DIDCOT TECHNOLOGY PARK, APPLEFORD, OX14 4PJ

Updated Ecological Impact Assessment (EcIA) Report

Prepared for: **Reef Estates Ltd**

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1.0 Introduction

SLR Consulting Ltd (SLR) was commissioned by Reef Estates Ltd in July 2022 to undertake an updated habitat and ecological walkover survey to inform an updated Ecological Impact Assessment (EcIA) for a proposed technology park development ('Didcot Technology Park') on land at Hill Farm, Appleford, Didcot, OX14 4PJ (Grid Reference: SU 52232 91999).

SLR previously completed a range of ecological survey work at the application site in 2015/2016[1], culminating in the production of an EcIA report. This was updated with another ecological survey completed in December 2019[2] and then submitted as part of the Local Development Order P17/V2490/LDO application for Didcot Technology Park. Comments on the submission were received from the countryside officer (ecologist) at Oxfordshire County Council, as follows:

- The protected species surveys are out of date ……. Likewise, the last update survey was in 2020 and being over two-years old, can be considered in need to of updating as habitats may have changed over time.
- [it is] recommend[ed] that in the absence of up-to-date surveys [for protected species], a further phase 1 habitat survey ("update preliminary ecological appraisal" – to confirm that the findings of previous surveys are likely still valid) is conducted during 2022 and ideally in the next two months.
- The metric calculations are based on DEFRA BNG version 2.0 whereas the DEFRA BNG metric is now [version] 3.1. An updated metric should be submitted ….. If the metric assessment shows a likely net loss overall, we will need to consider amending condition A11 to have an offsetting provision for each [development] parcel that comes forward too.
- The LDO submission should demonstrate … no net loss of biodiversity (as a minimum) but … the LDO should aim for a 10% net gain in biodiversity (this formal target could be reserved for the discharge of A11, but good to establish an understanding at this stage).
- Condition A11 [should be updated as follows]: (i) Criterion 1 – an updated 2022 habitat survey should be the baseline and referenced in the condition; (ii) Criterion 4 should refer to 30 years not 25 years (consistent with Part 6 of the Environment Act 2021); (iii) The condition should refer to DEFRA BNG 3.1 (to ensure consistency and we will need to use the metric used at the point of granting the LDO – even though newer metrics will be released).
- Add a [further] condition requiring a biodiversity net gain compliance statement so that as each building/phase comes forward we can see its contribution and what needs to be done to meet the target.

1.1 Purpose of this Report

The purpose of this report is to provide an updated EcIA addressing the comments from stakeholders. It summarises data from previous reports concerning the Site, as well as incorporating an updated desk study and habitat survey, assess whether the state of ecological features have changed. The information derived from the habitat survey will also provide the baseline for the biodiversity net gain assessment.

[1] SLR Consulting (2016). Didcot Technology Park – Ecological Impact Assessment Report.
[2] SLR Consulting (2020). Didcot Technology Park – EcIA Report

1.2 Site Description

The application site (herein known as the 'Site') for the proposed technology park is located on the northern edge of Didcot, immediately north of the main A4130 road and approximately 850 m south of the village of Appleford. The Site is approximately 23.2 hectares (ha) in extent and comprises a number of large agricultural fields, mature hedgerows, two fishing lakes, a residential dwelling, agricultural barns / buildings, hard-standing, and two small roads. The land within the application site is primarily used for agriculture, however, there is an active wood recycling facility occupying the barns and hard-standing within the centre of the Site. The wider landscape is largely arable and pasture fields which border the north-east of the site. Further north is the River Thames, which is approximately 1.5km from the site boundary. The Great Western mainline railway forms the eastern boundary of the site, beyond which is an extensive matrix of arable and grazed pasture fields divided by hedgerows and occasional small blocks of woodland. Immediately adjacent to the south of the site is the A4130 road and associated embankments, beyond which is a large industrial estate. Immediately adjacent to the northwest and west of the site is an active landfill site. However, the areas of landfill which border the site have now been capped and restored.

1.3 Details of the Proposed Development

A proposed development layout map is found in Drawing 5.

Reef Estates Ltd submitted a Local Development Order (LDO) application for the construction of Didcot Technology Park (DTP). As the development would be completed under an LDO rather than a conventional planning application the exact details of the development remain flexible. However, from the current master plan (Appendix EC01) and LDO design plans, it is anticipated that the technology park would comprise two main development zones each comprising multiple individual build plots and road infrastructure to serve the site. Up to 90,000m$_2$ of floorspace could be created under the LDO and this would include allowances for Data Centres and / or Battery Storage (and no other use falling within Class C8) and Class B2 Industrial Processes (other than B1c). Flexibility under the LDO is governed by a number of development parameters including: site access; maximum floorspace; development zones; maximum building zones and landscape strategy.

A road development known as the Didcot Garden Town HIF 1 Scheme (hereafter referred to as the HIF road) passes through the Didcot Technology Park Site, shown in Drawing 5. The construction of the HIF Road is likely to affect the habitats directly adjacent to the Site, which may have implications for the mitigation and enhancement of habitats for BNG. Oxfordshire County Council submitted an LDO for this development, which is currently under determination.

The DTP LDO draft for public consultation states[3]:

"*The LDO will facilitate via a Section 106 agreement and land dedication in conjunction with Oxfordshire County Council the delivery of a section of the* [to be constructed] *Didcot to Culham River Crossing* [road scheme] *and a variety of sustainable access points to the proposed site including two new bus stops, cycling and pedestrian parallel crossings and extensive routes through and into the site via the new and existing road network including safeguarding of land to the east of the site for a future railway crossing.*"

[3] 2090 Didcot Technology Park Local Development Order v7.01. https://data.whitehorsedc.gov.uk/java/support/Main.jsp?MODULE=ApplicationDetails&REF=P17/V2490/LDO#exactline

An environmental statement and associated ecological surveys have been completed by AECOM for the HIF road project[4]. These have been used within this report to aid understanding of baseline conditions, as well as understand cumulative effects of both developments on ecological features.

1.4 Evidence of Technical Competence and Experience

Blake Perkins, Graduate Ecologist with SLR, surveyed the Site and updated this report. He has an MSc in Plant and Fungal Taxonomy, Diversity and Conservation and over a years' experience in ecological studies and monitoring. He is a Qualifying Member of the Chartered Institute of Ecology and Environmental Management (CIEEM).

Marsha Perera , Graduate Ecologist with SLR, surveyed the Site. She has an MSc in Environment, Development, and Politics, and has over a years' experience in ecological studies and monitoring.

This report has been subject to Quality Assurance review as per SLRs policies by Richard Arnold BSc MRes MCIEEM CEnv. Richard has 23 years of experience as a professional ecological consultant, during which time he has worked on many development projects. He has a particular interest in ecology in London and is co-author of the London Bird Atlas.

1.5 Relevant Legislation and Policy

The key wildlife legislation underpinning the conservation of habitats and species are included in Appendix 1.

Local Plan

Vale of the White Horse District Council Local Plan 2031 Part 1[5] includes:
Core Policy 46: Conservation and Improvement of Biodiversity

Development that will conserve, restore and enhance biodiversity in the district will be permitted. Opportunities for biodiversity gain, including the connection of sites, large-scale habitat restoration, enhancement and habitat re-creation will be actively sought, with a primary focus on delivery in the Conservation Target Areas. A net loss of biodiversity will be avoided.

The highest level of protection will be given to sites and species of international nature conservation importance (Special Areas of Conservation and European Protected Species). Development that is likely to result in a significant effect, either alone or in combination, on such sites and species will need to satisfy the requirements of the Habitat Regulations.

Development likely to result in the loss, deterioration or harm to habitats or species of importance to biodiversity or of importance for geological conservation interests, either directly or indirectly, will not be permitted unless:

- *i. the need for, and benefits of, the development in the proposed location outweighs the adverse effect on the relevant biodiversity interest;*
- *ii. it can be demonstrated that it could not reasonably be located on an alternative site that would result in less or no harm to the biodiversity interests; and*

[4] https://myeplanning2.oxfordshire.gov.uk/Planning/Display/R3.0138/21#undefined
[5] Vale of the White Horse District Council (2016) *Local plan 2031 part 1*. Available at: https://www.whitehorsedc.gov.uk/vale-of-white-horse-district-council/planning-and-development/local-plan-and-planning-policies/local-plan-2031/

iii. measures can be provided (and are secured through planning conditions or legal agreements), that would avoid, mitigate against or, as a last resort, compensate for, the adverse effects likely to result from development.

The habitats and species of importance to biodiversity and sites of geological interest considered in relation to points i) to iii) comprise:

- *Sites of Special Scientific Interest (SSSI)*
- *Local Wildlife Sites*
- *Local Nature Reserves*
- *Priority Habitats and species listed in the national and local Biodiversity Action Plan*
- *Ancient Woodland and veteran trees*
- *Legally Protected Species*
- *Locally Important Geological Sites*

The level of protection and mitigation should be proportionate to the status of the habitat or species and its importance individually and as part of a wider network.

It is recognised that habitats/areas not considered above (i.e. Nationally or Locally designated and not priority habitats) can still have a significant biodiversity value within their local context, particularly where they are situated within a Conservation Target Area and/or they have good potential to be restored to priority habitat status or form/have good potential to form links between priority habitats or act as corridors for priority species. These habitats will be given due weight in the consideration of planning applications. If significant harm to these sites cannot be avoided (through locating on an alternative site with less harmful impacts) it will be expected that mitigation will be provided to avoid a net loss in biodiversity or, as a last resort, compensation will be required to offset the impacts and achieve a net gain in biodiversity.

2.0 Methodology

An updated desk study and field survey were undertaken to ensure the current ecological baseline is considered in the assessment and any differences compared to the previous surveys are taken into account. As such, the methodology for the 2020 EcIA report undertaken by SLR has also been included with minor amendments. These methods were followed in this report.

2.1 Scope

The 2022 field survey was undertaken within the Site boundary of the proposed development, found in Drawing 1. This focused on recording the current ecological baseline as requested by the Oxford County Council ecologist, including UK Habitat (UKHab) Classification survey within this boundary, as well as assessing the suitability of these habitats for protected and notable species (including Red List species).

The 2020 field survey was held within the same boundaries. Separate faunal surveys had study areas defined by the "zone of influence of the proposed development on individual ecological features". Thirty metres of land adjacent to the Site boundary was included (access permitting) in the UKHab survey, and wider study areas were included for specific species surveys, such as for great crested newt eDNA and breeding birds.

The desk top study for this EcIA follows that of the 2020 report, considering impacts on designated sites and protected and notable habitats and species within 2 km of the Site.

The scope of the EcIA also includes consideration the Oxfordshire County Council road development known as Didcot Garden Town HIF 1 Scheme (hereafter referred to as the 'HIF Road'). The construction of the HIF road is likely to result in impacts to habitats adjacent to the Site, which may have implications for the mitigation and enhancement of habitats for BNG. An environmental statement and associated ecological surveys have been completed by AECOM for the HIF road project[6], and these will be referenced further in this EcIA.

2.2 Baseline Data Collection

2.2.1 Desk Study

An ecological data search was received from Thames Valley Environmental Records Centre (TVERC) in August 2022 to provide records of protected, priority or otherwise notable species (species with conservation designations, such as Red Listed species, but have no legal protection), invasive non-native species, and designated sites (including statutory and non-statutory protected sites) within a 2 km radius of the Site.

An internet-based desk study was undertaken, whereby the Multi-Agency Geographic Information for the Countryside (MAGIC) website (http://magic.defra.gov.uk) was searched for statutory designated sites (such as Sites of Special Scientific Interest (SSSIs)), European Protected Species (EPS) Licences within 2km, ancient woodland, and priority habitats.

The SLR 2016 and 2020 reports provided data on previous surveys and records of habitat and species on Site. The environmental statement and associated ecological surveys for the HIF Road development

[6] https://myeplanning2.oxfordshire.gov.uk/Planning/Display/R3.0138/21#undefined

were used for additional information on nearby species surveys and allow the assessment of potential cumulative effects.

2.2.2 Field Survey(s)

2022 field survey

The Site was subject to re-survey by Blake Perkins and Marsha Perera, Graduate Ecologists at SLR, on Wednesday 17th August 2022. The site was assessed for changes to habitats and features with potential to support protected or notable species, as compared to previous surveys. The habitats present were mapped using the UK Habitat (UKHab) classification criteria and coding[7]. Particular features of interest were recorded on the field map using target notes (TN) and notes on the condition of each habitat were also recorded. The survey covered the entire Site and adjacent areas within 30 m (access permitting).

The UK Habitat Classification (UKHab) is a comprehensive classification system for the UK that has been developed to benefit from changes in habitat categorisation and recording analysis in recent decades. The system comprises a principal hierarchy (the Primary Habitats) which include broad habitats and priority habitats and non-hierarchical Secondary codes. Habitat nomenclature and definitions have been designed to remain as close to existing systems as possible in order that data can be collected, analysed and translated without ambiguity.

This level of survey includes the documentation of habitats to a recognised standard, but also includes the recording of field evidence indicating the presence or potential presence of species that could constitute a material consideration in planning terms, such as protected or notable plant or faunal species. Notes of principal habitat types, supported by photographs, were recorded.

Whilst not a full botanical or protected species survey, the method of survey enables experienced ecologists to obtain an understanding of the ecology of a site such that it is possible either:

- to confirm the conservation significance of the site and assess the potential for impacts on habitats/species likely to represent a material consideration in planning terms; or
- to establish the scope and extent of any additional specialist ecological surveys that will be required before such confirmation can be made.

Habitats and features were assessed and compared against previous surveys for their structure and potential to support protected or notable species, together with any field signs of such species including reptiles and breeding birds. Habitats underwent a condition assessment, following Natural England's The Biodiversity Metric 3.1, which then can be used to inform a BNG assessment.

Trees within the survey area were assessed for their potential to support roosting bats via an external assessment at ground-level, based on criteria within the third edition of the Bat Conservation Trust's Good Practice Guidelines (Collins, 2016). Searches were also made for non-native invasive species listed on Schedule 9 of the Wildlife and Countryside Act 1981 (as amended), such as Japanese knotweed *Fallopia japonica* and Himalayan balsam *Impatiens glandulifera*.

The area subject to survey is shown in Drawing 1.

SLR 2020 field survey

"A UK Habitat Classification (UKHab) survey was undertaken by Robert Williams BSc (hons) MSc ACIEEM on 8th January 2020 using the standard UK Habitat Classification survey methodology. The

[7] https://ukhab.org/

survey covered the application site and immediately adjacent habitats within at least to ensure any important ecological features within the zone of influence of the works were identified. Habitats and features with the potential to support protected and/ or conservation priority fauna, together with any field signs of such species were searched for. The study area for badger (*Meles meles*) was set to include all adjacent habitats within 30m of the study area (where accessible and suitable sett building substrates existed) to ensure any setts within disturbance distance of the proposed development would be identified. The trees and buildings within the study area were also assessed for their potential to support roosting bats, based on criteria within the third edition of the Bat Conservation Trust's Good Practice Guidelines (Collins, 2016). Terrestrial habitats within the study area were also assessed for their suitability for invertebrates, amphibians, reptiles, breeding birds and rare plants. Searches were also made for non-native invasive species listed on Schedule 9 of the Wildlife and Countryside Act 1981 (as amended), such as Japanese knotweed (*Fallopia japonica*) and Himalayan balsam (*Impatiens glandulifera*). The two ponds within the application site were subject to Habitat Suitability Index (HSI) assessment for GCN and also inspected for signs of otter and water vole." (SLR Consulting, 2020).

2.3 Assessment Approach

The ecological evaluation and impact assessment approach used in this report is based on Guidelines for Ecological Impact Assessment in the United Kingdom and Ireland ("CIEEM guidelines")(CIEEM, 2018).

