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Land East of Park View Woodstock

Environmental Statement Technical Appendix E: Natural Heritage

June 2022

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Contents

1 Introduction

1.1 This report presents the approach and findings of the assessment of potential effects of the Proposed Development at Land East of Park View, Woodstock on ecology and nature conservation. It includes:

- Ecological site description.
- A summary of relevant planning policy and legislation.
- A description of the methods of data collection that were used to inform the assessment.
- Presentation of the baseline conditions at the Site (the boundaries of which are indicated in Figure 1) and surrounding area.
- The identification of important ecology receptors that could be affected by the Proposed Development.
- The identification of potential effects on these receptors.
- An assessment of the likely extent of these effects, taking into account the mitigation already designed-in to the Proposed Development.
- A specification of appropriate additional mitigation measures necessary to reduce these effects to an acceptable level.
- An identification of residual ecological effects and their significance.
- An identification of cumulative ecological effects and their significance with other projects identified in the vicinity.

Background to commission

1.2 BSG Ecology was commissioned by Blenheim Estates Homes on 25 March 2021 to carry out ecological survey and assessment work of the Proposed Development at Land East of Park View, Woodstock ('the Site').

Site description

1.3 The Site consists a single arable field, with poor semi-improved grassland field margins and broadleaved semi-natural woodland and hedgerows at the boundaries and is approximately 48.65 ha in extent. It is located to the south-east of Woodstock; the extent of the Site is shown on Figure 1. The land is bordered by the A44 to the south, beyond which are the grounds of Blenheim Palace. To the east is Upper Campsfield Road, to the north is Shipton Road and the west a new residential development (Park View, Woodstock). The wider surrounds to the north, east and south are dominated by arable and grassland fields.

Description of project

1.4 Outline planning application to develop up to 500 dwellings, a community square (0.3 ha) and a primary road with associated infrastructure, open space, engineering and ancillary works.

Previous ecology work

1.5 A suite of ecological surveys was undertaken in 2014 and 2016 by BSG Ecology to inform a planning application for Land East of Woodstock, which included both this Site and the Park View development to the west. Surveys included an extended Phase 1 habitat survey, desk study, great crested newt survey, badger survey, dormouse survey, reptile survey, Roman snail survey, bat surveys and a characterisation of the breeding bird community. The results were reported within BSG Ecology's Ecology Report (BSG Ecology, 2016). Planning permission for the Park View development was granted by West Oxfordshire District Council in May 2018 (ref: 16/01364/OUT).

2 Legislation and policy

2.1 The following paragraphs summarise planning policy and legislation of relevance to ecology and nature conservation which were taken into account in the production of this report.

2.2 The Site falls within the planning authority area of Cherwell District Council (CDC). It is therefore necessary to consider the application in the context of their Development Plan policies as well as material considerations including the National Planning Policy Framework (NPPF) and Planning Practice Guidance (PPG).

National Planning Policy Framework

2.3 The Government issued the National Planning Policy Framework (NPPF) in July 2021. Text excerpts from the NPPF are shown where they may be relevant to planning applications and biodiversity including protected sites, habitats and species.

2.4 The Government sets out the three objectives for sustainable development (economy, social and environmental) at Paragraphs 8-10 to be delivered through the plan preparation and implementation level and *'are not criteria against which every decision can or should be judged'* (Paragraph 9). The planning system's environmental objective is *'to protect and enhance our natural, built and historic environment; including making effective use of land, improving biodiversity…'* (Paragraph 8c).

2.5 In conserving and enhancing the natural environment, the NPPF (Paragraph 174) states that *'planning policies and decisions should contribute to and enhance the natural and local environment by:*

- *Protecting and enhancing...sites of biodiversity value... '(in a manner commensurate with their statutory status or identified quality in the development plan)'.*
- *Recognising the wider benefits from natural capital and ecosystem services including trees and woodland.*
- *Minimising impacts on and providing net gains for biodiversity, including by establishing coherent ecological networks that are more resilient to current and future pressures.*
- *Preventing both new and existing development from contributing to or being put at unacceptable risk from, or being adversely affected by unacceptable levels of soil, air, water or noise pollution or land instability.'*

2.6 In respect of protected sites, at Paragraph 175, the NPPF requires local planning authorities to distinguish, at the plan level, *'…between the hierarchy of international, national and locally designated sites; allocate land with the least environmental or amenity value...take a strategic approach to maintaining and enhancing networks of habitats and green infrastructure; and plan for the enhancement of natural capital at a catchment or landscape scale across local authority boundaries.'* A footnote to Paragraph 175 refers to the preferred use of agricultural land of poorer quality if significant development of agricultural land is to take place.

2.7 Paragraph 179 refers to how plans should aim to protect and enhance biodiversity. Plans should: *'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* [a footnote refers to ODPM Circular 06/2005 for further guidance in respect of statutory obligations for biodiversity in the planning system], *wildlife corridors and stepping stones that connect them and areas identified by national and local partnerships for habitat management, enhancement, restoration or creation'* and to '*promote the conservation, restoration and re-creation 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.'*

2.8 Paragraph 180 advises that, when determining planning applications, *'…local planning authorities should apply the following principles:*

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

2.9 Paragraph 181 states that, *'the following should be given the same protection as habitats sites:*

- *Potential Special Protection Areas and possible Special Areas of Conservation;*
- *Listed or proposed Ramsar sites; and*
- *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.'*

2.10 In Paragraph 182 the NPPF refers back to sustainable development in relation to appropriate assessment and states: *'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'.*

2.11 In Paragraph 183, the NPPF refers to planning policies and decisions taking account of ground conditions and risks arising from land instability and contamination at sites. In relation to risks associated with land remediation account is to be taken of *'potential impacts on the natural environment'* that arise from land remediation.

2.12 In Paragraph 185 the NPPF states that planning policies and decisions should ensure that development is appropriate to the location and take into account likely effects (including cumulative) on the natural environment and, in doing so, they *'should limit the impact of light pollution from artificial light on local amenity, intrinsically dark landscapes and nature conservation'* (Paragraph 185c).

Planning Practice Guidance

2.13 The government's PPG on the natural environment was released as an online resource in March 2014, and last updated in July 2019, and variously updates and supersedes historic planning guidance documents and circulars.

2.14 The PPG provides further guidance with respect to ecological issues.

The Environment Act 2021

2.15 The Environment Act includes the provision of mandatory biodiversity gain for developments in England; this will be mandated through an amendment to the Town and Country Planning Act 1990. The two-year transition period following Royal Assent (November 2021) means that mandatory biodiversity gain will become law in autumn 2023. This will require:

- The provision of a required percentage of biodiversity gain, currently set nationally to be at 10%
- The use of the national Defra Biodiversity Metric to calculate the biodiversity gain, currently Metric 3.1
- The provision of a biodiversity gain plan to demonstrate how biodiversity gain will be delivered on and or off-site; statutory instruments and regulations are in preparation by Defra and Natural England to provide templates for reporting
- Biodiversity gain will be secured for a fixed period, currently nationally set at 30 years
- Demonstration of how the biodiversity gain will be secured; conservation covenants will be used to deliver this which are in preparation by Defra and Natural England
- A national register of land used for biodiversity gain will be established; this will involve setting up a new biodiversity credits market, the approach for which is in preparation by Defra and Natural England

2.16 The policy basis for net gain is already set out in the NPPF. During the transition period, we would expect local planning authorities to increasingly require the measures set out within the Environment Act as part of their development decision making process.

2.17 Cherwell District Council Policy ESD 10 (Cherwell District Council, 2015) requires applications to demonstrate a net gain for biodiversity. In addition, the Adopted Cherwell Local Plan 2011-2031 Part 1 Partial Review – Oxford's Unmet Housing Need (Cherwell District Council, 2020) sets out specific requirements for sites allocated within the Local Plan and states for each that *'The application(s) shall be supported by the Biodiversity Impact Assessment (BIA) based on the DEFRA biodiversity metric (unless the Council has adopted a local, alternative methodology), to be agreed with Cherwell District Council'.* Although the Proposed Development is not allocated in the Local Plan, it is anticipated that the same requirements will be expected by Cherwell District Council.

2.18 BIAs are spreadsheet-based calculation tools that provide a clear and repeatable method to help evaluate the current biodiversity value of a site and the biodiversity value of a proposed development. Hence, they allow the net gain or loss in biodiversity resulting from a development to be determined.

Government Circular ODPM 06/2005 Biodiversity and Geological Conservation

2.19 Paragraph 98 of Government Circular 06/2005 advises that "*the presence of a protected species is a material consideration when a planning authority is considering a development proposal that, if carried out, would be likely to result in harm to the species or its habitat. Local authorities should consult Natural England before granting planning permission. They should consider attaching appropriate planning conditions or entering into planning obligations under which the developer would take steps to secure the long-term protection of the species. They should also advise developers that they must comply with any statutory species' protection provisions affecting the site concerned...*"

2.20 Paragraph 99 of Government Circular 06/2005[1] advises that *"it is essential that the presence or otherwise of protected species, and the extent that they may be affected by the proposed development, is established before the planning permission is granted, otherwise all relevant material considerations may not have been addressed in making the decision. The need to ensure ecological surveys are carried out should therefore only be left to coverage under planning conditions in exceptional circumstances, with the result that the surveys are carried out after planning permission has been granted*".

[1] *ODPM Circular 06/2005. Government Circular: Biodiversity and Geological Conservation – Statutory Obligations and their Impacts within the Planning System* (2005). HMSO Norwich.

