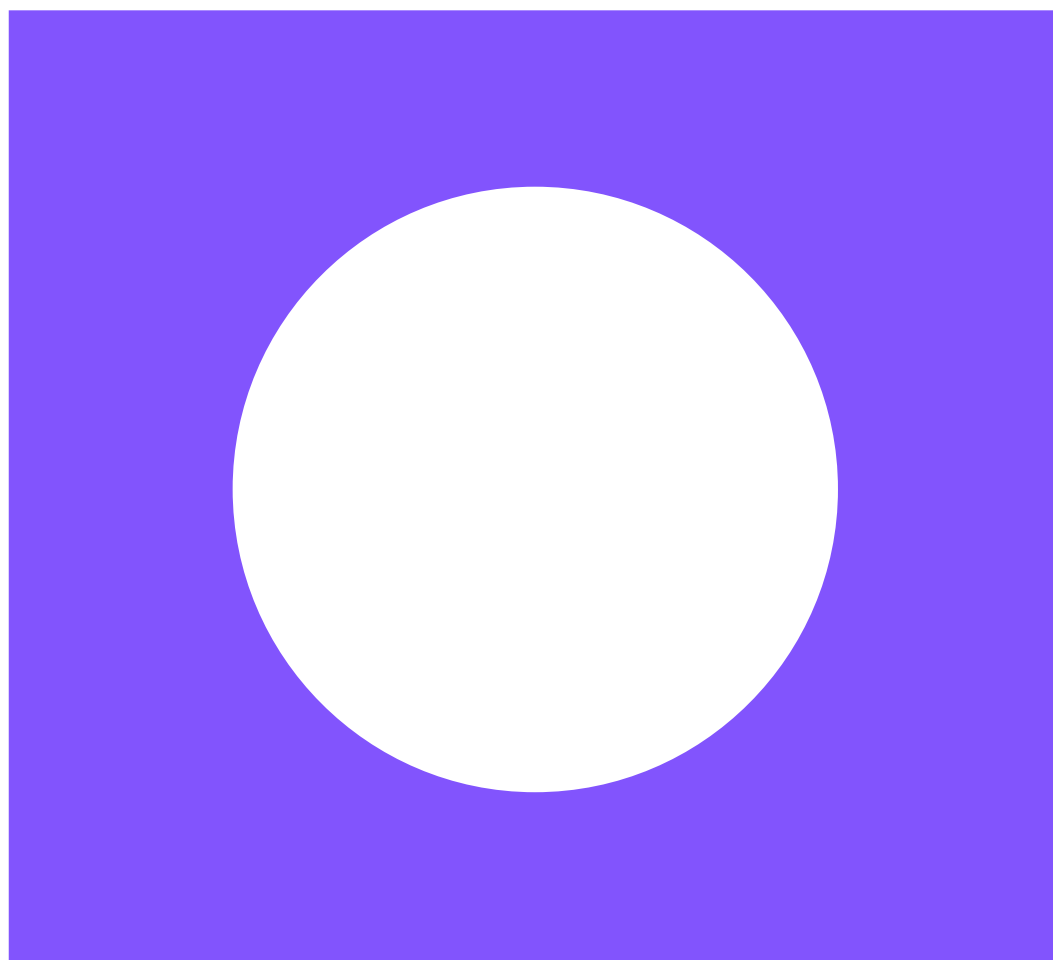




Arborfield STW

Preliminary Ecological Appraisal Report

November 2025

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Arborfield STW

Preliminary Ecological Appraisal Report

November 2025

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Executive summary

Mott MacDonald have been commissioned by Thames Water to undertake a Preliminary Ecological Appraisal (PEA) (and Biodiversity Net Gain Assessment, supplied in conjunction with this report) of land within Arborfield Sewage Treatment Works (STW), to support the Stage Gate 1 Review of Thames Water's Capital Delivery Stage Gate Process (Solution Option and Definition). No detailed scope, phasing or Project briefs are available at this time, and therefore the assessments made in this report consider all areas within the Site. Once Project details are produced, further assessments of ecology impacts may be required. The planning requirements are unknown; however, it is considered that planning permission may be required under the Town and Country Planning Act 1990. Therefore, BNG could be required. The Site (the area within the red line boundary) covers an area of approximately 4.7 hectares and comprises the operational Arborfield STW, and an expansion area immediately southeast, consisting of agricultural land.

A desk study of existing information and reports was undertaken, in addition to a UK Habitat Classification survey which was conducted on 14 October 2025. The survey looked at habitat suitability for, and evidence of, protected and notable species. Baseline condition assessments of the habitats were also undertaken, to inform subsequent Biodiversity Net Gain (BNG) calculations. The Biodiversity Calculator (completed in the Statutory Metric) (Document reference: M100.01-DN-ARBOS1ZZ-100-CA-EN-0001) and Habitat Condition Assessments (Document reference: M100.01-DN-ARBOS1ZZ-100-AS-EN-0005) are supplied in conjunction with this report.

There is one statutory designated site within 2.0km of the Site (Longmoor Bog SSSI), and the Site lies within the SSSI Impact Risk Zones of this SSSI. Depending on the design of the Project, consultation with Natural England may be required regarding potential impacts to Longmoor Bog SSSI, although this is considered unlikely owing to the distance and lack of connectivity to the Site.

Avoidance measures are recommended in Section 5.2 to reduce any potential impacts at the design stage. Works should:

- Avoid impacts to all species by minimising the loss of habitat, using existing hardstanding and implementing a buffer between works and sensitive ecological habitats wherever possible.
- Avoid affecting the following habitats:
 - Hedgerows
 - Lines of trees
 - Mixed scrub
 - Bramble scrub
 - Individual trees
 - The Barkham Brook immediately south of the Site and associated riparian habitat (within 10m of the watercourse)
 - Buildings B1 and B2
- Avoid the RPA of trees on Site.
- Avoid impacts to nocturnal species such as bats by avoiding the need for artificial lighting and night-time working, or if this is not possible, following the Institute of Lighting Professionals (ILP) Guidance Note on artificial lighting and bats (ILP, 2023) in the design of operational lighting.

- Avoid impacting nesting birds by avoiding the nesting bird season (February - August inclusive).

Where impacts to sensitive features cannot be avoided, further surveys set out in Section 5.3 may be required. These could include surveys for [REDACTED] bats, birds, hazel dormouse, otter, and a MoRPH survey.

Recommendations for mitigation are fully presented in Section 5.4; these include recommendations for lighting, excavations, dust-suppression and invasive non-native species. Species-specific mitigation should be identified following protected species surveys. Mitigation will be secured through a Construction Environmental Management Plan (CEMP).

This PEA is considered to be valid for 18 months after the date of survey – until May 2027. After this date, the report should be reviewed by a competent ecologist and an updated site walkover (and subsequently a new PEA) may be required.

The recommendations provided within this Document are based on a site boundary only. It is advised that ecology risks and recommendations should be reviewed and updated following receipt of a more detailed design.

1 Introduction

1.1 Project overview and site description

Background

Mott MacDonald have been appointed by Thames Water Utilities Limited (hereafter 'Thames Water') to undertake a Preliminary Ecological Appraisal (PEA) (and Biodiversity Net Gain Assessment, supplied in conjunction with this report) to support the Stage Gate 1 Review of Thames Water's Capital Delivery Stage Gate Process (Solution Option and Definition).

Asset Management Period 8 (AMP8) upgrade works are proposed at Arborfield Sewage Treatment Works (STW) to account for the growth in the catchment and meet the 2036 design horizon (hereafter, the 'Project'). The Project aims to ensure the treatment of effluents meets the new consent levels for cypermethrin, low phosphorus, ammonia, and Biochemical Oxygen Demand (BOD)¹.

No detailed scope, phasing or Project briefs are available at this time. Further details will be produced at a later stage of the Project to inform further assessments, as required. The planning requirements are unknown, however it is considered that planning permission may be required under the Town and Country Planning Act 1990.

Site location

The Site is located in a rural setting within Wokingham Borough Council, at Wood Lane, Arborfield, Wokingham, RG41 4TS and indicative on OS Grid Reference SU 76900 67400.

The Site boundary for the Project includes the operational Arborfield STW and a 1.45 hectares (ha) expansion area immediately southeast, consisting of agricultural land. Arborfield STW and the expansion are together referred to as the 'Site'. Access to the Site is from Wood Lane, a small rural lane providing access to the Site and agricultural and commercial properties only.

Figure 1.1 shows the Site boundary. The extent of the Site which measures approximately 4.1 ha and is expected to include the area of construction, as well as any temporary works and access required.

¹ The Environment Act 2021 sets out a new target for actions to reduce phosphorus loading from treated wastewater from the water industry by 80% by 2037 against a 2020 baseline.

Figure 1.1: Site location plan



Source: Mott MacDonald, 2025.

1.2 Aims and objectives of this document

This PEA report has been prepared in accordance with the Chartered Institute of Ecology and Environmental Management (CIEEM) 'Guidelines for Preliminary Ecological Appraisal' 2nd edition (2017). The purpose of this report is to provide an assessment of the protected and/or notable habitats and species which occur or have the potential to occur within or near to the Project and which could be impacted. The aims of this assessment are to:

- Undertake a desktop review to identify any existing information regarding protected and/or notable species and sites with a nature conservation designation within the defined zone of influence (ZoI) for the Project.
- Carry out a UK Habitat Classification survey to provide a description of the existing broad habitat types both within and immediately adjacent to the Project.
- To record the presence or potential presence of any protected and/or notable species of flora or fauna during the site visit.
- Identify the presence of any invasive plant species on or adjacent to the Project.
- Provide a UK Habitat classification (UKHab) map with target notes of ecological features as identified above.
- Outline any ecological constraints to the Project.
- Provide recommendations for further ecological survey work or assessment.
- Identify any high-level mitigation or compensation measures that may be required to offset potential development impacts.
- Identify opportunities for enhancement in line with national and local planning policy.