2.3.1 Limitations

Desk Study

Desk study data is unlikely to be exhaustive, especially in respect of species, and is intended mainly to set a context for the study. It is therefore possible that important habitats or protected species not identified during the data search do in fact occur within the vicinity of the site. Interpretation of maps and aerial photography has been conducted in good faith, using recent imagery, but it has not been possible to verify the accuracy of any statements relating to land use and habitat context outside of the field study area. The datasets for priority habitats by MAGIC and the Thames Valley Environmental Records Centre (TVERC) are provisional and exclude some types, such as hedgerow and ponds.

Field Survey(s)

The Site was almost fully accessible during the survey, however the small industrial complex within the centre of the Site was not accessed due to activity during the visit. However, observations could be made from outside the area, and habitat changes are unlikely. The survey was undertaken in mid-August during drought; therefore, some species were difficult to identify as were at the end of their season and may have been missed.

It should be noted that the lack of evidence of any one protected species during survey visits does not necessarily preclude its presence at the site in the future. The likely presence/absence of species will be discussed further in the report, and a pre-works check may be necessary for transient species. It is considered that the survey was suitable for conducting protected species risk assessments based on habitat type, collected data and local knowledge.

This EcIA report represents an update to the previous EcIA reports produced in 2016 and 2020. Great crested newt, reptiles, breeding birds, commuting/foraging bats and roosting bat surveys were completed during the appropriate seasons in 2016, and UKHab was updated in January 2020. It is acknowledged that more than six years has passed since most these surveys were completed. However, on the basis that the habitat composition and quality within the study area remains largely

unchanged since the 2016 surveys were completed, the survey data in respect of these species collected in 2016 is considered adequate to enable to accurate assessment of effects and impacts predicted to result from the proposed development. The 2016 survey data has therefore been used to inform this impact assessment. Not all ponds within 500 m of the Site could be surveyed for this report due to access restraints, and a pond being dry at the time of the survey.

The HIF Road development undertook species surveys for great crested newt, reptiles, breeding birds, wintering birds, commuting/foraging bats, and roosting bat between 2019 and 2021. Depending on the species, the study areas for these surveys encompasses varying proportions of the Site, with an obvious focus on the road dissecting the centre of the Site. However, connectivity between these areas and the outer boundary of the Site is good, and as such surveys along the road provide reliable and more recent updates to ecological features, which is included in this report. Ponds surveyed in the 2016 report are also surveyed for the HIF Road. Not all corresponding ponds to the 2016 SLR report could be surveyed for this report due to access restraints, and a pond being dry at the time of the survey.

2.3.2 Important Ecological Features

Ecological features can be important for a variety of reasons and the rationale used to identify them is explained in the text. Importance may relate, for example, to the quality or extent of the site or habitats therein; habitat and/ or species rarity; the extent to which such habitats and/ or species are threatened throughout their range, or to their rate of decline.

2.3.3 Determining Importance

The importance of an ecological feature should be considered within a defined geographical context. The following frame of reference has been used in this case, relying on known/ published accounts of distribution and rarity where available, and professional experience:

- International;
- National (i.e. UK/ England etc.);
- Regional (i.e. South East of England);
- County (i.e. Oxfordshire); and
- Local (i.e. within circa 2km).

The above frame of reference is applied to the ecological features identified during the desk study and surveys to inform this report.

The value of habitats has been measured against published selection criteria where available. Examples of relevant criteria include: guidelines for the selection of biological SSSIs, descriptions of habitats listed on Annex 1 of the Habitats Directive; descriptions of habitats of principal importance for biodiversity under Section 41 of Natural Environment and Rural Communities (NERC) Act 2006 (also referred top a priority habitats); Local Wildlife Site Selection Criteria; and Habitat Action Plans (HAPs) contained within Local Biodiversity Action Plans.

Examples of relevant lists and criteria include: species of European conservation importance (as listed on Annexes II, IV and V of the Habitats Directive or Annex 1 of the Birds Directive); species of principal importance for biodiversity under Section 41 of the NERC Act 2006 (priority species) and Birds of Conservation Concern (Stanbury, et al., 2021).

For the purposes of this report ecological features of Local importance or greater and/or subject to legal protection have been subject to detailed assessment. Effects on other ecological features are considered unlikely to be significant in legal or policy terms.

2.3.4 Impact Assessment

The impact assessment process involves the following steps:

- identifying and characterising potential impacts;
- incorporating measures to avoid and mitigate (reduce) these impacts;
- assessing the significance of any residual effects after mitigation;
- identifying appropriate compensation measures to offset significant residual effects (if required); and
- identifying opportunities for ecological enhancement.

When describing impacts, reference has been made to the following characteristics, as appropriate:

- positive or negative;
- extent;
- magnitude;
- duration;
- timing;
- frequency; and
- reversibility.

The impact assessment process considers both direct and indirect impacts: direct ecological impacts are changes that are directly attributable to a defined action, e.g. the physical loss of habitat occupied by a species during the construction process. Indirect ecological impacts are attributable to an action, but which affect ecological resources through effects on an intermediary ecosystem, process or feature, e.g. the creation of roads which cause hydrological changes, which, in the absence of mitigation, could lead to the drying out of

Consideration of conservation status is important for evaluating the effects of impacts on individual habitats and species and assessing their significance:

- Habitats – conservation status is determined by the sum of the influences acting on the habitat that may affect its extent, structure and functions as well as its distribution and its typical species within a given geographical area.
- Species – conservation status is determined by the sum of influences acting on the species concerned that may affect its abundance and distribution within a given geographical area.

2.3.5 Significant Effects

The concept of ecological significance is addressed in paragraphs 5.24 through to 5.28 of CIEEM Guidelines (CIEEM, 2018). Significance is a concept related to the weight that should be attached to effects when decisions are made. For the purpose of EcIA, a 'significant effect' is an effect that is sufficiently important to require assessment and reporting so that the decision maker is adequately informed of the environmental consequences of permitting a project.

2.3.6 Cumulative Effects

Cumulative effects can result from individually insignificant but collectively significant actions taking place over a period of time or concentrated in a location. Cumulative effects can occur where a proposed development results in individually insignificant impacts that, when considered in-combination with impacts of other proposed or permitted plans and projects, can result in significant effects.

2.3.7 Avoidance, Mitigation, Compensation and Enhancement

When seeking mitigation or compensation solutions, efforts should be consistent with the geographical scale at which an effect is significant. For example, mitigation and compensation for effects on a species population significant at a county scale should ensure no net loss of the population at a county scale. The relative geographical scale at which the effect is significant will have a bearing on the required outcome which must be achieved.

Where potentially significant effects have been identified, the mitigation hierarchy has been applied, as recommended in the CIEEM Guidelines (CIEEM, 2018). The mitigation hierarchy sets out a sequential approach beginning with the avoidance of impacts where possible, the application of mitigation measures to minimise unavoidable impacts and then compensation for any remaining impacts. Once avoidance and mitigation measures have been applied residual effects are then identified along with any necessary compensation measures, and incorporation of opportunities for enhancement.

It is important for the EcIA to clearly differentiate between avoidance mitigation, compensation and enhancement and these terms are defined here as follows:

- Avoidance is used where an impact has been avoided, e.g. through changes in scheme design;
- Mitigation is used to refer to measures to reduce or remedy a specific negative impact *in situ*;
- Compensation describes measures taken to offset residual effects, i.e. where mitigation *in situ* is not possible; and
- Enhancement is the provision of new benefits for biodiversity that are additional to those provided as part of mitigation or compensation measures, although they can be complementary.

3.0 Baseline Ecological Conditions

The results of the desk and field survey are reported below and describe the baseline conditions at the site and within the surrounding area.

3.1 Designated Sites

3.1.1 Statutory Designated Sites

There are no statutory designated sites within 2 km of the Site, and none within hydrological or ecological connections to the Site. The closest sites are Little Wittenham SSSI, which is found 4.3 km east of the Site, designated due to its importance as a great crested newt breeding site, and Mowbray fields local nature reserve, found 3 km South. The application site is overlapped by the SSSI impact risk zones (IRZ) for Little Wittenham SSSI, however the type of development is not identified as a risk.

3.1.2 Non-statutory Designated Sites

There is one non-statutory ecological site within 2 km of the Site, Sutton Courtenay Environmental Education Centre which is found approximately 1.4 km south west. It is 1.4 ha in area, and primarily a field study centre managed by Berkshire, Buckinghamshire and Oxfordshire Wildlife Trust (BBOWT), with meadow and woodland habitats. There is no habitat loss and no anticipated impacts on the non-statutory site due to the distance from Site, the scale of the proposed development and lack of hydrological links therefore non-statutory designated sites will not be taken forward in this assessment as important ecological features.

3.2 Ancient Woodland

The TVERC data search and MAGIC confirmed the presence of one ancient woodland[8] within 2 km of the Site, found approximately 550 m east. This is shown in Drawing 2.

No ancient woodland was recorded with the Site during the field survey.

3.3 Priority Habitats

3.3.1 Deciduous Woodland

The desk study identified several small stands of deciduous woodland found within the study area, the closest being 70 m southeast, and south of the A4130 and railway. Other stands were identified 200m north, on the corner of the B4016, within the industrial area in the northwest of Didcot, along the railway running towards Swindon, and within the reserve around Sutton Courtenay Environmental Education Centre. Woodland areas are shown in Drawing 2.

No deciduous woodland was recorded within the Site during the field survey.

8 Ancient Woodland is not a formal designation as such, but is a term applied to sites in England and Wales whose documented history shows them to have been continuously wooded since approximately 1600, and which are by extension considered likely to have been continuously wooded since the last Ice Age. Ancient Woodland sites and their mature soils are considerably more complex and biodiverse ecosystems than secondarily wooded sites, and therefore represent environmental capital that should be considered to be a finite resource, as it is not renewable in a human timescale.

3.3.2 Ponds

The desk study identified 19 ponds within 2 km of the Site, including the two ponds recorded within the Site during the field survey. These two ponds are described in Table 1, however these are not deemed priority, as they do not meet the criteria.

3.3.3 Hedgerow

The desk study identified that hedgerows are abundant in the wider area, and well represented within the Site.

Hedgerow was recorded within the Site during the field survey and is described in Table 1.

3.3.4 Orchard

The desk study identified Appleford Community Orchard approximately 165 m north of the Site. Although not mapped as a Traditional Orchard on MAGIC, this site may fall under the UK BAP definition.

No orchard habitat was recorded within the Site during the field survey.

3.4 Habitats within the Site

The results of the survey are illustrated in plan form in Drawing 1 and described in Table 1 below. Target notes (TN) are annotated on Drawing 1 in red and demark areas of interest for easier description.

The field survey recorded habitats similar to those recorded in 2020, however due to changes in management some areas of grassland have developed from *g4 modified grassland* to a more diverse, moderate condition, *g3c other neutral grassland*.

Table 1 - Habitats included in survey area

Photograph	UKHab Classification and Description
	Hedgerow (h2a) – Priority habitat Hedgerow was found between the western Pond 1 and the road. This was predominantly Hazel *Coryllus avena*, with hawthorn *Crataegus monogyna*, blackthorn *Prunus spinosa*, and field maple *Acer campestre*. This hedgerow was assessed as good condition. Unmanaged species poor hedgerow surrounded field TN6, which consisted of hawthorn, elder *Sambucus nigra*, bramble *Rubus fruticosus*, and ivy *Hedera helix*. These were also in good condition, however without management may develop into scrub. Hedgerow follows the western side of the access road (TN5) from the south, made up predominantly of blackthorn and hawthorn. This was assessed as moderate condition. Hedgerow was found along the north of field TN9. This was short and gappy and was assessed as poor condition.

Photograph	UKHab Classification and Description
	**Pond (r1, 19)** Two fishing ponds are on Site, situated in the northern portion, either side of the landfill access road (TN5). which meet the priority habitat criteria. The eastern pond (Pond 2) is fringed with bulrush *Typha sp.*, common reed *Phragmites australis*, and rush *Juncus Sp.*, as well as herbs such as hairy willowherb *Epilobium hirsutum* and gypsywort *Lycopus europaeus*. along half of the pond margin, with bare mud and a line of willow *Salix spp*. in the other areas. There is very limited aquatic vegetation within the pond, although the non-native invasive plant species New Zealand pygmyweed *Crassula helmsii* and curly waterweed *Lagarosiphon major* was recorded in the 2020 site walkover. The western pond (Pond 1) is broadly similar but is more shaded, with hedgerows and a small margin of modified grassland. Pond 1 was assessed as moderate condition, and Pond 2 as poor condition.
	**Other neutral grassland (g3c)** The grasslands in the northern portion of the site are classed as other neutral grassland, comprising of a mix of grass species and tall herbs. The north-eastern fields (TN4, 6), surrounding Pond 2 and alongside the railway line, were classified as modified grassland in the 2020 report. The grassland has grown and developed into a tall sward, growing taller further south. The classification has changed due to an increasing proportion of tall herbs, including ragwort *Senecio jacobaea*, ribwort plantain *Plantago lanceolata*, teasel *Dipsacus fullonum*, creeping thistle

Photograph	UKHab Classification and Description
	*Cirsium arvense*, cow parsley *Anthriscus sylvestris*, fleabane *Pulicaria dysenterica*, ox-eye daisy *Leucanthemum vulgare*, bristly oxtongue *Helminthotheca echioides*, nettle *Urtica dioica*, and Colt's-foot *Tussilago farfara*. Grass species included perennial ryegrass *Lolium perenne*, cocksfoot *Dactylis glomerata*, Yorkshire fog *Holcus lanatus*, and false-oat grass *Arrhenatherum elatius*. Despite this diversity, the area was classed as moderate condition, as there were <9 species per m^2. The grassland TN3 in the northwest of the Site had a similar diversity and the same moderate condition. This habitat is important at the local level as it is rare within the nearby landscape, which is dominated by arable and commercial land.
	Modified grassland (g4) The southern fields (TN7, 8, 9) were all classed as modified grassland, in poor condition. These were used as arable fields in 2020, but are currently used as hay and grazing fields, with sheep observed on TN8 at the time of survey. These fields were dominated by species such as perennial rye-grass and other vigorous grasses, with some herbs such as creeping thistle.

Photograph	UKHab Classification and Description
	Mixed scrub (h3h) Mixed scrub was found largely on the borders of the Site, and on the field margins, particularly along the eastern edge alongside the railway, and alongside TN3. Species include elder, hawthorn, bramble, dog rose *Rosa canina*, blackthorn, and English elm *Ulmus procera*. These patches were in moderate condition.
	**Line of trees (w1g6)** Around each of the ponds, a line of willow trees was observed in the habitat survey, predominantly crack willow *Salix fragilis* and goat willow *Salix caprea*. These are in moderate condition. There is also a line of deciduous horse chestnut *Aesculus hippocastanum* trees between Hartwright house in the north, and the commercial site TN5, alongside the Site boundary road and HIF Road development layout. Another line of deciduous trees extends from the broadleaf woodland in the west of the Site.
No image available	Built-up areas and gardens (u1) The Site is dissected by roads (u1e), and includes a commercial area (buildings 1-3) and Hill Farm cottage (building 4) (u1b6).The location of these buildings can be found in Drawing 4.

Photograph	UKHab Classification and Description
No image available	Ditch, dry (r1, 191, 117) A dry ditch runs along the southern section of the access road.

3.5 Species

3.5.1 Plants

Notable Plant Species

Desk Study

TVERC returned 11 records of protected and notable plant species within 2 km of the Site, including hoary plantain *Plantago media*, carline thistle *Carlina vulgaris*, ragged-robin *Silene flos-cuculi*, toothed medick *Medicago polymorpha,* and bluebell *Hyacinthoides non-scripta*. The latter of which is listed on Schedule 8 of The Wildlife and Countryside Act, preventing the removal and sale of bulbs.

