negative effects on the qualifying species associated with the SPA.

11.5.119 Guidance from the Institute of Air Quality Management (IAQM)(Holman *et al*, 2019) and Natural England (2018) states that a screening threshold, of an increase of 1,000 or more Average Annual Daily Trips (AADT) (or 200 Heavy Duty Vehicles (HDV)) either alone or in-combination with other development, should be used to determine whether proposals have the potential to result in negative effects from air quality change.

11.5.120 When comparing the 2040 'Do Minimum' flows on links in proximity of the SPA with the 2040 'Do Something' flows, the change in AADT is no greater than 483 AADT (or 13 HDV), thereby falling below the aforementioned screening threshold.

11.5.121 Detailed modelling of in-combination air quality impacts has been carried out as part of the Local Plan Update Reg 19 Habitats Regulations Assessment (HRA) (AECOM, 2025). This modelling included the Proposed Development as part of Policy SS13 and wider future growth associated with Local Plan development and other neighbouring Local Plans. Increases in the levels of airborne NO_x and NH_3, and subsequent Nitrogen deposition to ground, was modelled along numerous transects on road links in proximity of several component parts of the SPA including the SSSIs in closest proximity to the Proposed Development. The HRA concluded that there would be no impacts from changes to air quality arising as a result of the Local Plan Update, including the Proposed Development, either alone or in-combination with other plans and projects.

11.5.122 On the basis of the above project-specific traffic modelling and detailed Local Plan air quality modelling, no significant negative air quality effects on the Thames Basin Heaths SPA as a result of the Proposed Development, either alone or in combination with other plans and projects, is anticipated.

Sites of Special Scientific Interest

Increase in Recreational Pressure

11.5.123 Taking into consideration the inherent design mitigation as outlined above, no significant negative effects are anticipated as a result of an increase in recreational pressure on SSSI's within the ZoI.

11.5.124 The proposed SANG and wider greenspace provision will provide alternative recreational spaces to divert new and existing visitors away from SSSI's, preventing an increase in recreational pressure arising as a result of the Proposed Development.

Local Wildlife Sites

Increase in Recreational Pressure

11.5.125 Taking into consideration the inherent design mitigation as outlined above, no significant negative effects are anticipated as a result of increases in recreational pressure on LWS's.

11.5.126 The proposed SANG and wider greenspace provision will provide alternative recreational spaces to divert new and existing visitors away from LWS's, whilst the design of the path network will seek to direct footfall away from sensitive ecological features, thereby preventing an increase in recreational pressure arising as a result of the Proposed Development.

Urban Edge Effects

11.5.127 With the introduction of up to 2,800 new residential dwellings and increased access to on-Site and immediately adjacent LWS's, it is possible that negative impacts could occur as a result of increased human presence. Such impacts could include fly-tipping, vandalism, arson and the introduction of invasive species. These impacts could result in habitat degradation and ultimately the features for which the LWS is designated.

11.5.128 The majority of LWS's are located away from the main development area, which reduces the likelihood and magnitude of impacts arising from urban edge effects. Loader's Copse LWS and Gravel Pit Wood, The Holt LWS however, are both within proximity of proposed residential development, and therefore more at risk.

11.5.129 With inclusion of the inherent mitigation measures, to include access management and the implementation of semi-natural buffers the residual effects of urban edge effects are unlikely to be significant.

Changes in Air Quality

11.5.130 Air quality modelling is ongoing and an assessment of potential impacts from changes in air quality on LWS's will be undertaken and submitted as an addendum to this Chapter.

River Loddon

Changes in Water Quality

11.5.131 With the implementation of the drainage strategy as outlined above, no significant negative effects on the River Loddon are anticipated as a result of changes in water quality.

Urban Edge Effects

11.5.132 With the introduction of up to 2,800 new residential dwellings and increased access to the River Loddon, it is possible that negative impacts could occur as a result of increased human presence. Such impacts could include fly-tipping and the introduction of invasive species. These impacts could result in habitat degradation of the River Loddon.

11.5.133 With the implementation of inherent access management measures as outlined above, it is considered that the urban edge effects are unlikely to be significant.

Coastal Floodplain Grazing Marsh and Grasslands

Increase in Recreational Pressure

11.5.134 Taking into consideration the inherent design mitigation, no significant negative effects are anticipated as a result of increases in recreational pressure on CFGM habitats.

11.5.135 As outlined above, the greenspaces within the Proposed Development has been designed to avoid habitats at risk of impacts from increased footfall, directing visitors from these areas and providing alternative recreational spaces.

Urban Edge Effects

11.5.136 With the implementation of inherent access management measures as outlined above to divert visitors from the most sensitive of habitats, it is considered that the urban edge effects are unlikely to be significant on CFGM and associated habitats.

Hedgerows and Treelines

Urban Edge Effects

11.5.137 The majority of retained hedgerows and treelines of note are located within EcoValley which will be subject to access management, through the incorporation of footpaths designed to avoid sensitive features.

11.5.138 With the implementation of inherent access management measures as outlined above, in combination with the incorporation of semi-natural buffers where relevant, it is considered that the urban edge effects are unlikely to be significant.

Historic Floodplain Ditches and Modified Watercourses

Changes in Water Quality

11.5.139 With the implementation of the drainage strategy as outlined above, no significant negative effects on the ditch and watercourse network are anticipated as a result of changes in water quality.

Rush Pasture

Increase in Recreational Pressure

11.5.140 Taking into consideration the inherent design mitigation, no significant negative effects are anticipated as a result of increases in recreational pressure on rush pasture habitats.

11.5.141 As outlined above, the greenspaces within the Proposed Development has been designed to avoid habitats at risk of impacts from increased footfall, directing visitors from these areas and providing alternative recreational spaces.

Swamp and Reedbed

11.5.142 The swamp and reedbed areas to be impacted as a result of the Proposed Development fall within the wider CFGM designation, and impacts arising during the operational phase of the Proposed Development are therefore, addressed above.

Other Lowland Mixed Deciduous Woodland & Wet Woodlands

Increase in Recreational Pressure

11.5.143 Taking into consideration the inherent design mitigation, no significant negative effects are anticipated as a result of increases in recreational pressure on woodland habitats.

11.5.144 As outlined above, the greenspaces within the Proposed Development has been designed to avoid habitats at risk of impacts from increased footfall, directing visitors from these areas and providing alternative recreational spaces.

Urban Edge Effects

11.5.145 With the implementation of inherent access management measures as outlined above, in combination with the implementation of semi-natural buffers to be incorporated along the lengths of all retained woodland, it is considered that the urban edge effects on woodlands are unlikely to be significant.

Flora of Conservation Interest

Changes in Water Quality

11.5.146 With the implementation of the drainage strategy as outlined above, no significant negative effects on Flora of Conservation interest, notably Loddon Pondweed, are anticipated as a result of changes in water quality.

Vegetation - Grasslands

11.5.147 The grasslands of ecological importance to be impacted as a result of the Proposed Development fall within the wider CFGM designation, and impacts arising during the operational phase of the Proposed Development are therefore, addressed above.

Veteran Trees

Increase in Recreational Pressure

11.5.148 A number of veteran trees are located within, or within close proximity, of the Proposed Development. Increases in recreational pressure may see increased levels of footfall within the root protection area of the tree, resulting in soil compaction which could have detrimental impacts.

11.5.149 With the implementation of inherent access management measures as outlined above, in combination with ongoing habitat management, it is considered that the impacts of recreational pressure on veteran trees are unlikely to be significant.

Urban Edge Effects

11.5.150 Veteran trees located within, or within close proximity of the Proposed Development are at risk of urban impacts, which may include vandalism, arson and direct damage. This may result in the loss of veteran features, or even total loss of the tree.

11.5.151 With the implementation of inherent access management measures as outlined above, in combination with the implementation of semi-natural buffer zones it is considered that the urban edge effects are unlikely to be significant.

Invertebrates

11.5.152 No impacts are anticipated on the invertebrate assemblage during the operational phase of the Proposed Development.

White-clawed Crayfish

Changes in Water Quality

11.5.153 With the implementation of the drainage strategy as outlined above, no significant negative effects on the White-clawed Crayfish population are anticipated as a result of changes in water quality.

Freshwater Fish

Disturbance

11.5.154 The southern section of the River Loddon includes gravel beds which are considered to be suitable for fish spawning. These areas are currently easily accessible as vegetation along the banks is limited, and mammal paths are present leading directly to the river.