1.3 Quality assurance and environmental management

All ecologists involved in the production of this report are members of the CIEEM and are bound by its code of conduct (CIEEM, 2022). Additionally, this report has been subject to Mott MacDonald Limited's internal quality assurance checks in line with ISO9001:2015.

All surveys and assessments were undertaken by suitably experienced ecologists as per CIEEMs competency framework (CIEEM, 2024a) and have been undertaken with reference to the recommendations given in BS 42020:2013 Biodiversity: Code of practice for planning and development (British Standards Institute, 2013).

As per the advice note from CIEEM (2019) On the Lifespan of Ecological Reports & Surveys; the findings presented in this report are valid for up to 18 months from the date of survey (i.e., May 2027). Following this, the survey data should be reviewed and, if appropriate, updated to ensure any assessment and mitigation approach remains valid.

2 Legislation and policy

2.1 Overview

Developers must ensure the construction and operational activities for the Project comply with national nature conservation legislation, and with national and local biodiversity planning policies.

The following legislative and planning policy context has been used to inform the assessment of the relative ecological value of the Site, potential constraints to the Project and recommendation for enhancements.

2.2 Legislative framework

The main pieces of legislation regarding the protection of species and habitats are the Conservation of Habitats and Species Regulations 2017 (as amended) (henceforth referred to as the '2017 Regulations') and the Wildlife and Countryside Act 1981 (as amended) ('the 1981 Act') and establishes the legal framework for species requiring strict protection - 'European Protected Species'.

These pieces of legislation provide a range of protection for many species and also create protected sites (including Sites of Special Scientific Interest (SSSIs), Special Protection Areas (SPAs) and Special Areas of Conservation (SACs)). These sites are referred to as 'Habitats Sites' and make up the 'National Site Network'. Ramsar sites are wetlands of international importance and are, for the purposes of assessment, treated in the same way as SPAs and SACs.

Activities which have the potential to harm protected species must be appropriately considered and mitigated, as must those with the potential to impact protected sites. In some instances, activities occurring some distance from a designated site have the potential to cause adverse effects and must be considered within an impact assessment.

Other species-specific legislation for certain groups () is also in place and is referenced within this report where relevant. A summary of protection by species/species group can be found in Appendix A.

Invasive non-native species (INNS) are regulated via a combination of the Invasive Alien Species (Permitting and Enforcement) Order 2019 (henceforth referred to as 'the 2019 Order') and Section 14/Schedule 9 of the 1981 Act.

Section 41 of the Natural Environment and Rural Communities (NERC) Act 2006, requires a list of habitats and species that are of principal importance for the conservation of biodiversity in England to be published. These habitats and species are known as S41, habitats of principal importance (HPI) and species of principal importance (SPI). The NERC Act also places a duty on public bodies to conserve and enhance biodiversity whilst undertaking their functions (the 'biodiversity duty').

The Environment Act (2021) requires that developments in England seeking planning permission under the Town & Country Planning Act (1990) deliver a minimum of 10% biodiversity net gain (in each habitat unit present) as measured by the Statutory Biodiversity Metric.

The Act requires the Local Planning Authority to enforce the following:

- A minimum of 10% increase in habitat value for wildlife compared with the pre-development baseline.
- Net gain outcomes, through habitat creation or enhancement as part of delivering mandatory biodiversity net gain, to be maintained for a minimum of 30 years.
- The use of a biodiversity metric.

This means that all English Planning Authorities have a duty to ensure that any plans or projects provide biodiversity net gains, as opposed to 'no net loss'.

The Environment Act also contains a number of other provisions, such as support for Nature Recovery Networks, strengthened protection for trees, and for conservation covenants.

2.3 National Planning Policy

The National Planning Policy Framework (NPPF, published on 12 December 2024) sets out the Government's planning policies for England. Section 15 covers Habitats and Biodiversity and paragraph 193 provides a list of principles that Local Planning Authorities should apply when determining planning applications. These include:

- *If significant harm to biodiversity resulting from a development cannot be avoided (through locating on an alternative site with less harmful impacts), adequately mitigated, or, as a last resort, compensated for, then planning permission should be refused.*
- *Development on land within or outside a Site of Special Scientific Interest, and which is likely to have an adverse effect on it (either individually or in combination with other developments), should not normally be permitted. The only exception is where the benefits of the development in the location proposed clearly outweigh both its likely impact on the features of the site that make it of special scientific interest, and any broader impacts on the national network of Sites of Special Scientific Interest.*
- *Development resulting in the loss or deterioration of irreplaceable habitats (such as ancient woodland and ancient or veteran trees) should be refused, unless there are wholly exceptional reasons and a suitable compensation strategy exists.*
- *Development whose primary objective is to conserve or enhance biodiversity should be supported; while opportunities to improve biodiversity in and around developments should be integrated as part of their design, especially where this can secure measurable net gains for biodiversity or enhance public access to nature where this is appropriate.*

2.4 Local Planning Policy

At a local level, planning policies relevant to the site are set out within the Wokingham Borough Core Strategy Development Plan Document (Wokingham Borough Council, 2010). The policies relevant to ecology are described below, with the relevant bullet points presented as extracts:

- Policy CP7 – Biodiversity – states that:
 - Sites designated as of importance for nature conservation at an international or national level will be conserved and enhanced and inappropriate development will be resisted. The degree of protection given will be appropriate to the status of the site in terms of its international or national importance.
 - Development:
 - Which may harm county designated sites (Local Wildlife Sites in Berkshire), whether directly or indirectly, or
 - Which may harm habitats or, species of principal importance in England for nature conservation, veteran trees or features of the landscape that are of major importance

for wild flora and fauna (including wildlife and river corridors), whether directly or indirectly, or

- That compromises the implementation of the national, regional, county and local biodiversity action plans

will only be permitted if it has been clearly demonstrated that the need for the proposal outweighs the need to safeguard the nature conservation importance, that no alternative site that would result in less or no harm is available which will meet the need, and:

- i) Mitigation measures can be put in place to prevent damaging impacts; or
- ii) Appropriate compensation measures to offset the scale and kind of losses are provided.

Berkshire has a Local Nature Recovery Strategy in place (Berkshire Nature Recovery, 2025). This consists of a Local Habitat Map, a Description of Berkshire, a List of Priorities and Measures and a Species Priorities List.

3 Methodology

3.1 Study area and zone of influence

The current guidance on Ecological Impact Assessments (EclA) (CIEEM, 2024b) recommends that all ecological features that occur within a ‘zone of influence’ (Zol)² for a Project are investigated. The Zol includes:

- Areas directly within the land take for the Project and access.
- Areas which will be temporarily affected during construction.
- Areas likely to be impacted by hydrological disruption.
- Areas where there is a risk of pollution and noise disturbance during construction and/or operation.

The Zol is variable depending on the ecological receptors affected. The size of study areas are determined by considering the potential Zol for each receptor. Table 3.1 below summarises the Zol used for ecological receptors.

Natural England’s Site of Special Scientific Interest (SSSI) impact risk zones (IRZ) have been used to inform the study. These were developed to assess potential adverse impacts of development on SSSI designated features, and the National Site Network. The IRZ buffers reflect different types of development proposal and their associated potential adverse impacts.

Table 3.1: Zone of Influence

Ecological receptors	Study area
SACs designated for bats	Within 10.0km of the Site
Sites designated for their national and international importance	Within 2.0km of the Site
Sites designated for their county or local importance	Within 2.0km of the Site
Desk study records (for protected and notable species)	Within 2.0km of the Site
Great crested newt <i>Triturus cristatus</i> : waterbodies	Within 0.5km of the Site
Habitats of Principal Importance and ancient woodland	Within 50m of the Site
Otter <i>Lutra lutra</i> and water vole <i>Arvicola amphibius</i>	Within 250m of the Site
WCA Schedule 1 species of nesting birds	Within 50m of the Site
Bat roosts, commuting routes and foraging areas	Within 30m of the Site
Common nesting birds and hazel dormouse <i>Muscardinus avellanarius</i> habitat	Within 30m of the Site
Reptiles, widespread amphibians and terrestrial invertebrates	Within 10m of the Site
Invasive plant species on Schedule 9 of the 1981 Act or Schedule 2 of the Invasive Alien Species (Enforcement and Permitting) Order 2019	Within 10m of the Site
UK Habitat Classification survey	Within the Site

Source: Mott MacDonald, 2025.

² Note that the Zol depicts a distance within which effects are identified as most likely. This does not equate to a certainty of effects within this distance, nor does it preclude the possibility of effects outside the Zol.

3.2 Desk study

A desk study was undertaken in October 2025, in accordance with current guidelines for Preliminary Ecological Appraisal (CIEEM, 2017) to determine the presence of any designated nature conservation sites and protected or notable species within the Zol of the Project.

Data was obtained from the Thames Valley Environmental Records Centre (TVERC) database on 17 October 2025, and relevant publicly available data, publications, reports and online databases. These include Multi-Agency Geographic Information for the Countryside (MAGIC), the Joint Nature Conservation Committee (JNCC) and the LBAP. The search for waterbodies within 500m of each site was conducted using OS mapping.