Local planning policy context

2.21 The Cherwell Local Plan was formally adopted on 20 July 2015 (Cherwell District Council, 2015) and sets out the overall planning framework for the District from 2011 – 2031. The following policies are relevant to ecology and nature conservation:

Policy ESD 9: Protection of the Oxford Meadows SAC

2.22 *"Developers will be required to demonstrate that:*

- During construction of the development there will be no adverse effects *on the water quality or quantity of any adjacent or nearby watercourse*
- *During operation of the development any run-off of water into adjacent or surrounding watercourses will meet Environmental Quality Standards (and where necessary oil interceptors, silt traps and Sustainable Drainage Systems will be included)*
- *New development will not significantly alter groundwater flows and that the hydrological regime of the Oxford Meadows SAC is maintained in terms of water quantity and quality*
- *Run-off rates of surface water from the development will be maintained at greenfield rates."*

Policy ESD 10: Protection and Enhancement of Biodiversity and the Natural Environment

2.23 *"Protection and enhancement of biodiversity and the natural environment will be achieved by the following:*

- *In considering proposals for development, a net gain in biodiversity will be sought by protecting, managing, enhancing and extending existing resources, and by creating new resources*
- *The protection of trees will be encouraged, with an aim to increase the number of trees in the District*
- *The reuse of soils will be sought*
- *If significant harm 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 development will not be permitted.*
- *Development which would result in damage to or loss of a site of international value will be subject to the Habitats Regulations Assessment process and will not be permitted unless it can be demonstrated that there will be no likely significant effects on the international site or that effects can be mitigated*
- *Development which would result in damage to or loss of a site of biodiversity or geological value of national importance will not be permitted unless the benefits of the development clearly outweigh the harm it would cause to the site and the wider national network of SSSIs, and the loss can be mitigated to achieve a net gain in biodiversity/geodiversity*
- *Development which would result in damage to or loss of a site of biodiversity or geological value of regional or local importance including habitats of species of principal importance for biodiversity will not be permitted unless the benefits of the development clearly outweigh the harm it would cause to the site, and the loss can be mitigated to achieve a net gain in biodiversity/geodiversity*
- *Development proposals will be expected to incorporate features to encourage biodiversity, and retain and where possible enhance existing features of nature conservation value within the site. Existing ecological networks should be identified and maintained to avoid habitat fragmentation, and ecological corridors should form an essential component of green infrastructure provision in association with new development to ensure habitat connectivity*
- *Relevant habitat and species surveys and associated reports will be required to accompany planning applications which may affect a site, habitat or species of known or potential ecological value*

- *Air quality assessments will also be required for development proposals that would be likely to have a significantly adverse impact on biodiversity by generating an increase in air pollution*
- *Planning conditions/obligations will be used to secure net gains in biodiversity by helping to deliver Biodiversity Action Plan targets and/or meeting the aims of Conservation Target Areas. Developments for which these are the principal aims will be viewed favourably*
- *A monitoring and management plan will be required for biodiversity features on site to ensure their long term suitable management."*

Policy ESD 11: Conservation Target Areas

2.24 *"*Where development is proposed within or adjacent to a Conservation Target Area biodiversity surveys and a report will be required to identify constraints and opportunities for biodiversity enhancement. Development which would prevent the aims of a Conservation Target Area being achieved will not be permitted. Where there is potential for development, the design and layout of the development, planning conditions or obligations will be used to secure biodiversity enhancement to help achieve the aims of the Conservation Target Area.*"*

Oxfordshire Wildlife and Landscape Study

2.25 The Oxfordshire Wildlife and Landscape Study (OWLS) provided the current landscape character and biodiversity assessment for Oxfordshire. This project identified 24 landscape types within the county.

2.26 The Site lies within the 'Estate Farmlands' landscape type. This is a rolling agricultural landscape characterised by parklands and a well ordered patter of fields and estate plantations.

Biodiversity Action Plan for Oxfordshire

2.27 The Biodiversity Action Plan (BAP) for Oxfordshire focuses on Conservation Target Areas (see below) and Oxfordshire BAP habitat targets, and lists UK Species of Principal Importance (SPI) and Habitats of Principal Importance (HPI) that are present in Oxfordshire.

Conservation Target Areas

2.28 The Biodiversity Action Plan for Oxfordshire includes 36 Conservation Target Areas (which are equivalent to Biodiversity Opportunity Areas in some other counties). These represent some of the most important areas for wildlife where targeted conservation action will have the greatest benefit.

Legislation

The Conservation of Habitats and Species Regulations, 2017 (as amended)

2.29 The Regulations provide for the designation and protection of 'European sites', the protection of 'European protected species', and the adaptation of planning and other controls for the protection of European Sites. Under the Regulations, competent authorities i.e. any Minister, Government department, public body, or person holding public office, have a general duty, in the exercise of any of their functions, to have regard to the EC Habitats Directive.

The Natural Environment and Rural Communities (NERC) Act, 2006

2.30 This Act places a duty on all public bodies to have regard to the conservation of biodiversity when exercising their duties, and requires the Secretary of State to identify a list of habitats and species which are of principal importance for the conservation of biodiversity in England (Section 41 habitats and species). The presence of species or habitats of principal importance is a material consideration in planning decisions, in accordance with the NPPF and PPG.

The Wildlife and Countryside Act, 1981 (as amended)

2.31 This Act provides 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) in Great Britain. The Act provides for the notification and confirmation of Sites of Special Scientific Interest (SSSIs), provides protection to all wild birds and special protection for certain species of birds, animals and plants listed in the Schedules of the Act.

2.32 Certain plant species are listed in Schedule 9 of the Wildlife and Countryside Act 1981 (as amended, making it an offence to plant or cause them to grow in the wild).

The Protection of Badgers Act, 1992

2.33 This Act makes it an offence to wilfully kill, injure, take, possess or cruelly ill-treat a badger, or to attempt to do so; or to intentionally or recklessly interfere with a sett. Sett interference includes disturbing badgers whilst they are occupying a sett, as well as damaging or destroying a sett or obstructing access to it. This legislation was introduced for reasons of animal welfare, rather than nature conservation. Badgers are a widespread and common species.

The Wild Mammals (Protection) Act, 1996 (as amended)

2.34 Under the Wild Mammals (Protection) Act 1996 it is an offence to cause unnecessary suffering to wild mammals, including crushing and asphyxiating. This Act is primarily concerned with animal welfare and aims to prevent cruelty. As a result, offences include those actions with the intent to inflict unnecessary suffering. A wild mammal includes any mammal which is not domestic or captive. Fox, wild deer and other mammals such as rabbits are therefore covered by the Act.

Hedgerows

2.35 Article 10 of the Habitats Directive requires that 'Member States shall endeavour…to encourage the management of features of the landscape which are of major importance for wild fauna and flora. Such features are those which, by virtue of their linear and continuous structure…or their function as stepping stones…are essential for the migration, dispersal and genetic exchange of wild species'. Examples given in the Directive include traditional field boundary systems (such as hedgerows).

2.36 The aim of the Hedgerow Regulations 1997, according to guidance produced by the Department of the Environment, is "*to protect important hedgerows in the countryside by controlling their removal through a system of notification*". In summary, the guidance states that the system is concerned with the removal of hedgerows, either in whole or in part, and covers any act which results in the destruction of a hedgerow. The procedure in the Regulations is triggered only when land managers or utility operators want to remove a hedgerow. The system is in favour of protecting and retaining 'important' hedgerows.

2.37 The Hedgerow Regulations set out criteria that must be used by the local planning authority in determining which hedgerows are 'important'. The criteria relate to the value of hedgerows from an archaeological, historical, wildlife and landscape perspective.

3 Methods

Establishing baseline conditions

Desk study

3.1 The local biological records centre, Thames Valley Environmental Records Centre (TVERC), was contacted for records of non-statutory designated sites and protected and notable[2] species within 2 km of the Site. The data were returned on 09 August 2021, and they add context to the findings of the field surveys. Records from within the last 10 years (i.e., 2012 to 2022) were considered within this report.

3.2 The Multi-Agency Geographic Information for the Countryside database (MAGIC, 2022) was consulted to establish whether any locally or nationally statutory designated sites occur within 2 km of the Site boundary. This was extended to 10 km for internationally and European important designated sites (see Figure 2). A search was also made to identify whether any European Protected Species Mitigation (EPSM) licences have been granted within 2 km of the Site.

Field surveys

Extended Phase 1 habitat survey

3.3 An extended Phase 1 Habitat survey was undertaken on 28 April 2021 by Joe Bishop, Senior Ecologist at BSG Ecology. The survey was conducted with reference to industry standard guidelines for Phase 1 habitat survey (JNCC, 2016) and involved a walkover of the Site, during which habitats present were identified and mapped visually using freely available aerial imagery (see Figure 3). Habitats of Principal Importance (HPI)[3] were identified with reference to Maddock (2011).

3.4 The Phase 1 habitat survey was extended to include an assessment of the potential of the Site to support protected and other species of conservation importance.

3.5 The aims of the survey were to establish the current baseline and identify any features of ecological value at the Site.

Hedgerow survey and assessment

3.6 A hedgerow survey and assessment was carried out at the Site on 28 April 2021 by Joe Bishop Senior Ecologist at BSG Ecology.

3.7 During the survey, hedgerows were mapped and the numbers of woody and woodland species (as defined in the Hedgerow Regulations, 1997) were recorded for each hedgerow. Hedgerows were placed into the categories: ‘species-rich’ or ‘species-poor’ by the surveyor, based on whether the average number of woody species present in a 30 m length was five or more (species rich) or fewer than five (species poor) (see Defra, 2007). Hedgerows were also subject to the collection of further information, including the presence of:

- A bank or wall
- Fewer than 10 % gaps
- Standard trees

[2] Notable species here include those of national or local conservation interest. Species of national conservation interest are Species of Principal Importance (Section 41 of the NERC Act), those listed in Red Data Lists for England or the UK, red-listed species in *Birds of Conservation Concern* list (Eaton *et al*., 2021), and species designated Nationally Scarce or Nationally Notable. Species of local conservation interest are those listed as Species of Conservation Concern in Oxfordshire.