The neutral grassland recorded in the 2022 field survey in the north of the Site (TN3, 4, 6) is new (it was modified grassland in 2020) and is highly unlikely to support rare species at this stage.

Invasive Non-native Plant Species

Desk Study

The TVERC data search report identified 2 records of Nuttall's waterweed *Elodea nuttallii* within 2 km of the Site, a non-native invasive plant species listed on Schedule 9 of the Wildlife and Countryside Act and Schedule 2 of the Invasive Alien Species Order 2019.

New Zealand pygmyweed *Crassula helmsii* was identified within the habitat survey on the eastern pond, and the 2020 EcIA habitat survey identified curly waterweed *Elodea densa*, both listed on Schedule 9 of the Wildlife and Countryside Act 1981.

3.5.2 Invertebrates

Desk Study

The data search returned 1223 records of protected and notable invertebrate species within 2 km of the site. These were largely lepidopteran species including buff ermine *Spilosoma lutea* and small squarespot *Diarsia rubi*, both priority species.

The data search also identified 15 records of *Crangonyx floridanus*, an invasive non-native species of freshwater shrimp (amphipod). All records originated from Moor Ditch, which is not hydrologically connected to waterbodies on Site, and is found approximately 90 m east.

2020 survey (HIF Road) (AECOM Limited, 2020)

The HIF Road invertebrate survey identified 29 unusual and noteworthy species in its survey area between the River Thames, and A4130 to the south of the Site. Of the 29 species, including bees, wasps, and weevils, 10 are nationally scarce, and one, *Cistogaster globosa*, is considered endangered. They highlight the value of the flooded gravel pits approximately 1.3 km north of Site.

2022 results (SLR)

Habitats on Site have improved in suitability for some of these species, such as the neutral grassland providing more nectar sources for pollinators, however, this habitat is not highly complex. The ponds on Site provide good breeding habitat for dragonflies such as the common darter *Sympetrum striolatum* and common clubtail *Gomphus vulgatissimus*.

3.5.3 Amphibians

Desk Study

The TVERC data search identified 77 records of amphibians within 2 km of the Site. These include 39 records of great crested newt (GCN) *Triturus cristatus*, 5 of common frog *Rana temporaria*, 2 of common toad *Bufo bufo*, 1 palmate newt *Lissotriton helveticus*, and 30 of smooth newt *Lissotriton vulgaris*. All these species are listed on Schedule 5 of The Wildlife and Countryside Act, with GCN with strict protection under Habitats Regulations. There were six GCN class European Protected Species licence return records within 2km; one located 1 km north of the site in Appleford, and five located 1.5 km southwest of the site in the local nature reserve.

2016 survey (SLR) (SLR Consulting, 2016)

The 2016 report by SLR identified eight ponds within 500 m of the Site, the locations of which can be found in Drawing 3. Ponds 1 and 2 are found within the Site boundary, 3 and 4 are 20 m and 300 m north west respectively. Ponds 5 and 6 are approximately 190 m and 260 m south, and 7 and 8 are 400 m south west. Pond 6 was dry at the time of the survey and 7 and 8 were denied access by the landowner, therefore eDNA samples were not taken. Ponds 1 – 5 were sampled for the presence of great crested newt using the environmental DNA (eDNA) survey method during June 2015. No traces of great crested newt eDNA were found in Ponds 1, 2, 3, or 5 and thus the species was absent from aquatic habitats within the Site. Pond 4 was the only pond to test positive for the presence of great crested newt. This pond is located approximately 300m north of the study area boundary and approximately 480m north of the closest area of proposed built development.

2020 survey (HIF Road) (AECOM Limited, 2020)

Further surveys were undertaken to inform the HIF road proposal between April and May 2020. Ponds identified included ponds 1, 2, 3, 4, 5, 7, and 8, corresponding to those in the 2016 SLR report. Of these ponds 1, 2, 3, and 4 were surveyed between April and May 2020. Pond 5 was dry at the time of survey, and 7 and 8 were deemed unsuitable for GCN. All ponds were subject to eDNA sampling, as well as traditional surveying (torching, egg-searching, netting) in all but pond 4. The surveys found GCN were absent at the time of survey.

2022 results (SLR)

There have been no significant changes to the aquatic habitats (Ponds 1 and 2) within the Site since completion of the surveys in 2015 and 2020. The terrestrial habitat suitable for amphibians within the study area changed little since the surveys in 2015 and 2020, as the northern grassland areas had a taller sward than previously described, improving its suitability for amphibians. However, the management of the larger southern fields and the disrupted connectivity due to roads, makes these fields sub-optimal for amphibians.

3.5.4 Reptiles

Desk Study

The data search returned 19 records of two species of protected reptiles within 2 km of the Site. These are grass snake *Natrix Helvetica*, and common lizard *Zootoca vivipara*. Six of these records were on Site, and are the records derived from the 2016 SLR surveys. Both species are listed on Schedule 5 of The Wildlife and Countryside Act and are Priority Species in England.

2016 survey (SLR) (SLR Consulting, 2016)

Grass snake and common lizard were identified within the 2016 SLR reptile survey, found along field margins in the eastern and western boundaries of the Site. Surveys took place between April and June 2016, and found three male common lizard, two adult grass snake, and one juvenile grass snake.

2020 survey (HIF Road) (AECOM Limited, 2021)

The HIF Road reptile ecological assessment surveyed two areas adjacent to, but outside the Site, one within 10 m, north of Hill farm and west of the ponds 1, 2, and 3, and another 300 m north of the Site, around pond 4. No reptiles were found in the adjacent reptile survey area, however, two adult common lizard and four juvenile grass snake were observed in the more distant northern survey area. Connectivity between this area and the Site is limited by a road.

2022 results (SLR)

Changes in management of the Site, mainly the lack of cutting in the north-eastern field leading to development of neutral grassland with tall herbs, have increased the suitability of this area of the Site for reptiles.

3.5.5 Birds

Nesting Birds

The data search returned 252 records of 70 species of protected or notable bird within 2 km of the Site. Seven records are associated with the Site, the most likely to nest on Site being kestrel *Falco tinnunculus*. These records are limited as they are >20 years old, and other records may be within the Site but have a confidential location.. Eighteen species are listed on Schedule 1 of The Wildlife and Countryside Act.

2016 survey (SLR) (SLR Consulting, 2016)

The 2016 SLR report is based on three survey visits on the Site between April and June 2016. A total of 27 bird species were recorded during the survey, nine of which were confirmed as breeding within the Site, with a further 11 considered as possibly breeding within the Site. Four species listed on Section 41 of the NERC Act as 'species of principal importance for the conservation of biodiversity in England' were recorded; skylark *Alauda arvensis*, song thrush *Turdus philomelos*, dunnock *Prunella modularis* and bullfinch *Pyrrhula pyrrhula*. Song thrush was confirmed as breeding on Site and others were considered as possibly breeding within the Site.

No evidence of barn owl was recorded during the SLR 2016 surveys and none of the trees within the Site are considered suitable for nesting for this species. The two agricultural barns (TN5) which form part of the wood recycling facility are considered broadly suitable for barn owl, however, no evidence of barn owl was noted during the SLR survey in January 2020. As the barns are in daily active use, they are considered too disturbed to be used by nesting barn owl.

2020 survey (HIF Road) (AECOM Limited, 2020)

The HIF Road breeding bird surveys identified three bird species possibly nesting within the Site, including six dunnock, one reed bunting *Emberiza schoeniclus*, and a mallard *Anas platyrhynchos*. The territories were concentrated in the north of the Site, around pond 1.

2022 results (SLR)

The habitats on Site have been confirmed to support breeding song thrush, as well as possibly supporting dunnock, mallard, bullfinch, reed bunting, and skylark. However, song thrush, bullfinch, and skylark were not recorded in the 2020 report, therefore are assumed to no longer use the Site. Additionally, the SLR 2022 field survey observed multiple red kite *Milvus milvus* foraging in the southern field TN7.

Wintering Birds

Desk Study

Of the 70 species of protected or notable bird within 2 km of the Site, six records of likely wintering birds are associated with the Site, including common sandpiper *Actitis hypoleucos*, dunlin *Calidris alpina*, green sandpiper *Tringa ochropus*, Iceland gull *Larus glaucoides*, and redshank *Tringa tetanus*. These records are limited as they are >20 years old, and other records may be within the Site but have a confidential location. The high number of species within 2 km is likely due to the presence of the ponds and waterbodies on and around the Site, attracting waterfowl.

2020 survey (HIF Road) (AECOM Limited, 2020)

For the HIF Road, AECOM undertook wintering bird surveys between November 2019 and March 2020. During this survey, mallard, yellowhammer *Emberiza citrinella*, red kite, song thrush, dunnock, kestrel, lesser black-backed gull *Larus fuscus*, herring gull *Larus argentatus*, black headed gull *Chroicocephalus ridibundus*, and skylark were observed on the Site. Of these, dunnock, herring gull, skylark, song thrush, and yellowhammer are NERC priority species, and red kite is a protected under Schedule 1 part 1 of the Wildlife & Countryside Act 1981.

2022 results (SLR)

The habitats on Site have not changed since the 2020 surveys, and habitats such as ponds, hedgerow, and trees are suitable for the overwintering bird species recorded in the 2020 survey.

3.5.6 Mammals

The data search returned 158 records of 15 species of protected or notable terrestrial mammals within 2 km of the Site.

Bats

Roosting Bats

Desk Study

Records for eight species of bat were returned the desk study: Daubenton's *Myotis daubentonii*, noctule *Nyctalus noctula*, Leisler's bat *Nyctalus leisleri*, common pipistrelle *Pipistrellus pipistrellus*, Nathusius's pipistrelle *Pipistrellus nathusii*, soprano pipistrelle *Pipistrellus pygmaeus*, serotine *Eptesicus serotinus*, and brown long-eared bat *Plecotus auritus*. Nathusius's pipistrelle is scarce in the UK and rare in Oxfordshire. Leisler's is also uncommon in the county. Noctule, soprano pipistrelle, and brown-long eared bats are priority species.

2016 survey (SLR) (SLR Consulting, 2016)

The four buildings on Site, and Hartwright House in the north of the Site, were assessed for potential roosting features, and emergence re-entry surveys were undertaken between May and June 2016. Buildings can be identified on Drawing 3. Building 3 could not be fully accessed due to a locked area, and building 4, Hill Farm cottage, was not inspected internally as there had been a full loft conversion. Buildings 1 – 4 were assessed as low – moderate suitability, no evidence of roosting bats was recorded during inspection and dusk emergence and dawn re-entry surveys. Building 5, Hartwright House, had confirmed presence of common pipistrelle through the identification of droppings in the main roof void.

The 2020 SLR preliminary roost surveys assessed the same conditions of each building. As each building was still under human use, no further surveys were undertaken.

The SLR 2020 survey of tree roost potential found the majority of trees within the Site were relatively young, in good condition, and were therefore considered to have negligible bat roost potential. Mature trees were recorded infrequently across the Site and upon inspection did not support obvious roost features. The 2022 field survey supported these findings.

2020 survey (HIF Road) (AECOM Limited, 2021)

The HIF Road surveys undertook preliminary roost assessments on all the buildings on Site (1-4), and building 5, and emergence and re-entry surveys were undertaken on buildings 2, 3, 4, and 5 between July and September 2020. These confirmed the presence of bats in Buildings 2 (common pipistrelle), 3 (soprano pipistrelle), and 5 (common and soprano pipistrelle).

The HIF Road tree roost survey assessed trees within a 100 m buffer of the road development, which included the trees found on the Site. Trees deemed to have moderate or high suitability then were subject to aerial inspection and/or emergence/re-entry surveys. They found no roosts in trees around the Site.

2022 results (SLR)

There are changes to the status of buildings since 2016 and therefore the results of this survey are still valid.

Commuting/Foraging Bats

2016 survey (SLR) (SLR Consulting, 2016)

Transect and static detector surveys were undertaken between May and September 2016. Transect surveys detected low levels of commuting and foraging common and soprano pipistrelle, as well as occasional *Myotis* species and noctule. No areas of Site had higher levels and no specific flight lines were identified. The same species were identified within the automated detector surveys, with most recordings of common pipistrelle (75%). Soprano pipistrelle had lower activity (13.75%), then noctule (7.84%), *Myotis* species (2.95%), Leisler's bat (0.18%), and brown long-eared bat (0.12%).

2020 survey (HIF Road) (AECOM Limited, 2021)
HIF Road undertook transect and static detector surveys between May to October 2020. One transect followed the road from the A4130 roundabout outside the south of the Site to pond 3 north of the Site. Two static detectors were placed within proximity to the Site, one south of pond 3, one in the treeline south of field TN9. The transect identified moderate activity of common pipistrelle and soprano pipistrelle, with occasional activity of noctule and Myotis species. Static detector surveys identified common pipistrelle, soprano pipistrelle, Nathusius' pipistrelle, noctule, and Myotis species, with low numbers of Leisler's bat, serotine, and brown long-eared.

2022 results (SLR)

Habitats on Site and in the surrounding area have not significantly changed since previous surveys. Therefore, the agricultural land dissected by hedgerow and road, is maintained at low value for commuting and foraging bats. No high activity commuting or foraging corridors were identified, however given the location of roosts in buildings 2, 3, and 5, species are likely to move along the treeline and main road for these buildings. The results of the activity surveys show the Site and its habitat do support commuting and foraging bats.

Badger

Desk Study

The TVERC data search report identified 12 records of badger within 2 km of the Site, including six setts, the closest of which is approximately 550 m from the Site, recorded in 2017.

2020 survey (SLR) (SLR Consulting, 2020)

The ecological walkover survey completed in January 2020 identified the presence of a four-hole subsidiary badger sett approximately 5 m south of the southern site boundary within the adjacent road embankment. The four holes had light accumulations of leaf litter within their entrance, in addition to small spoil mounds of shingle, with badger hair present in the spoil, and well-worn paths between the holes. Based on the field signs the sett was considered to be moderately active.

Otter

Desk Study

TVERC returned three records of otter (*Lutra lutra*), however the closest of which was 700 m south of the site, separated by the A4130.

2016 survey (SLR) (SLR Consulting, 2016)

Ponds 1-3 were surveyed for signs of otter activity in 2015 and found no evidence.

2020 survey (SLR) (SLR Consulting, 2020)

Ponds 1-3 were surveyed for signs of otter activity in January 2020 and found no evidence.

2020 survey (HIF Road) (AECOM Limited, 2021)

Otter surveys covered the Moor Ditch and a ditch south of pond 3. These identified evidence of otter in Moor Ditch in the form of otter footprints, spraint, and potential resting sites.

2022 results (SLR)

The Site contains large ponds which are stocked with fish. There is limited connectivity between these and nearby watercourses, the closest of which is Moor Ditch approximately 375 m from pond 2, on the other side of the railway. A smaller ditch does run from Moor Ditch to the northern boundary of the Site, but this is shallow and dry for much of the year, therefore is unlikely to be suitable habitat. Other ponds and lakes to the north of the Site may provide suitable habitat, but these are also separated by minor roads and railway.

The habitat on Site has low potential to support otters due to limited connectivity with locations where otter activity has been observed and generally unsuitable habitat.

Water Vole

Desk Study

The TVERC data search report identified 12 records of water vole (*Arvicola amphibius*) within 2 km of the Site. The closest is found approximately 130 m east of the Site in Moor Ditch, on the other side of

the railway, and approximately 450 m from suitable habitat on Site. These records are limited as they are all >10 years old.

2016 survey (SLR) (SLR Consulting, 2016)

The survey in 2015 found no evidence of water vole in the ponds or ditches on Site, despite assessing the habitat as suitable.