Natural England's Priority Habitat Inventory (PHI) (England) is a dataset of confirmed and potential HPI geographic extents and locations. This was used to inform what HPI could be present. Potential habitats of principal importance were noted and confirmed as such during the field survey, where possible.

All biological records within the last 10 years were considered and, in some cases, records older than 10 years have been included to inform the assessment where appropriate. It should be noted that the absence of records should not be taken as confirmation that a species is absent from the search area.

3.3 Field survey

The field survey was completed on 14 October 2025 and consisted of a UK Habitat Classification (UKHab) survey (UKHab, 2023), which involved mapping of habitats by a suitably qualified and experienced ecologist from Mott MacDonald and an assessment of the Site's potential to support protected species.

During the field survey, habitat types were identified and mapped in compliance with the UKHab guidance documents. Primary habitats on-site were classified using Level 4 and 5 of the UKHab hierarchy and urban features have been classified up to Level 5 of the hierarchy. Dominant plant species were noted, as were any protected, uncommon, invasive species or species indicative of particular habitat types, but there was no attempt to compile exhaustive species lists for this element of the site assessment. Plant species recorded are included in the relevant results sub-sections in Section 4. Botanical nomenclature in this report follows Stace (2019) for both scientific and English names.

The walkover of the Site also included an assessment of the likelihood of protected and notable animal species being present using species specific industry standard best practice guidance.

To inform the Biodiversity Net Gain calculations, the condition of each habitat was assessed during the field survey using the published condition assessment criteria in The Statutory Biodiversity Metric (DEFRA, 2024).

Table 3.2 details the weather conditions at the time of the field survey.

Table 3.2: Survey weather conditions

Date	Temperature (°C)	Cloud cover (%)	Wind (Beaufort scale)	Precipitation
14/10/2025	12	100	2	None

Source: Mott MacDonald, 2025.

3.4 Limitations

The following limitations are relevant to this assessment:

- Biological records obtained from records centres do not necessarily represent a full and complete list for a given area, and the absence of a species or habitat record does not prove it is not present. Records are not often collected as a result of systematic surveys and therefore geographic, temporal (annual and seasonal) and species coverage is not often representative. However, this data is considered sufficient alongside the other sources reviewed and ecological survey of the site to inform this assessment of constraints.
- Records older than 10 years were considered on a case-by-case basis, with those less than 10 years old used as standard. This is to ensure that changes in local conditions and habitats do not skew results, for example inferring species may be present from an older record prior to development of an area, when no suitable habitats exist anymore. This has been taken into account in the assessment and recommendations.
- Ordnance survey maps do not provide a complete record of waterbodies present within a landscape but were reviewed alongside aerial imagery to provide as robust an assessment as possible.
- Ecological surveys are limited to factors which affect the presence of plants and animals, such as time of year, migration patterns and behaviour. With a single site visit it is possible that certain species may have been overlooked or under-recorded during the assessment as optimal survey periods vary from species to species. This PEA report therefore cannot be considered to provide a wholly comprehensive account of the ecological interest of the Site, and it should be noted that this report does not constitute an Ecological Impact Assessment. The survey does, however, provide a “snapshot” of the ecological interest present on the day of the survey visit.
- The optimal time for botanical surveys is between April to September inclusive. The site visit took place in October and was therefore considered to be outside the optimal time for assessing plant communities. Although only fourteen days out of optimal season and weather conditions were largely similar between the survey date and 30 September, it is possible that some species of flora were missed during this site visit. However, enough species were present in order to be able to make an assessment, and this was therefore not a significant limitation.
- During the survey, the more commonly encountered invasive non-native species were looked for, such as Japanese knotweed *Reynoutria japonica*, Himalayan balsam *Impatiens glandulifera*, rhododendron *Rhododendron ponticum*, Virginia creeper *Parthenocissus quinquefolia*, wall cotoneaster *Cotoneaster horizontalis* and montbretia *Crocasmia x crocosmiiflora*. There is a low risk that some less common invasive non-native species may have been omitted from the field survey.
- There was no access to the Barkham Brook to the south of the Site, so the watercourse was not surveyed in detail. However, it could be viewed through the fence at certain points, which was sufficient to obtain a general overview of the watercourse.
- Natural England's inventory of HPI is precautionary and many of the areas have not been surveyed. Whether a habitat present qualifies as having HPI status often depends on the composition of the habitat present, size and its context within the local landscape. It is not possible to confirm whether these are HPI without further survey. HPI are considered to be of at least county value.

4 Results and interpretation

This section presents the results of the desk study and field survey along with an interpretation. To inform an assessment of potential ecological constraints, possible impact pathways from the Project have been identified and considered. This has been undertaken on a precautionary basis to reflect that the works scope and methodology are not yet finalised, and optioneering is still ongoing.

4.1 Desk study

For ease of reference, desk study records for protected and notable species are included together with field sightings/evidence in Section 4.4.

4.1.1 Sites designated for their international importance

The desk study returned no SPAs, SACs or Ramsar Sites within 2.0km of the Site, and no SACs designated for bats within 10.0km of the Site. Therefore, these sites are not considered further in this report.

4.1.2 Sites designated for their national or county importance

The desk study identified that the Site lies within the SSSI IRZ of one SSSI. Longmoor Bog SSSI is located 1.82km south-east of the Site at its closest point.

It is a base-poor valley mire, with a well-developed carr of alder *Alnus glutinosa*, grey willow *Salix cinerea*, downy birch *Betula pubescens* and alder buckthorn *Frangula alnus*, and an area of wet heathland dominated by purple moor-grass *Molinia caerulea* and cross-leaved heath *Erica tetralix*. The remainder of the site is predominantly secondary mixed woodland.

The woodland and heathland support a variety of breeding birds including woodcock *Scolopax rusticola*, great spotted woodpecker *Dendrocopos major*, treecreeper *Certhia familiaris* and tree pipit *Anthus trivialis*.

It is an important site for insects, especially bog bush cricket *Metrioptera brachyptera*, silver-studded blue *Plebejus argus*, moths including waved black *Parascotia fuliginaria*, marbled white spot *Cithacodia pygarga*, wood ant *formica rufa* and dragonflies including *Anax imperator*, *Aeshna cyanea*, *Aeshna juncea*, *Cordulea aenea* and *Orthetrum cancellatum*.

The SSSI IRZ necessitates consultation with Natural England for any of the following proposals:

- **Infrastructure:** Pipelines and underground cables, pylons and overhead cables (excluding upgrades and refurbishment of existing network). Any transport proposal including new or extended footways, cycleways, roads/car parks, railways and waterways (excluding routine maintenance). Airports, helipads and other aviation proposals.
- **Minerals, oil and gas:** Planning applications for quarries, including: new proposals, Review of Minerals Permissions (ROMP), extensions, variations to conditions etc. Oil & gas exploration/extraction.
- **Air Pollution:** Any industrial/agricultural development that could cause air pollution (including: industrial processes, livestock & poultry units with a floorspace > 500m², slurry lagoons > 200m² & manure stores > 250 tonnes).
- **Combustion:** General combustion processes >20MW energy input. Incl: energy from waste incineration, other incineration, landfill gas generation plant, pyrolysis/gasification, anaerobic digestion, sewage treatment works, other incineration/combustion.

- **Waste:** Landfill. Including: inert landfill, non-hazardous landfill, hazardous landfill.
- **Compost:** Any composting proposal with more than 75000 tonnes maximum annual operational throughput. Incl: open windrow composting, in-vessel composting, anaerobic digestion, other waste management.
- **Water Supply:** Large infrastructure such as warehousing/industry where the total net additional gross internal floorspace following development is 1000m² or more.

It is unlikely that the Project will fall under any of these criteria, or that there will be impacts on the habitats of Longmoor Bog SSSI as a result of the construction of the Project. Owing to the distance, lack of connectivity and lack of pollution pathways to the Site, it is unlikely that Natural England would need to be consulted regarding Longmoor Bog SSSI. However, this depends on the design of the Project and there remains a chance Natural England would need to be consulted. Therefore recommendations are therefore given in Section 5 regarding designated sites.

4.1.3 Sites designated for their local importance

A total of 20 Sites of Importance for Nature Conservation (SINCs) were identified by TVERC as being located within the ZoI. See Table 4.1 below for a description of the each of these sites.