[3] Habitats of Principal Importance in England are designated by Natural England in accordance within Section 41 of the Natural Environment and Rural Community Act 2006. They are described (as Priority Habitats) in Maddock (2011).

- Woodland species
- An adjacent ditch
- A score of four or more points in connection with sub-paragraph 5 of paragraph 7 of the Wildlife and Landscape criteria in the list of Additional Criteria for Determining “Important” Hedgerows included in Schedule 1 of the Hedgerow Regulations 1997.
- A parallel hedgerow within 15 m.

3.8 Freely available aerial imagery from Bing Maps (Bing Maps, 2021) was used to aid in the locating and mapping of hedgerows by indicating their lengths and the presence of significant gaps.

3.9 The above information was used to identify hedgerows at the Site meeting the criteria for determining ‘Important’ hedgerows under *Wildlife and Landscape* in Schedule 1 of the Hedgerow Regulations 1997.

Badger Survey

3.10 In order to obtain information on the presence and usage of the Site by badgers *Meles meles*, and on the location of any badger setts, the Site was subject to a badger survey by Phil Chapman on 27 September 2021.

3.11 The badger survey included mapping any latrines, obvious pathways used by badger and locations of setts. Any evidence recorded was mapped and described (see Figure 4). Several categories of badger setts have been identified as described below (adapted from Neal and Cheeseman,1996; Harris *et al*., 1994):

- **Main sett** - Normally where cubs are raised and in continuous and regular use throughout the year. Typified by large spoil heaps and well-trodden paths. There can be many entrances to the sett (often with some of these disused), although a main sett can sometimes only have a single entrance.
- **Annexe setts** – Intermediate-sized and may be used by breeding badgers. Normally close to a main sett and connected to it by obvious paths. They may not be in use all the time, even if the main sett is very active.
- **Subsidiary sett** – Similar to annexe setts but are likely to be further away (at least 50 m from the main sett) and not as well connected to the main sett as annexe setts. May only be used intermittently.
- **Outlier setts** – Small setts with one or two entrance holes which are used sporadically by badgers as a temporary refuge (Neal & Cheeseman, 1996). Spoil heaps are likely to be small and there may not be obvious paths connecting to other setts. Use may be sporadic. There may be several outlier setts within one badger social group’s territory (Neal & Cheeseman, 1996).

3.12 For all badger sett entrance holes that were found, sett was discovered, an indication of the level of activity was also made according to Harris *et al*. (1989), as follows:

- **Active** – active sett entrances contain no debris or vegetation, are obviously regularly used and often show signs of having been recently excavated.
- **Partially used** – partially used entrances are those not in regular use, and which may have debris (leaf litter, twigs, moss, etc.) around the entrance. However, they could potentially be used regularly in the future with minimal clearance necessary.
- **Disused** – disused sett entrances show signs of not having been used for a considerable period of time and would not be used again without extensive clearance by a badger.

Bat survey

Ground level tree assessment

3.13 A ground level tree assessment (GLTA) was undertaken of trees within the woodland on the eastern boundary within and adjacent to the footprint of the proposed new access onto Upper Campsfield Road to assess their suitability to support roosting bats. Each tree was inspected by Rachel Bamford on 04 April 2022 from the ground using binoculars where necessary. A search was made of each tree for Potential Roost Features (PRFs) (such as knot holes and rot damage, cracks and cavities created by branch loss, lifted bark, and dense ivy growth). Evidence of roosting bats, such as droppings or staining under PRFs was also searched for.

3.14 The trees were assigned a category defining their suitability to support roosting bats, in accordance with Table 1 (Figures 5).

Table 1. Tree suitability for roosting bats; adapted from Collins, 2016

Suitability	**Roosting Habitat**
Negligible	Negligible PRFs, which may be isolated from suitable foraging habitat.
Low	A tree with one or more PRFs which have a very limited potential to be used by individual opportunistic bats. These features do not have the correct dimensions or conditions and/or are not connected to suitable foraging habitat that could be used by a larger number of bats.
Moderate	A tree with one or more PRFs which could be used by bats because of their dimension and conditions. However, these features are unlikely to support a roost of high conservation status with respect to roost type only. The tree may also have PRFs which are obscured or not possible to survey from the ground level. The surrounding habitat is continuous and/or well connected to the wider landscape.
High	A tree with one or more PRFs which are obviously suitable for use by a larger number of bats on a more regular basis and potentially for longer periods of time, due to their dimensions and conditions. The surrounding habitat is high quality, continuous and/or well connected to the wider landscape.
Confirmed Roost	Presence of bats or evidence of recent use by bats.

Walked activity transects

3.15 Dusk walked activity transects were undertaken at the Site between May and September 2021. The aim of the surveys is to identify the assemblage and interpret the behaviour and distribution of bats within a site and surrounding area. The surveys were carried out once per season (i.e. spring (April/May), summer (June/July/August) and autumn (September/October) and commenced at sunset and continued for at least two hours after sunset, taking into account standard industry guidance for a Low Suitability Site (Collins, 2016).

3.16 Each transect was walked by two surveyors. The direction of each transect route was altered to ensure that different parts of the Site were surveyed at different times of the night. This approach will remove any bias that could be introduced into the survey data if the transects were always walked in the same direction. Each transect covered all suitable habitats within the Site (see Figure 5).

3.17 Equipment used included an Anabat Scout, which allows recording of bat calls for later analysis. Field notes included a record of the time of each bat encounter, allowing results to be cross-referenced with the recorded data.

3.18 All surveys have been undertaken during optimal weather conditions, avoiding heavy rain, strong winds and temperatures above 10°C, thus taking into account standard industry guidance (Collins, 2016). Table 2 lists the survey dates, key personnel and a summary of weather conditions for the surveys at the Site.

Table 2: Dates, times and weather conditions recorded during the bat activity transect surveys

Date	Surveyor	Survey times	Weather Conditions
07/05/2021	Peter Newbold and Niki Sporrong	20:40-22:40	Cloud 1/8, Wind BF 0, no rain recorded during the survey, and temperature: at start: 12ºc, at end: 8ºc.
04/08/2021	Sarah Joscelyne and Andy Hearn	20:49-22:49	Cloud 3/8, Wind BF 0, no rain recorded during the survey, and temperature: at start: 17ºc, at end: 16ºc
27/09/2021	Philip Chapman and Oliver Kemp	18:51-20:51	Cloud 1/8, Wind BF 2, light rain recorded during the survey, and temperature: at start: 12ºc, at end: 13ºc.
28/09/2021	Philip Chapman and Oliver Kemp	05:01-07:01	Cloud 8/8, Wind BF 0, no rain recorded during the survey, and temperature: at start: 11ºc, at end: 11ºc

Automated detector surveys

3.19 Two automated bat detectors were deployed on three occasions between April and September 2021, one in the north-west of the Site along hedgerow H2 and one on the eastern boundary (see Figure 5).

3.20 The detectors recorded data for five consecutive nights in each deployment. They were programmed to begin recording from half an hour before sunset until half an hour after sunrise, which allows continuous monitoring to take place during the period when bats are active, i.e., sunset to sunrise. Survey hours varied throughout the survey season according to daylight hours and have been calculated for each recording session in order to accurately calculate activity indices. The automated detector surveys were conducted using SM2 bat detectors which are full spectrum bat detectors used to automatically record bat echolocation calls.

3.21 Table 3 shows the dates the detectors were deployed and the number of nights of data recorded at each location across the survey season.

Table 3: Dates and number of nights of data from automated detectors across the survey period.

Season	Dates	Location	Nights of data
Spring	01/05/2021 – 05/05/2021	1	5
		2	5
Summer	23/07/2021 – 27/07/2021	2	5
	08/08/2021 – 12/08/2021	1	5
Autumn	23/09/2021 – 28/09/2021	1	5
	28/09/2021 – 02/10/2021	2	5

Bat data analysis

Automated detectors were set to record WAC files which were later converted using Kaleidoscope (software created by Wildlife Acoustics) to ZC (Zero Crossing) files. The ZC output files were subsequently viewed and analysed using AnaLookW software (software by Titley Electronics).

3.22 The Kaleidoscope parameters used were as follows:

- Kaleidoscope Version 5.1.8.
- Outputs – ZC files using a division ratio of 8.
- Noise files were also filtered and kept (and scanned and checked in AnaLook).
- Default signal of interest settings were used (16-120 KHz, 2-500ms and minimum no. of calls = 2).

3.23 The calls were analysed using AnalookW software to give an indication of the species of bat present and their relative levels of activity. The software enables analysis of the relative activity of different species of bats by counting the minimum number of bat calls recorded within discrete sound files. For the purpose of the analysis a bat pass is defined as a single, uninterrupted sequence of an echolocation calls lasting a maximum of 15 seconds. The species analysis follows the call parameters as describe in Russ (2012). The assessment of relative bat activity between species is based on the relative abundance of recorded calls of each species within each survey period (i.e., each period of static monitoring per month) and across the combined study period.

3.24 It should be recognised that a series of separate sound files could represent multiple bats calling infrequently (e.g., as they each pass overhead moving in one direction) or a small number of bats (or even one individual) calling frequently (e.g., bats making repeated foraging passes up and down a feature). This cannot be determined unless bats can be directly observed at all times. Despite this, an indication of overall patterns of use of the Site by different species can be established based on the regularity of recording.