11.5.155 Given the close proximity of these habitats to the SANG, where dogs will present off-lead, there is a risk that fish spawning grounds will be disturbed by dogs, and people, entering the shallow water for recreational activities.

11.5.156 In the absence of mitigation, this could result in a significant negative effect at the County level.

11.5.157 The implementation of habitat management plans will result in a significant positive effect at the Local level.

Changes in Water Quality

11.5.158 With the implementation of the drainage strategy as outlined above, no significant negative effects on the freshwater fish assemblage are anticipated as a result of changes in water quality.

Great Crested Newt

Increased Mortality

11.5.159 With the introduction of the Proposed Development there will be an increased risk of mortality for GCN associated with the increase in road traffic, people and domestic cats. The

risk is particularly prevalent in the spring when GCN will be dispersing from their breeding ponds. Management activities such as mowing and strimming within green infrastructure used by GCN may also result in harm to GCN.

11.5.160 Whilst the Proposed Development is expected to support greater numbers of GCN through the creation and long-term management of extensive suitable terrestrial habitats, in the absence of mitigation they could undermine the benefits predicted to arise as a result. In the absence of mitigation this could result in a significant negative effect at the Local level.

Breeding Birds

Disturbance

11.5.161 Increased levels of human activity within the Proposed Development will likely result in an increase in levels of disturbance to nesting and foraging birds within the ZoI. The majority of disturbance will be associated with recreational activities such as dog walking, increased noise and lighting.

11.5.162 Disturbance can cause breeding birds to take flight more frequently, leading to increased stress and energy expenditure, vulnerability to predation, reduced foraging time and disruption to circadian rhythms. These factors can result in reduced fitness and breeding success.

11.5.163 With the increase in habitat extent and quality proposed to be delivered in line with the Proposed Development, the habitat capable of supporting breeding birds will be substantially increased, and as such impacts arising from disturbance are unlikely to reduce populations. As a result, impacts arising as a result of disturbance are considered unlikely to be significant.

Cat Predation

11.5.164 The introduction of new residential development will bring with it an increase in the number of domestic cats within the local area. Domestic cats travel, on average, approximately 400m from their home and it is therefore within this distance that the highest levels of predation would be expected.

11.5.165 Approximately 29% of all households in the UK are cat-owning (Pet Food Association, 2024). Using the same proportion, it can therefore be assumed that around 812 homes within the Proposed Development may have a cat. Although it is not possible to quantify the impacts this may have on the local bird assemblage, the sudden introduction of predators into a low-density predator area would be expected to have a detrimental effect on the breeding bird assemblage. Nestlings are particularly vulnerable to predation due to their inability to fly away.

11.5.166 However, a substantial amount of the birds recorded during the course of the breeding bird surveys were recorded on the western side of the River Loddon. Whilst access points across the river will be provided, these will be limited in number and will substantially reduce the number and likelihood of domestic cats crossing the river. Breeding birds on the western side of the River Loddon are therefore, unlikely to be significantly impacted by increases in the presence of domestic cats.

11.5.167 Furthermore, the breeding bird population supported by the ZoI is anticipated to increase through the provision of new nesting and foraging habitats to be created within the open greenspaces of the Proposed Development. New semi-natural habitats will be created on the western side of the River Loddon, including woodlands, scrub habitats and tree planting to increase nesting opportunities. Meanwhile the increase in floral and habitat diversity will further

increase foraging opportunities. Taking this into consideration, on balance an increase in predation is unlikely to have a significant effect on the breeding bird population.

Wintering Birds

Cat Predation

11.5.168 As with breeding birds, the introduction of domestic cats will increase the risks of predation for wintering birds as a result of the Proposed Development.

11.5.169 However, as with breeding birds, a substantial proportion of the wintering bird assemblage was recorded on the western side of the Loddon, most notably overwintering wildfowl, and predation from cats is unlikely to substantially increase particularly given the frequent inundation events.

11.5.170 Furthermore, the wintering bird population supported by the ZoI is anticipated to increase through the provision of new foraging habitats to be created within the open greenspaces of the Proposed Development. New semi-natural habitats will be created on the western side of the River Loddon, including wetlands, meanwhile the increase in floral and habitat diversity will further increase foraging opportunities. Taking this into consideration, on balance, an increase in predation is unlikely to have a significant effect on the wintering bird population.

Disturbance

11.5.171 Currently public access to the River Loddon floodplain is limited to a small number of public footpaths which become mostly inaccessible during the winter months due to high water levels. Wintering wildfowl utilising the floodplains are therefore, relatively undisturbed during this time, although some disturbance within proximity of existing footpaths may occur whilst flood waters are relatively low.

11.5.172 The Proposed Development includes increased levels of public access to the River Loddon floodplains, through the introduction of EcoValley and SANG. However, taking into consideration the inherent design mitigation as outlined above to direct footfall, no significant negative effects are anticipated during the operational phase of the Proposed Development.

Bats

Disturbance

11.5.173 Following the completion of the Proposed Development, it is anticipated that there will be a change in the light levels across the Site, which could impact upon bat foraging/commuting behaviour and alter use of existing roosts.

11.5.174 However, taking into consideration the inherent design mitigation as outlined above, with the implementation of a sensitive lighting strategy, no significant negative effects are anticipated during the operational phase of the Proposed Development.

Creation of New Roosting Opportunities

11.5.175 In addition to any compensatory roosts to be provided as part of EPSL requirements as outlined above, additional roosting opportunities will be incorporated into the Proposed Development through the inclusion of bat boxes and specially designed features.

11.5.176 Bat boxes will be incorporated into new residential dwellings to support bats such as Common Pipistrelle. Opportunities to incorporate bat roosting features into the proposed River

Loddon bridge crossing will provide new roosting habitats for species such as Daubenton's, whilst EcoValley will provide new roost opportunities through the provision of tree mounted bat boxes, construction of a wildlife tower and 'veteranisation' of mature trees.

11.5.177 Further details are set out in the Ecological Mitigation and Enhancement Strategy included at **Appendix 11.16**.

11.5.178 The creation of new roosting opportunities will have a long-term significant positive effect at the Local level.

Otter

Disturbance

11.5.179 Through increased levels of public access along the River Loddon, there may be an increased level of disturbance for Otter which currently use the river by people and dogs.

11.5.180 Given that no holt or couches have been identified within the Site boundary, disturbance of resting Otter by people or dogs is not considered likely to occur as a result of the Proposed Development.

11.5.181 Furthermore, the peak activity time for Otter is dusk and dawn. Given that the main areas of access alongside the river are proposed to comprise semi-natural habitats, including SANG, SANG Link and EcoValley which will not benefit from artificial lighting, use of these areas by people and dogs during the peak activity time for Otter is likely to be very low. Furthermore, the surveys indicate that this stretch of the River Loddon forms part of a larger territory for Otter, so the very low use of paths adjacent to the river are highly unlikely to coincide with the occasional Otter activity.

11.5.182 As a result, no significant negative effects for Otter are anticipated as a result of increased disturbance arising from the Proposed Development.

Changes in Water Quality

11.5.183 With the implementation of the drainage strategy as outlined above, no significant negative effects on the Otter population are anticipated as a result of changes in water quality.

11.6 Additional Mitigation & Compensation

Construction Phase

Rushy Mead LWS

Loss of Habitats

11.6.1 The loss of Rushy Mead LWS will be compensated through management of retained habitats, and new woodland planting.

11.6.2 The LWS will be incorporated into a conservation-led management regime (as set out above) which would add value for local biodiversity. Through the introduction of coppicing and thinning of existing vegetation, removal of pheasant materials and change of surrounding land use to reduce the impacts of agricultural runoff the condition of the retained habitats can be improved.

11.6.3 Consideration was given to the planting of new woodland on land adjoining Rushy Mead LWS, however based on the existing wet woodlands and ditches that currently exist on the perimeters, and the opportunities to deliver valuable wetland habitats in the vicinity of the LWS, the creation of other lowland mixed deciduous woodland in this location was not considered to be suitable.

11.6.4 New woodland planting is proposed on land to the south of St Johns Copse LWS and ancient woodland. The delivery of woodland here will substantially exceed the amount of habitat to be lost from Rushy Mead. Furthermore, the proximity to St Johns Copse will eventually allow for the colonisation by ancient woodland indicator species found within the copse, such as Bluebell *Hyacinthoides non-scripta*. In the long-term, the new woodland planting will provide an extension to the existing LWS and provide valuable woodland habitats.