Table 4.1: Summary of SINCs within the ZoI

Site name	Designation	Distance and direction from the Site	Reason for designation
Hazeltons Copse	Local Wildlife Site (LWS)	0.05km west	Designated for its ancient woodland, containing 23 ancient woodland indicator species. The site connects to two nearby woodland LWSs via the green lane. The ditch and brook to the east joins with the River Loddon to the north.
The Coombes	LWS	0.16km north-east	Designated for its lowland mixed deciduous woodland which has 23 ancient woodland indicator species. A stream runs through the woodland, and there are drains with varying degrees of moisture running through the site. The north-western tip comprises a semi-improved grassland with elements of lowland meadow. A small grassland with some acidic components lies to the south-east. Protected and notable species recorded in the site include [REDACTED] redwing <i>Turdus iliacus</i> , tawny owl <i>Strix aluco</i> , white admiral <i>Limenitis camilla</i> , willow warbler <i>Phylloscopus trochilus</i> and cuckoo <i>Cuculus canorus</i> .
Bearwood Estate – Woods and Lakes	LWS	0.44km north-east	Designated for its broadleaved, mixed and conifer woodland and a large lake. A number of species associated with ancient woodland including wood spurge <i>Euphorbia amygdaloides</i> , yellow archangel <i>Lamium galeobdolon</i> and yellow pimpernel <i>Lysimachia nemorum</i> . A good variety of birds and the silver-washed fritillary <i>Argynnis paphia</i> .
Spring Copse and Long Copse (North)	LWS	1.50km south-west	Designated for its ancient woodland and lowland mixed deciduous woodland. The canopy is large oak and ash <i>Fraxinus excelsior</i> , and the ground flora includes bluebell <i>Hyacinthoides non scripta</i> , dog's mercury <i>Mercurialis perennis</i> and wood anemone <i>Anemone nemorosa</i> .
Gravel Pit Wood, The Holt	LWS	1.58km north	Designated for its lowland mixed deciduous woodland. Has a stream, some springs, ponds, an area which

Site name	Designation	Distance and direction from the Site	Reason for designation
			has elements of wet woodland, a couple of veteran oaks <i>Quercus robur</i> .
Pound Copse	LWS	1.62km west	Designated for its ancient woodland. Contains the NVC communities W8 (<i>Fraxinus excelsior</i> - <i>Acer campestre</i> - <i>Mercurialis perennis</i> woodland) and W10 (<i>Quercus robur</i> – <i>Pteridium aquilinum</i> – <i>Rubus fruticosus</i> agg. woodland). There are also damp depressions and an area of sedge swamp.
Long Copse (South) and Robin Hood Copse	LWS	1.82km south-west	Designated for its ancient woodland with diverse ground flora including bluebell and yellow archangel.
Longmoor Bog and Woodland, California Country Park	LWS	1.91km south-east	This is part of California Country Park that lies outside the Longmoor Bog SSSI. There is a lack of specific habitat details in the citation.
River Loddon (part)	LWS	1.93km north-west	A 17km stretch of the River Loddon running from Swallowfield to its confluence with the River Thames near Wargrave. This section of the river has a diversity of features and supports protected and notable species water vole, Loddon pondweed <i>Potamogeton nodosus</i> and a variety of dragonflies and damselflies.

Source: Mott MacDonald, 2025.

Gravel Pit Wood, The Holt LWS may be impacted from the Project through pollution via the Barkham Brook, which flows directly adjacent to the Site, and flows through the middle of the LWS which is located 1.92km downstream of the Site. Further recommendations in respect to pollution and this LWS are detailed in Section 5.

Owing to the distance and lack of connectivity to the Site, none of the other SINCs are anticipated to be impacted as a result of the Project. The Coombes and Hazeltons Copse are hydrologically linked to the Site, but as they are located upstream of the Site, no impacts are anticipated on these sites. They are therefore scoped out from further consideration in this Document.

4.1.4 Habitats of Principal Importance and ancient woodland

See Table 4.2 below for a description of the HPIs identified within the Zol.

Table 4.2: Habitats of Principal Importance within the Zol

Habitat	Distance from Site	Description
Lowland mixed deciduous woodland	Immediately adjacent to the Site, to the west	According to MAGIC habitat mapping, lowland mixed deciduous woodland is present immediately west of the Site, both sides of the road.
Ancient woodland	60m west of the Site	According to MAGIC habitat mapping, ancient woodland is present within Hazeltons Copse, located 60m west of the site at its closest point.

Source: Priority Habitat Inventory (England), Natural England, 2020, Ancient Woodland Inventory (England), 2023.

The ancient woodland is considered to be a sufficient distance from the Site that it will not be impacted by the Project. However, lowland mixed deciduous woodland (immediately adjacent to the Site) may be impacted by the Project through noise, lighting or pollution. The development of scheme options should take into consideration the location of this habitat and apply the mitigation hierarchy to avoid, minimise, restore, offset. This habitat is considered to be of high conservation value. Further recommendations in respect to HPIs are detailed in Section 5.

4.1.5 Waterbodies

Two waterbodies were returned from the desk study, 0.40km and 0.47km south of the Site. Owing to the distance and lack of connectivity to the Site, no impacts on the waterbodies are anticipated and they are scoped out from further consideration.

4.2 Species and habitats assessment criteria

Species in this assessment are included due to being notable for the following reasons:

- Species and habitats protected by legislation.
- Habitats of Principal Importance.
- Species and habitats listed as a local priority for conservation (Local Biodiversity Action Plan (LBAP) species).
- IUCN threatened birds in Great Britain (critically endangered, endangered or vulnerable).
- Birds of Conservation Concern (BoCC) red or amber.
- Nationally rare, nationally scarce or near threatened species.
- Invasive non-native species.

Species for which the Project may pose a welfare issue are also included for consideration where appropriate.

4.3 Field survey – habitats

The locations of all habitats are shown in the UKHab map in Appendix B.

Target Notes are included as Appendix C which provide locations, photographs and further details of additional features of ecological interest (e.g. habitat areas too small to map or signs / sightings of notable sensitive species). The locations of these are shown on the UKHab map in Appendix B and referred to as TN1, TN2, etc.

Nine primary UKHab types with six secondary codes were identified within the Site:

Other neutral grassland, g3c 10 (ONG1)

One area of other neutral grassland (ONG1) with scattered scrub was present, immediately north of the entrance gate into the STW. It comprised abundant cock's-foot *Dactylis glomerata*, frequent Yorkshire fog *Holcus lanatus*, creeping cinquefoil *Potentilla reptans*, occasional perennial ryegrass *Lolium perenne*, false-oat grass *Arrhenatherum elatius*, ribwort plantain *Plantago lanceolata*, hogweed *Heracleum sphondylium*, yarrow *Achillea millefolium*, oxeye daisy *Leucanthemum vulgare*, common nettle *Urtica dioica* and white dead nettle *Lamium album*, rare cranesbill sp. *Geranium sp.*, mugwort *Artemisia vulgaris*, red campion *Silene dioica*, white clover *Trifolium repens*, creeping buttercup *Ranunculus repens* and creeping thistle *Cirsium arvense*. The scattered scrub comprised occasional bramble *Rubus fruticosus agg.* and willow *Salix sp.*

This habitat is not listed under S41 of the NERC Act (2006) and is considered of local ecological importance, as it may support common invertebrates, reptiles and mammals.

This habitat was assigned a habitat condition score of moderate.

Modified grassland, g4 (MG1)

The rest of the grassland within the STW was modified grassland (MG1). This was grass-dominated and species-poor, comprising frequent perennial ryegrass and Yorkshire fog,

occasional annual meadowgrass *Poa annua*, barren brome *Anisantha sterilis*, yarrow, creeping cinquefoil, ribwort plantain, common daisy *Bellis perennis* and cranesbill sp.

This habitat is not listed under S41 of the NERC Act (2006) and is considered of local ecological importance, as it may support common invertebrates, birds and mammals.

This habitat was assigned a habitat condition score of poor.

Modified grassland, g4 128 204 (MG2)

Modified grassland was also present within the expansion area (MG2). This was slightly more species diverse and tussocky, and contained a veteran pedunculate oak tree in the centre. Species comprised abundant perennial ryegrass, frequent white clover, false-oat grass, creeping buttercup, Yorkshire fog, timothy *Phleum pratense*, meadowgrass sp. *Poa sp.*, common ragwort *Jacobaea vulgaris*, occasional bird's-foot-trefoil *Lotus corniculatus*, red clover *Trifolium pratense*, creeping thistle, creeping cinquefoil, dandelion *Taraxacum officinale* and common knapweed *Centaurea nigra*, and rare common fleabane *Pulicaria dysenterica* and silverweed *Potentilla anserina*.

This habitat is not listed under S41 of the NERC Act (2006) and is considered of local ecological importance, as it may support common invertebrates, birds and mammals.

This habitat was assigned a habitat condition score of good.

Mixed scrub, h3h (MS1)

One area of mixed scrub (MS1) was present within the Site. This was located in the west of the Site, adjacent to the line of trees along Cole Lane. This comprised abundant bramble, frequent blackthorn *Prunus spinosa*, occasional hawthorn *Crataegus monogyna*, English elm *Ulmus procera*, young pedunculate oak *Quercus robur* and hazel *Corylus avellana*.

This habitat is not listed under S41 of the NERC Act (2006) and is considered of local ecological importance, as it may support common invertebrates, birds and mammals.

This habitat was assigned a habitat condition score of moderate.

Bramble scrub, h3d (BS1)

One area of bramble scrub (BS1) was present in the north-east of the STW, covering a small mound. This comprised solely of bramble.

This habitat is not listed under S41 of the NERC Act (2006) and is considered of local ecological importance, as it may support common invertebrates, birds and mammals.

Habitat condition assessments are not applicable to this habitat type; it was therefore given a habitat condition score of 'Condition Assessment N/A'.

Line of trees, w1 33 (LOT1)

One line of trees (LOT1) was present within the Site, located along the northern boundary of the STW. It comprised frequent field maple *Acer campestre* and wild cherry *Prunus avium*, occasional alder *Alnus glutinosa*, silver birch *Betula pendula* and ash, and rare spruce *Picea sp.*

This habitat is not listed under S41 of the NERC Act (2006) and is considered of local ecological importance, as it may support common invertebrates, birds and mammals.

This habitat was assigned a habitat condition score of poor.

Ecologically valuable line of trees, w1 34 (LOT2)

One ecologically valuable line of trees was present within the Site, located along a section of the southern boundary of the STW. It comprised frequent pedunculate oak and field maple.