2020 survey (SLR) (SLR Consulting, 2020)

The survey in January 2020 found no evidence of water vole in the ponds or ditches on Site, despite assessing the habitat as suitable.

2020 Survey (HIF Road) (AECOM Limited, 2021)

Water vole surveys covered the Moor Ditch and a ditch south of pond 3. No evidence for water vole was identified in these areas, nor within their wider surveys along the development route from Didcot to the north of the River Thames.

2022 results (SLR)

The fishing ponds 1 and 2 within the north of the Site represent the only suitable habitat for water vole within the Site. The water level within the ponds remains relatively constant and there are areas of emergent vegetation suitable for water voles to feed upon. In certain areas, pond banks are of a suitable angle for water vole burrowing. However, due to the lack of dense, continuous stands of emergent vegetation the ponds cannot currently be classed as optimal water vole habitat. The ponds are also not directly connected to any other suitable habitats in the wider landscape and thus colonisation by water voles is less likely to occur. The wet ditches within the Site are assessed as having negligible potential for water vole due to heavy shading by dense bramble growing on the bank tops, resulting in a complete absence of aquatic and marginal vegetation suitable for water voles to feed on. In addition, the ditches do not appear to be connected to any other ditches or water courses and are too small to support an independent population of water vole.

The habitat conditions for water vole have not changed significantly since the previous surveys. There is negligible potential for water vole to be present on Site.

Other Mammals

Desk Study

TVERC returned records of only two other mammal species: 42 records of hedgehog *Erinaceus europaeus* and one of brown hare *Lepus europaeus*.

2022 results (SLR)

The neutral grassland with tall herbs and shrubs in the northeast of the Site provided some limited opportunities for hedgehog foraging, as well as the single residential property. The nearest large residential areas, known to provide foraging habitat for hedgehogs, are 150m southeast of the Site, however connectivity to this area is limited due to the A4130 and railway. Hibernation opportunities for hedgehogs are limited due to the lack of log piles or areas of deep litter within the Site. Brown hare is likely to use the cut modified grassland in the south of the Site, however this is grazed by sheep, making it less suitable than nearby arable habitats.

No evidence was seen during the SLR field surveys, nor the HIF Road surveys. However, as there is suitable habitat for these relatively common and widespread mammals, they are assumed to be present on the Site at least occasionally.

3.6 Scoping and Summary of Important Ecological Features

Ecological features are scoped and summarised in Table 2 below, with habitats and species determined for further impact assessments.

Table 2 – Scoping and Summary of Important Ecological Features

Ecological Feature	Presence on / around the Site	Pathway for impact	Scale at which Feature is Important	Comments on Legal Status and/or Importance	Included in Impact assessment
Habitats					
Ancient woodland	550 m east	No	Local	National Planning Policy Framework 2018	No
Deciduous woodland	70 m southeast	No	Local	NERC Act 2006 S.41 Habitat of Principal Importance Local BAP Priority Habitat	No
Orchard	165 north	No	Local	NERC Act 2006 S.41 Habitat of Principal Importance	No
Hedgerows	On Site	Yes	Local	NERC Act 2006 S.41 Habitat of Principal Importance Local BAP Priority Habitat	Yes
Ponds	On Site	Yes	Local	NERC Act 2006 S.41 Habitat of Principal Importance Local BAP Priority Habitat	Yes
Other neutral grassland	On Site	Yes	Site	Habitat previously lacking on Site, providing shelter and forage for protected and notable invertebrates, reptiles, and amphibians. Not protected.	Yes
Modified grassland	On Site	Yes	Negligible	N/A	No

Ecological Feature	Presence on / around the Site	Pathway for impact	Scale at which Feature is Important	Comments on Legal Status and/or Importance	Included in Impact assessment
Mixed scrub	On Site	Yes	Local	N/A	No
Line of trees	On Site	Yes	Site	N/A	No
Ditch (dry)	On Site	Yes	Negligible	N/A	No
Species					
Plants	On Site	Yes	Negligible		
Invasive Non-native Plants	On Site	Yes	N/A	Schedule 9 of the Wildlife and Countryside Act 1981	Yes
Invertebrates	On Site	Yes	Local	Schedule 5 of the Wildlife and Countryside Act 1981 (as amended) Local BAP Priority Species	Yes
Great crested newts	Suitable habitat	Yes	Local	Schedule 5 of the Wildlife and Countryside Act 1981 (as amended) Schedule 2 of the Conservation of Habitats and Species NERC Act 2006 S.41 Species of Principal Importance European Protected Species under Annex IV of the European Habitats Directive. Local BAP Priority Species	Yes

Ecological Feature		Presence on / around the Site	Pathway for impact	Scale at which Feature is Important	Comments on Legal Status and/or Importance	Included in Impact assessment
Other Amphibians		On Site	Yes	Local	Schedule 5 of the Wildlife and Countryside Act 1981 (as amended) Local BAP Priority Species	Yes
Reptiles		On Site	Yes	Local	Local BAP Priority Species Priority Species in England Schedule 5 of the Wildlife and Countryside Act 1981 (as amended)	Yes
Nesting Birds	Farmland	On Site	Yes	Site	Wildlife & Countryside Act 1981 NERC Act 2006 S.41 Species of Principal Importance Local BAP Priority Species	Yes
	Woodland	On Site	Yes	Site	Wildlife & Countryside Act 1981 NERC Act 2006 S.41 Species of Principal Importance Local BAP Priority Species	Yes
	Water	On Site	Yes	Local	Wildlife & Countryside Act 1981 NERC Act 2006 S.41 Species of Principal Importance Local BAP Priority Species	Yes
Wintering Birds	Farmland	On Site	Yes	Site	NERC Act 2006 S.41 Species of Principal Importance Local BAP Priority Species	Yes

Ecological Feature		Presence on / around the Site	Pathway for impact	Scale at which Feature is Important	Comments on Legal Status and/or Importance	Included in Impact assessment
	Woodland	On Site	Yes	Site	NERC Act 2006 S.41 Species of Principal Importance Local BAP Priority Species	Yes
	Water	On Site	Yes	County	NERC Act 2006 S.41 Species of Principal Importance Local BAP Priority Species	Yes
Roosting Bats	Common pipistrelle	On Site	Yes	Local	Schedule 5 of the Wildlife and Countryside Act 1981 (as amended) Local BAP Priority Species	Yes
	Soprano pipistrelle	On Site	Yes	Local	Schedule 5 of the Wildlife and Countryside Act 1981 (as amended) NERC Act 2006 S.41 Species of Principal Importance Local BAP Priority Species	Yes
Commuting/ Foraging Bats	Common pipistrelle	On Site	Yes	Local	Schedule 5 of the Wildlife and Countryside Act 1981 (as amended) Local BAP Priority Species	Yes
	Soprano pipistrelle	On Site	Yes	Local	Schedule 5 of the Wildlife and Countryside Act 1981 (as amended) NERC Act 2006 S.41 Species of Principal Importance Local BAP Priority Species	Yes

Ecological Feature		Presence on / around the Site	Pathway for impact	Scale at which Feature is Important	Comments on Legal Status and/or Importance	Included in Impact assessment
	Noctule	On Site	Yes	Local	Schedule 5 of the Wildlife and Countryside Act 1981 (as amended) NERC Act 2006 S.41 Species of Principal Importance Local BAP Priority Species	Yes
	Myotis spp.	On Site	Yes	Local	Schedule 5 of the Wildlife and Countryside Act 1981 (as amended) NERC Act 2006 S.41 Species of Principal Importance Local BAP Priority Species	Yes
	Other bats	On Site	Yes	Local	Schedule 5 of the Wildlife and Countryside Act 1981 (as amended) NERC Act 2006 S.41 Species of Principal Importance Local BAP Priority Species	Yes
Badger		On Site	Yes	County	Schedule 6 of Wildlife & Countryside Act 1981 Protection of Badgers Act 1992 NERC Act 2006 S.41 Species of Principal Importance Local BAP Priority Species	Yes
Water vole		Assumed absence	No	Negligible	Schedule 5 of the Wildlife and Countryside Act 1981 (as amended)	No

Ecological Feature	Presence on / around the Site	Pathway for impact	Scale at which Feature is Important	Comments on Legal Status and/or Importance	Included in Impact assessment
				NERC Act 2006 S.41 Species of Principal Importance	
Otters	375 m east	No	County	Local BAP Priority Species	Yes
Hedgehog	Suitable habitat: assumed presence	Yes	County	Schedule 6 of Wildlife & Countryside Act 1981 NERC Act 2006 S.41 Species of Principal Importance Local BAP Priority Species	Yes
Brown Hare	Suitable habitat: assumed presence	Yes	County	NERC Act 2006 S.41 Species of Principal Importance Local BAP Priority Species	Yes

4.0 Assessment of Effects and Mitigation Measures

Impacts consider the construction phase and operational phases of the development. Where required, avoidance and mitigation measures forming part of the development are incorporated into the assessments. A summary of effects on important ecological features before and after mitigation and proposed enhancement is provided in Table 4**Error! Reference source not found.**.

4.1 Embedded mitigation

The following design principles and "designed-in" mitigation have informed the assessment of impacts.

- Within the design of the proposal good practice environmental and pollution control measures are incorporated, including current best practice guidance such as:
  - CIRIA C532, 'Control of water pollution from construction sites: guidance for consultants and contractors' (2001).
  - CIRIA C741, 'Environmental good practice on site guide' (2015 4th Ed.).
- Landscaping measures are proposed within the design of the development to minimise loss of biodiversity on-site and include:
  - Utilising the existing site access point to maintain the continuity of boundary vegetation at the site. This has helped to limits losses of habitats at the site boundary to avoid unnecessary habitat fragmentation;
  - A 10m root protection zone (RPZ) will be maintained around the margins of the site to ensure the roots of retained trees and hedgerows are not adversely impacted by the proposals and wildlife corridors will be maintained around areas of built development even during the construction phase of the development. This buffer zone will also protect key areas of reptile habitat on the eastern Site boundary and bat foraging habitat along the woodland edge in the west of the Site;
  - Landscaping during operation will include aftercare management to encourage wildlife and development of biodiverse habitats.
- All lighting associated with the scheme will be minimal required for health and safety. It will be designed to minimise light spill and will not increase the illuminance of the vegetated site boundaries which may be used by foraging bats. The specification for lamps will comply with the latest guidance in respect of bats and lighting in the UK (Institute of Lighting Professionals, 2018) as follows:
  - All luminaires will lack UV elements when manufactured. Metal halide, fluorescent sources will not be used.
  - LED luminaires will be used where possible due to their sharp cut-off, lower intensity, good colour rendition and dimming capability.
  - A warm white spectrum (ideally <2700Kelvin) will be adopted to reduce blue light component.
  - Luminaires will feature peak wavelengths higher than 550nm to avoid the component of light most disturbing to bats (Stone, Jones, & Harris, 2012).

- Only luminaires with an upward light ratio of 0% and with good optical control will be used;
- Luminaires will always be mounted on the horizontal, i.e. no upward tilt;

The following sections set out an assessment of effects on each important ecological feature, and present mitigation measures required to address them.

4.2 Hedgerows

4.2.1 Potential Impacts

Construction Phase

The exact scale of hedgerow loss will depend upon the final layout of buildings within the proposed Didcot Technology Park. Under Local Development Order applications, the layout remains flexible and so this report assumes that all internal hedgerows are lost and those around the site boundaries are retained. This would lead to a loss of approximately 580 m of hedgerow habitat.

The hedgerows to be lost meet the priority habitat criteria but are species-poor agricultural hedgerows, many of which are defunct with significant gaps, or are remnant isolated hedgerow fragments. There are no mature or veteran trees within these hedgerows.

The hedgerows to be lost do not connect to the wider hedgerow network and as such their loss is unlikely to cause habitat fragmentation beyond the Site boundary. Hedgerow habitat is common and widespread within the locality, and as such, without mitigation, a negative effect on hedgerows at the Site level only is predicted.

Operational Phase

The hedgerow will border the built zone in the east of the Site, therefore may be subject to minimal pollution from the railway.

4.2.2 Mitigation and Compensation

New species-rich hedgerows will be created to replace species-poor hedgerows lost during development. The LDO commits to the planting of approximately 591m of new hedgerow along the eastern boundary of the Site.

In addition, a minimum of 10% area of each individual plot within the build zones will be landscaped for the benefit of biodiversity and thus it is likely that additional lengths of native species-rich hedgerow will be created within the build zones of the development. Both new and existing hedgerows will be bought into long-term management beneficial for biodiversity in accordance with the Site's Ecological Management Plan.

A sensitive lighting plan along this boundary will ensure lighting levels of < 1 lux.

4.2.3 Residual Impacts

It is predicted that the minimum compensation planting would lead to a minor gain of 11m of hedgerow, as well as an increase in species diversity within the hedgerow. With further native species-rich hedgerows also likely to be created within the build zones as part of the minimum of 10% area retained for soft landscaping within each individual plot. Overall, the proposed development is predicted to give a positive effect on the hedgerow resource at a Site level.

4.3 Ponds

4.3.1 Potential Impacts

Construction Phase

No ponds are to be lost as part of the development plan. Pond 2 will be enlarged to increase flood water storage capacity during the construction phase, work that will have a short-term impact on the marginal vegetation and fauna associated with the pond. As part of the works ecological enhancements will be made to the pond to provide shallow margins and large draw-down zones and incorporate wetland scrapes. In the medium to long-term, the proposed works will increase the biodiversity value of the pond which currently has steep banks and narrow shallow margins.

Expansion of the ponds would remove the line of trees around each pond.

There is a risk of enrichment and pollution run-off from construction into ponds.

Operational Phase

Ponds 1 and 2 will both form part of the sustainable urban drainage (SUDS) system for the Site and will receive water from a network of vegetated swales. These swales will carry water from roads and hardstanding during periods of heavy rainfall. The use of permeable paving will reduce the amount of water entering the swales, and the vegetation within the swale will help filter out fine sediment and pollutants. However, it should be acknowledged that there is a low risk of diffuse pollutants entering the ponds via the SUDS system. The risk of significant levels of pollutants entering the pond are not considered significant as the SUDS system will be designed to cope with the level of run-off predicted from Site roads.

The development of the HIF road is likely to increase traffic on the western edge of pond 1, however the removal of the road (TN5) between the ponds will decrease HGV transport though this area. As such, there is not predicted to be a substantial change in pollution (from people and/or traffic) or impact to the ponds. Commercial development does not typically lead to large increases in recreational or amenity pressure on surrounding habitats and a buffer of retained vegetation will maintain separation between Site traffic and the ponds. No sensitive species of flora or fauna were noted using the ponds during any of the previous ecological surveys and the potential presence of species sensitive to disturbance is considered unlikely. It is observed that the baseline conditions are such that the ponds are already subject to relatively high levels of disturbance as a result of the adjacent landfill haul road and the active use of both ponds as fishing lakes.

4.3.2 Mitigation and Compensation

Up to two additional ponds will also be created as part of ecological enhancements within the proposed development. These ponds will form part of the Site landscaping but will be designed in such a way as to maximise their potential benefit to biodiversity.

Line of trees around the ponds should be retained. The pond creation and enhancement will take place around these.

As part of the embedded mitigation and a construction environmental management plan (CEMP), pollution from transport and construction activities will be minimised and contained, and enriched run-off from development areas will be captured and prevented from running into water bodies, including the ponds on Site.

4.3.3 Residual Impacts

The enhancement of Pond 2 during development is considered to have a positive effect on the pond resource at Site level. The removal of the road currently separating ponds 1 and 2 will increase connectivity and reduce operational pollution through traffic.