River Loddon (and LWS)

Degradation of Habitats

11.6.5 The degradation of habitats arising from the installation of the River Loddon bridge crossing will be compensated through the enhancement of habitats to improve the quality and extent of aquatic habitats.

11.6.6 Enhancement measures will focus on the establishment of diverse marginal and aquatic vegetation, to increase the complexity of habitat structure. This will be achieved through selective vegetation thinning along the banks to increase light penetration. Although natural colonisation would be the preferred method of establishing vegetation, seeding and/or plug planting will be considered where required, most notably to increase species diversity where appropriate.

Coastal Floodplain Grazing Marsh & Grasslands

Loss of Habitats

11.6.7 The loss of CFGM will be compensated by the enhancement of habitats within the retained areas of CFGM. Currently the majority of habitats within the CFGM are species-poor grasslands which form part of the ongoing farming practices across the Site.

11.6.8 Enhancement of habitats will focus on the same component habitats which are due to be lost as a result of the new road. For example, where grassland components are lost, an equivalent amount of grassland will be enhanced to increase the value of retained CFGM. Whilst the extent of CFGM will not be increased, as this is reliant on the floodplain dynamics of the River Loddon, through habitat creation, enhancement and ongoing management the extent of species-rich

valuable habitats will be increased, thereby increasing opportunities for species which are associated with CFGM habitats.

Hedgerows and Treelines

Loss of Habitats

11.6.9 The hedgerows and treelines to be breached to create access for the Proposed Development will be managed to improve their existing value. Where required, gaps will be filled with native species, to improve connectivity and increase species diversity and semi-natural buffers will be included along the length of the hedgerows.

11.6.10 In the longer-term, more appropriate management practices will be implemented. The hedgerows will be subject to traditional management practices such as hedge laying with rotational cutting to provide a diversity of habitats.

11.6.11 Through the management of retained hedgerow, the small losses anticipated to facilitate access will be off-set.

Other Lowland Mixed Deciduous Woodlands

Loss of Habitats

11.6.12 The woodland to be lost to facilitate the road network has been identified as a late Victorian plantation on ex-arable/pastureland, shown as mixed plantation on maps from the late 1800s but no conifers are present today. The woodland includes many derelict Ash and Hazel coppice stools, and the woodland is currently unmanaged. To compensate for the loss of the woodland, the retained areas will be managed via an appropriate conservation-led management regime. Coppicing will be reintroduced into the woodland, aiding in increasing light levels and providing opportunities for woodland flora, including species such as Bluebell and Dog's Mercury which have previously been recorded.

11.6.13 Selective thinning will clear some of the 'leggy' growth, allowing retained trees more room to grow and further increasing light penetration. Scrub growth at the eastern part of the woodland, where the diversity of the ground flora is reduced, will be cut back and managed to increase the space for ground flora.

Flora of Conservation Interest

Damage/Destruction

11.6.14 The Short-styled Field Rose located near the River Loddon bridge crossing, and the Round-leaved Dog Rose, are at risk of damage or destruction as works for the bridge and road progress. To prevent damage/destruction, it is recommended that a working method statement is implemented during construction.

11.6.15 Broadly, the working method statement will require the route of the road to be marked on the ground in advance of works, so the exact impacts on the Short-styled Field Rose and Round-leaved Dog Rose can be established. If the rose is located within the footprint of the construction works, or within such proximity that it is considered likely to be negatively impacted, then the plant will be transplanted to a suitable alternative location.

11.6.16 These measures shall be secured through the provision of a conditioned Ecological Mitigation and Enhancement Plan, as set out within the Ecological Mitigation and Enhancement Strategy included at **Appendix 11.16**.

Degradation of Habitats

11.6.17 A population of Loddon Pondweed is a risk of loss due to the likely degradation of habitats arising from the construction of the proposed River Loddon bridge crossing.

11.6.18 Enhancement measures to be undertaken along the River Loddon including selective thinning along the banks to increase light penetration. This will in part be targeted at sections of the River Loddon where populations of Loddon Pondweed have been identified. Increasing light penetration in these areas will further increase the suitability of the habitats to support pondweed, allowing for growth of existing populations and further reinforcing Loddon Pondweed populations within the Site.

Veteran Trees

Loss of Veteran Trees

11.6.19 The loss of veteran trees will be mitigation through a two-step strategy, involving tree replacement and dead wood management.

11.6.20 To compensate for the loss of these trees, they will be replaced with standard trees of a suitable species (ideally like-for-like where feasible), in a suitable location within EcoValley, or suitable semi-natural habitats around the Proposed Development.

11.6.21 Where a veteran tree is felled, the resulting logs will be relocated to suitable habitats in as large a section as it possible. Suitable locations may be within EcoValley or within semi-natural habitats around the Proposed Development. The deadwood will be utilised in a variety of ways to maximize ecological value. This will include the vertical installation of logs to provide standing deadwood habitats, whilst others may be partially buried to create decaying wood which will be of benefit to species such as Stag Beetle *Lucanus cervus.*

11.6.22 Whilst the above strategy addresses the tree loss itself and aims to maintain some of the notable features of a veteran tree, the loss of an irreplaceable habitat cannot be mitigated for. When considering the above, the loss of the three identified veteran trees will therefore, result in a negative effect at the Zone of Influence level only.

11.6.23 These measures shall be secured through the provision of a conditioned Ecological Mitigation and Enhancement Plan, as set out within the Ecological Mitigation and Enhancement Strategy included at **Appendix 11.16**.

Great Crested Newt

Harm to Individuals

11.6.24 Any works to be completed within suitable terrestrial habitats will be conducted under either a Working Method Statement (WMS), a European Protected Species Licence (EPSL) or under Wokingham Borough Council's District Licence. Whether a licence is necessary and proportional depends on the projected risk of harm to GCN and will be determined on a phase-by-phase basis with reference to the respective clearance areas from the GCN breeding ponds and the suitability of the affected and intervening habitats. As a general principle, an appropriate licence will likely be required to legitimise works undertaken within 500m of breeding ponds.

11.6.25 Further details of suitable licencing options and methodologies are provided in the Ecological Mitigation and Enhancement Strategy included at **Appendix 11.16**.

Breeding Birds

Harm to Individuals and Damage/Destruction of Nests

11.6.26 Whilst no significant effects are predicted to arise as a result of harm to individual birds and/or their nests, they are afforded legal protection under the Wildlife and Countryside Act 1981 (as amended) which must be considered during the construction phase.

11.6.27 Where possible, vegetation clearance will be undertaken outside of the breeding bird season (March – August inclusive). Building demolition will also take place outside of the season where possible with due consideration given to restriction relating to roosting bats. Where this is not possible, a nesting bird check will be undertaken by a suitably qualified ecologist no more than 24 hours prior to demolition clearance or building demolition.

11.6.28 Should an active nest be identified, a suitable buffer will be set up around the nest, the size of which will be dependent upon the location of the nest and the species recorded. Works will only be allowed to recommence once an ecologist has confirmed that the nest is no longer active.

11.6.29 These measures shall be secured through a conditioned Ecological Mitigation and Enhancement Plan, as set out within the Ecological Mitigation and Enhancement Strategy included at **Appendix 11.16**.

Loss of Foraging and Nesting Habitats

11.6.30 As outlined above, the loss of Skylark habitats is the driver behind the likely impacts to the local breeding bird population. A Skylark Mitigation Strategy will be implemented to ensure no net loss of Skylark nesting during the construction phase of the Proposed Development.

11.6.31 The first phases of the Proposed Development are anticipated to be delivered at the south of the Site, including on arable land where Skylark have been recorded. During this phase, Skylark plots will be delivered on arable land within the wider Site. If necessary, grazed pasture will be converted to arable crops, growing winter cereals to deliver these plots. In the region of four territories were recorded in the Phase 1 and Phase 2 areas. Based on a ratio of two plots for every territory lost, eight Skylark plots must be delivered on Site, in addition to the 10 committed sites, at a density of 2 plots per hectare, located no less than 50m from boundary features.

11.6.32 As the Proposed Development progresses, suitable land for Skylark territories will be reduced to the point where they can no longer be adequately mitigated on Site. At this point, Skylark plots will be provided at Tanners Farm which is located immediately to the south of the Site, on the other side of the A327. The land has recently been purchased by the applicant and will be fully operational by time later phases of the Proposed Development come forward.