This habitat is not listed under S41 of the NERC Act (2006) and is considered of local ecological importance, as it may support common invertebrates, birds and mammals.

This habitat was assigned a habitat condition score of moderate.

Native hedgerow with trees, h2a6 (H1, H2 & H3)

Three native hedgerows with trees were identified on Site. The first (H1) was located along a section of the eastern boundary of the STW, and comprised frequent blackthorn and bramble, and rare ash.

The second (H2) was located along the northern side of Wood Lane (the access road into the STW). It comprised frequent hawthorn and bramble, occasional rose *Rosa sp.*, field maple and ash, and rare alder.

The third (H3) was located adjacent to the north-eastern border of the expansion area, and comprised abundant blackthorn, occasional hawthorn and rare ash.

This habitat is listed under S41 of the NERC Act (2006) and is considered of local ecological importance, as it may support common invertebrates, birds and mammals.

All three hedgerows were assigned a habitat condition score of moderate.

Ditch, r1 50 (D1)

A ditch was present which traversed the width of the expansion area field. It was dry at the time of the survey but could contain water at certain times of the year. It was approximately 0.7m deep and 2m wide. Species comprised frequent perennial ryegrass, hard rush *Juncus inflexus*, compact rush *Juncus conglomeratus*, occasional creeping jenny, soft rush *Juncus effusus*, water mint *Mentha aquatica*, false fox-sedge *Carex otrubae* and dock *Rumex sp.*

This habitat is not listed under S41 of the NERC Act (2006) and is considered of local ecological importance, as it may support common invertebrates and mammals.

This habitat was assigned a habitat condition score of moderate.

Buildings, u1b5 (U1)

A number of buildings were present within the Site, including Buildings B1 and B2 which are described in more detail in Section 4.4.3.

This habitat is not listed under S41 of the NERC Act (2006) and is considered of local ecological importance, as Buildings B1 and B2 could potentially support roosting bats.

Habitat condition assessments are not applicable to this habitat type; it was therefore given a habitat condition score of 'N/A - Other'.

Other developed land, u1b6 (U1)

Hardstanding around the site comprised various infrastructure including filter beds, access roads and concrete pathways.

This habitat is not listed under S41 of the NERC Act (2006) and is considered of negligible ecological importance.

Habitat condition assessments are not applicable to this habitat type; it was therefore given a habitat condition score of 'N/A - Other'.

4.3.1 Habitat condition assessments

The habitat condition assessment score attributed to each habitat to inform future BNG calculations was captured for each of the habitats within each parcel. A full breakdown of the passed and failed criteria can be found within the Habitat Condition Assessment sheets (Document reference: M100.01-DN-ARBOS1ZZ-100-AS-EN-0005).

4.4 Protected/notable species

Species are included in this assessment if suitable habitat to support them was assessed as being present or potentially present within or adjacent to the Site boundary.

4.4.1 Amphibians

4.4.1.1 Great crested newt

Six records of great crested newt were returned within 2.0km of the Site. The closest record is from 2024, which was located 1.21km west of the Site. No great crested newt licence return records were identified on MAGIC.

Two ponds were located within 500m of the Site, located 0.40km and 0.47km south of the Site. Both ponds were located south of the Barkham Brook, which forms a partial barrier to great crested newt movement, and habitat connectivity between the ponds and the Site is poor, with roads, properties and arable fields between them and the Site. The presence of great crested newt within the Site is considered unlikely. However, there is a chance that they are present, so great crested newt are scoped in for further consideration in this Document.

4.4.1.2 Common toad

Two records of common toad *Bufo bufo* were returned from TVERC. The closest record is from 2019, which was located 1.73km south-east of the Site.

The closest pond is located 0.40m east of the Site, which is within the general range of this species. However, habitat connectivity between the ponds and the Site is poor, with roads, properties and arable fields between them. The presence of toad within the Site is considered unlikely. However, there is a chance that they are present, so toad are scoped in for further consideration in this Document.

[REDACTED]

4.4.3 Bats

A summary of bat records returned from TVERC within 2.0km of the Site is provided below. Fourteen granted bat licences were found within 2.0km of the Site on MAGIC mapping, with the closest located 1.23km south of the Site, for destruction of a resting place for brown long-eared *Plecotus auritus*, common pipistrelle *Pipistrellus pipistrellus* and soprano pipistrelle *Pipistrellus pygmaeus* in 2019.

Table 4.5: Summary of bat species records

Species	No. of records	Closest Record	Most recent record
Barbastelle <i>Barbastella barbastellus</i>	17	880m west	2024
Bat species <i>Chiroptera</i>	30	500m north	2022
Brown long-eared	135	490m east	2024
Common pipistrelle	281	370m south-east	2024
Daubenton's bat <i>Myotis daubentonii</i>	8	370m south-east	2019
Leisler's Bat <i>Nyctalus leisleri</i>	18	900m west	2022
Myotis species (Undetermined) <i>Myotis spp.</i>	62	900m west	2024
Nathusius' pipistrelle <i>Pipistrellus nathusii</i>	16	380m south	2022
Natterer's bat <i>Myotis nattereri</i>	19	500m north	2022
Noctule bat <i>Nyctalus noctula</i>	148	380m south	2024
Pipistrelle species (Undetermined) <i>Pipistrellus spp.</i>	42	500m north	2024
Serotine <i>Eptesicus serotinus</i>	42	825m north	2023
Soprano pipistrelle	205	375m south	2024

Source: TVERC, 2025.

The survey identified three trees and two buildings with bat roosting suitability within the Site. The locations of these features are shown on the UKHab map in Appendix B, and these features are summarised in Table 4.6 below.

Table 4.6: Summary of features assessed for bat roost suitability

Feature / Target Note	Bat roost suitability	Description	Photograph
T1 / TN1	Further Assessment Required (FAR)	Pedunculate oak with split branch, 5m high, south-facing.	
T2 / TN2	FAR	Pedunculate oak with dense ivy on all sides of trunk, south of watercourse.	No photograph available

Feature / Target Note	Bat roost suitability	Description	Photograph
T3 / TN3	FAR	Veteran pedunculate oak with many dead branches and likely PRFs which can't be seen from ground-level.	

Feature / Target Note	Bat roost suitability	Description	Photograph
B1 / TN4	High	Brick building with missing tile on roof near the corner on the eastern side, 2.5m high, south-east-facing.	

Feature / Target Note	Bat roost suitability	Description	Photograph
B2 / TN5	Moderate	Brick building with gap above garage door, 2m high, south-facing.	 

Source: Mott MacDonald, 2025.

The lines of trees, hedgerows and ditch within the Site, as well as the watercourse within the Zol, provide good foraging and commuting habitat for bats. The Site is also surrounded by suitable bat habitat, including woodland, grassland and hedgerows.

If present, there is potential for the Project to have impacts on bats through removal and/or disturbance of trees 1, 2 and 3, and buildings 1 and 2, which could be used for roosting, increases in lighting and/or reduction in foraging resource.

Further recommendations with respect to bats are provided in Section 5.

4.4.4 Birds

A summary of notable bird species records returned from TVERC is shown in the table below.

Table 4.7: Summary of notable bird species records

Species	No. of records	Most recent record	Schedule 1 of 1981 Act	NERC Section 41	Bird of Conservation Concern Red	Bird of Conservation Concern Amber
Barn owl <i>Tyto alba</i>	3	2020	✓	✗	✗	✗
Cuckoo <i>Cuculus canorus</i>	2	2015	✗	✗	✓	✗
Crossbill <i>Loxia curvirostra</i>	1	2020	✓	✓	✓	✗
Dartford warbler <i>Curruca undata</i>	228	2021	✓	✗	✗	✓

Species	No. of records	Most recent record	Schedule 1 of 1981 Act	NERC Section 41	Bird of Conservation Concern Red	Bird of Conservation Concern Amber
Firecrest <i>Regulus ignicapilla</i>	2	2023	✓	✗	✗	✗
Red kite <i>Milvus milvus</i>	41	2023	✓	✗	✗	✗
House martin <i>Delichon urbicum</i>	1	2016	✗	✗	✓	✗
House sparrow <i>Passer domesticus</i>	5	2021	✗	✓	✓	✗
Kingfisher <i>Alcedo atthis</i>	1	2017	✓	✗	✗	✗
Lesser redpoll <i>Acanthis cabaret</i>	4	2023	✗	✓	✓	✗
Linnet <i>Linaria cannabina</i>	5	2021	✗	✗	✓	✗
Nightingale <i>Luscinia Megarhynchos</i>	2	2015	✗	✓	✓	✗
Peregrine <i>Falco peregrinus</i>	2	2023	✓	✗	✗	✗
Skylark <i>Alauda arvensis</i>	8	2023	✗	✓	✓	✗
Spotted flycatcher <i>Muscicapa striata</i>	5	2021	✗	✓	✓	✗
Woodcock <i>Scolopax rusticola</i>	1	2020	✗	✗	✓	✗

Source: TVERC, 2025.

Habitats present within the Site such as lines of trees, hedgerows with trees and individual trees present nesting opportunities for bird species including Schedule 1 and local BAP species. Further habitats outside the Site but within the ZoI, such as the line of trees along Cole Lane to the west, and the woodland along the footpath east of the Site, also provide nesting opportunities. The veteran oak tree in the expansion area (TN5) could support nesting red kite.

Bird species such as tits, sparrows, passerines and corvids were observed within the Site, including blue tit *Cyanistes caeruleus*, woodpigeon *Columba palumbus*, wren *Troglodytes troglodytes* and carrion crow *Corvus corone*.