4.4 Non-native Invasive Plants

4.4.1 Potential Impacts

Construction Phase

The curly water weed noted in the 2020 survey, and New Zealand pygmyweed within Pond 2 are both highly invasive in aquatic environments. Thus, without mitigation the proposed extension to Pond 2 in the construction phase of the development has the potential to result in the inadvertent spread of these plants via excavation works.

4.4.2 Mitigation

Any excavated sediments removed from Pond 2 should be retained on Site or disposed of appropriately to avoid the inadvertent spread of these plants[9]. Any sediments removed from the pond should also be stored at least 50m from other waterbodies or watercourses (e.g. the drainage ditch adjacent to the northern site boundary) for the same reason.

Once works to extend Pond 2 are complete, all machinery and tools should be cleaned off to remove mud and other debris before leaving the work area. An Ecological Construction Method Statement will be produced for the development contractors and this document will contain details regarding the presence of curly waterweed and New Zealand pygmyweed within Pond 2. The Method Statement will detail the actions to be taken and agreed method for disposal.

4.4.3 Residual Impacts

Overall, no significant effects on non-native invasive plants are predicted as a result of the proposed development.

4.5 Invertebrates

4.5.1 Potential Impacts

Construction Phase

The largest losses of habitat across the Site will occur in the southern modified grassland. This has low value for invertebrate species, particularly for pollinators. Northern build zone will result in a loss of neutral grassland, which has higher suitability for invertebrates sue to greater species diversity, biomass, and flowers. Loss of this area may cause impacts on pollinator invertebrate species. Pond expansion will disturb and potentially damage invertebrate species.

Unmitigated development would also create pollution in the form of waste, dust, light, noise, and vibration, all likely to impact and potentially kill protected or notable invertebrates.

[9] https://www.gov.uk/guidance/prevent-the-spread-of-harmful-invasive-and-non-native-plants

Operational Phase

Increased traffic around Site would likely impact invertebrate survival through collision.

4.5.2 Mitigation and Compensation

Habitats lost will be compensated or enhanced. Pond 2 will be expanded with larger areas of shallow water, good breeding habitat for many species including notable dragonflies. The neutral grassland will be enhanced to species-rich grassland, improving forage for pollinators and other species.

The removal of the HGV landfill access road (TN5) currently between the ponds will increase connectivity between these habitats, as well as reduce traffic-induced losses.

A CEMP will define mitigation measures to prevent waste and pollution into the Site and minimise impacts of noise and vibration on nearby habitats. A lighting strategy should be implemented to reduce invertebrate attraction to built areas and excessive predation.

4.5.3 Residual Impacts

Overall, the development is predicted to have a net positive impact on invertebrate species.

4.6 Amphibians

4.6.1 Potential Impacts

Aquatic habitats

Construction Phase

Pond 4 (pond locations shown in Drawing 3) was the only pond sampled to test positive for GCN presence during the eDNA survey completed in 2015, however more recent HIF Road surveys in 2020 conclude the species is absent. As other ponds surveyed within 500 m of the Site were also negative for GCN eDNA, and the Site has poor connectivity to other waterbodies due to roads and rail, it is unlikely that GCN are present on Site. GCN are reasoned to be absent from the Site and development footprint and therefore no adverse impacts arising from the proposed development are predicted.

Ponds 1 and 2 within the Site both provide suitable breeding grounds for other amphibian species. Pond 1 will be maintained, and Pond 2 will be retained and enhanced as part of the proposed development. This enhancement includes the expansion of the pond, which without mitigation, may damage and unintentionally kill amphibians, as well as nearby vegetation. Pollution from construction vehicles, and silt/soil run-off may instigate eutrophication.

Operational Phase

As discussed in Section 4.3.3, there is an overall positive impact on pond habitat post-construction and no impacts on water quality. No impacts are therefore predicted on amphibian aquatic habitats during the operational phase.

Terrestrial habitats

Construction Phase

The neutral grassland in the north of the Site, as well as vegetation around the ponds provides suitable terrestrial habitat for amphibians. As part of the pond expansion, as well as development of the built areas, there is likely to be a loss of some of this habitat, particularly in the southern end of fields TN 3, 4, and 6. Unmitigated development may cause kill sheltering amphibians, as well as increase waste and pollution in these areas.

Operational Phase

No impacts are predicted on amphibian terrestrial habitats during the operational phase.

4.6.2 Mitigation and Compensation

Pollution and waste mitigation will be incorporated into the CEMP to avoid pollution of aquatic and terrestrial habitats. Enriched run-off and silts will be captured and released elsewhere on Site (or appropriately disposed of if risk of invasive plant species) to prevent polluting the waterbodies.

Expansion of the pond should take place outside of the peak breeding/spawning season for the species on Site, between January and June, to minimise losses of amphibian eggs and tadpoles. Where possible, removal of fish from the ponds would improve survival as well as invertebrate diversity, forage for amphibians.

Staged cutting of the neutral grassland and pond-edge vegetation around pond 2 is necessary before development to minimise the risk of killing and/or injuring individual animals. Retention of willow trees and vegetation around the pond will minimise disturbance to amphibians. If this cannot be avoided, a qualified ecologist will need to survey the works, checking the habitat for amphibian species immediately prior to removal. Planting of native and appropriate freshwater plant species post-expansion will provide new habitat for species.

Up to two additional ponds will also be created as part of ecological enhancements within the proposed development. These ponds will form part of the Site landscaping but will be designed in such a way as to maximise their potential benefit to biodiversity. These ponds are predicted have further positive effects on any local amphibian population present.

It is anticipated that the enhancement of Pond 2 during development, and the creation of species-rich grassland and woodland edge habitat in proximity to both ponds will increase species diversity and invertebrate prey for amphibians, compensating for losses in overall area.

4.6.3 Residual Impacts

Overall, the proposed development is predicted to result in a positive effect on amphibian populations at the Site level.

4.7 Reptiles

4.7.1 Potential Impacts

Construction Phase

Baseline surveys completed in 2016 recorded small populations of grass snake and common lizard within the field margins in the east and west of the site, the railway corridor being considered a key habitat for this species group. Update surveys also recorded potential for reptiles within grassland in the north of the Site. Expansion of unmanaged neutral grassland in TN3, 4, and 6 in the north of the Site has increased suitable habitat for reptile species.

Unmitigated development will cause the loss of some of the unmanaged neutral through built zones and pond expansion. Removal of this suitable habitat may result in killing or injury to reptiles on Site, and impact to the local population.

Disturbance caused by noise, vibration, and vehicle movement during the construction phase is also anticipated to have a negligible impact on the local reptile population. The main area of reptile interest at the Site (TN11 and 12) is immediately adjacent to the embankment of the great western mainline

railway and these habitats are therefore regularly subject to loud noise, ground vibration, and train movements.

Operational Phase

Due to the height of the proposed buildings and the potential for them to be positioned in proximity to the eastern boundary partial shading of reptile habitats along this boundary may occur in localised areas during daylight hours. However, the building height along this boundary has been limited to 12 m which should help limit the effects of building shading on the suitability of the reptile habitat. The worst-case scenario for the extent of the shading is not predicted to make the habitat unsuitable for reptiles and habitat loss because of shading is not expected. However, the increased shading may lead to a loss of habitat condition, and thus may potentially limit or lower the reptile carrying capacity of the habitat.

As a result, and using the precautionary principle, in the absence of mitigation the proposed development would have a negative impact upon the reptile population at Site level.

4.7.2 Mitigation and Compensation

Across the whole site, to minimise the risk of killing and/or injuring individual reptiles, sensitive clearance of suitable habitats (i.e. areas of tall neutral grassland) will be undertaken prior to development. In brief, this will involve two-staged directional cutting of suitable habitats working towards retained habitat at the Site boundaries. The detailed methodology would be incorporated into an Ecological Construction Method Statement to be implemented prior to and during construction.

Enhancement of retained habitats for reptile would be achieved through the creation of species-rich grassland, dead wood piles, and hibernacula (as part of the ecological enhancements recommended in Section 4.17). These actions would focus on land adjacent to ponds 1 and 2 as this area is directly connected to the reptile habitat along the eastern boundary of the Site. Further graduated woodland-grassland edges in the western boundaries of the Site would also provide further suitable habitat, limiting potential impacts building shading on habitat quality along the eastern site boundary.

4.7.3 Residual Impacts

Overall, successful implementation of the mitigation, compensation and enhancement measures outlined above is predicted to result in a neutral effect on the reptile population at Site level.

4.8 Nesting Birds

4.8.1 Potential Impacts

Construction Phase

The effects of habitat loss and fragmentation would lead to a loss of carrying capacity within the Site during the construction phase. It is predicted that several common bird species would be affected, including the species of conservation concern recorded breeding / possibly breeding within the Site, namely bullfinch, dunnock, mallard, reed bunting, song thrush, skylark, and red kite. All these species are widespread, and the Site is unlikely to support a locally important population, due to poor quality habitat and the abundance of similar habitat in the wider landscape.

Large losses will occur to modified grassland habitats in the south of the Site, and some of the neutral grassland to the north. These areas provide poor, yet suitable habitat for ground-nesting farmland

birds such as skylark. Unmitigated clearing of these fields may result in the disturbance, displacement, injury, or killing of this species.

There will be a loss of approximately 580 m of low diversity hedgerow, suitable habitats for many nesting birds including dunnock. Unmitigated removal of this habitat may injure or kill nesting bird species and/or their young.

Ponds and surrounding vegetation also provide nesting habitat for aquatic birds, including mallard and reed bunting. Unmitigated removal of this habitat as part of the expansion of pond 2 may injure or kill nesting bird species and/or their young.

Pollution in the form of waste, noise, vibration, and light may cause disturbances to nesting birds during construction in all habitats, however the Site and local bird population is already subject to high levels of baseline disturbance from local agriculture, HGV transport, commercial operations, and the railway.

In the absence of mitigation, the proposed development would have a negative impact upon the breeding bird assemblage at Site level.

Operational Phase

Increased lighting around the built zones within the completed development may have an adverse effect upon the breeding bird habitats within the Site, particularly the proposed hedgerow along the railway. It may affect risk of predation or the energy required to successfully breed and maintain territories.

4.8.2 Mitigation and Compensation

As a general mitigation measure, vegetation clearance will be timed to avoid the breeding season (March to August inclusive). If this is not possible, a pre-works check will be undertaken by an experienced ecologist and advise provided on any habitat removal to ensure no breeding birds or active nests are disturbed.

Enhancement of the neutral grassland, including appropriate future management, will provide improved habitat for some ground-nesting birds, with more shelter and forage. The enhancement of pond area, species planting, and the connectivity between ponds 1 and 2 will also improve suitability for aquatic birds.

Compensation of hedgerow through replacement, greater species diversity, and suitable management, should improve the suitability of this habitat for nesting birds. Woodland edges and associated planting in the west of the Site will also create habitat for these species. Additional implementation of ecological enhancements include the provision of bird boxes mounted on trees and buildings.

The lighting scheme will avoid overspill or illumination of areas of retained habitat, and other created habitats intended for use by breeding birds.

4.8.3 Residual Impacts

Overall, successful implementation of the measures outlined above is predicted to give a neutral effect on the breeding bird assemblage at Site level.

4.9 Wintering Birds

4.9.1 Potential Impacts

Construction Phase

Unmitigated development will damage and destroy habitat suitable for wintering birds, including hedgerows and emergent vegetation around the ponds. This may disturb and displace birds.

Operational Phase

Lighting regimes from built zones may disturb overwintering species, particularly within the proposed hedgerow along the railway. It may affect risk of predation.

4.9.2 Mitigation and Compensation

The enhancement of pond area, species planting, and the connectivity between ponds 1 and 2 will improve suitability for aquatic birds through increased habitat, shallow water, and improved forage.

Compensation of hedgerow through replacement, greater species diversity, and suitable management, should improve the suitability of this habitat for wintering birds. Woodland edges and associated planting in the west of the Site will also create habitat for these species.

The lighting scheme will avoid overspill or illumination of areas of retained habitat, and other created habitats intended for use by wintering birds.

4.9.3 Residual Impacts

Overall, successful implementation of the measures outlined above is predicted to give a positive effect on the wintering bird assemblage.

4.10 Roosting Bats

4.10.1 Potential Impacts

Construction Phase

Bat roosts were identified within buildings 2, 3, and 5 within, and adjacent to the Site during the emergence surveys of the HIF road, completed in 2020. These were of common pipistrelle and soprano pipistrelle. Current development plans result in the demolishment of buildings 2, and 3. In the absence of mitigation the loss of these roosts would have a negative impact on these species of bats within the Site and may cause injury or killing of individuals. This loss and negative effect would extend beyond the Site as it would reduce the genetic exchange within the local population.

The bat roost identified in building 5 (Hartwright House) was a common pipistrelle located outside but immediately adjacent to the north-western application site boundary. The potential for disturbance to this bat roost during the construction phase is considered negligible on account of the building being separated from the proposed development Site by a large garden and boundary line of scrub and tall trees. No night time working is proposed and therefore illumination of the Site during construction is unlikely.

No trees within the application site or on the Site boundary were considered suitable for use by roosting bats, and no roosts were found during the HIF surveys.

Operational Phase

There may be an increase in traffic and lighting as a result of the development and the HIF Road past the roost in building 5.

Habitats around compensation areas for new roosts will require suitable management.

4.10.2 Mitigation and Compensation

Updated bat emergence / re-entry surveys ('roost detection' surveys) would be completed in the appropriate season in advance of the demolition of buildings 1, 2, and 3 to ensure the continued state bat roosts, as per the results of 2016 and 2020 surveys.

Building 5 is will not be demolished within the current plans, however updated roost detection surveys pre-development should be undertaken for appropriate mitigation. Woodland planting will be implemented to the south of this building, to screen the roost from additional build zone and HIF road lighting. The removal of the HGV landfill access road (TN5) to the east of the building will be removed, reducing traffic on this route.

If the update surveys did detect the presence of a bat roost(s) it is considered unlikely to be for a species or roost type of moderate or high conservation importance. Mitigation of any roosts found would be implemented and agreed as part of a European protected species (EPS) licence application to ensure the favourable conservation status of the species is maintained. Appropriate measures can then be taken by an ecologist to safely remove or exclude the bats. Compensation of appropriate bat roosts will be provided as a purpose-built bat roost in the north of the Site, with suitable nearby commuting and foraging habitat.

The provision of bat boxes mounted on trees and buildings would increase roosting opportunities within the Site. These should be focused in the north of the Site, away from the larger build zones and associated lighting.

4.10.3 Residual Impacts

Successful implementation of the compensation and enhancements measures outlined above is predicted to give a neutral effect on roosting bats at the local level.

4.11 Foraging and commuting bats

4.11.1 Potential Impacts

Construction Phase

The proposed development would lead to loss and fragmentation of bat foraging habitat and commuting routes at the Site. The proposed development would lead to the loss approximately 580 m of hedgerow, most of which is defunct and species-poor and located within the Site interior. The 2016 baseline survey data indicates that these commuting routes are little used by bats. Treeline habitats around the perimeter of the Site will be retained and provide a similar function.

The loss and fragmentation of bat foraging habitat and commuting routes is therefore predicted to have a negative effect.

Operational Phase

Increased lighting (i.e. security and highways lighting), and traffic of the Site and HIF Road during its operation, is a potential impact upon commuting and foraging bats, and upon commuting routes from

the known roosts in buildings 2, 3, and 5. Unmitigated, increased lighting could have a negative effect to commuting and foraging bats on Site.

4.11.2 Mitigation and Compensation

The loss and fragmentation of bat foraging habitat and commuting routes is to be compensated for by a range of habitat creation measures. Approximately 590m of new species-rich hedgerows will be planted along the east of the Site, as well as the creation of woodland edge-type habitats (trees grading down to scrub and grassland) along the west. The treeline along the road between the buildings will be retained. This will strengthen and increase the commuting routes for bats around the perimeter of the Site, in addition to providing an improved foraging resource for bats due to greater species diversity. Other measures within the Site, including the creation of species-rich meadows in the north and increasing the area of Pond 2 will also result in increased numbers of flying insects, thereby increasing the quality of habitat for bat foraging.