11.6.33 Based on the loss at the higher end of the recorded territories, the loss of 14 Skylark territories must be mitigated for plus the current 10 Skylark plots positioned on the Site must also be relocated. This equates to a total of 38 Skylark plots to be provided.

11.6.34 Full details of the Skylark Mitigation Strategy should be secured via a S106 agreement.

Wintering Birds

Loss of Foraging Habitats

11.6.35 The loss of winter foraging opportunities cannot be mitigated for on the Proposed Development. Mitigation measures will therefore be provided on the adjacent Tanners Farm, where the Skylark mitigation is proposed to be delivered. As with the Skylark mitigation strategy, the farmland winter bird mitigation strategy is proposed to be delivered on a phased basis as the

amount of arable land within the Proposed Development is decreased. To ensure foraging resources are available, at least one field of winter stubble will be provided each year. Given that the current farming regime does not commit to any amount of winter stubble, and the amount may change on any given year, securing a minimum area of winter stubble will ensure that farmland birds are provided with a foraging source during the winter months.

11.6.36 Full details of the Farmland Winter Bird Mitigation Strategy should be secured via a S106 agreement.

Bats

Harm to Individuals and Damage/Destruction of Roosts

11.6.37 Any works to a building supporting a confirmed roost which is to be lost or disturbed as a result of planned works will be undertaken under a European Protected Species Licence (EPSL) from Natural England. The licence application will include a detailed mitigation strategy, developed in accordance with best practice guidance, that will be adopted to avoid detrimental impacts on bats.

11.6.38 Where a structure is not confirmed as an active roost but nevertheless retains suitable features to support roosting bats, works must be carried out under ecological supervision and a precautionary working method statement which may include all or some of the measures identified above. The extent of ecological supervision will be based on Bat Conservation Trust (BCT) Guidelines and will depend on the suitability of the feature and the anticipated level of risk.

11.6.39 When providing new roosting features as mitigation for the loss of a bat roost, the bat mitigation guidelines state that '*The ideal scenario is to provide the same roost in the same place, like-for-like, with only temporary functional loss, and with any enhancements that can reasonably be provided'*.

11.6.40 B17, B22, B24 and B27 are known to support populations of Brown Long-eared bats, including a maternity roost. This species are roof void dwelling species and thus provision of new roosting features will require a roof void of suitable dimensions either as a stand-alone purpose-built bat structure or within a roof void above a building known as a bat loft. The locations and specifications

11.6.41 Bat boxes may also form part of the mitigation strategy for loss of smaller day roosts for crevice dwelling species such as Common Pipistrelle. These will be closely cited to the original bat roost location and provision for integrated bat boxes in new buildings will be prioritised, as well as tree mounted bat boxes, as these offer greater longevity.

11.6.42 Further details are set out in the Ecological Mitigation and Enhancement Strategy included at **Appendix 11.16.**

Loss of Roosting Opportunities

11.6.43 To compensate for the loss of roosting opportunities artificial roosts will be incorporated into retained buildings and positioned on mature retained trees throughout the Site.

11.6.44 In retained buildings with suitable bat roosting features (which have not been identified as confirmed roosts and dealt with via licencing as outlined above), where refurbishment will result in the loss of these features, new roosting features will be incorporated into the building. Such features may include bat access tiles, bat boxes and accessible loft spaces, depending on the original features to be lost.

11.6.45 To compensate for the loss of tree roosting features, bat boxes will be installed onto retained mature trees within (where possible) close proximity of the original tree. Boxes will cater to a range of tree-dwelling species, and where possible will seek to replicate the feature to be lost. For example, if a tree with suitable hibernation features is felled, a hibernation box will be installed nearby.

11.6.46 Further details are set out in the Ecological Mitigation and Enhancement Strategy included at **Appendix 11.16.**

Operational Phase

Local Wildlife Sites

Implementation of Management Plans

11.6.47 Currently, LWS's within the Site boundary benefit from limited management, largely relating to potential hazardous situations when they emerge, for example dangerous trees etc. They do not form part of the existing farm management regime. As part of the wider EcoValley proposals, all LWS's within the Site boundary will be subject to conservation-led management regimes. Such works will include the removal of invasive species where present, vegetation thinning to reduce shading both in woodlands and along the River Loddon and management of scrub.

11.6.48 Specific measures for each LWS will be identified and incorporated into the relevant management plan, based on available botanical and protected species survey data. The ultimate aim of the management plans will be to ensure the LWS meets its relevant designation, providing the highest quality habitats possible and delivery opportunities for local biodiversity.

11.6.49 Gravel Pit Wood, The Holt LWS is outside of the Site boundary and will therefore, not be incorporated into a management plan.

11.6.50 Habitat management measures will be secured through a Habitat Management and Monitoring Plan, or equivalent management plan, to be secured via S106 agreement or conservation covenant.

11.6.51 Further details can be found in the Ecological Mitigation and Enhancement Strategy set out at **Appendix 11.16.**

11.6.52 The implementation of habitat management plans will result in a significant positive effect at the Local level.

River Loddon

Implementation of Management Plans

11.6.53 Habitat management works are proposed to be undertaken on the River Loddon to improve the existing habitats within the riparian corridor and the river channel itself.

11.6.54 Along parts of the River Loddon, dense vegetation is causing shading, preventing the growth of marginal and aquatic vegetation. Selective thinning of vegetation along the banks will increase light penetration to the channel therefore, increasing the level of marginal and aquatic flora. Additional measures, such as the stabilisation of banks with natural materials, will also be implemented at required locations to reduce sedimentation and improve the water quality.

11.6.55 At present, Himalayan Balsam is abundant along parts of the river. Long-term management will include measures to reduce coverage. Whilst the ultimate aim would be to eradicate the balsam

completely, this is unlikely to be successful given the extensive coverage present on land outside of the Applicant's control.

11.6.56 Any proposed management works will take into consideration protected and notable species which rely on the habitats within the river, as outlined below.

11.6.57 Habitat management measures will be secured through a Habitat Management and Monitoring Plan, or equivalent management plan, to be secured via S106 agreement or conservation covenant.

11.6.58 Further details can be found in the Ecological Mitigation and Enhancement Strategy set out at **Appendix 11.16.**

11.6.59 The implementation of habitat management plans will result in a significant positive effect at the Local level.

Coastal Floodplain Grazing Marsh

Implementation of Habitat Creation and Management Plans

11.6.60 Currently included within the current farmland management regime, the CFGM will benefit from habitat creation, restoration and enhancement as well as the implementation of appropriate conservation-led management regimes.

11.6.61 Habitat works will seek to reintroduce semi-natural habitats found within traditional CFGM, increasing habitat diversity and providing greater value to local biodiversity. Proposals will be informed by local conditions and survey results to provide habitats of the greatest benefit to the local landscape. The introduction of species-rich grasslands, wetlands and standing water will be complemented by the introduction of appropriate conservation-led management, such as grazing. Further details can be found in the Ecological Mitigation and Enhancement Strategy found in **Appendix 11.16**.

11.6.62 Habitat management measures will be secured through a Habitat Management and Monitoring Plan, or equivalent management plan, to be secured via S106 agreement or conservation covenant.

11.6.63 The implementation of habitat creation and management plans will therefore result in a significant positive effect at the County level.

Hedgerows and Treelines

Implementation of Habitat Creation and Management Plans

11.6.64 Hedgerows and treelines within EcoValley will be incorporated into management plans and managed using traditional methods such as hedge laying and trimmed on a rotation basis. This will improve the structure of retained hedgerow and increase nesting and sheltering opportunities for the local bird assemblage. Where needed, gaps will be filled in with native planting, suitable for the local conditions. Further details can be found in the Ecological Mitigation and Enhancement Strategy set out at **Appendix 11.16.**

11.6.65 Habitat management measures will be secured through a Habitat Management and Monitoring Plan, or equivalent management plan, to be secured via S106 agreement or conservation covenant.

11.6.66 The implementation of habitat creation and management plans will therefore result in a significant positive effect at the County level.

Historic Floodplain Ditches and Modified Watercourses

Implementation of Habitat Creation and Management Plans

11.6.67 As outlined above the CFGM will be subject to conservation-led habitat management and this will extend to the ditches and watercourses. Opportunities to increase their value to local biodiversity will include localised vegetation thinning to increase light penetration, and therefore increase flora levels, and control of non-native species.