The Barkham Brook is located within the ZoI and runs along the Site's southern boundary, just outside of the Site. No access was given to the watercourse banks so a thorough search for suitable kingfisher habitat was not conducted, but from the sections of watercourse which could be seen, it was deemed unsuitable for nesting kingfisher.

The Project has the potential to impact nesting/breeding birds, including Schedule 1 bird species such as firecrest and red kite, depending which habitats will be lost or disturbed, and the construction methods used. Further recommendations for bird species are provided in Section 5.

4.4.5 Hazel dormouse

No records of hazel dormice *Muscardinus avellanarius* were returned within 2.0km of the Site by TVERC. No EPS mitigation licences for hazel dormice were returned by MAGIC within the search area.

Hazel dormice could potentially use hedgerows and mixed scrub within the Site. As such, further recommendations for hazel dormouse are provided in Section 5.

4.4.6 Invertebrates

The table below summarises notable invertebrate species records returned from TVERC within 2.0km of the Site.

Table 4.8: Selected notable terrestrial invertebrate species records

Species	No. of records	Most recent record	Proximity to Site	Designation(s)
Cinnabar <i>Tyria jacobaeae</i>	7	2019	1.71km south-east	Nationally Scarce
Purple emperor <i>Apatura iris</i>	1	2021	1.74km north	Local Species of Conservation Concern
Stag beetle <i>Lucanus cervus</i>	52	2023	0.51km south	NERC Section 41, Habitats and Species Directive Annex II

Source: TVERC, 2025.

The habitats present on Site are unlikely to support notable terrestrial invertebrate species. They are therefore scoped out from further consideration in this Document.

One record of white-clawed crayfish *Austropotamobius pallipes* was returned from TVERC, located 690m south-east of the Site in 2020. This was from the same watercourse that is located within the Zol, approximately 770m upstream from the Site. It is therefore possible that white-clawed crayfish are present within the Zol, and further recommendations for white-clawed crayfish are provided in Section 5. However, it is assumed that the works will not directly impact the watercourse or its banks. Therefore, white-clawed crayfish are scoped out from further consideration.

4.4.7 Notable/protected plants

See Table 4.9 below for notable plant species records within 2.0km of the Site, returned from TVERC.

Table 4.9: Summary of notable plant species records

Species	Number of records	Most recent record	Conservation status/designations
Bluebell <i>Hyacinthoides non-scripta</i>	5	2024	WCA Schedule 8
Heath speedwell <i>Veronica officinalis</i>	3	2024	IUCN Near Threatened - England
Sanicle <i>Sanicula europaea</i>	2	2018	IUCN Near Threatened - England
Star sedge <i>Carex echinata</i>	1	2018	IUCN Near Threatened - England

Source: TVERC, 2025.

None of these species were identified within the Zol during the survey. No rare or protected plant species were recorded in the Site during the survey and the likelihood of them being present is considered low; notable plants are therefore scoped out of further consideration.

4.4.8 Other mammals

The desk study returned three records of hedgehog *Erinaceus europaeus*, with the closest located 725m south-west of the Site in 2021. One record of polecat *Mustela putorius* was returned, located 1.90km west of the Site in 2016. Hedgehog and polecat are both SPI.

No signs of hedgehog or polecat were recorded during the field survey, and no suitable habitat for polecat was identified within the Site. However, the hedgerows, mixed scrub and bramble scrub could support sheltering hedgehogs. Therefore, hedgehogs are scoped in for further consideration and recommendations are given in Section 5.

4.4.9 Otter

One record of otter *Lutra lutra* was returned from TVERC, located 1.29km south-east of the Site in 2016. No EPS mitigation licences for otter were returned within 2.0km by MAGIC.

The Barkham Brook is located outside the Site but within the Zol, and runs parallel to the Site's southern boundary. No access was given to the watercourse banks so a thorough search for otter signs was not conducted, but there could potentially be otter holts and/or resting places within the Zol. Therefore, otter are scoped in for further assessment and recommendations are given in Section 5.

4.4.10 Reptiles

Twenty-six records of slow-worm *Anguis fragilis* were returned within 2.0km of the Site. The most recent record is from 2024, and the closest record is 81m west of the Site. Fifty-nine records of common lizard *Zootoca vivipara* were also returned, the closest being 40m west of the Site and the most recent being from 2024. Thirty-five records of grass snake *Natrix helvetica* were also returned, the closest being 67m south-west of the Site and the most recent being from 2024. Fifty-two records of adder *Vipera berus* were also returned, the closest being 167m south-east of the Site and the most recent being from 2024.

No evidence of reptiles was recorded during the field survey; however, the other neutral grassland, modified grassland, mixed scrub, bramble scrub and hedgerows were assessed as suitable habitat for reptile shelter and foraging. Reptiles are therefore scoped in for further consideration; recommendations are given in Section 5.

4.4.11 Water vole

No records of European water vole *Arvicola amphibius* were returned from TVERC within 2.0km of the Site.

The Barkham Brook is located outside the Site but within the Zol and runs parallel to the Site's southern boundary. No access was given to the watercourse banks so a thorough search for water vole signs was not conducted, but the watercourse could potentially support feeding and burrowing water vole within the Zol. However, it is assumed that the works will not directly impact the watercourse or its banks. Therefore, water vole will not be impacted and are scoped out of further assessment in this Document.

4.4.12 Invasive non-native species

See Table 4.10 below for records of non-native invasive species (INNS) and returned from TVERC within 2.0km.

Table 4.10: Invasive non-native species records

Species	Most recent record	Closest record	Number of records
Himalayan balsam <i>Impatiens glandulifera</i>	2024	250m west	4
Nuttall's waterweed* <i>Elodea nuttallii</i>	2015	1.36km north	1
Rhododendron* <i>Rhododendron ponticum</i>	2019	1.33km south	4

Source: TVERC, 2025. * Species listed on Schedule 9 of the WCA.

Himalayan balsam was observed within the Site during the field survey, by the Barkham Brook, at TN6 and TN7.

Recommendations for invasive species, including best-practice and mitigation is detailed in Section 5.

4.5 Summary of ecological constraints

Based on the findings of the desk study, field survey and interpretation of the potential for protected and notable flora and fauna. Table 4.11 below summarises those receptors that require further survey, assessment or have other recommendations.

Table 4.11: Ecological receptors for further consideration

Ecological receptor	Scoped in or out of further consideration
Designated sites	In
Ancient woodland	Out
Habitats of principal importance	In
Great crested newt	In
Common toad	In
Bats	In
Birds	In
Hazel dormouse	In
Hedgehog	In
Invertebrates	Out
White-clawed crayfish	Out
Notable/protected plants	Out
Otter	In
Reptiles	In
Water vole	Out
Invasive non-native species	In

Source: Mott MacDonald, 2025.

5 Recommendations for further surveys, mitigation and enhancement

5.1 Overview

On the basis of the survey work undertaken to date, the current scope of works and consideration of ecological constraints, this section provides details on further species presence/likely absence surveys that may be required to inform further assessment. High level recommendations for mitigation, compensation and enhancement, where known, are included below.

In the first instance, the Project design should look to avoid sensitive features identified in Section 4. Avoidance measures are detailed in Section 5.2; where impacts to sensitive features cannot be avoided, further surveys set out in Section 5.3 may be required.

5.2 Avoidance

Where possible, the design of the works across all parcels should seek to avoid impacts to ecological receptors, or where this is not possible, minimise the impacts from the Project. In particular, works should:

- Avoid impacts to all species by minimising the loss of habitat, using existing hardstanding and implementing a buffer between works and sensitive ecological habitats wherever possible.
- Avoid affecting the following habitats:
 - Hedgerows
 - Lines of trees
 - Mixed scrub
 - Bramble scrub
 - Individual trees
 - Barkham Brook immediately south of the Site and associated riparian habitat (within 10m of the watercourse)
 - Buildings B1 and B2
- Avoid the RPA of trees on Site.
 - See Arboricultural Constraints Report (Document reference: M100.01-DN-ARBOS1ZZ-100-AS-EN-0002) for details on RPAs.
- Avoid impacts to nocturnal species such as bats by avoiding the need for artificial lighting and night-time working, or if this is not possible, following the Institute of Lighting Professionals (ILP) Guidance Note on artificial lighting and bats (ILP, 2023) in the design of operational lighting.
- Avoid impacting nesting birds by avoiding the nesting bird season (February - August inclusive).

Further survey and assessment along with mitigation and enhancement measures that are likely to be appropriate for the proposed development are detailed within the following sections below.

5.3 Further survey and assessment

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

5.3.2 Bats

If impacts from the Project to trees T1-3 cannot be avoided, aerial inspection (tree climbing) surveys are required to determine presence or likely absence of roosting bats in these trees. These surveys require three visits between May and September (with at least two in the period May to August) spaced at least three weeks apart.

If impacts from the Project to buildings B1 or B2 cannot be avoided, a Preliminary Roost Assessment (PRA) will be required to inform further surveys. This will involve one visit, and will include an internal inspection of buildings B1 and B2. The PRA can be carried out at any time of year. The PRA report may recommend further surveys to determine the presence or likely absence of roosting bats, and this report should be completed in advance of the bat active season (spring/summer) so that any follow-on surveys can be completed that same season and any potential delays can be avoided.