3.25 Where possible, bat calls are identified to species level. However, species of the genus *Myotis* are grouped together as their calls are similar in structure and have overlapping call parameters, making species identification problematic (Russ, 2012). For long-eared bats *Plecotus* species, although calls between grey long-eared bats *Plecotus austriacus* and brown-long-eared bats *Plecotus auritus* cannot be distinguished due to overlapping call parameters, since grey long-eared bats are restricted to the extreme south of the UK (Harris & Yalden, 2008), any *Plecotus* calls recorded are assumed to be brown long-eared bat.

3.26 For *Pipistrellus* species the following criteria based on measurements of peak frequency are used to classify calls:

- Common pipistrelle *Pipistrellus pipistrellus* ≥ 42 and <49KHz
- Soprano pipistrelle *Pipistrellus pygmaeus* ≥ 51KHz
- Nathusius' pipistrelle *Pipistrellus nathusii* <39KHz
- Common / soprano pipistrelle ≥49 and <51KHz
- Common / Nathusius' pipistrelle ≥39 and <42KHz

3.27 In addition, the following categories are used for calls which cannot be identified with confidence due to the overlap in call characteristics between species or species groups:

- *Myotis* / long-eared *Plecotus*
- *Myotis* / serotine *Serotinus eptesicus*
- Leisler's bat *Nyctalus leisleri* / serotine
- Long-eared / serotine
- Serotine / *Nyctalus* sp.
- Noctule *Nyctalus noctula* / Leisler's bat

Dormouse survey

3.28 Dormouse *Muscardinus avellanarius* surveys have been carried out in suitable habitat within the Site by Oliver Kemp (Natural England licence 2015-7917-CLS-CLS) and Anna Muckle (Natural England

licence 2016-22296-CLS-CLS). This involved the deployment of 64 nest tubes withing hedgerows at the Site and 23 boxes in the woodland (Figure 6). Nest tubes and boxes were deployed following industry standard guidance (Bright *et al*, 2006).

3.29 Nest tubes were deployed in May 2021 and were checked monthly between May and October (see Table 4). During each checking visit the tubes were inspected for the presence of dormice and also for signs of recently constructed dormouse nests.

Table 4: Dates, times and weather conditions recorded during the dormouse surveys.

Visit no.	Licensed surveyor	Date	Weather conditions
1	Anna Muckle	27/05/2021	Cloud 3/8, Wind BF 1 no rain, temperature at start: 15ºc, at end: 16ºc
2	Oliver Kemp	16/06/2021	Cloud 4/8, Wind BF 2 no rain, temperature at start: 19ºc, at end: 20ºc
3	Oliver Kemp	15/07/2021	Cloud 4/8, Wind BF 3 no rain, temperature at start: 18ºc, at end: 19ºc
4	Oliver Kemp	26/08/2021	Cloud 5/8, Wind BF 2 no rain, temperature at start: 15ºc, at end: 15ºc
5	Oliver Kemp	27/09/2021	Cloud 5/8, Wind BF 3 no rain, temperature at start: 13ºc, at end: 14ºc
6	Oliver Kemp	14/10/2021	Cloud 6/8, Wind BF 2 no rain, temperature at start: 12ºc, at end: 13ºc

Reptile surveys

3.30 Artificial refuges (1 m x 0.5 m sheets of roofing felt) were deployed throughout the site on 04 May 2021. A total of approximately 100 refugia were deployed (Figure 7). The refugia were left *in situ* for two weeks prior to the first survey visit to allow the refugia to "bed down". The refugia were checked for reptile presence on seven occasions during suitable weather conditions (e.g. sun or partial cloud, air temperature 9 to 18°C, sunshine after rain, first sunshine after dull overcast weather (Froglife, 1999)). The surveys were carried out between May and September 2021. Reptile survey details are provided in Table 5.

Table 5: Reptile survey details.

Visit no.	Surveyor	Date	Weather conditions
1	Matthew Simmons	19/05/2021	Cloud 1/8, Wind BF 3, no rain, temperature at start: 10ºc, at end: 13ºc
2	Anna Muckle	27/05/2021	Cloud 1/8, Wind BF 1, no rain, temperature at start: 15ºc, at end: 18ºc
3	Kai Hayes	08/06/2021	Cloud 1/8, Wind BF 1, no rain, temperature at start: 16ºc, at end: 18ºc
4	John Baker	16/06/2021	Cloud 0/8, Wind BF 1, no rain, temperature at start: 12ºc, at end: 16ºc
5	Matthew Simmons	23/09/2021	Cloud 7/8, Wind BF 2, no rain, temperature at start: 16ºc, at end: 18ºc
6	Philip Chapman	27/09/2021	Cloud 4/8, wind BF 4, dry, temperature 15ºC
7	Jonathan Slessor	29/09/2021	Cloud 1/8, Wind BF 2, heavy rain recorded before , no rain during survey, temperature at start: 10ºc, at end: 11ºc.

Limitations

3.31 Some mats were found to be missing over the course of the surveys. This was limited to those along the northern edge of the site. Since the mats were subsequently replaced, this is not considered to be a constraint.

Great crested newts

eDNA survey

3.32 Two ponds are situated within 250m of the Site (see Figure 8). An environmental (eDNA) survey was undertaken of both ponds on 04 May 2021 by Oliver Kemp (Natural England licence number 2019-43472-CLS-CLS) and Joe Bishop. This was carried out within the specified survey window for eDNA analysis, and in accordance with the published methodology (Biggs et. al., 2014).

3.33 Water samples were collected from the perimeter of the pond and sent to a certified laboratory (Surescreen Scientifics Ltd) to be analysed for presence of great crested newt eDNA. Great crested newt DNA is released into aquatic environments through the shedding of skin cells, urine, faeces and saliva. It can persist in water for several weeks and when water samples are collected, they can be tested for the eDNA of the species. Natural England has approved a protocol for collecting and testing samples which they will accept as evidence of presence or likely absence of GCN (Natural England, 2022). This protocol was followed in this survey.

Farmland bird surveys

3.34 Many farmland birds are in decline and therefore listed as either notable or Species of Principal Importance (SPI)[4] under Section 41 of the NERC Act. In order to confirm presence or absence of farmland birds and approximate numbers of any rarer breeding birds, three farmland bird surveys

[4] Species of Principal Importance are those listed in response to Section 41 of the Natural Environment and Rural Communities (NERC) Act 2006 for the purposes of conserving biodiversity in England.

were carried out at the Site between April and June 2021. Farmland bird survey details are provided in Table 6.

3.35 During survey visits, the weather conditions were suitable for farmland bird surveys, with no rain or winds exceeding Force 5 on the Beaufort Scale.

3.36 The transects were designed to target all areas of the Site suitable for breeding birds, including the hedgerows, woodland and arable field (see Figure 9). Birds observed beyond the boundary of the Site were also noted in order to contextualise the information gained.

3.37 Bird locations were mapped, and behaviour recorded using standard British Trust for Ornithology (BTO) codes and symbols on field maps during each survey. The maps obtained as a result of the two visits were then collated to produce a single territory map.

Table 6: Farmland bird survey details

Visit no.	Surveyors	Date	Weather conditions
1	Joe Bishop	28/04/2021	Cloud 0/8, Wind BF 2, no rain and temperature at start: 3^0c, at end: 5^0c
2	John Baker	14/05/2021	Cloud 8/8, Wind BF 2, no rain, and temperature at start: 15^0c, at end: 17^0c
3	John Baker	16/06/2021	Cloud 1/8, Wind BF1, no rain, and temperature at start: 14^0c, at end: 15^0c

Limitations

3.38 Intermittent rain was recorded during the survey conducted on 14 May 2021. The rain was not heavy enough to be considered a major impediment to the survey and therefore is not considered a constraint.

Biodiversity gain assessment

3.39 In line with national and local policy, there will be a requirement for this development to achieve a biodiversity gain. In order to demonstrate this, the Defra Biodiversity Metric 3.1 calculation tool (Defra, 2022) has been used to provide a quantitative assessment of the change in biodiversity associated with the development by assigning biodiversity value to a site pre- and post-development.

3.40 The extended Phase 1 habitat survey information was used to complete the existing Site baseline calculation. Information was then taken from the Proposed Development plans to carry out the post-development landscaping scenario calculation.

3.41 The calculator requires that habitat distinctiveness and condition are determined together with the area of habitat that will be affected. These were determined for the baseline calculation from the Phase 1 habitat survey, and for the post-development calculation by the assessor's judgement on realistically achievable habitat conditions for this Site and development.

3.42 Taken together, the above calculations will identify the net gain/loss in biodiversity units (BU).

Ecological Impact Assessment (EcIA) process

3.43 The evaluation and assessment within this chapter has been undertaken with reference to relevant parts of the Guidelines for Ecological Impact Assessment in the UK and Ireland developed by the Chartered Institute of Ecology and Environmental Management (CIEEM, 2022). Although this is recognised as current best practice for ecological assessment, the guidance itself recognises that it

is not a prescription about exactly how to undertake an ecological impact assessment (EcIA); rather, it aims to "provide guidance to practitioners for refining their own methodologies". Therefore, BSG Ecology has applied its own methodology in line with this and also that of Terence O'Rourke Ltd.

Important ecological receptors

3.44 A first step in EcIA is to determine which ecological receptors (habitats, species, ecosystems and their functions/processes) are important. Important receptors should then be subject to detailed assessment if they are likely to be affected by the Proposed Development. It is not necessary to carry out detailed assessment of receptors that are sufficiently widespread, unthreatened and resilient to project effects, such that there is no risk to their viability.

3.45 Ecological receptors can be important for a variety of reasons and the rationale used to identify these is explained below. Importance may relate, for example, to the quality or extent of designated sites or habitats, to habitat/species rarity, to the extent to which they are threatened throughout their range, or to their rate of decline.