The effects of increased lighting upon commuting and foraging bats will be mitigated for via a sensitive lighting scheme for the development. This will be particularly important in several areas, namely in the vicinity of Hartwright House (Building 5) to avoid affecting commuting routes from the known bat roost, and the habitat buffer being retained around the perimeter of the Site to maintain the current integrity of these areas for commuting.

In these areas the lighting scheme will be designed to ensure light levels are a maximum of 1 lux or below. Whilst these areas are considered to be a priority for mitigation, lighting impacts on linear semi-natural habitat within the build zone would be minimised where possible to ensure they are suitable for use by commuting and foraging bats.

Where lighting is required, the design will include back shields/baffles and luminaires with additional shields to cut down light pollution. Where possible lights will be operated by Passive Infra-Red (PIR) sensors to reduce levels of permanent light.

4.11.3 Residual Impacts

Successful implementation of the compensation and enhancements measures outlined above is predicted to give a neutral effect on commuting and foraging bats at the local level.

4.12 Otter

4.12.1 Potential Impacts

Construction Phase

Ponds 1 and 2 within the Site both provide suitable habitat for otter, despite no evidence of this species on Site. Pond 1 will be maintained, and Pond 2 will be retained and enhanced as part of the proposed development. This enhancement includes the expansion of the pond, which will damage pond edge habitat. Pollution from construction vehicles, and silt/soil run-off may instigate eutrophication.

Operational Phase

As discussed in Section 4.3.3, there is an overall positive impact on pond habitat post-construction and no impacts on water quality. No impacts are therefore predicted on amphibian aquatic habitats during the operational phase.

4.12.2 Mitigation and Compensation

Pollution and waste mitigation will be incorporated into the CEMP to avoid pollution of aquatic and terrestrial habitats. Enriched run-off and silts will be captured and released elsewhere on Site (or appropriately disposed of if risk of invasive plant species) to prevent polluting the waterbodies.

The expansion and diverse planting of pond 2 will result in improved habitat for otter.

4.12.3 Residual Impacts

Overall, successful implementation of the compensation measures outlined above is predicted to give a neutral effect on the otter population at the Site level.

4.13 Badger

4.13.1 Potential Impacts

Construction Phase

No badger setts will be destroyed as a result of the proposed development. The four-hole subsidiary badger sett observed in 2020 is 5 m outside of the application site boundary and at least 20 m from the closest area of built development. It was then considered there was negligible risk of any part of the sett being inadvertently damaged by the adjacent development works.

The arable land and agricultural grassland within the Site provides suitable foraging habitat for badgers. Whilst a high proportion of these habitats will be lost during the construction phase of the development, the habitats are not considered to be critical to the support of the local badger population on account of the abundance of similar habitats in the vicinity and the lack of other setts within the application site (thus highlighting their access to other foraging areas). Given the maintenance of the 10m buffer zone around the perimeter of Site the development is not considered likely to have any significant effect on badger movement during the construction phase of the development.

Without mitigation, the construction of the proposed development would have a neutral effect on foraging badgers at Site level only.

Operational Phase

The existing Site is already subject to high levels of existing disturbance (e.g. wood recycling, agricultural management, adjacent rail line) and the operational phase of the proposed development is not therefore predicted to result in increased levels of noise or human disturbance that would adversely affect the viability or occupation of the subsidiary badger sett adjacent to the southern boundary of the Site.

Without mitigation, the operational phase of the development alone would be predicted to result in a neutral effect on the local badger population.

4.13.2 Mitigation and Compensation

As part of the Ecological Construction Method Statement a check of the development area would be undertaken immediately prior to the works commencing with special care being taken to check for any signs of badger activity or signs of sett creation. Should any signs of activity i.e.: setts be found then the works within 20 m of the sett then the development would need to be delayed until it can be established if the sett is considered active or not and if it is therefore whether a Natural England Badger sett closure licence is required.

Mitigation measures proposed to protect the existing sett, if determined in use immediately prior to works commencing, would include marking out a 20m exclusion zone around the sett using hazard tape or barrier fencing. This physical barrier will prevent inadvertent access to areas within 20m of the sett during construction works and will limit any potential disturbance impacts.

Best practice protection measures are recommended for construction to ensure badgers (and other small to medium size mammals) are protected throughout the works:

- Any trenches or deep pits within the development site that are to be left open overnight should be provided with a means of escape should a badger enter. The simplest method for this would be in the form of a roughened plank of wood placed in the trench as a ramp to the surface. This is particularly important if the trench fills with water;
- Any trenches/pits should be inspected each morning to ensure no badgers have become trapped overnight. Should a badger become trapped in a trench it will likely attempt to dig itself into the side of the trench, by forming a temporary sett;
- The storage of topsoil or other 'soft' building materials on site should be given careful consideration. Badgers will readily adopt such mounds as setts. So as to avoid the adoption of any mounds, these should be kept to a minimum and any essential mounds subject to daily inspections with consideration given to temporarily fencing any such mounds to exclude badgers;
- The storage of any chemicals/liquids on site should be well away from the boundaries and contained in such a way that they cannot be accessed or knocked over by any roaming badgers; and
- Fires should only be lit in secure compounds away from areas of potential badger activity and not allowed to remain lit during the night.

The hedgerow and woodland-edge planting proposed within the Site are likely to provide increased cover suitable for the creation of badger setts and the areas of species-rich grassland are likely to represent high quality foraging habitats.

4.13.3 Residual Impacts

Implementation of the compensation measures outlined above is predicted to give a neutral effect on the badger population at the Site level. However, the cumulative effects of the HIF road and North East Didcot developments will greatly reduce the local badger potential territory. As such there is predicted to be a **negative** effect on the local badger population.

4.14 Hedgehog

4.14.1 Potential impacts

Construction Phase

Unmitigated development would remove some grassland and all hedgerow habitat. This is likely to cause some loss of foraging and commuting habitat for hedgehog (if present). Unmitigated development may pose risks of terrestrial mammals falling into trenches and getting injured/trapped or getting poisoned by any chemicals not secured overnight (particularly hedgehog which are very inquisitive with strong smells).

Operational Phase

There is likely to be a minimal change in traffic on Site, as a result of this development. However, in combination with the HIF Road development, there is likely to be a negative impact on the local hedgehog population due to reduced connectivity and increased mortality.

Mitigation and Enhancement Measures

As part of the Construction Ecological Management Plan a check of the development area would be undertaken immediately prior to the works commencing. Removal of hedgerow and areas of leaf litter or tree roots should take place outside of the hibernation season (October to April inclusive). If this is not possible, searching of these areas pre-development should be undertaken by a qualified ecologist. Should any hedgehogs be found, they would be relocated to a safe location.

In order to minimise the potential for killing or injuring hedgehogs (and other small to medium sized mammals) during Site clearance, removal of dense vegetation and tall grass should be undertaken using appropriate two-staged cutting. The vegetation should be checked for mammals between these two cuts by a qualified ecologist. Should any hedgehogs be found, they should be moved to a suitable area of habitat that is not subject to clearance.

Any trenches created during construction will either be filled in overnight or have an escape ramp in the form of either an earth slope or wooden plank. Any chemicals stored on site must be sealed and securely stored, and any fuel spills cleared promptly in daylight hours.

The hedgerow and woodland-edge planting proposed within the Site as well as areas of species-rich grassland are likely to provide improved habitat for hedgehogs.

Hedgehog housing will be provided in the western boundary of the Site, alongside the woodland edge planting in that area.

4.14.2 Residual Impacts

Overall, successful implementation of the compensation measures outlined above is predicted to give a neutral effect on the hedgehog population at the Site level.

4.15 Brown hare

4.15.1 Potential impacts

Construction Phase

Unmitigated development would remove large areas of modified grassland and some neutral grassland habitat. This is likely to cause some loss of foraging and commuting habitat for brown hare. Unmitigated development may pose risks of terrestrial mammals falling into trenches and getting injured/trapped or getting poisoned by any chemicals not secured overnight.

Operational Phase

There is likely to be a minimal change in traffic on Site as a result of this development, as the HGV access road (TN5) between the ponds will be removed, increasing connectivity around the Site. However, in combination with the HIF Road, and North East Didcot development, there is likely to be a negative impact on the local brown hare population.

4.15.2 Mitigation and Enhancement Measures

In order to minimise the potential for killing or injuring hare (and other small to medium sized mammals) during Site clearance, removal of dense vegetation and tall grass should be undertaken using appropriate two-staged cutting. The vegetation should be checked for mammals between these two cuts by a qualified ecologist. Should any hedgehogs be found, they should be moved to a suitable area of habitat that is not subject to clearance.

Any trenches created during construction will either be filled in overnight or have an escape ramp in the form of either an earth slope or wooden plank. Any chemicals stored on site must be sealed and securely stored, and any fuel spills cleared promptly in daylight hours.

Managed species-rich grassland will provide improved habitat for foraging hare, as well as greater shelter for rearing young (leverets).

4.15.3 Residual Impacts

Overall, implementation of the compensation measures outlined above is predicted to give a **negative** effect on the brown hare population at the Site level.

4.16 Cumulative Effects

The cumulative effects from the construction and operational phases of this proposal are considered in combination with other projects in the area.

HIF Scheme – Didcot-Culham River Crossing Road (HIF Road)

The HIF Road development has been included within the proposed layout and includes a CEMP to outline measures to mitigate for significant disturbance alongside the Site development. Minimal removal of habitats on Site will be necessary as a result of the HIF Road. A potential cumulative effect may be in increase of traffic along the road, reducing air quality. It is unlikely to significantly increase noise and vibration within the Site, as current levels are high due to the HGV access road (TN5) that runs between the ponds, the commercial buildings, and adjacent railway. This road runs along the likely commuting route of bats roosting in buildings 5. As such, lighting and air pollution are likely to impact these roosts as well as foraging/commuting species along these routes. Woodland planting south of building 5 will provide increased screening from the HIF Road. Additional planting of north-south species-rich hedgerow in the east of the Site, will provide suitable alternative routes and foraging habitat for bats, as well as compensate for hedgerow loss along the road.

The increased traffic of the HIF Road may increase mortality of small terrestrial mammals such as hedgehog and brown hare and decrease connectivity of their habitats. Hedgehog houses will be created in the western boundary of the Site, alongside the woodland edge planting, providing new habitat and forage for this species. The loss of open modified grassland habitat and increased traffic is likely to have a negative impact on the local brown hare population.

North East Didcot Development

The North East Didcot Development is located approximately 60 m east of the Site at the closest point and is proposed on an area of species-poor intensively managed farmland.

The in-combination effect of habitat loss and fragmentation during the construction phase and increased disturbance (through increased lighting) during the operation phase could, without mitigation, lead to an additional decrease in habitat quality for bats. However, with the successful implementation of mitigation and compensation measures recommended any in-combination effects are expected to be insignificant.

The operational loss of arable habitat/modified grassland in combination with the Technology Park will reduce habitat for terrestrial mammal territories such as brown hare and badger and is likely to have an impact on these species.

4.17 Proposed Biodiversity Enhancements

A range of biodiversity enhancements are proposed to ensure that the Didcot Technology Park development delivers at least a neutral impact to important ecological features highlighted by this assessment.

The biodiversity enhancements suggested are in addition to the mitigation and compensation measures already detailed. The enhancements suggested are considered suitable for the geology and context of the site, and where appropriate, target habitats or species of local conservation priority. Ecological enhancements at the Site will include the following:

- A network of ecological enhancement zones both within the build zones (10% of each individual built plot will be reserved for soft landscaping for the benefit of biodiversity) and comprising the 10m buffer zone around the perimeter of the site will have new habitats of high value for biodiversity created. This will represent a significant improvement for biodiversity on the existing low distinctiveness habitats currently present in these areas. The subsequent management of the newly created habitats will also represent an enhancement on the current intensive agricultural management at the site.
- Grasslands within the soft-landscaped part of build zones and ecological enhancement areas, shall be seeded with species-rich mixes that provide a 'meadow' type community that will also be managed to maintain a diversity of species of biodiversity value. There were no areas of species-rich grassland lost as a result of this development so this would represent a biodiversity benefit.
- Woodland edge habitats will be created around the margins of the Site to provide a range of habitat grading from woodland to scrub, and scrub to grassland. Such habitats have high biodiversity values on account of being highly productive with abundant flowers and fruits and having high structural heterogeneity.
- Pond 2 will be enhanced and enlarged to create shallow margins, large draw-down zones and a number of wetland scrapes, as well as biodiverse native planting, significantly increasing its current biodiversity value.
- New surface water drainage ponds and vegetated swales created within the technology park will be designed to ensure they provide a biodiversity benefit, as well as performing a drainage function.
- Whilst there is limited scope for biodiversity enhancement of the Pond 1 or its surroundings, this pond will be maintained such that it's recreational and amenity use can continue. The long-term maintenance of the feature will ensure its value for recreation activities into the future, which is considered an important Ecosystem Service and amenity function for local people.
- Biodiverse green roofs on buildings.
- Urban tree planting within the build zones.

In addition to this a range of small scale constructed habitat features would be incorporated into the Site, targeting key faunal species. These would include but are not restricted to:

- A range of bat boxes (tree and building mounted to serve different species and seasons), at least 10 per build zone;
- A range of bird boxes to serve a varied range of species, both tree and building mounted at least 10 per build zone;
- Insect boxes to be located mainly on the edges of the built environment;
- A minimum of four artificial (log and rubble) hibernacula for reptiles and amphibians to be located in areas of suitable habitats (in grassland, edge of scrub and by wetlands areas for example); and
- A minimum of five deadwood piles within secluded areas of the site for invertebrates and lower plants to colonise.
- Hedgehog housing is to be created in the western boundary of the Site, alongside the woodland edge.

In parallel to these measures, it is proposed that an Ecological Management Plan will be drafted to inform the management of both new and existing habitats post-development. The implementation of a management plan combined with the enhancements proposed above will provide a biodiversity benefit within the Site.

4.18 Proposed Monitoring

If approved, Didcot Technology Park would be constructed under a Local Development Order. This method of planning approval offers significant flexibility regarding the proposed timescale of development. Construction activities may therefore take place soon after the order is approved, over several years, or at some point in the future. Baseline ecological monitoring is therefore required to ensure that ecological conditions at the site remain the same until the development is completed. The type of monitoring and frequency required are highlighted in Table 3 below and details of the surveys would be provided in the ecological construction management plan.

Table 3 - Summary of Proposed Ecological Monitoring

Survey	Description	Timing and Frequency
Ecological Walkover	Walkover survey required to update general ecological baseline for the Site. This will include assessment of habitat changes and a search for evidence of protected species.	Single visit between April and September. Conducted in the appropriate season prior to development works commencing in each new development zone.
Great Crested Newt	Environmental DNA (eDNA) survey of all ponds within 500m of the Site to ensure great crested newts are absent from the site.	Single visit between 15th April and 30th June. Conducted in the appropriate season prior to development works commencing in each new development zone.
Bats	Update emergence / re-entry surveys on Buildings 1, 2, 3, 5	Surveys completed between May and September. Surveys

Survey	Description	Timing and Frequency
	prior to demolition. This is to ensure bats roosts have not established within buildings since baseline surveys.	should be undertaken at the earliest possible opportunity within the year of proposed building demolition.
Reptiles	An assessment of suitable habitat, namely neutral grassland on Site, can be undertaken to assess continued likely presence of reptiles. If habitat has changed, update survey to ensure the size and extent of reptile population at the Site has remained unchanged since the baseline survey.	Surveys completed between April and October. Surveys should be undertaken at the earliest possible opportunity within the year of proposed habitat clearance within each new development zone.
Nesting Birds	Update survey to ensure the breeding bird assemblage at the Site remains unchanged.	Update survey only required if habitat baseline is deemed to have changed significantly since baseline breeding bird survey was completed.
Badger	A walkover to check the status of the badger sett named in the south of the Site, and check presence of others in the rest of the Site.	Survey to be conducted immediately prior to development works commencing in each new development zone.