11.6.68 Long-term opportunities to alter the morphology and water flows will be reviewed (under the guidance of hydrological experts) to provide benefits to the floodplain systems and create new aquatic and riparian habitats. Further details can be found in the Ecological Mitigation and Enhancement Strategy set out at **Appendix 11.16.**

11.6.69 Habitat management measures will be secured through a Habitat Management and Monitoring Plan, or equivalent management plan, to be secured via S106 agreement or conservation covenant.

11.6.70 The implementation of habitat creation and management plans will therefore, result in a significant positive effect at the County level.

Rush Pasture

Implementation of Habitat Creation and Management Plans

11.6.71 The purple moor grass and rush pasture is currently species poor and subject to low input grazing. The area falls within the proposed EcoValley boundary and will therefore be subject to a conservation-led management regime to improve its value to local biodiversity.

11.6.72 Opportunities to improve the rush pasture include scrub management to prevent further encroachment and introduction of an appropriate grazing regime to benefit species composition and habitat structure.

11.6.73 Habitat management measures will be secured through a Habitat Management and Monitoring Plan, or equivalent management plan, to be secured via S106 agreement or conservation covenant.

11.6.74 The implementation of habitat creation and management plans will therefore result in a significant positive effect at the County level.

Other Lowland Mixed Deciduous Woodland & Wet Woodlands

Implementation of Management Plans

11.6.75 Woodlands which do not benefit from an LWS designation will be incorporated into conservation-led management regimes to improve their value to local biodiversity. Whilst specific measures will be led by the requirements of individual woodlands, based on botanical surveys, these may include selective vegetation thinning to increase light penetration, implementation of rotational coppicing and management of scrub/understorey.

11.6.76 Habitat management measures will be secured through a Habitat Management and Monitoring Plan, or equivalent management plan, to be secured via S106 agreement or conservation covenant.

11.6.77 Further details can be found in the Ecological Mitigation and Enhancement Strategy set out at **Appendix 11.16.**

11.6.78 The implementation of habitat management plans will result in a significant positive effect at the Local level.

Flora of Conservation Interest

Implementation of Management Plans

11.6.79 Flora of conservation interest will be taken into consideration during the creation of management plans for the wider habitats within which they are located, or could colonise in future. Suitable measures, to be informed by the species and habitat, will be incorporated to increase their abundance where possible, and increase resilience to environmental events.

11.6.80 Habitat management measures will be secured through a Habitat Management and Monitoring Plan, or equivalent management plan, to be secured via S106 agreement or conservation covenant.

11.6.81 Further details can be found in the Ecological Mitigation and Enhancement Strategy set out at **Appendix 11.16.**

11.6.82 The implementation of habitat management plans will result in a significant positive effect at the Local level.

Invertebrates

Implementation of Habitat Creation and Management Plans

11.6.83 Habitat creation and management works to be undertaken across the Site will benefit the local invertebrate assemblage by providing an increase in habitat diversity and extent, increasing the foraging and sheltering opportunities available.

11.6.84 The increase in floral diversity as a result of habitat creation and restoration works will further increase the diversity of the invertebrate assemblage, and the incorporation of management practices to retain deadwood will benefit saproxylic invertebrates.

11.6.85 Increasing the extent of wetland habitats will increase opportunities for riparian specialists, including species of conservation interest identified during the course of the surveys.

11.6.86 Habitat management measures will be secured through a Habitat Management and Monitoring Plan, or equivalent management plan, to be secured via S106 agreement or conservation covenant.

11.6.87 Further details can be found in the Ecological Mitigation and Enhancement Strategy set out at **Appendix 11.16.**

11.6.88 The implementation of habitat management plans will result in a significant positive effect at the Local level.

White-clawed Crayfish

Implementation of Habitat Creation and Management Plans

11.6.89 Although the upper sections of Barkham Brook are currently suitable to support WCC, the suitability of the brook decreases through the downstream sections. As part of the wider ditch management, as outlined above, opportunities to increase the suitability of the lower sections of the brook where possible.

11.6.90 The habitat suitability assessment will be used to identify actions that will be of benefit to WCC and these will be incorporated into the wider management of Barkham Brook.

11.6.91 Consideration will be given to the connectivity to the River Loddon to ensure that the Signal Crayfish population is unable to migrate up the brook and impact upon the WCC populations further upstream.

11.6.92 Habitat management measures will be secured through a Habitat Management and Monitoring Plan, or equivalent management plan, to be secured via S106 agreement or conservation covenant.

11.6.93 Further details can be found in the Ecological Mitigation and Enhancement Strategy set out at **Appendix 11.16.**

11.6.94 The implementation of habitat management plans will result in a significant positive effect at the Local level.

Freshwater Fish

Disturbance

11.6.95 Whilst access management will be used to deter people away from sensitive habitats, given the desirability of riverside locations for recreational activities disturbance to fish spawning grounds is still considered a risk.

11.6.96 To prevent unauthorised access to fish spawning habitats, in addition to access management via footpath routing and perimeter fencing, native planting will be used to screen access to the riverbank. The planting of Dogwood, Alder Buckthorn, Goat Willow and Guelder Rose will create a natural buffer along the riparian corridor, reducing ease of access and minimising the risk of people and dogs utilising the shallow areas of the River Loddon for recreational activities. The planting is shown on Lourdes Meadow SANG Planting Sheet 5 of 5 and will be secured through the SANG Management Plan via a planning condition.

Implementation of Habitat Management Plans

11.6.97 Habitat management works intended to improve the value of the River Loddon, as outlined above, will by proxy provide benefits to the local fish assemblage by increasing the extent of suitable habitats, providing new foraging and sheltering opportunities.

11.6.98 Measures targeted at species known to be present, such as Eel, will be incorporated to benefit local populations. In the long-term, opportunities to restore historic connections to the local watercourse network will be investigated (in line with advice from hydrologists) to allow for movement through the local watercourse network, and minimise risk of strandings and isolation following flooding event.

11.6.99 Habitat management measures will be secured through a Habitat Management and Monitoring Plan, or equivalent management plan, to be secured via S106 agreement or conservation covenant.

11.6.100 Further details can be found in the Ecological Mitigation and Enhancement Strategy set out at **Appendix 11.16.**

Great Crested Newt

Increased Mortality

11.6.101 Whilst the increased levels of open greenspace will increase the levels of optimum terrestrial habitats for Great Crested Newt, their dispersal through the Site increases the risk of mortality.

11.6.102 The risk of mortality will be reduced through the inclusion of modified gully pots with recessed kerbs, wildlife tunnels/culverts within the proposed road network. Full details shall be prepared at the relevant reserved matters stage and secured via a planning condition.

11.6.103 Wildlife tunnels, as outlined in the inherent mitigation measures above, will further reduce the risk of mortality associated with local traffic.

Implementation of Habitat Creation and Management Plans

11.6.104 The creation and management of natural open greenspace within 500m of the known breeding ponds will provide greater permeability through the landscape for the local GCN population.

11.6.105 The inclusion of scrub planting, hedgerows and provision of deadwood will provide new terrestrial habitats for GCN. New waterbodies will be included throughout the Proposed Development, to include a proportion of attenuation basins which will be over deep, holding water on a permanent basis, thereby increasing permeability through the landscape for the local GCN populations in the vicinity of the Site.

11.6.106 Habitat management measures will be secured through a Habitat Management and Monitoring Plan, or equivalent management plan, to be secured via S106 agreement or conservation covenant.

11.6.107 Further details can be found in the Ecological Mitigation and Enhancement Strategy set out at **Appendix 11.16.**

11.6.108 The implementation of habitat management and creation plans will result in a significant positive effect at the Local level.

Breeding Birds

Implementation of Habitat Creation and Management Plans

11.6.109 The introduction of management plans into retained habitats will increase their value to the breeding bird assemblage, increasing nesting and foraging opportunities. New habitat creation will further diversify the local bird assemblage, creating opportunities for species which are not currently breeding on Site, such as Swift, or are present in low numbers. The proposed wetland creation within EcoValley will increase the extent of habitats for species such as Reed Bunting and Sedge Warbler, which have previously been recorded along the length of the River Loddon.

11.6.110 The inclusion of native planting within the Proposed Development will increase foraging opportunities for breeding birds, providing seeds, fruits, berries and increasing the diversity and abundance of local invertebrates.

11.6.111 Habitat management measures will be secured through a Habitat Management and Monitoring Plan, or equivalent management plan, to be secured via S106 agreement or conservation covenant.