Evaluation: determining importance

3.46 The importance of an ecological receptor should be considered within a defined geographical context. The level of geographical importance of an ecological receptor can then categorised as high, medium, low or negligible. Table 7 sets out the frame of reference that has been used in this case:

Table 7: Comparison of the CIEEM and current approach for assessing the importance of an ecological receptor

CIEEM guidance	**Current approach**
International (European)	High
United Kingdom	High
National (England)	High to medium
Regional (south-east England)	Medium
County (Oxfordshire)	Medium
District (Cherwell)	Medium
Local or parish	Low

3.47 Taking into account the CIEEM guidance (CIEEM, 2022), features of less than Local, or Low, importance are generally considered unlikely to trigger the need for mitigation or to conflict with policy. Features which require mitigation in order to ensure legal compliance are considered to be important features, even if their conservation value is low or not applicable (e.g. badger, which is not a rare species but which receives legal protection on animal welfare grounds).

Receptors to be excluded from further assessment

3.48 The assessment of ecological effects focuses on those ecological receptors likely to suffer significant effects (adverse or beneficial). Prior to this stage of the assessment, it was possible to scope out particular ecological receptors from further assessment by taking into account both the likelihood of a significant effect occurring and the evaluation of particular features described above. Ecological receptors to be excluded from further assessment and those to be taken forward within the assessment are summarised in Tables 17 and 18 below, with a rationale for doing so.

Assessment of effects

3.49 The assessment of effects process involves:

- Identifying and characterising significant effects.
- Incorporating measures to avoid and mitigate (reduce) these significant effects.
- Assessing the significance of any residual effects after mitigation.
- Identifying appropriate compensation measures to offset significant residual effects.
- Identifying opportunities for ecological enhancement.

3.50 It is only necessary to assess and report significant residual effects (those that remain after mitigation measures have been taken into account). However, it is good practice for the EcIA to make clear both the potential significant effects without mitigation and the residual significant effects following mitigation. This process of assessment without mitigation helps to identify necessary and relevant mitigation measures that are proportionate to the size, nature and scale of anticipated effects.

3.51 The assessment only needs to describe those characteristics of effects that are relevant to understanding the ecological effect and determining the significance. It should consider, as appropriate: direct, indirect, secondary, and cumulative effects and whether these are short, medium, long-term, permanent, temporary, reversible and / or irreversible. In this report, positive effects are referred to as beneficial, negative effects as adverse. The assessment of significant effects then takes into account the baseline conditions to describe:

- How the baseline conditions will change as a result of the project and associated activities.
- Cumulative effects of the proposal and those arising from other developments.

3.52 Significant effects

3.53 The CIEEM guidance (CIEEM, 2022) sets out information in paragraphs 5.24 through to 5.28 about the concept of ecological significance and how it relates to the ability to deliver biodiversity conservation objectives for a given receptor.

3.54 Significant effects are qualified with reference to an appropriate geographic scale, and the scale of significance of an effect may or may not be the same as the geographic context in which the feature is considered important.

3.55 The nature of the identified significant effects on each assessed receptor is characterised for each receptor based on the following factors where relevant):

- Magnitude of change: large, medium, small or negligible,
- Duration: short term or long term,
- Nature: Beneficial or adverse,
- Degree of effect: very substantial, substantial, moderate, slight or negligible,
- Level of certainty: absolute, reasonable or limited.

3.56 These factors are considered, along with available research, professional judgement about the sensitivity of the receptor affected, and professional judgement about how the significant effect is likely to affect the site, habitat, or population's structure and continued function. Where it is concluded that an effect would be likely to reduce the importance of an assessed feature, it is described as

significant. The degree of significance of the effect takes into account the geographic context of the feature's importance and the degree to which its interest is judged to be affected.

3.57 CIEEM best practice encourages the expression of significance of ecological effects with reference to a geographic frame of reference, as described above. However, the Terence O'Rourke Ltd approach determines significance based on the degree of the effect. Appendix 1 demonstrates how the importance (sensitivity) of a receptor and the magnitude of change relates to degree of effect through the use of a matrix. Table 8 provides a means of relating the two approaches and is provided in order to allow the ecological impact assessment to be integrated into the wider EIA without compromising the CIEEM best practice approach (CIEEM, 2022).

Table 8: Relationship between the CIEEM EcIA assessment of significance and how the EIA approach assesses significance.

CIEEM guidance	**Current approach**
Significant	Very substantial
	Substantial
	Moderate
Not significant	Slight
	Negligible

Mitigation

3.58 Where significant effects have been identified, the mitigation hierarchy has been taken into account, as suggested in the EcIA Guidelines (CIEEM, 2022), which sets out a sequential approach of avoiding significant effects where possible, applying mitigation measures to minimise unavoidable significant effects and then compensating for any remaining significant effects. Once avoidance and mitigation measures, and any necessary compensation measures, have been applied, and opportunities for enhancement incorporated, residual significant effects have then been identified. This approach is reflected across UK planning policy.

3.59 Where mitigation and compensation has been proposed, this is proportionate 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" (CIEEM, 2022. Paragraph 5.28).

3.60 The principals of enhancement as set out in the CIEEM guidance and of net gain in biodiversity, as set out in the NPPF are also incorporated into the mitigation section, to ensure that feasible opportunities for ecological enhancement and for reductions in the severity of non-significant adverse effects are also incorporated in the Proposed Development.

4 Baseline conditions

4.1 The following section describes the results of the desk study, updated extended Phase 1 habitat survey, and the various further ecology surveys.

Desk study

Internationally important sites

4.2 Oxford Meadows Special Area of Conservation (SAC) is approximately 5.2 km south of the Site and is 267.4 ha in size. The primary reason for the section of this site as a SAC is the presence of the Annex 1 habitat 'lowland hay meadow'. The site includes vegetation communities that a unique, reflecting the influence of long-term grazing and hay-cutting. One species found includes the Annex 2 species creeping marshwort *Apium repens*, which is found within the Port Meadow area of the SAC, the larger of only two known sites in the UK for this species.

4.3 A number of Sites of Special Scientific Interest (SSSIs) form component parts of the SAC and include Cassington Meadows SSSI, Pixey and Yarnton Meads SSSI, Wolvercote Meadows SSSI, Port Meadow with Wolvercote Common and Green SSSI. These SSSIs are more than 2 km from the Site are therefore only included for the relevance to the SAC.

Statutory sites

4.4 There is one statutory designated site within 2 km of the Site, Blenheim Park Site of Special Scientific Interest (SSSI) This SSSI is located 1.4 km to the west of the Site. Blenheim Park is designated as an SSSI due to its features of special interest including: excellent parkland, wood pasture habitat with veteran oaks, ancient woodland with characteristic flora and nationally scarce invertebrates, and lakes of county importance for breeding, migratory and wintering birds.

4.5 One other site is within 2 km of the Site, this being Shipton-on-Cherwell and Whitehill Farm Quarries SSSI, located 1.3 km to the northeast of the site. The SSSI designation is purely geological, however there is ecological interest, as outlined in the designation for Bunker's Hill Quarry Local Wildlife Site below.

4.6 Natural England's scoping response highlighted an additional six SSSIs that may be impacted by the Proposed Development. Cassington Meadows SSSI, Pixey and Yarnton Meads SSSI, and Port Meadow with Wolvercote Common and Green SSSI are described in the section above. Rushey Meadows SSSI, Wytham Ditches and Flushes SSSI and Hook Meadow and The Trap Grounds SSSI are all more than 2 km from the Site and more than 200 m from major roads such that they are not considered likely to be impacted by the Proposed Development and are not considered further in this report.

Non-statutory sites

4.7 There are ten non-statutory designated sites within 2 km of the Site boundary; three Conservation Target Areas (CTA), four Local Wildlife Sites (LWS), one proposed Local Wildlife Site (pLWS) and two Wildlife Sites (WS). Further details on these designated sites are provided in Table 9.

Table 9: Non-statutory sites within 2 km of the Site

Site name	Distance and direction from the Site	Description (taken from designation documentation).
Sansoms Green Lane WS	0.2 km N	0.7 ha site comprising a double species-rich hedgerow (HPI) on either side of a Public Right of Way (PRoW). Barn

Site name	Distance and direction from the Site	Description (taken from designation documentation).
		owl *Tyto alba* (Schedule 1) and house sparrow P*asser domesticus* (SPI) recorded.
Woodstock Water Meadows LWS	1.1 km NW	Low lying water meadows with areas of lowland fen, wet woodland and floodplain grazing marsh (HPI). Mammal SPI recorded including otter *Lutra lutra* and water vole *Arvicola amphibius*. In addition, a number of bird SPI have been identified such as: turtle dove *Streptopelia turtur*, marsh tit *Poecile palustris*, spotted flycatcher M*uscicapa striata*, cuckoo *Cuculus canorus*, reed bunting *Emberiza schoeniclus* and two Schedule one species kingfisher *Alcedo atthis* and quail *Coturnix coturnix* .
Blenheim and Ditchley Parks CTA	1.2 km SW	2651 ha area. Includes Blenheim Park (see Blenheim Park SSSI), and nearby Ditchley Park (also historic parkland/wood pasture with veteran trees as well as areas of broadleaf woodland). Oxford Biodiversity Action Plan targets associated with this area include: • Management of ancient parkland • Management/restoration of wood pasture • Management/restoration of lowland mixed deciduous woodland • Management and creation of arable field margins
Lower Cherwell Valley CTA	1.4 km NE	609 ha area running along the Cherwell from just south of Lower Heyford to Kidlington. Overlies Langford Meadow LWS, plus Shipton-on-Cherwell and Whitehill Farm Quarries SSSI, and Bunker's Hill Quarry LWS. The latter portion is the only section within 2 km of the Site. Biodiversity interest of the whole area includes HPI/BAP habitats (fen/swamp/reedbed, limestone grassland, lowland meadow, wet grassland/floodplain grazing marsh, eutrophic standing water, scrub) and species Oxford Biodiversity Action Plan targets associated with this area include: • Management and creation of reedbed • Management/restoration of lowland fen and rivers • Management/restoration/creation of lowland meadow and floodplain grazing marsh.
Bunker's Hill Quarry LWS	1.4 km NE	Overlies Shipton-on-Cherwell and Whitehill Farm Quarries SSSI. Wetlands and calcareous grassland plus open-ground habitats in old quarry areas (total 62.6 ha). Of interest for overwintering/breeding/migrant birds.
Glyme and Dorn Valleys CTA	1.5 km W	2496 ha area. Includes the whole Glyme Valley and tributaries including the Dorn. Encompasses Wooton Jubilee Fields and Glyme valley LWS. Biodiversity interest includes Habitats of Principal Importance (HPI)/Biodiversity Action Plan (BAP) habitats (limestone grassland, lowland meadow, fen/swamp/reedbed, parkland, woodland, and eutrophic standing water), and species (white-clawed