If any bat roosts are found, a European Protected Species Mitigation (EPSM) licence may be required prior to commencement of any works likely to impact any roosts. EPSM licences would need to be informed by valid survey data, with bat survey data generally lasting up to a year from completion of survey. Once granted, any mitigation specified in the licence application would need to be undertaken prior to works commencing and specified methodologies followed during construction.

5.3.3 Birds

If the bird nesting season (February to August inclusive) cannot be avoided, and hedgerows / lines of trees / mixed scrub / the veteran oak tree cannot be avoided, breeding bird surveys may be required in accordance with best practice guidelines (Bird Survey & Assessment Steering Group, 2025), between March and July inclusive. The requirement for breeding bird surveys will depend on Project specifics such as construction start date and duration, location and footprint of works, equipment and machinery to be used, and the type and extent of habitat loss.

If impacts and habitat removal are minimal, pre-commencement surveys for red kite may be sufficient.

5.3.4 Hazel dormouse

If any hedgerows or mixed scrub need to be cleared as part of the Project, or impacts are anticipated through disturbance, hazel dormouse presence/absence surveys may be required.

This should follow best practice guidance set out in the Hazel Dormouse Mitigation Handbook (Wells et al., 2025), and these surveys are generally conducted from April to September.

5.3.5 MoRPH survey

If impacts from the Project to the watercourse south of the Site or associated riparian habitat (within 10m of the watercourse) cannot be avoided, and the Project requires Planning Permission, a MoRPH survey should be conducted, and the river section of the Statutory Biodiversity Metric should be completed. Although this survey can be carried out at any time of year, it is best completed between May and September when aquatic vegetation is clearly apparent. Ideal months for survey are May, June and October when all vegetation is visible but not so well-developed that it makes access or observation of some physical features difficult.

5.3.6 Otter

If impacts from the Project to the watercourse or associated riparian habitat (within 10m of the watercourse) cannot be avoided, then a further survey for otter is advised at least 250m upstream and downstream, and suitable resting habitat would need to be checked. The length of the survey will be determined based on the scale of the potential impact. This survey could be carried out at any time of year.

5.4 Mitigation and consultation

The following requirements and recommendations will be secured through a Construction Environmental Management Plan (CEMP).

5.4.1 General recommendations

- **Construction Environmental Management Plan (CEMP):** A CEMP or equivalent should be produced prior to the commencement of the works, which will capture all measures to minimise impacts to areas of retained habitat and to safeguard protected and/or notable species throughout the works. The CEMP should include the measures below, which will be tailored to the proposed development, once there is more detail on construction activities and phasing.
- **Lighting.** Should any night-time construction work be deemed essential, this should avoid unnecessary disturbance by ensuring that the height of lighting columns are as low as possible; and that lighting hoods, cowls and shields are used to focus light into the working areas and away from the surrounding environment. An ecologist should be consulted prior to installing artificial lighting, with a compliance check carried out during the works (ILP, 2023);
- **Excavations** should be fenced off and/or covered to avoid animals becoming trapped. Otherwise, a mammal ladder should be erected to allow any animals that may become trapped to escape, and a check undertaken each morning to check if animals have become trapped overnight. If a trapped animal is found, then a suitably experienced ecologist should be contacted immediately to advise.
- **Dust-suppression** should be implemented during the demolition and other construction works which could produce dust. This could be in the form of water misting cannons, and should be implemented to avoid deposition of dust on retained habitats (especially the lowland mixed deciduous woodland).
- Specific mitigation requirements for [REDACTED] bats, birds, hazel dormouse and otter will be identified following the completion of further surveys and will be included within the species-specific survey report(s).
- If protected species are observed during construction, all works must immediately stop, and advice be sought from an Ecologist.

- Any hazardous or potentially hazardous chemicals or substances should be securely stored overnight.
- All works should follow guidance relating to pollution protection as part of standard working methods (CIRIA, 2001).

5.4.2 Designated sites

Depending on the design of the Project, consultation with Natural England may be required to determine potential impacts to Longmoor Bog SSSI from the Project. This would especially be required if the Project falls under any of the IRZ criteria listed in Section 4.1.2.

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

5.4.4 Great crested newt, reptiles and common toad

Any vegetation removal should be done under a two-stage cut methodology, with an ecologist undertaking a fingertip search before vegetation being cut to 15cm height. This should then be left overnight for any animals to disperse. The next day, the vegetation should be cut to ground-level after another fingertip search by an ecologist. Any animals found should be removed and released in a suitable habitat a safe distance from the works. If vegetation removal is required, it is recommended that it takes place during the herptile active season (March to September inclusive).

Once the vegetation has been removed, an ecologist may need to check for reptile/amphibian hibernation features, if groundworks are required between October and February inclusive.

5.4.5 Invasive non-native species

If works within 7m of the Himalayan balsam at TN6 and TN7 cannot be avoided, measures to stop avoid spread Himalayan balsam should be implemented as a best practice measure.

5.4.6 Possible enhancements

The Environment Act 2021 has mandated achieving a 10% increase in 'habitat units', as measured by the statutory biodiversity metric, for most Town and Country Planning Act Developments from 12 February 2024. MML was commissioned to undertake a BNG calculation of this Site. If Thames Water will not use their permitted development rights for this Project, and a planning application is required, the Biodiversity Calculator will need to be completed fully and a BNG Design Stage Report, Biodiversity Gain Plan and Habitat Management and Monitoring Plan will need to be issued in support of this planning application.

Under Section 40 of the NERC Act all public authorities in England and Wales are required to "have regard, so far as is consistent with the proper exercise of those functions, to the purpose of conserving biodiversity." The Environment Act 2021 has amended this duty so that there is an expectation on public authorities to look strategically at their policies and operations at least every five years and assess what action they can take to further the conservation and enhancement of biodiversity. Guidance on the implementation of this legislation in respect to planning is provided in the NPPS, 2023 which required that in pursuing sustainable development, net gains in biodiversity are achieved where possible.

Examples of enhancement measures that could be considered as counting towards increasing the biodiversity value of the Site, if implemented correctly, are included below. However, it is

recommended that consultation should be made with the Thames Water Biodiversity team before designing post-development BNG, as Shrivenham STW is a Site of Biodiversity Interest (SBI).

- Enhancement via the improvement of the modified grassland MG1 and/or MG2 to other neutral grassland by scarification then overseeding the area with a suitable native wildflower grass mixture, changing management to a once yearly mow with collection of cuttings. MG2 can be further enhanced by targeted mowing to create a varied sward height.
- Enhancing grassland ONG1 from moderate to good condition by scarification then overseeding the area with a suitable native wildflower grass mixture, changing management to a once yearly mow with collection of cuttings and removing approximately half of the existing bramble within the grassland.
- Habitat creation by planting native trees.
- Habitat creation by creating a pond within MG2 in the expansion area, away from where works are planned.
- Creating log piles in the edges of hedgerows, mixed scrub or bramble scrub to enhance the site for invertebrates.
- Installing bird and/or bat boxes on mature trees or buildings where no works are planned.

6 Summary and conclusion

There is potential for impacts to designated sites, HPis, bats, birds, reptiles, common toad, hedgehog and terrestrial invertebrates, and potential for spreading of invasive non-native species, as a result of construction of the Project. Therefore, avoidance measures and potential further surveys are set out in Sections 5.2 and 5.3, to inform option selection and detailed design.

For each of these protected species there are seasonal windows in which these surveys can be undertaken, with the majority requiring surveying from Spring 2026. These seasonal windows are detailed in Section 5.3.

Best practice guidelines and mitigation during construction is recommended where necessary, while species-specific mitigation will be provided following further surveys, where required.

Should planning permission be required, results from the further surveys would need to be detailed in an Ecological Impact Assessment which would be submitted to the LPA as part of the planning application.

The recommendations provided within this Document are based on a site boundary only. It is advised that ecology risks and recommendations should be reviewed and updated following receipt of a more detailed design.

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A. Relevant legislation and policy