11.6.112 Further details can be found in the Ecological Mitigation and Enhancement Strategy set out at **Appendix 11.16.**

11.6.113 The implementation of habitat management and creation plans will result in a significant positive effect at the Local level.

Wintering Birds

Implementation of Habitat Creation and Management Plans

11.6.114 The habitat creation and enhancements proposed to be delivered within EcoValley and the Natural Greenspaces of the Proposed Development will increase the extent and quality of habitats for wintering birds.

11.6.115 The provision of native planting, to include fruit and berry-bearing species will provide migratory species such as Redwing and Fieldfare with additional foraging opportunities. By including a variety of species, foraging opportunities will be available at various times of the year.

11.6.116 EcoValley will include extensive wetland creation and restoration, diversifying habitats available for overwintering waterfowl. The land surrounding Rushy Mead will be enhanced, including scrapes and islands, to include areas of permanent standing water outside inundation events. Plant species known to be food sources will be included, thereby increasing the quality of the floodplain for waterfowl.

11.6.117 Habitat management measures will be secured through a Habitat Management and Monitoring Plan, or equivalent management plan, to be secured via S106 agreement or conservation covenant.

11.6.118 Further details can be found in the Ecological Mitigation and Enhancement Strategy set out at **Appendix 11.16.**

11.6.119 The implementation of habitat management and creation plans will result in a significant positive effect at the Local level.

Bats

Implementation of Habitat Creation and Management Plan

11.6.120 The proposed habitat creation and restoration plans for the River Loddon corridor includes numerous features that will benefit the local bat assemblage by creating new roosting, foraging and commuting habitats through the proposed EcoValley and natural open spaces of the Proposed Development.

11.6.121 Increasing the diversity of local flora through habitat creation and enhancement will further increase the invertebrate assemblage, thereby increasing foraging resources. The inclusion of new wetland habitats will also provide additional foraging resources for specialist species such as Daubenton’s bat.

11.6.122 The implementation of conservation-led management regimes within retained woodlands will further enhance these habitats for woodland specialists, such as Barbastelle and Noctule.

11.6.123 The total area and diversity of habitat creation proposed will substantially increase the roosting, foraging and commuting opportunities for the local bat assemblage. This will result in a long-term significant positive effect at the County level.

11.7 Residual effects

11.7.1 The implementation of the inherent and additional mitigation measures as outlined above are predicted to result in both positive and negative residual effects on Important Ecological Features, as described below.

Construction Phase

11.7.2 Following the application of the mitigation measures as outlined above, there will be temporary significant negative effect on the wintering bird assemblage as a result of disturbance.

Operational Phase

11.7.3 The proposed habitat creation and management measures, as outlined in the SANG Delivery Plan, Ecological Mitigation and Enhancement Strategy and to be detailed in future phase specific Ecological Mitigation and Enhancement Plans (EMEP) which will provide significant benefits to local biodiversity, as well as providing a recreational resource.

11.7.4 The implementation of the above strategies is therefore, predicted to result in a significant positive effect at the Local level on the following Important Ecological Features:

- Hall Farm Woodland Triangle LWS
- Rushy Mead LWS
- Loader's Copse LWS
- River Loddon (and LWS)
- CFGM (including grasslands and wetlands)
- Hedgerows and treelines
- Floodplain watercourses and modified ditches
- Rush Pasture
- Other Lowland Mixed Deciduous Woodlands
- Wet Woodlands
- Flora of Conservation Interest
- Invertebrates
- White-clawed Crayfish
- Freshwater Fish
- Breeding birds
- Wintering Birds
- Bats

11.8 Biodiversity Net Gain

11.8.1 In line with draft policy NE1 and SS13 of the Wokingham Borough Council Update Local Plan, and the Biodiversity Net Gain Regulations an assessment has been made of the potential for the Proposed Development to deliver biodiversity net gain. This has been measured using the statutory metric. Full details are presented in **Appendix 11.19**, including the calculator inputs/outputs, a description of parameters used, and any assumptions made.

11.8.2 According to the statutory metric, the Proposed Development is predicted to result in a net gain of at least 514.98 habitat units (25.40%), 57.00 hedgerow units (20.15%) and 25.77 river units (20.59%).

11.8.3 This figure includes a discount of units that would have otherwise been created in order to deliver a basic functional SANG, in line with the requirements of Natural England's SANG Guidance. It also discounts features that are required as mitigation/compensation for significant ecological effects.

11.8.4 The output generated by the statutory metric relates to habitats only, and does not account for the gains proposed for specific species groups, such as the provision of hibernation features for herptiles, or the inclusion of wildlife boxes as outlined in the Ecological Mitigation and Enhancement Strategy.

11.8.5 The metric also does not reflect the enhanced landscape-level connectivity that the SANG and EcoValley will provide for species such as invertebrates, reptiles and mammals. The creation of EcoValley would create a substantial green link through the landscape, linking up to existing biodiverse greenspaces such as Langley Mead SANG and The Ridge SANG.

11.9 Implications of Climate Change

11.9.1 Climate change has been identified as one of the key drivers of biodiversity loss across the world (IPBES, 2019). Increases in global temperature patterns are causing fauna species to shift their distribution in response, with a global trend in movement towards the poles as temperatures shift faster than species are able to adapt (CIEEM, 2022).

11.9.2 Furthermore, changes in temperature are resulting in changes to key seasons for species, including breeding, mating and flowering species. A key impact of this is the resultant disparity between predator-prey dynamics which impacts upon food resources and influences species fitness and survivability as a result (CIEEM, 2022). Habitats themselves also change in response to changes in temperature, with floral species distributions also changing to reflect local conditions.

11.9.3 However, species movements throughout the landscape are restricted by human barriers. This of particular prevalence for less mobile species such as flora, small mammals and invertebrates.

11.9.4 It is for these reasons that climate change is a driver of species extinction and resulting loss in diversity.

11.9.5 The Proposed Development incorporates measures to increase resilience to anticipated climate change.

11.9.6 As shown on the Illustrative Open Space Strategy, green corridors are included within the Proposed Development to aid in species movement through the Site and increase permeability in the local landscape. This will enable species to more easily shift their distributions over time to adapt to local climates.

11.9.7 Planting will consider future conditions to ensure longevity. For example, land within the floodplain which is anticipated to undergo more extended periods of inundation as a result of climate change and will include species such as Alder, which are better adapted to these wet conditions. Similarly, within dry areas of the Site, such as development area, species which are more drought tolerant will be included, such as Dogwood and Hazel, to cope with longer drier summers.

11.9.8 New habitats to be created will aid in carbon capture. Floodplains and woodlands are some of the highest carbon storing habitats in the UK (Gregg *et al*, 2021). Their restoration and creation within EcoValley will therefore aid in local carbon capture and storage over and above the current capabilities of the existing habitats.

11.10 Cumulative effects

11.10.1 Consideration has been given to the potential for residual negative effects of the Proposed Development to act cumulatively with other committed schemes as identified within Chapter 5, as well as the additional development proposed within Loddon Valley Garden Village.

Loddon Valley Garden Village Strategic Development Location

11.10.2 All wintering wildfowl were recorded within the Site boundary, and substantial populations of ducks and geese were not identified within the wider Loddon Valley Garden Village Strategic Development land.

11.10.3 Additional negative effects arising on wintering wildfowl within the wider Loddon Valley Garden Village Strategic Development therefore are not anticipated.

11.10.4 No other Important Ecological Features are subject to residual negative effects as a result of the Proposed Development, and there are therefore no further cumulative impacts arising from the wider Loddon Valley Garden Village Strategic Development.

Wider Committed Development

11.10.5 The residual negative effects associated with the construction phase relate specifically to the disturbance of overwintering foraging and roosting birds utilising the River Loddon floodplain during the construction of the River Loddon bridge crossing and associated road.

11.10.6 The effects arising during the construction phase will be temporary and sporadic in nature and are therefore, unlikely to align to result in a level of disturbance that would act cumulatively with another scheme. Furthermore, no identified committed schemes are located within proximity of wetland habitats and therefore are unlikely to support significant populations of overwintering wildfowl.

11.10.7 As such, it is considered that there are no sites which are likely to act cumulatively with the Proposed Development to generate additional impacts on the overwintering bird assemblage as a result of disturbance during the construction phase.

11.10.8 No other Important Ecological Features are subject to residual negative effects as a result of the Proposed Development, and there are therefore no further cumulative impacts arising from wider committed development.

11.11 Summary

11.11.1 This impact assessment has been undertaken in accordance with CIEEM's Guidelines for the Assessment of Ecological Impacts in the UK and Ireland (CIEEM, 2018).