Site name	Distance and direction from the Site	Description (taken from designation documentation).
		crayfish *Austropotamobius pallipes* in the upper Dorn – over 2 km from the Site). Oxford Biodiversity Action Plan targets associated with this area include: • Management and creation of limestone grassland Management/restoration of lowland meadows, fen and rivers • Management/restoration/creation of lowland mixed/deciduous woodland, • Management/restoration of parkland, and lowland mixed deciduous woodland.
Blenheim Park – New Park and part of Great Park pLWS	1.5 km W	As per Blenheim Park SSSI.
Langford Meadow LWS	1.5 km SE	11 ha site with wet and lowland meadow, lowland fen habitats and species-rich hedgerows (HPI). Important site for birds with previous records of breeding including reed bunting and overwintering snipe *Gallinago gallinago*. Protected mammal species such as noctule N*yctalus noctula* and pipistrelle *Pipistrellus* bats and badgers have also been recorded.
Bladon Heath LWS	1.6 km S	97 ha area comprising remnant acid grassland and patches of lowland mixed deciduous woodland (HPI). Woodland field fauna particularly species-rich and include ancient woodland indicator species such as bluebell *Hyacinthoides non-scripta* and wild strawberry *Fragaria vesca.*
Weavely Furze Firewood Allotments WS	1.7 km N	1.7 ha community woodland. To the east of the site there is a block of broadleaved semi-natural woodland with an open ash canopy, a small seasonal pond and a section of stream. Main part of the site comprises scrub with areas of young, planted trees including wild cherry *Prunus avium*, ash *Fraxinus excelsior* and field maple *Acer campestre*.

Field survey

Habitats

4.8 Phase 1 habitat types present within the Site are listed in Table 10. The distribution of these habitats at the Site is shown on Figure 3.

Table 10: Habitats present at the Site

Habitat	Description
Arable	Much of the Site supports arable land (currently planted to cereals). Arable is considered to be of negligible intrinsic value due to its low floristic diversity and intensive management and is not an HPI (Maddock, 2011).

Habitat	Description
Poor semi-improved grassland	The margins of the arable field comprise 5 m wide strips of poor semi-improved grassland. These are areas of uncultivated land which support a rough sward. The grass species recorded included: frequent Yorkshire fog *Holcus lanatus* and occasional cock's-foot *Dactylis glomerata*, false oat-grass *Arrhenatherum elatius* and red fescue *Festuca rubra.* The herbs recorded included frequent ribwort plantain *Plantago lanceolata*, occasional dandelion *Taraxacum officinale*, cow parsley *Anthriscus sylvestris,* hogweed *Heracleum sphondyliu*, ground-ivy *Glechoma hederace*a, creeping buttercup *Ranunculus repens*, dove's foot crane's-bill *Geranium mole* and common field speedwell *Veronica persica*, and rare common ragwort *Senecio jacobaea,* cleavers *Galium aparine*, field forget-me-not *Myosotis arvensis*, comfrey, red dead nettle, bird's foot trefoil *Lotus corniculatus* and field pansy *Viola arvensis*. These margins have a low floristic diversity and are not specifically managed for wildlife. Therefore, they do not meet the *Arable Field Margins* criteria (Maddock, 2011) and are not considered to be an HPI.
Broadleaved semi-natural woodland	Much of the northern and eastern boundaries of the Site supports a narrow band of broadleaved semi-natural woodland. The canopy comprises a mix of oak *Quercus sp.*, ash and sycamore, with the more mature trees supporting ivy *Hedera helix* growth. The shrub layer is dense in most places, particularly along the northern boundary, and comprises hawthorn, wild privet *Ligustrum vulgare*, field maple, hazel *Corylus avellana* with rare spindle *Euonymus europaeus* and wayfaring tree *Viburnum lantana*. The non-native species Oregon grape *Mahonia aquifolium* was locally abundant in places in the eastern section of the woodland. The ground flora comprised frequent ivy and dog's mercury *Mercurialis perennis*, and occasional garlic mustard *Alliaria petiolata*, lords-and-ladies *Arum maculatum*, and common nettle *Urtica dioica*. A number of veteran trees are present along the northern boundary, with some standing and fallen deadwood present throughout the woodland. Though the majority of the woodland is natural, some management in the form of additional planting is present throughout the eastern strip. Existing gaps in the form of farm access tracks exist on both the northern and eastern parts of the woodland. The woodland within the Site is considered to meet the *Lowland Mixed Deciduous Woodland* criteria as outlined by Maddock (2011) and is therefore an HPI.
Species-poor intact hedgerow	Hedgerow H1 is a species-poor intact hedge along the southern boundary and extending north-east to form the boundary of neighbouring properties. Hedgerow H1 consists of frequent hawthorn and ash, with occasional hazel and field maple and rare wayfaring tree. The hedgerow had been subject to recent management (flailing). The ground flora was limited with bare ground present. Species recorded included frequent cow parsley *Anthriscus sylvestris*, occasional lords-and-ladies, cleavers, common nettle, garlic mustard and rare lesser celandine *Ficaria verna.*

Habitat	Description
	Hedgerow H1 meets the criteria for the HPI *hedgerows* as outlined by Maddock (2011).
Species-rich hedgerow with trees	Hedgerow H2 is a species-rich hedgerows with trees bordering the arable field to the west with a dry ditch along the southern half of hedgerow. The woody species include frequent hazel with occasional blackthorn *Prunus spinosa*, hawthorn, ash and dog-rose *Rosa canina* and rare oak. Occasional bramble and rare sycamore are also present. Ground flora was dominated by ivy with occasional lords-and-ladies, cleavers, herb-Robert *Geranium robertianum*, dog violet *Viola riviniana* and creeping thistle *Cirsium arvense*. The section to the south of Pest House is associated with a dry ditch. Previous survey work carried out by BSG Ecology in 2016 recorded a small stand of bluebell *Hyacinthoides non-scripta* in the southern half of H2, approximately 50 m north of the junction with hedgerow H3. Hedgerow H2 meets the criteria for the HPI *hedgerows* as outlined by Maddock (2011).
Species-rich intact hedgerow	Hedgerow H3 is a species-rich intact hedgerow located at the northern Site boundary between Hedgerow H2 and the woodland. The woody species include frequent hazel with occasional blackthorn *Prunus spinosa*, hawthorn, ash and dog-rose *Rosa canina* and rare oak. Occasional bramble and rare sycamore are also present. Ground flora was dominated by ivy with occasional lords-and-ladies, cleavers, herb-Robert *Geranium robertianum*, dog violet *Viola riviniana* and creeping thistle *Cirsium arvense*. Hedgerow H3 meets the criteria for the HPI *hedgerows* as outlined by Maddock (2011).

Hedgerow survey and assessment

4.9 Due to their structure and composition, Hedgerows H1 and H3 and the majority of Hedgerow H2 do not qualify as 'important' under the Hedgerow Regulations. However, due to the presence of a clump of bluebells in one location of Hedgerow H2 in 2016, this section of hedgerow is considered to be important due to the presence of a Schedule 8 plant species.

Species

Badger

4.10 The desk study returned 15 records of badger within 2 km of the Site, seven of which relate to badger setts, indicating that this species is widespread in the local area. None of these records relate to the Site itself. These records are confidential and detailed locations are not included in this report. Badgers are protected under the Protection of Badgers Act 1992. They are protected from killing, injury and their setts are also protected.

4.1 Suitable set building habitat present within the Site includes woodland and hedgerow bases. Suitable foraging habitat includes the woodland, hedgerows and poor semi-improved grassland, and to a lesser extent the arable field.

4.2 Detailed survey results are included at confidential Appendix 2 and shown on confidential Figure 4. Due to the potential for illegal persecution of this species, this information will remain confidential and is not for circulation beyond the planning authority.

Bats

4.3 The desk study returned 162 records of bats within 2 km of the Site corresponding to 15 species. Records for two species, barbastelle *Barbastella barbastellus* and common pipistrelle *Pipistrellus pipistrellus,* relate to the Site itself, associated with the woodland and Hedgerow H2.

4.4 The Site predominantly comprises arable land, which is of limited value to bats, however the boundary hedgerows and woodland provide more favourable foraging and commuting habitat. The woodland on the northern and eastern boundary of the Site provides habitat connectivity to the wider landscape to the north but connectivity is otherwise limited due to the size and extent of the hedgerows. As such, the Site is considered to be of low suitability for bats. It should however be noted that the Site is close to very good habitat for bats, including Blenheim Park and the River Glyme and their associated habitats. There are a number of known roosts of different bat species within the Blenheim Estate and the habitats there are of exceptional quality for bats**.**

Ground level tree assessment

4.5 The ground level tree assessment recorded trees with suitability to support roosting bats, as summarised below in Table 11 and shown on Figure 5.