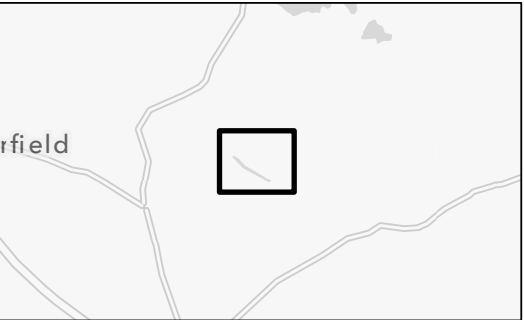
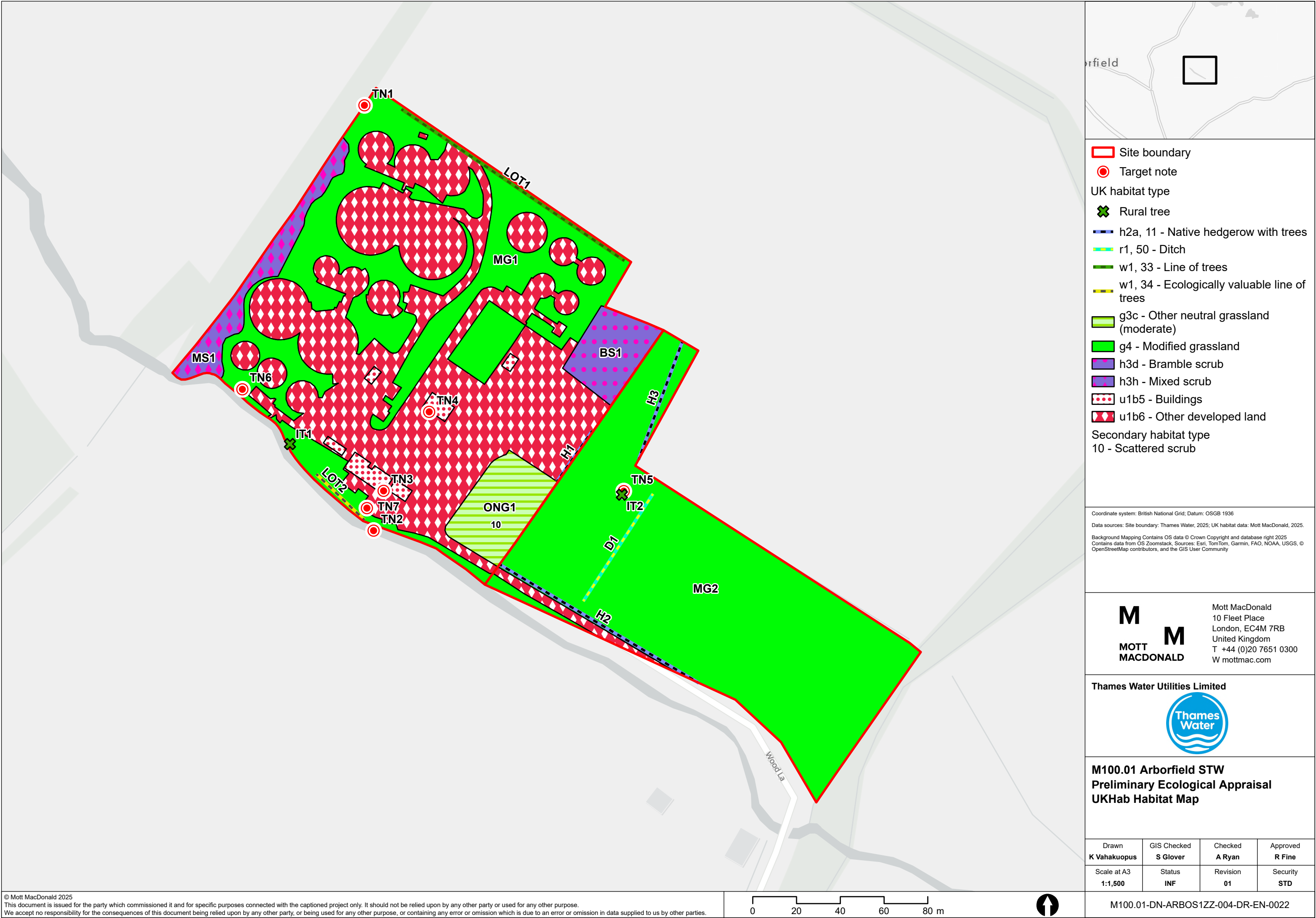
Species	Summary of legislation and policy
European Protected Species - (EPS) - Animals Bats (all species) Dormouse Great crested newt Otter	Legislation These species are listed on Schedule 2 of the Conservation of Habitats and Species Regulations 2017 (as amended). In summary it is an offence to: - Deliberately capture, injury or kill such a species; - Deliberately disturb such a species by which - It impairs their ability to survive, breed or reproduce, or to rear or nurture their young; or in the case of animals of a hibernating or migratory species, to hibernate or migrate. - It significantly affects the local distribution or abundance of the species to which they belong. - Deliberately takes or destroys the eggs of such a species; and - Damages or destroys a breeding site or resting place of such a species. All species as given here are also listed on Schedule 5 of the Wildlife and Countryside Act 1981 (as amended) (the 1981 Act) and receive additional, limited, protection. In summary it is an offence to: - Intentionally or recklessly damage or destroy a structure or place used for shelter or protection; - Intentionally or recklessly disturb such a species while it is occupying a structure or place used for shelter or protection; and - Intentionally or recklessly obstruct access to any structure or place used for shelter or protection. Policy Seven species of bats, dormouse, great crested newt and otter are also listed on Section 41 (S41) of the Natural Environment and Rural Communities Act (NERC) (2006) as species of principal importance/priority species.
Widespread reptiles: Common/viviparous lizard, slow worm, grass snake, adder	Legislation All widespread reptiles are afforded partial protection under Schedule 5 of the 1981 Act. It is offence to intentionally kill or injure any of these species. Policy All widespread reptiles are also listed on S41 of the NERC Act.
Wild birds, their nests and eggs	Legislation All wild birds are fully protected at all times under the 1981 Act. In summary it is an offence to intentionally: - Kill, injure or take any wild bird. - It is also an offence to: - Take, damage or destroy the nest of any wild bird while it is being built or in use. - Take or destroy the eggs of any wild bird. In addition to the above, it is also an offence for species listed on Schedule 1 of the 1981 Act as amended to: - Disturb and wild bird whilst it is building a nest or is in, on or near a nest containing eggs or young. - Disturb dependent young of such a bird. - Nests of certain species (osprey, golden and white-tailed eagle) are also protected at all times in England, Wales and Scotland.

Species

Summary of legislation and policy

	Policy A total of 49 bird species are listed on S41 of the NERC Act.
Badger	Legislation Badgers and their setts are protected under the Protection of Badgers Act (1992). In summary it is an offence to: • Wilfully kill, injure or take a badger; • Interfere with a badger sett in any of the following ways: – Damage a badger sett or any part of it. – Destroy a badger sett. – Obstruct access to, or any entrance of, a badger sett. – Disturb a badger when it is occupying a badger sett.
Widespread mammals e.g. Hedgehog Brown hare	Legislation All wild mammals are afforded protection from actions which are considered cruel under the Wild Mammals (protection) Act 1996 and others are listed on Schedule 6 of the 1981 Act which prohibits certain methods of taking them e.g. artificial light for hedgehog and traps for polecat. Policy All species as given here are listed on S41 of the NERC Act.
Widespread Amphibians e.g. Common toad	Legislation Widespread amphibians have no protection under legislation, however common toad is listed as a priority species under S41 of the NERC Act in England
Terrestrial invertebrates	Legislation Some invertebrates are fully protected under Schedule 2 of the 2017 Regulations (e.g. large blue butterfly) with others receiving varying degrees of protection (from full to that relating to sale only) under the 1981 Act. The Schedules will need to be checked for the species concerned and the level of protection, taking care to take account of footnotes within the Schedules, which reference the relevant sub sections and define the protection status. Policy A total of 398 invertebrate species are listed on S41 of the NERC Act, the majority of which are terrestrial invertebrates.
Wild Plants	Some species of plant, e.g. floating water plantain are listed as EPS plants under the 2017 Regulations and are afforded full protection. A large amount of plant species are also listed on Schedule 8 of the 1981 Act and as such also have protection from being taken from the wild. Most plants listed on Schedule 8 have full protection however this does not apply to all species. Notably the native bluebell (<i>H. non scripta</i>) is afforded protection from sale only.
Invasive non-native species Himalayan balsam	Legislation It is an offence to plant or otherwise cause such a plant to grow in the wild species listed on Schedule 9 of the 1981 Act and Schedule 2 of The Invasive Alien Species (Enforcement and Permitting) Order 2019.

B. UKHab habitat map



Coordinate system: British National Grid; Datum: OSGB 1936

Data sources: Site boundary: Thames Water, 2025; UK habitat data: Mott MacDonald, 2025.

Background Mapping Contains OS data © Crown Copyright and database right 2025
Contains data from OS Zoomstack, Sources: Esri, TomTom, Garmin, FAO, NOAA, USGS, © OpenStreetMap contributors, and the GIS User Community

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Thames Water

M100.01 Arborfield STW
Preliminary Ecological Appraisal
UKHab Habitat Map

Drawn K Vahakuopus	GIS Checked S Glover	Checked A Ryan	Approved R Fine
Scale at A3 1:1,500	Status INF	Revision 01	Security STD
M100.01-DN-ARBOS1ZZ-004-DR-EN-0022			

C. Target Notes and Habitat Photographs

Target Note	Description	Photograph(s)
TN1	Bat PRF (tree): pedunculate oak with split branch, 5m high, south-facing.	
TN2	Bat PRF (tree): pedunculate oak with dense ivy on all sides of trunk, south of watercourse.	No photograph available
TN3	Bat PRF (tree): veteran pedunculate oak with many dead branches and likely PRFs which can't be seen from ground-level.	

Target Note	Description	Photograph(s)
TN4	Bat PRF (structure): brick building with missing tile on roof near the corner on the eastern side, 2.5m high, south-east-facing.	
TN5	Bat PRF (structure):	

Target Note	Description	Photograph(s)
TN6	Himalayan Balsam	
TN7	Himalayan Balsam	

Habitat Reference	Description	Photograph(s)
ONG1	Other neutral grassland in the south-east of the STW.	
MG1	Modified grassland throughout the STW.	

Habitat Reference	Description	Photograph(s)
MG2	Modified grassland in the expansion area.	
MS1	Mixed scrub in the west of the STW.	
BS1	Bramble scrub in the east of the STW.	
LOT1	Line of trees in the north of the STW.	No photo available
LOT2	Ecologically valuable line of trees in the south of the STW.	

Habitat Reference	Description	Photograph(s)
H1	Hedgerow with trees in the east of the STW.	
H2	Hedgerow south of the expansion area and north of the access road.	
H3	Hedgerow north-east of the expansion area.	
D1	Ditch within the expansion area.	

Habitat Reference	Description	Photograph(s)
U1	Other developed land and buildings within the STW.	