4.19 Summary of Effects

A summary of potential impacts, proposed mitigation, residual effects and, where relevant, proposed compensation measures is provided for each important ecological feature included in the assessment in Table 4. Assuming the mitigation and enhancements are implemented as described, no further residual impacts are anticipated with regards to species as a result of the proposal.

Table 4 - Summary of Potential Impacts, Proposed Mitigation and Residual Effects

Ecological Feature	Potential Impacts	Proposed Mitigation	Means of Delivering Mitigation	Residual Effects
Hedgerow	Loss or damage to priority habitat	New native and species-diverse hedgerow to be created. This and existing hedgerow to be managed to benefit biodiversity.	Planning Condition Ecological Management Plan	Positive at Site level
Ponds	Damage to priority habitat directly through construction, or indirectly via pollutants	Pollution control measures. Expansion of pond 2 and addition of up to two new ponds on Site.	Planning Condition	Positive at Site level
Other neutral grassland	Loss of habitat important for Site biodiversity.	Pollution control measures. Enhancement into species-rich grassland.	Planning Condition Ecological Management Plan	Neutral at Site level
Non-native Invasive Plants	Spread of non-native invasive species from pond 2.	Appropriate disposal of excavated sediments from pond. Cleaning of construction equipment.	Planning Condition Ecological Construction Method Statement	Not Significant
Invertebrate	Disturbance during construction and loss of habitat	New native and species-diverse habitats to be created.	Planning Condition	Positive at Site level
Amphibians	Disturbance during construction and loss of habitat	Sensitive clearance of vegetation under ecological supervision. Expansion and creation of ponds. Improvement/creation of terrestrial habitats. Creation of hibernacula and wood piles.	Planning Condition Ecological Construction Method Statement	Positive at Site level

Ecological Feature	Potential Impacts	Proposed Mitigation	Means of Delivering Mitigation	Residual Effects
Reptiles	Disturbance during construction and loss of habitat	Sensitive clearance of vegetation under ecological supervision, including timing of works to minimise impact. Improvement/creation of terrestrial habitats. Creation of hibernacula and wood piles.	Planning Condition Ecological Construction Method Statement	Neutral at Site level
Nesting Birds	Disturbance during construction and loss of habitat. Potential for light spill impact leading to increased predation and affecting breeding.	Pre-vegetation removal check. Timing restriction on development in nesting season or supervised clearing by ecologist. Implementation of a lighting strategy will prevent light spill impacting linear features. Increase in quality of hedgerows and habitats. Installation of bird boxes.	Planning Condition Ecological Construction Method Statement	Positive at Site level
Wintering Birds	Disturbance during construction and loss of habitat. Potential for light spill impact leading to increased predation and affecting breeding.	Pre-vegetation removal check. Timing restriction on development in wintering season or supervised clearing by ecologist. Implementation of a lighting strategy will prevent light spill impacting linear features. Increase in quality of habitats.	Planning Condition Ecological Construction Method Statement	Positive at local level
Roosting Bats	Potential for light spill impact leading to loss of use of habitat or disturbance of commuting and foraging bats.	Application of EPS licence for conservation/removal. Creation of new bat roost. Installation of bat boxes.	Planning Condition Ecological Construction Method Statement	Neutral at local level

Ecological Feature	Potential Impacts	Proposed Mitigation	Means of Delivering Mitigation	Residual Effects
Foraging/ Commuting Bats	Loss of foraging and commuting habitat.	Increase in quality of hedgerows and habitats. Implementation of a lighting strategy will prevent light spill impacting linear features.	Planning Condition Ecological Construction Method Statement	Neutral at local level
Otter	Disturbance during construction and loss of habitat	Sensitive clearance of vegetation under ecological supervision, including timing of works to minimise impact. Expansion and enhancement of pond 2.	Planning Condition Ecological Construction Method Statement	Neutral at Site level
Badger	Disturbance during construction, damage of potential setts, and loss of habitat Loss of habitat from adjacent developments	Pre-development check of the site by a suitably qualified ecologist. Best practice methods of construction. Creation of woodland edge habitats and species-rich grassland within the application site suitable for badger sett-building and foraging.	Planning Condition Ecological Construction Method Statement	Negative at Site level
Hedgehog	Disturbance during construction and loss of habitat Increased mortality from HIF Road	Sensitive clearance of vegetation under ecological supervision, including timing of works to minimise impact. Increase in quality of hedgerows and habitats. Provision of housing in western boundary.	Planning Condition Ecological Construction Method Statement	Neutral at local level
Brown Hare	Disturbance during construction and loss of habitat Increased mortality from HIF Road	Sensitive clearance of vegetation under ecological supervision, including timing of works to minimise impact. Increase in quality of grassland habitat.	Planning Condition Ecological Construction Method Statement	Negative at local level

5.0 Conclusions

Reef Estates Ltd have proposed a technology park development ('Didcot Technology Park') on land at Hill Farm, Appleford, Didcot, OX14 4PJ (Grid Reference: SU 52232 91999). The Site consists of a number of managed and unmanaged arable fields and neutral grassland, divided by hedgerow and mixed scrub. This is dissected by roads aligned north-south. There are also two fishing ponds in the north of the Site, as well as developed land under commercial and residential use.

On the basis of ecological surveys, the habitats within the Site were also known to, or considered likely to, support protected or notable species of:

- Non-native invasive plants (curly waterweed and New Zealand pygmyweed);
- Invertebrate;
- Amphibians;
- Reptiles (common lizard and grass snake);
- Nesting birds;
- Wintering birds;
- Roosting bats;
- Foraging and commuting bats;
- Otter;
- Badgers;
- Hedgehog; and
- Brown hare.

Since previous surveys in 2016 and 2020, modified grassland in the north of the Site has developed into neutral grassland due to lack of management. As such, this habitat has greater suitability for a range of species including invertebrates, amphibians, and reptiles. Additionally, bat roosts were identified in multiple buildings proposed for demolition. The adjacent development of the HIF 1 Didcot – Culham River crossing road has been taken into consideration when determining the impact of ecological features on Site.

Following successful implementation of the proposed mitigation, enhancement, and compensation measures, there would be a positive effect on priority habitats on Site; hedgerow and ponds. There is predicted to be a positive effect on protected and notable invertebrates, nesting, and wintering birds. There is predicted to be a neutral effect on amphibians, reptiles, rooting, foraging, and commuting bats, otter, and hedgehog. There is predicted to be a negative effect on badger and brown hare as a result of cumulative effect of the HIF Road, North East Didcot, and Didcot Technology Park developments due to habitat loss, fragmentation, and increased traffic.

6.0 References

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DRAWING 1 – UK HABITAT SURVEY

452000

452500

192500

192000

W1 - w1g6

h2a

W2 - w1g6

u1e 111

r1 19

1

2

r1 19

u1e 111

4

g3c 16

W3 - w1g6

3

g3c

12

g3c 10 11

5

h3h

h3h

h2a

10

u1b5

u1b5

g3c

6

u1e 111

h3h

W4 - w1g6

h2a

u1b5

7

g3c 10 11

g4

h2a

g4 65

8

h3h 11

h3h

g3c 69

g4 60

11

9

h2a

r1 191

0

200

400

Metres

N

LEGEND

Site Boundary

UK Habitat Classification

h2a - Hedgerow (Priority Habitat)

u1e - Built Linear Features

g3c - Other Neutral Grassland

g4 - Modified Grassland

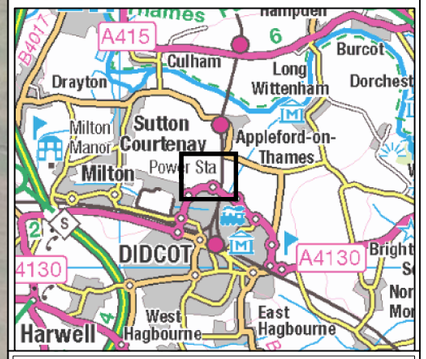
h3h - Mixed Scrub

r1 - Standing Open Water and Canals

u1b5 - Buildings

w1g6 - Line of Trees

Secondary Habitats
10 - Scattered Scrub
11 - Scattered Trees
16 - Tall Herb
19 - Ponds (Priority Habitat)
60 - Sheep Grazed
65 - Hay
69 - Fence
111 - Road
191 - Ditch



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DIDCOT TECHNOLOGY PARK LDO

PRELIMINARY ECOLOGICAL APPRAISAL

UK HABITAT CLASSIFICATION

FIGURE 1

Scale 1:4,000 @ A3

Date NOVEMBER 2022

425.064506.00001.0002.1 UK Habitat Classification

DRAWING 2: DESIGNATED SITES MAP

449000 450000 451000 452000 453000 454000 455000

194000 193000 192000 191000

425.064506.00001.0001.0 Designated Sites

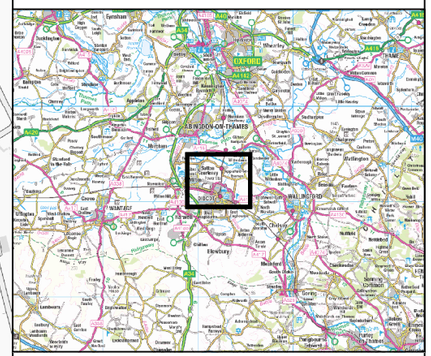
N

LEGEND

- Site Boundary
- Site Boundary 2 km Buffer
- Ancient Woodland
- Sutton Courtenay Environmental Education Centre

Priority Habitat Inventory

- Deciduous woodland
- Lowland meadows
- No Main Habitat but Additional Habitats Present



0 0.25 0.5 0.75 1

Kilometres

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ECOLOGY

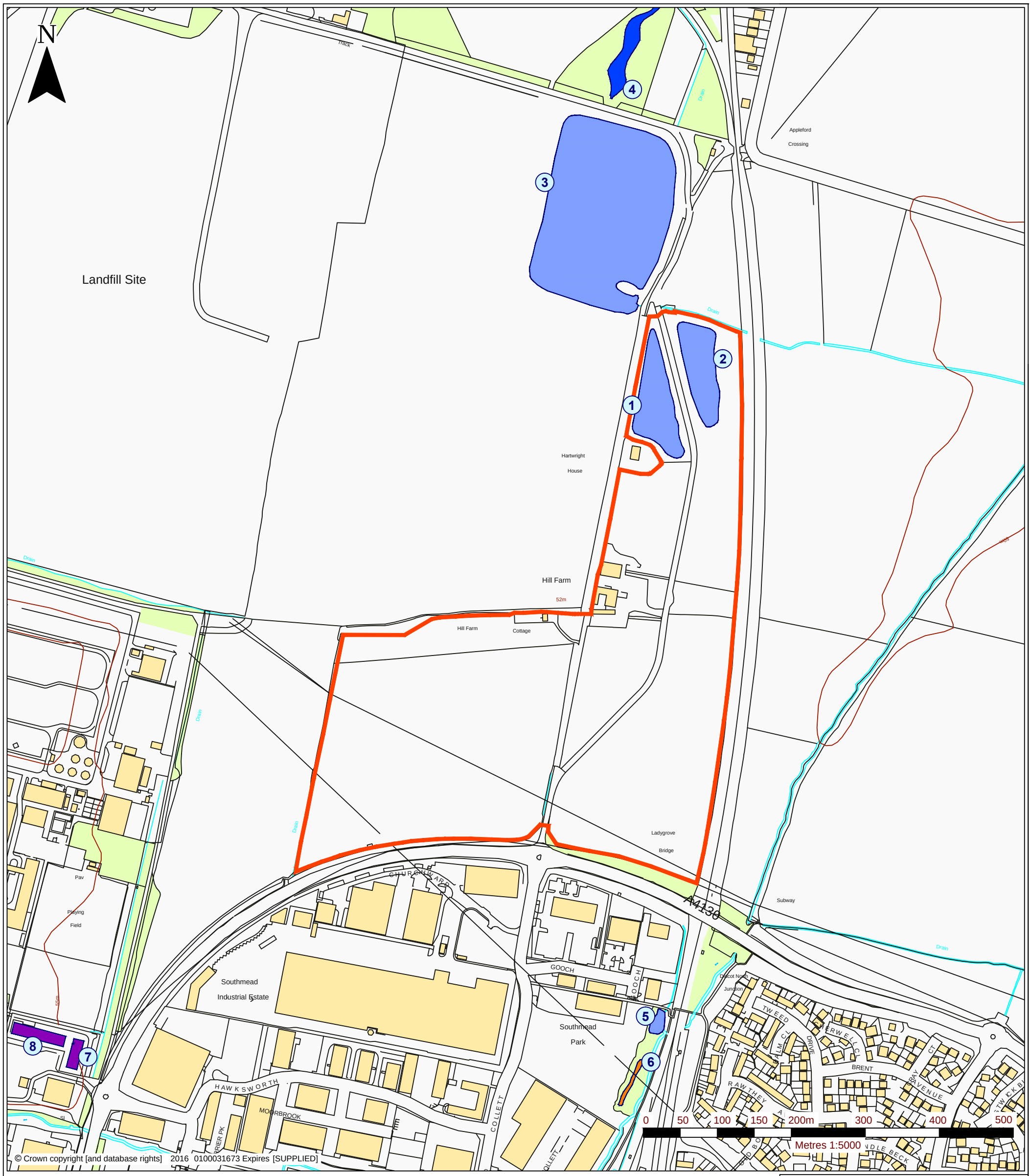
DESIGNATED SITES WITHIN 2KM

FIGURE 1

Scale 1:20,000 @ A3

Date AUGUST 2022

DRAWING 3: LOCATION OF PONDS WITHIN 500 M



LEGEND

- SITE BOUNDARY
- 4 POND NUMBER
- POND SURVEYED GREAT CRESTED NEWT ABSENT
- POND SURVEYED GREAT CRESTED NEWT PRESENT
- POND NOT SURVEYED POND DRY
- POND NOT SURVEYED NO ACCESS

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DIDCOT TECHNOLOGY PARK

GREAT CRESTED NEWT SURVEY

GREAT CRESTED NEWT SURVEY PLAN

DTP/GCN1

Scale 1:5000 @ A3

Date AUGUST 2016

01455.00006.19.DTP-GCN1.1_GCN_NEWT_SURVEY.dwg

DRAWING 4: LOCATION OF BUILDINGS

N

Drain

Hartwright

House

B5

B1

Hill Farm

B2

52m

B4

B3

Hill Farm

Cottage

Drain

Ladygrove

Bridge

0

80m

200

Metres 1:2500

LEGEND

SITE BOUNDARY

BUILDING

B1 BUILDING REFERENCE NUMBER

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BAT SURVEY

BAT SURVEY AREA AND BUILDING LOCATION PLAN

DTP/BAT1

Scale 1:2500 @ A3

Date AUGUST 2016

01455.00006.19.DTP-BAT1.1_BAT_SURVEY&BUILDINGS.dwg

DRAWING 5: PROPOSED DEVELOPMENT LAYOUT

Rev	Date	Description
REEF GROUP	Job Title: Didcot Technology Park	Drawing Name: ECOLOGY STRATEGY PLAN
51 Welbeck Street, London, W1G 9HL T: 020 7637 0601 W: www.reefgroup.co.uk	Drawing Status: LDO	Drawing Scale: 1:3500 @A4
URBANR	Date Issued: 26.09.22	Layout ID: Fig 4 Revision

EC01 POND AREA

Existing eastern pond will be enlarged to increase flood water storage capacity. As part of works ecological enhancements will be made to the pond to provide shallow margins and large draw down zones, and incorporate wetland scrapes, thereby increasing the biodiversity value. Species-rich grassland will be created adjacent to the pond to provide additional suitable habitats for reptiles. Existing western waterbody has limited opportunities for ecological enhancement due to existing recreational use as a fishing lake. However, long-term maintenance of the habitat will ensure its existing biodiversity value is maintained, along with its value for recreation which is an important ecosystem service.