Table 11. Ground level tree assessment results

Tree number	**Description of PRFs**	**Overall suitability for roosting bats**
T1	Semi mature sycamore with a south-facing knot hole at 2 m.	Moderate
T2	Semi-mature oak with a south-facing cavity in the main trunk at 3 m.	Moderate
T3	Mature oak with two west-facing woodpecker holes at 5-7 meters height and two north-facing woodpecker holes at 6-8 m height. A broken limb with a north-facing rot hole and potential cavity at 7 m.	High
T4	Mature sycamore with two east-facing knot holes at 3 m in a dead part of a southern extending branch.	Moderate
T5	Mature field maple with a rotten branch and patches of bark missing and possible cavity behind. The feature is quite exposed limiting its suitability for bats.	Low
T6	Semi-mature sycamore with thick ivy stems. The stems are not tight to main stem such that their value as a roost site is limited. There was potential for other features to be present behind foliage cover.	Low
T7	Mature oak with a small hole in the top of a dead branch and a cavity behind peeling back on an eastern branch.	Low
T8	Dead oak with ivy cover and a rot hole at the base of a south-facing dead branch at 4 m. Limb with splits at 6 m.	Moderate
T9	Mature oak with ivy cover and rotting bark with potential crevices. The features are quite exposed limiting their suitability for bats.	Low
T10	Mature oak with cavity behind split branches.	Moderate

Tree number	Description of PRFs	Overall suitability for roosting bats
T11	Dead oak with a south-facing rot hole at 8 m in the base of a limb.	Moderate
T12	Mature oak with peeling bark on one of the top limbs and a possible cavity behind.	Low
T13	Semi-mature sycamore with knot hole and tear out in an east-facing limb. Cavities behind do not appear to extend far into the limbs..	Low
T14	Mature sycamore with a south-facing knot hole at 4-5 m.	Moderate
T15	Dead oak with fissures in main stem, possible cavity behind.	Moderate

Walked activity transects

4.6 The walked transect surveys recorded at least six species of bats as follows:

- Common pipistrelle
- Soprano pipistrelle
- Noctule
- Leisler's bat
- Serotine
- *Myotis* species

4.7 The vast majority of the bat activity recorded was by foraging common pipistrelle, followed by soprano pipistrelle, with low numbers of passes by noctule and Leisler's, two passes by *Myotis* sp. and a single pass of serotine. Most activity across all species was recorded at the western end of the northern band of woodland and at the western end of hedgerow H1 at the southern boundary. Soprano pipistrelle was recorded at all Site boundaries, and was the only species recorded on the eastern boundary.

4.8 Early activity recorded during the transects (within or close to emergence times for the relevant species) was limited but included commuting common pipistrelle at 21 minutes after sunset and soprano pipistrelle and noctule 22 minutes after sunset during the August survey along the southern edge of the northern band of woodland. It is possible that these bats were roosting in trees within the woodland. During the dawn transect in September, the last bat recorded was a soprano pipistrelle at 50 minutes before sunrise.

4.9 The majority of foraging pipistrelle bat activity was at the western end of the northern band of woodland, along hedgerow H3 at the northern boundary and the northern half of hedgerow H2 at the western boundary. A lower level of pipistrelle foraging activity was recorded along hedgerow H1 at the southern boundary and the band of woodland along the eastern boundary.

4.10 Commuting noctule, Leisler's bat and serotine (single pass) were recorded along hedgerow H1 at the southern boundary, with the greatest number of passes by noctule. Note these bats fly and forage at height and may be recorded at a greater distance to their actual location than other bat species. Leisler's bat and serotine were only recorded in September.

4.11 Two passes of commuting *Myotis* species were recorded in August in the south-west corner of the Site at the junction between hedgerows H1 and H2 and in the north-east corner of the arable field offsite to the north of the Site.

4.12 Overall, the transect surveys at the Site show all boundary features are used by commuting and foraging bats, with the woodland in the north of the Site and hedgerow H1 in the south of the Site being of particular importance in the context of the Site.

Automated detector surveys

4.13 Analysis of the automated detector results identified the use of the Site by at least nine species of foraging bats. A total of 2142 passes were recorded overall, equivalent to 7.2 bats per survey hour. Table 12 below sets out the total numbers of bat passes at each location. Table 13 sets out the timing of bat passes through the night. References to species status across Oxfordshire are informed by the distribution tables provided on the Oxfordshire Bat Group website (OBG, 2022), distributions across the rest of the UK are informed by the relevant species information sheets provided by the Bat Conservation Trust (BCT, 2010a,b,c).

Table 12: Total bat passes against bats recorded per survey hour (B/h) for each recording location

Species	**L1**		**L2**		**Total**	**Overall B/h**
	n	**B/h**	**n**	**B/h**		
Barbastelle bat	19	0.1	7	<0.01	26	0.1
Brown long-eared bat	16	0.1	5	<0.01	21	0.1
Common pipistrelle	252	1.7	374	2.5	626	2.1
Nathusius' pipistrelle	1	<0.01	0	<0.01	1	<0.01
Soprano pipistrelle	366	2.4	758	5.1	1124	3.8
Leisler's bat	30	0.2	17	0.1	47	0.2
Myotis sp.	135	0.9	76	0.5	211	0.7
Noctule	53	0.4	31	0.2	84	0.3
Noctule / Leisler's bat	0	<0.01	1	<0.01	1	<0.01
Serotine	0	<0.01	1	<0.01	1	<0.01
Total	**872**	**5.8**	**1270**	**8.6**	**2142**	**7.2**

4.14 The majority of bat passes recorded were of pipistrelle species, accounting for over 82 % of recorded activity at the Site. Soprano pipistrelle was by far the most frequently recorded species (number of passes (n) = 1124, equating to 52.5 % of recorded bat activity). Lower numbers of common pipistrelle were also recorded (n = 626; equating to 29.2% overall activity), and there was also a single pass by Nathusius' pipistrelle (0.05 % overall activity). Common and soprano pipistrelle are both described as "common and widespread" in Oxfordshire, while Nathusius' pipistrelle is described as "Rare". For common and soprano pipistrelle, the majority of recorded activity (65.0 %) was at Location 2 on the western edge of the eastern band of woodland. The Nathusius' pipistrelle pass relates to Location 1.

4.15 *Myotis* species were the next most frequently recorded group, accounting for 9.9% overall activity. It is not possible to definitively identify *Myotis* genus bats to species level from their calls alone due to

the overlap between parameters of these species. A higher proportion of *Myotis* species bats (64.0 %) were recorded at Location 1 at the northern end of Hedgerow H2.

4.16 A total of 132 passes of *Nyctalus* species bats (noctule and Leisler's bat) were recorded (6.2 % overall activity). The majority (84/132) of these were noctule, of which 53 passes (64.6 %) were recorded at Location 1. Forty-seven probable Leisler's bat passes were recorded, of which 30 (63.8 %) were recorded at Location 1. One pass was recorded which could not be confidently attributed to either species, recorded at Location 2. Both noctule and Leisler's bat are tree roosting species described as "Uncommon though widespread" in Oxfordshire; however Leisler's bat is a scarce species across the wider UK.

4.17 A total of 26 passes were recorded of barbastelle bat (1.2 % overall activity). This is a rare species across the UK; although Oxfordshire appears to be a stronghold for the species which is described as "widespread though uncommon" distribution in the county. Barbastelle is a tree roosting species typically associated with woodland and parkland, and known populations are present on the nearby Blenheim Estate. Barbastelle were recorded at both monitoring locations, with the majority (73.0 %) recorded at Location 1.

4.18 A total of 21 passes of brown long-eared bat were recorded (0.9 % overall activity). The majority (76 %) of these passes were recorded at Location 1. Brown long-eared bats are often under-recorded due to the quiet and directional nature of their echolocation calls; the actual level of brown long-eared bat activity is likely to be higher than indicated. Brown long-eared bats are described as 'widespread and relatively common' in Oxfordshire. They roost both in trees and buildings.

4.19 A single serotine pass was recorded at Location 2 in September. Serotine is an uncommon species nationally, found mostly in the southern counties. It is described as "Widespread though uncommon; few known roosts" in Oxfordshire.

4.20 Overall, the majority of common and soprano pipistrelle activity was recorded at Location 2 (woodland at the eastern boundary), with the majority of activity of all other species recorded at Location 1 (hedgerow H2 at the western boundary). The higher numbers of passes of barbastelle, brown long-eared, noctule, Leisler's bat and *Myotis* species bats at Location 1 may be linked to its close proximity to the woodland and parkland habitats at the Blenheim Estate on the opposite side of the A44 from the Site (all these species will roost within woodland).

4.21 Table 13 presents a summary of the timing of bat passes through the survey nights; this information can be used to determine whether certain bat species recorded on site have been recorded within typical emergence times for the species, as per Andrews (2016).