11.11.2 Important Ecological Features with the potential to be affected (either positively or negatively) by the Proposed Development have been identified through a comprehensive desktop study and field survey work undertaken by EPR between 2022 and 2025. This work informed the evaluation of baseline conditions in relation to biodiversity, as well as the iterative design process for the Proposed Development.

11.11.3 The Important Ecological Features scoped in for detailed impact assessment include: off-Site areas designated for nature conservation; on-Site LWS; CFGM and associated habitats; historic floodplain ditches and modified watercourses; rush pasture; woodlands; hedgerows and treelines; flora of conservation interest; invertebrates; WCC; freshwater fish; GCN; breeding birds; overwintering birds; bats; and Otter. Features which did not meet the threshold for

detailed impact assessment, such as Water Vole and Dormice, are taken into consideration in the Ecological Mitigation and Enhancement Strategy.

11.11.4 An assessment of the likely significant effects of the Proposed Development on Important Ecological Features has been undertaken, taking into consideration inherent mitigation measures to be delivered as part of the Proposed Development. Likely significant effects in the construction phase include direct harm to species and loss/fragmentation of habitats. During the operational phase, likely significant effects include disturbance.

11.11.5 Key mitigation measures to be delivered include the implementation of a CEMP, drainage strategy, buffer zones, delivery of SANG and implementation of habitat creation and management plans.

11.11.6 Residual negative effects remain in respect of disturbance to wintering birds during the construction phase of the Proposed Development. These effects will not act cumulatively with other committed schemes, and will result in a temporary negative effect at the Local level.

11.11.7 Through the proposals for extensive habitat creation and restoration within EcoValley, significant positive effects will be achieved for the majority of Important Ecological Features.

11.11.8 This assessment has shown that, with the exception of residual temporary negative effects on the wintering bird population, and subject to the implementation the impact avoidance and mitigation measures described, the Proposed Development confirms with all biodiversity related legislation and policy, as listed at **Appendix 11.1**.

11.11.9 A summary of the assessment is set out in **Table 11.12** overleaf.

11.12 References

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11.13 Assessor information

Table 11.12 Assessor Information

Chapter	Responsibility	Name	Qualifications	Assessor information
Ecology	Ecological Planning and Research Ltd	Katie Cammack	BSc (Hons) MSc MCIEEM	Principal Ecological Consultant. Katie has worked in ecological consultancy for more than 10 years and regularly produces documents in support of planning applications. This includes Ecological Impact Assessment, Information for Habitats Regulations Assessment, Protected Species and Mitigation Reports as well as contributing chapters for Environmental Statements.

Chapter	Responsibility	Name	Qualifications	Assessor information
Ecology	Ecological Planning and Research Ltd	Alison Hogan	BSc (Hons) MSc MCIEEM	Managing Director Alison has over 20 years' experience in ecological survey and project management and has been responsible for managing and undertaking a variety of ecological assessments for development proposals at all scales including major road schemes and housing developments. She has considerable experience of the design and implementation of ecological mitigation for large-scale infrastructure projects and the provision of advice in relation to large-scale residential developments. She has a thorough understanding of the UK planning process and has undertaken many Ecological Impact Assessments for a variety of schemes, has provided information for Appropriate Assessment and assisted in Strategic Environmental Assessments.

Table 11.13 Summary of effects

Important Ecological Feature	Importance	Description of potential impact	Proposed mitigation	Residual effect	Significant / not significant
Construction Phase					
Thames Basin Heaths SPA	International	No impacts predicted	N/A	N/A	N/A
Longmoor Bog SSSI & Bramshill SSSI	National	No impacts predicted	N/A	N/A	N/A
Rushy Mead LWS	County	Loss of habitats	Woodland planting extension to St Johns Copse LWS	None	N/A
		Damage to retained habitats	Implementation of CEMP Implementation of buffers	None	N/A
Additional LWS	County	Damage to retained habitats	Implementation of CEMP Implementation of buffers	None	N/A
River Loddon (& LWS)	County	Habitat degradation	Long-term habitat management under EMES	None	N/A
		Changes in water quality	Implementation of drainage strategy	None	N/A
CFGM	County	Damage to retained habitats	Implementation of CEMP Implementation of buffers	None	N/A

Important Ecological Feature	Importance	Description of potential impact	Proposed mitigation	Residual effect	Significant / not significant
		Loss of habitats	Habitat enhancements Long-term habitat management under EMES	None	N/A
Hedgerows and Treelines	County/Local	Damage to retained habitats	Implementation of CEMP Implementation of buffers	None	N/A
		Loss of habitats	Habitat enhancements Long-term habitat management under EMES	None	N/A
Historic Floodplain Ditches and Modified Watercourses	County	Loss of habitats	Long-term habitat management under EMES	Permanent negative at the ZoI level	Not significant
		Damage to retained habitats	Implementation of CEMP Implementation of buffers	None	N/A
		Changes to water quality	Implementation of CEMP	None	N/A
Rush Pasture	County	Damage to retained habitats	Implementation of CEMP Implementation of buffers	None	N/A
Swamp and Reedbed	County	Damage to retained habitats	Implementation of CEMP	None	N/A

Important Ecological Feature	Importance	Description of potential impact	Proposed mitigation	Residual effect	Significant / not significant
			Implementation of buffers		
		Loss of habitats	Long-term habitat management outlined in EMES, secured through EMEP	None	N/A
Other Lowland Mixed Deciduous Woodland	Local	Damage to retained habitats	Implementation of CEMP Implementation of buffers	None	N/A
		Loss of habitats	Long-term habitat management outlined in EMES, secured through EMEP	None	N/A
Wet Woodlands	Local	Damage to retained habitats	Implementation of CEMP	None	N/A
Flora of Conservation Interest	National/County/Local	Damage to retained flora	Implementation of CEMP Implementation of buffers	None	N/A
		Loss of Flora	Implementation of Working Method Statement	None	N/A
		Habitat Degradation	Long-term habitat management outlined in EMES, secured through EMEP	None	N/A

Important Ecological Feature	Importance	Description of potential impact	Proposed mitigation	Residual effect	Significant / not significant
		Changes in Water Quality	Implementation of CEMP	None	N/A
Grasslands	Local	Damage to retained habitats	Implementation of CEMP Implementation of buffers	None	N/A
		Loss of habitats	Long-term habitat management outlined in EMES, secured through EMEP	None	N/A
Veteran Trees	County	Damage to retained trees	Implementation of CEMP Implementation of buffers	None	N/A
		Loss of veteran trees	Implementation of veteran tree mitigation strategy	Permanent negative at the ZoI level	Not significant
Invertebrates	Local	Habitat loss/fragmentation	Long-term habitat management outlined in EMES, secured through EMEP	None	N/A
White-clawed Crayfish	Local	Changes to water quality	Implementation of CEMP	None	N/A
Freshwater Fish	TBC	Changes in water quality	Implementation of CEMP	None	N/A

Important Ecological Feature	Importance	Description of potential impact	Proposed mitigation	Residual effect	Significant / not significant
Great Crested Newt	Local	Harm to individuals	Works to proceed under WLMS or appropriate licence	None	N/A
		Habitat loss/fragmentation	Long-term habitat management outlined in EMES, secured through EMEP	None	N/A
Breeding birds	County	Harm to individuals/destruction of nests	Pre-works nesting bird checks	None	N/A
		Loss of foraging and nesting habitats	Long-term habitat management outlined in EMES, secured through EMEP Skylark Mitigation Strategy	None	N/A
Wintering Birds	County	Disturbance	Implementation of CEMP	Temporary negative at the Local level	Significant
Bat Roosts	County	Harm to individuals	Works to proceed under WLMS or appropriate licence	None	N/A
		Damage/destruction of roosts	Works to proceed under WLMS or appropriate licence Provision of replacement roosts	None	N/A