EC02 HARTWRIGHT HOUSE EDGE

Woodland planting is proposed to this area to screen bat roost in Hartwright House from light spill. A habitat grading from trees to scrub, and then scrub to grassland will be achieved to create a woodland edge and a grassland ride habitat. Artificial lighting in the area will be sensitively designed to ensure light levels around Hartwright House remain <1 lux.

EC03 PARK DRIVE CORRIDOR ZONE

It is envisaged to create landscaping along the park drive with wetland features as part of an overall sustainable urban drainage design. This will include a series of basins, connected by shallow above ground, drainage swales and linear wetlands. The main SUDS attenuation area will be enhanced for biodiversity by providing shallow areas, gentle slopes, and with pond margins planted with a range of native aquatic plants. Dry flood storage areas will be stripped of top-soil and sown to species-rich grassland. The strategic landscape planting in this zone will use species of proven benefit to wildlife (i.e. fruiting and flowering species offering nectar and berries) and will therefore have a biodiversity benefit, as well as aesthetic appeal.

EC04 NORTHWEST EDGE WOODLAND

The broadleaved woodland in this area will be expanded with additional tree planting and woodland edge habitat will be created, providing a range of habitats from mature woodland grading to scrub and species-rich grassland. This habitat will be extended along the length of the zone to provide a continuous habitat corridor around the built development. The proposed lighting scheme this area will have light levels of 1 lux or below to minimise the risk of impacts to commuting and foraging bats and other wildlife.

EC05 SOUTHWEST EDGE

The mostly broad-leaved semi-natural woodland along the A4130 is retained.

There are also two areas of dense scrub which form part of the southern and western boundaries. These areas are comprised of small trees and scrub of varying heights and maturity.

Habitat connectivity and biodiversity value along these boundaries will be increased by creating woodland edge and grassland ride habitat (habitat grading from trees to scrub, and then scrub to grassland etc). A sensitive lighting scheme in this area will ensure habitats suitable for bat foraging and commuting along the site boundary will have light levels of <1lux.

EC06 CENTRAL ZONE (EAST)

This zone applies to the access areas off the 'park drive' primary connectors. This may also include a sustainable urban drainage swales enhanced for biodiversity (including shallow margins, gentle slopes, and planting with a range of native aquatic and marginal plants) and the creation of new areas of species-rich grassland. The strategic landscape planting in this zone will use species of proven benefit to wildlife (i.e. fruiting and flowering species offering nectar and berries) and will therefore have a biodiversity benefit, as well as aesthetic appeal.

EC07 RAILWAY EDGE

Habitat connectivity along the eastern boundary is to be improved through the creation of a new native species-rich hedgerow with standard trees. This will re-connect and enhance the existing fragments of hedgerow, thereby improving the eastern boundary for commuting and foraging bats. Sensitive lighting along this boundary will ensure light levels of less than 1 lux are maintained along this route. This hedgerow will border the built development and will provide a screen for a wildlife corridor of species-rich grassland along the eastern boundary. This grassland will provide areas of additional habitat for the reptile population along the eastern boundary of the site. Northern areas will include shallow drainage swales and linear wetlands which will be enhanced for biodiversity by providing shallow areas, gentle slopes, and with pond margins planted with a range of native aquatic plants.

BUILD ZONES

The main landscape treatment to the development plots is relatively formal, with close cut grass lawns and ornamental hedges with specimen trees and flowering shrubs. Towards the margin of each plot the landscape treatment becomes much more informal, grassland becoming richer in wildflowers and features to encourage wildlife colonization, such as habitat stacks and native shrub blocks predominating. These connect with the landscape framework of hedges and swales to create a strong ecological matrix. A minimum of 10% soft landscaping per individual plots must be provided.

Rev	Date	Description	
REEF GROUP		Job Title: Didcot Technology Park Appleford, Abingdon OX14 4PJ	Drawing Name: ECOLOGY STRATEGY PLAN LEGEND
51 Welbeck Street, London, W1G 9HL T: 020 7637 0601 W: www.reefgroup.co.uk		Drawing Status: LDO	Drawing Scale: 1:3500 @A4
URBANR		Date Issued: 26.09.22	Layout ID / Revision: Fig 4

APPENDIX 01

Relevant Legislation and Planning Policy

Relevant Legislation and Planning Policy

Legislation

A summary of legislation relevant to (onshore) biodiversity in England and Wales is provided below. Note that the summary provided here is intended for general guidance only and the original legislation should be consulted for definitive information.

Conservation of Habitats and Species Regulations 2017

The Conservation of Habitats and Species Regulations 2017 (the Habitats Regulations) consolidate the Conservation of Habitats and Species Regulations 2010 with subsequent amendments. The Regulations transpose Council Directive 92/43/EEC, on the conservation of natural habitats and of wild fauna and flora (EC Habitats Directive), into national law. Under the Habitats Regulations it is an offence to deliberately capture, kill or disturb[1] wild animals listed under Schedule 2 of the Regulations. It is also an offence to damage or destroy a breeding site or resting place of such an animal (even if the animal is not present at the time).

Wildlife & Countryside Act 1981

The Wildlife and Countryside Act 1981, as amended by the Countryside and Rights of Way (CRoW) Act 2000 and the Natural Environment and Rural Communities (NERC) Act 2006, consolidates and amends existing national legislation to implement the Convention on the Conservation of European Wildlife and Natural Habitats (Bern Convention) and Council Directive 79/409/EEC on the Conservation of Wild Birds (Birds Directive), making it an offence to:

- Intentionally kill, injure or take any wild bird or their eggs or nests (with certain exceptions) and disturb any bird species listed under Schedule 1 to the Act, or its dependent young while it is nesting;
- Intentionally kill, injure or take any wild animal listed under Schedule 5 to the Act;
- Intentionally or recklessly damage, destroy or obstruct any place used for shelter or protection by any wild animal listed under Schedule 5 to the Act;
- Intentionally or recklessly disturb certain Schedule 5 animal species while they occupy a place used for shelter or protection;
- Pick or uproot any wild plant listed under Schedule 8 of the Act; or
- Plant or cause to grow in the wild any plant species listed under Schedule 9 of the Act.

Protection of Badgers Act 1992

The Protection of Badgers Act 1992 makes it illegal to kill, injure or take a badger or to intentionally or recklessly interfere with a badger sett. Sett interference includes disturbing badgers whilst they are occupying a sett or obstructing access to it.

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[1] Disturbance, as defined by the Conservation of Habitats and Species Regulations 2010, includes in particular any action which impairs the ability of animals to survive, breed, rear their young, hibernate or migrate (where relevant); or which affects significantly the local distribution or abundance of the species.

Natural Environment & Rural Communities (NERC) Act 2006

Section 40 of the NERC Act 2006 places a duty on public authorities to have regard to the purpose of conserving biodiversity to have due regard for biodiversity and nature conservation during the course of their operations. Public authorities include government departments, local authorities and statutory undertakers.

Section 41 of the Act (Section 42 in Wales) requires the publication of a list of habitats and species publish which are of principal importance for the purpose of conserving biodiversity. The Section 41 list is used to guide authorities in implementing their duty to have regard to the conservation of biodiversity.

Note that Sections 40 and 42 were superseded in Wales by the Environment (Wales) Act 2016 (see below).

Environment (Wales) Act 2016

The Environment (Wales) Act puts in place the legislation needed to plan and manage Wales' natural resources in a more proactive, sustainable and joined-up way. Part 1 Section 6 of the Act introduces a new biodiversity duty, which replaces and enhances the biodiversity duties set out in the NERC Act 2006 and requires public authorities to seek to maintain and enhance biodiversity in the exercise of their functions and in so doing promote the resilience of ecosystems.

Section 7 of the Act lists living organisms and types of habitat in Wales, considered to be of key significance to sustain and improve biodiversity in relation to Wales.

Planning Policy

A summary of national planning policy relevant to (onshore) biodiversity in England and Wales is provided below. Note that the summary provided here is intended for general guidance only and the original policy documents should be consulted for definitive information. For local planning policy relevant to biodiversity the relevant local plans should be consulted.

National Planning Policy (England)

The National Planning Policy Framework (NPPF)[2] sets out guidance for local planning authorities and decision-makers in how to apply planning policies when drawing up plans and making decisions about planning applications. Along with Government Circular 06/05[3], the broad policy objectives in relation to the protection of biodiversity and geological conservation in England through the planning system are set out. Specific policies relating to habitats and biodiversity are set out in paragraphs 131, 174 and 179-182 of the NPPF.

Paragraph 131 states that:

"Trees make an important contribution to the character and quality of urban environments and can also help mitigate and adapt to climate change. Planning policies and decisions should ensure that new streets are tree-lined, that opportunities are taken to incorporate trees elsewhere in developments (such as parks and community orchards), that appropriate measures are in place to secure the long-term maintenance of newly planted trees, and that existing trees are retained wherever possible. Applicants and local planning authorities should work with highways officers and tree officers to ensure that the right trees are planted in the right places, and solutions are found that are compatible with highways standards and the needs of different users"

[2] Ministry of Housing, Communities and Local Government. 2021. National Planning Policy Framework. July 2021.
[3] Office of the Deputy Prime Minister. 2005. Government Circular: Biodiversity and Geological Conservation – Statutory Obligations and their Impact within the Planning System. ODPM Circular 06/2005.

Paragraph 174 states that:

"Planning policies and decisions should contribute to and enhance the natural and local environment by:

a) protecting and enhancing valued landscapes, sites of biodiversity or geological value and soils (in a manner commensurate with their statutory status or identified quality in the development plan);

b) recognising the intrinsic character and beauty of the countryside, and the wider benefits from natural capital and ecosystem services – including the economic and other benefits of the best and most versatile agricultural land, and of trees and woodland;

c) maintaining the character of the undeveloped coast, while improving public access to it where appropriate;

d) minimising impacts on and providing net gains for biodiversity, including by establishing coherent ecological networks that are more resilient to current and future pressures;

e) preventing new and existing development from contributing to, being put at unacceptable risk from, or being adversely affected by, unacceptable levels of soil, air, water or noise pollution or land instability. Development f) should, wherever possible, help to improve local environmental conditions such as air and water quality, taking into account relevant information such as river basin management plans; and

f) remediating and mitigating despoiled, degraded, derelict, contaminated and unstable land, where appropriate".

Paragraph 179 states that:

"To protect and enhance biodiversity and geodiversity, plans should:

a) Identify, map and safeguard components of local wildlife-rich habitats and wider ecological networks, including the hierarchy of international, national and locally designated sites of importance for biodiversity; wildlife corridors and stepping stones that connect them; and areas identified by national and local partnerships for habitat management, enhancement, restoration or creation; and

b) promote the conservation, restoration and enhancement of priority habitats, ecological networks and the protection and recovery of priority species; and identify and pursue opportunities for securing measurable net gains for biodiversity."

Paragraph 180 of the NPPF states that:

"When determining planning applications, local planning authorities should apply the following principles:

a) if significant harm to biodiversity resulting from a development cannot be avoided (through locating on an alternative site with less harmful impacts), adequately mitigated, or, as a last resort, compensated for, then planning permission should be refused;

b) development 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;

c) 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; and

d) 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."

Paragraphs 181-182 relate to European sites (referred to as habitats sites) and state:

"The following should be given the same protection as habitats sites:

a) potential Special Protection Areas and possible Special Areas of Conservation;

b) listed or proposed Ramsar sites; and

c) sites identified, or required, as compensatory measures for adverse effects on habitats sites, potential Special Protection Areas, possible Special Areas of Conservation, and listed or proposed Ramsar sites.

The presumption in favour of sustainable development does not apply where the plan or project is likely to have a significant effect on a habitats site (either alone or in combination with other plans or projects), unless an appropriate assessment has concluded that the plan or project will not adversely affect the integrity of the habitats site."

National Planning Policy (Wales)

Planning Policy Wales (PPW)[4] sets out the land use planning policies of the Welsh Government. The primary objective of PPW is to ensure that the planning system contributes towards the delivery of sustainable development and improves the social, economic, environmental and cultural well-being of Wales. Section 6.4 of PPW relates to biodiversity and ecological networks.

Paragraph 6.4.3 of PPW states that:

"The planning system has a key role to play in helping to reverse the decline in biodiversity and increasing the resilience of ecosystems, at various scales, by ensuring appropriate mechanisms are in place to both protect against loss and to secure enhancement."

It goes on to state that:

"Development plan strategies, policies and development proposals must consider the need to:

- *support the conservation of biodiversity, in particular the conservation of wildlife and habitats;*
- *ensure action in Wales contributes to meeting international responsibilities and obligations for biodiversity and habitats;*
- *ensure statutorily and non-statutorily designated sites are properly protected and managed;*
- *safeguard protected and priority species and existing biodiversity assets from impacts which directly affect their nature conservation interests and compromise the resilience of ecological networks and the components which underpin them, such as water and soil, including peat; and*
- *secure enhancement of and improvements to ecosystem resilience by improving diversity, condition, extent and connectivity of ecological networks."*

Section 6.4 goes on to set out policy in respect of:

- The Biodiversity and Resilience of Ecosystems Duty, as set out in Section 6 of the Environment (Wales) Act 2016;
- Designated Sites, including:
    - Sites of Special Scientific Interest;
    - Special Protection Areas, Special Areas of Conservation and Ramsar Sites;
    - Proposed Special Areas of Conservation, Special Protection Areas and Ramsar sites; and

[4] Welsh Government. 2018. Planning Policy Wales. Edition 10, December 2018.

- Non-statutory Designations.

- Protected Species; and
- Trees, Woodlands and Hedgerows.

PPW is supplemented by a series of Technical Advice Notes (TANs), Welsh Government Circulars, and policy clarification letters, which together with PPW provide the national planning policy framework for Wales. TAN 5[5] deals with Nature Conservation and Planning and states in paragraph 2.4:

"When considering policies and proposals in local development plans and when deciding planning applications that may affect nature conservation, local planning authorities should:

- *Pay particular attention to the principles of sustainable development, including respect for environmental limits, applying the precautionary principle, using scientific knowledge to aid decision making and taking account of the full range of costs and benefits in a long term perspective;*
- *Contribute to the protection and improvement of the environment, so as to improve the quality of life and protect local and global ecosystems, seeking to avoid irreversible harmful effects on the natural environment;*
- *Promote the conservation and enhancement of statutorily designated areas and undeveloped coast;*
- *Ensure that appropriate weight is attached to designated sites of international, national and local importance;*
- *Protect wildlife and natural features in the wider environment, with appropriate weight attached to priority habitats and species in Biodiversity Action Plans;*
- *Ensure that all material considerations are taken into account and decisions are informed by adequate information about the potential effects of development on nature conservation;*
- *Ensure that the range and population of protected species is sustained;*
- *Adopt a step-wise approach to avoid harm to nature conservation, minimise unavoidable harm by mitigation measures, offset residual harm by compensation measures and look for new opportunities to enhance nature conservation; where there may be significant harmful effects local planning authorities will need to be satisfied that any reasonable alternative sites that would result in less or no harm have been fully considered."*

[5] Welsh Assembly Government. 2009. Planning Policy Wales Technical Advice Note 5: Nature Conservation and Planning. September 2009.

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