Important Ecological Feature	Importance	Description of potential impact	Proposed mitigation	Residual effect	Significant / not significant
Bat Assemblage	Regional	Loss/Fragmentation of Foraging/Commuting Habitats	Long-term habitat management outlined in EMES, secured through EMEP	None	N/A
Otter	Local	Disturbance	Implementation of CEMP	None	N/A
		Changes to water quality	Implementation of CEMP	None	N/A
Operation Phase					
Thames Basin Heaths SPA	International	Increase in recreational pressure	Provision of SANG and SAMM contribution	None	N/A
		Changes in air quality	N/A	None	N/A
Longmoor Bog SSSI & Bramshill SSSI	National	Increase in recreational pressure	Provision of SANG	None	N/A
LWS	County	Increase in recreational pressure	Provision of SANG Access management	None	N/A
		Urban edge effects	Provision of SANG Access management	None	N/A
		Changes in air quality	TBC – to follow in addendum	TBC – to follow in addendum	TBC – to follow in addendum
		Implementation of management plans	N/A	Permanent positive at the Local level	Significant
River Loddon (& LWS)	County	Changes in water quality	Implementation of drainage strategy	None	N/A

Important Ecological Feature	Importance	Description of potential impact	Proposed mitigation	Residual effect	Significant / not significant
		Urban edge effects	Provision of SANG Access management	None	N/A
		Implementation of management plans	N/A	Permanent positive at the Local level	Significant
CFGM	County	Increase in recreational pressure	Provision of SANG Access management	None	N/A
		Urban edge effects	Provision of SANG Access management	None	N/A
		Implementation of habitat creation and management plans	N/A	Permanent positive at the County level	Significant
Hedgerows and treelines	County/local	Urban edge effects	Provision of SANG Access management	None	N/A
		Implementation of habitat creation and management plans	N/A	Permanent positive at the County level	Significant
Historic floodplain ditches and modified watercourses	County	Changes in water quality	Implementation of drainage strategy	None	N/A
		Implementation of habitat creation and management plans	N/A	Permanent positive at the County level	Significant
Rush pasture	County	Increase in recreational pressure	Provision of SANG Access management	None	N/A
		Implementation of habitat creation and management plans	N/A	Permanent positive at the County level	Significant

Important Ecological Feature	Importance	Description of potential impact	Proposed mitigation	Residual effect	Significant / not significant
Other Lowland Mixed Deciduous Woodland	Local	Increase in recreational pressure	Provision of SANG Access management	None	N/A
		Urban edge effects	Provision of SANG Access management	None	N/A
		Implementation of habitat creation and management plans	N/A	Permanent positive at the Local level	Significant
Wet Woodland	Local	Increase in recreational pressure	Provision of SANG Access management	None	N/A
		Urban edge effects	Provision of SANG Access management	None	N/A
		Implementation of habitat creation and management plans	N/A	Permanent positive at the Local level	Significant
Flora of Conservation Interest	National/ County/Local	Implementation of habitat creation and management plans	N/A	Permanent positive at the County/Local level	Significant
		Changes in water quality	Implementation of drainage strategy	None	N/A
Veteran Trees	County	Increase in recreational pressure	Provision of SANG Access management	None	N/A
		Urban edge effects	Provision of SANG Access management	None	N/A
Invertebrates	Local	Implementation of habitat creation and management plans	N/A	Permanent positive at the Local level	Significant

Important Ecological Feature	Importance	Description of potential impact	Proposed mitigation	Residual effect	Significant / not significant
White-clawed Crayfish	Local	Changes in water quality	Implementation of drainage strategy	None	N/A
		Implementation of habitat creation and management plans	N/A	Permanent positive at the Local level	Significant
Freshwater Fish	County	Changes in water quality	Implementation of drainage strategy	None	N/A
		Disturbance	Access management Additional planting	None	N/A
		Implementation of habitat management plans	N/A	Permanent positive at the Local level	Significant
Great Crested Newt	Local	Increased mortality	Provision of modified gully pots with recessed kerbs, wildlife tunnels/culverts	None	N/A
		Implementation of habitat creation and management plans	N/A	Permanent positive at the Local level	Significant
Breeding birds	County	Disturbance	Implementation of lighting strategy	None	N/A
		Implementation of habitat creation and management plans	N/A	Permanent positive at the Local level	Significant
		Cat predation	N/A	None	N/A
Wintering birds	County	Cat predation	N/A	None	N/A
		Disturbance	Access management	None	N/A

Important Ecological Feature	Importance	Description of potential impact	Proposed mitigation	Residual effect	Significant / not significant
		Implementation of habitat creation and management plans	N/A	Permanent positive at the Local level	Significant
Bats	Regional	Disturbance	Implementation of lighting strategy	None	N/A
		Implementation of habitat creation and management plans	N/A	Permanent positive at the County level	Significant
		Creation of new roosting opportunities	N/A	Permanent positive at the Local level	Significant
Otter	Local	Changes in water quality	Implementation of drainage strategy	None	N/A
		Disturbance	N/A	None	N/A

11.14 Mitigation commitments Summary

Table 11.14 Summary for Securing Mitigation

Identified receptor	Type and purpose of additional mitigation measure (prevent, reduce, offset, enhance)	Means by which mitigation may be secured (e.g. planning condition / legal agreement)	Delivered by	Auditable by
Construction Phase				
Local wildlife sites River Loddon CFGM (and associated habitats) Hedgerows and treelines Ditches and modified watercourses Rush pasture Woodlands Flora of conservation interest Veteran trees Invertebrates White-clawed crayfish Freshwater fish GCN Breeding birds Wintering birds Bats Otter	CEMP (prevent)	Planning condition	Contractor	LPA
Local wildlife sites River Loddon	Implementation of buffer zones (prevent)	Planning condition	Contractor	LPA

Identified receptor	Type and purpose of additional mitigation measure (prevent, reduce, offset, enhance)	Means by which mitigation may be secured (e.g. planning condition / legal agreement)	Delivered by	Auditable by
CFGM (and associated habitats) Hedgerows and treelines Ditches and modified watercourses Rush pasture Woodlands Flora of conservation interest Veteran trees				
Woodlands Veteran trees	Root protection areas (prevent)	Planning condition	Contractor	LPA
Local wildlife sites River Loddon CFGM (and associated habitats) Hedgerows and treelines Ditches and modified watercourses Rush pasture Woodlands Freshwater fish GCN Otter	Drainage strategy (prevent)	Planning condition	Developer	LPA
Breeding birds Wintering birds Bats Otter	Lighting strategy (prevent/reduce)	Planning condition	Developer	LPA

Identified receptor	Type and purpose of additional mitigation measure (prevent, reduce, offset, enhance)	Means by which mitigation may be secured (e.g. planning condition / legal agreement)	Delivered by	Auditable by
GCN Breeding birds Wintering birds Bats Otter	Greenspace provision	Planning condition	Developer	LPA
Local wildlife sites River Loddon CFGM (and associated habitats) Hedgerows and treelines Ditches and modified watercourses Rush pasture Woodlands Flora of conservation interest Veteran trees Invertebrates White-clawed crayfish Freshwater fish GCN Breeding birds Wintering birds Bats Otter	EMEP (prevent/reduce/offset/enhance)	Planning condition	Developer	LPA
GCN Bats	EPSL (prevent/offset)	Planning condition	Developer	Natural England
Breeding Birds	Skylark Mitigation Strategy (offset)	Legal agreement	Applicant	LPA

Identified receptor	Type and purpose of additional mitigation measure (prevent, reduce, offset, enhance)	Means by which mitigation may be secured (e.g. planning condition / legal agreement)	Delivered by	Auditable by
Wintering Birds	Winter farmland bird mitigation strategy (offset)	Legal agreement	Applicant	LPA
Operation Phase				
Thames Basin Heaths SPA Longmoor Bog SSSI Bramshill SSSI Local Wildlife Sites	Suitable Alternative Natural Greenspace (prevent)	Legal agreement	Applicant	LPA
Thames Basin Heaths SPA Longmoor Bog SSSI Bramshill SSSI Local Wildlife Sites	Access management (prevent)	Planning condition	Application	LPA
Thames Basin Heaths SPA	SAMM contribution (offset)	Legal agreement	Application	LPA
Breeding birds Wintering birds Bats Otter	Lighting Strategy (prevent/reduce)	Planning condition	Applicant/Developer	LPA
Local wildlife sites River Loddon CFGM (and associated habitats) Hedgerows and treelines Ditches and modified watercourses Rush pasture Woodlands	Habitat Creation/Management Plans (offset/enhance)	Planning condition	Applicant/Developer	LPA

Identified receptor	Type and purpose of additional mitigation measure (prevent, reduce, offset, enhance)	Means by which mitigation may be secured (e.g. planning condition / legal agreement)	Delivered by	Auditable by
Flora of conservation interest Veteran trees Invertebrates White-clawed crayfish Freshwater fish GCN Breeding birds Wintering birds Bats Otter				