Table 13: Summary of bat passes per time of night; pink shaded cells indicate typical emergence times for each species

Species	Before sunset / after sunrise	0-20	20-40	40-60	60-80	80-100	100-120	Middle of night	120-100	100-80	80-60	60-40	40-20	0-20	Grand Total
Barbastelle bat			1	4	1	5		14							**26**
Brown long-eared bat							1	19		1					**21**
Common pipistrelle		9	58	41	23	27	30	410	5	9	5	8	1	**0**	**626**
Nathusius' pipistrelle								1							
Soprano pipistrelle		2	119	48	22	38	65	615	36	40	80	33	26		**1124**
Leisler's bat		1	1	10	7	9	2	16				1			**47**
Myotis species				3	4	18	14	166	1	4	1				**211**
Noctule		10	22	9	13	5	2	9				4	8	2	**84**
Noctule / Leisler's bat					1										**1**
Serotine				1											**1**
Grand Total		**22**	**201**	**116**	**71**	**103**	**114**	**1250**	**42**	**54**	**86**	**46**	**35**	**2**	**2142**

4.22 The following results therefore indicate the possible presence of roosts in close proximity to the site (such as within the woodland, or nearby residential properties and boundary tree lines to the west):

- A number of both common and soprano pipistrelle passes were recorded within the typical emergence time for these species (0-20 minutes after sunset). All nine passes by common pipistrelle were recorded 14 to 15 minutes after sunset on the 25 September at Location 1, and two passes by soprano pipistrelle were recorded 14 to 15 minutes after sunset on the 30 September at Location 2. A further soprano pipistrelle was also recorded five minutes before sunset on 22 October. It is therefore likely that roosts of both species are present close to both detector locations, either within trees or the building close to the western boundary, and /or within the woodland at the northern and eastern Site boundaries.

- Ten noctule passes were recorded within the typical emergence time for this species (0-20 minutes after sunset). A single pass was recorded 15 minutes after sunset on the 12 August at Location 1, seven passes between five and 19 minutes after sunset between 23 and 25 July at Location 2, and two passes eight minutes after sunset on 24 September at Location 1. This indicates that noctule roosts are likely to be present in trees to the west of Location 1 and/or in the woodland within the Site.

- Three passes by *Myotis* species bats were recorded within their typical emergence times between 44 and 51 minutes after sunset. Two passes were recorded in May and July at Location 2 and one pass in September at Location 1. Although these passes are within the range of typical emergence times for each species/group, as they are towards the end of this range, the timings do not necessarily indicate nearby roosts.

- A single pass by Leisler's bat in on 25 September was recorded within the typical emergence time for this species. The Leisler's bat pass was recorded nine minutes after sunset at Location 2, suggesting that a roost may be present within the woodland at the Site.

- A single pass by barbastelle was recorded 39 minutes at Location 1 on 30 September. As this pass was at the very end of the typical emergence time for this species, the timing does not necessarily indicate that a roost is nearby.

4.23 No early passes by brown long-eared bat or Nathusius' pipistrelle were recorded; it is unlikely these species were roosting on or adjacent to the Site during the survey periods, although foraging behaviour by these species was recorded on a few occasions during the middle of the night period.

4.24 Overall, times of calls indicate possible roosting by four bat species on or in close proximity to the Site, including common pipistrelle, soprano pipistrelle, noctule and Leisler's bat. It is plausible that mature trees within the woodland and on/beyond the western Site boundary could be used by roosting bats. The number of passes by soprano pipistrelle at 20 to 40 minutes after sunset (n = 119), 78 % of which were recorded at Location 1 and 62% of this number in September, shows that hedgerow H2 is likely to be a regularly used commuting route from soprano pipistrelle bat roosts. Common pipistrelle and noctule passes recorded 20 to 40 minutes after sunset suggest that these species also make use of this hedgerow to commute from roosts.

Dormouse

4.25 Dormouse is known to have a patchy distribution throughout Oxfordshire and is thought to be very under-recorded at the county level. A total of five records were returned for dormouse. Of these, three records relate to the Site itself from 2014. Two of these records are of one and two nests in the southern section of broadleaved semi-natural woodland. The third record relates to the centre of the arable field which is likely human error in reporting the grid reference and is assumed to relate to the hedgerows or woodland at the Site. One record for a single dormouse nest is associated with a hedgerow immediately north of the Site north of Shipton Road. The fifth record relates to a hedgerow to the east of the Site and is move than 1 km from the Site.

4.26 Dormouse and its places of shelter are strictly protected under the provisions afforded to species listed on Schedule 5 of the 1981 Wildlife and Countryside Act (WCA) and Schedule 2 of the Conservation of Habitats and Species Regulations 2017 (as amended).

4.1 Hedgerow H1 is considered to be sub-optimal dormouse habitat (low species diversity with no honeysuckle, although hazel is occasionally present). Hedgerows H2 and H3 support a greater diversity of species including hazel and the woodland has a dense understory throughout much of the block which includes hazel, and therefore provide optimal habitat for dormouse. The surveys for dormouse conducted at the Site between June and November 2021 (Figure 6) did not find any evidence of dormouse.

4.2 The small gaps in the hedgerows H2 and H3 and woodland including farm vehicle access routes and footpaths may limit dormouse dispersal within the Site to some extent. However, the nature and size of the gaps are not sufficient to act as significant barriers.

4.3 Surveys undertaken by BSG Ecology in 2014 (BSG Ecology, 2014) recorded two unoccupied nests which showed features strongly indicative of having been built by dormouse; one nest within hedgerow H3 and one within the southern part of the eastern woodland band. Though incomplete, the nests recorded in 2014 consisted of partly woven grass strands, and showed the strat of a roof structure as well as a cup at the base and is considered to be a sign of the presence of the species on Site.

4.4 The dispersal of dormouse (often juveniles) from areas of optimal habitat occurs during autumn months. The time of year the nests were recorded (October and November 2014), combined with its location in a hedgerow of sub-optimal value to the north of the Site and in woodland to the east of the Site, indicates that the nests may have been constructed by a juvenile dormouse as part of its dispersal from areas to the north of the Site, and does not form part of a small population of dormouse resident within the Site itself.

4.5 Due to the cryptic habits of dormice, they are under-recorded at all levels. The survey methodologies available for this species cannot reveal population sizes in a given site. The assessment of the value of the dormouse resource on the Site is therefore based on professional judgement and known densities taken from published sources of information. The majority of the hedgerows and within the Site are sub optimal habitat for dormouse, and it is therefore likely if dormouse are present that the Site supports a small population.

4.6 Despite the lack of evidence to suggest that dormouse are currently utilising the Site, taking into account the nearby desk study results, 2014 survey results and the suitable habitat in the form of hedgerows and woodland on Site, a precautionary approach will be taken and the assessment will consider that dormouse are present at low densities in suitable habitat at the Site.

Other mammals

4.7 The desk study returned 24 records of five other species of mammal within 2 km of the Site. These are outlined in Table 14.

Table 14: Other mammals recorded within 2 km of the Site.

Common name	Latin name	Number of records	Closest record	Date of closest record
Brown Hare	*Lepus europaeus*	1	1.6 km SE	2015
European Otter	*Lutra lutra*	11	1.5 km SW	2019
European Water Vole	*Arvicola amphibius*	3	1.3 km NW	2013
Polecat	*Mustela putorius*	1	1.4 km NW	2014
West European Hedgehog	*Erinaceus europaeus*	8	0.3 km NW	2018

4.8 These species are all SPI. Otter and water vole are also protected under Schedule 5 of the WCA 1981 (as amended) and otter is additionally a European Protected Species under Schedule 2 of the Conservation of Habitats and Species Regulations 2017 (as amended). Given the habitats present on the Site brown hare, hedgehog and polecat all have the potential to be present. Water vole and otter do not have the potential to be present at the Site due to the absence of aquatic habitats.

Reptiles

4.9 The desk study returned 21 records of two species of reptile within 2 km of the Site. These comprise 16 records of slow worm *Anguis fragilis* and five records of grass snake *Natrix helvetica*, the closest of which was for a grass snake on Site in 2014. Both species are SPI and protected from killing and injury under the WCA 1981 (as amended).

4.10 The extended Phase 1 habitat survey identified that the poor semi-improved grassland field margins provided suitable habitat for reptiles. The reptile survey at the Site confirmed the presence of a small population of common lizard, with a peak count of two recorded on 19 May 2021. One male common lizard was recorded on southern boundary and one female common lizard on the southern section of the eastern boundary (see Figure 7). Subsequent visits after the 19 May 2021 yielded no further sightings of common lizards. No other reptiles were found on Site, although a small population of slow worm was identified in the fields to north of the Site, north of Shipton Road both in 2021 and in 2014 (BSG Ecology, 2014).

Great crested newt

4.11 Great crested newt is an SPI and the animal and its places of shelter and breeding are strictly protected under the provisions afforded to species listed on Schedule 5 of the 1981 WCA and Schedule 2 of the Conservation of Habitats and Species Regulations 2017 (as amended).

4.12 The desk study returned five records of great crested newt within 2 km of the Site. These records relate to ponds within the grounds of The Marlborough Church of England School with the closest being 305 m north-west of the Site. These ponds (Ponds 1 to 4) were surveyed by BSG Ecology in 2014 (BSG Ecology, 2014).

4.13 Two ponds are present within 250 m of the Site (Ponds P5 and P6, Figure 8), located approximately 35 m west of the Site within the garden of Pest House. The eDNA survey results for both ponds were returned as negative for great crested newts in 2021.

4.14 There is some suitable foraging and commuting habitat for great crested newt on Site comprising the rough grassland field margins and hedgerow bases. The woodland and hedgerow basis provides some sheltering and hibernating habitat for this species.

4.15 Given the likely absence of great crested newts within ponds within 250 m of the Site and limited terrestrial habitats, this species is considered unlikely to be present on Site.

Other amphibians

4.16 The desk study returned three records of smooth newt *Lissotriton vulgaris* and one record of common frog *Rana temporaria* within 2 km of the Site. The closest of which is for smooth newt, located within the ponds at The Marlborough Church of England School, approximately 305 m north-west of the Site, dated 2014.

Birds

4.17 The desk study returned 2270 records of 42 bird species within 2 km of the Site. The data was filtered to only include records of species likely to utilise habitats on the Site (hedgerows, woodland, rough grassland or arable habitats).

4.18 Ten records corresponded to three species specially protected under Schedule 1 of the Wildlife and Countryside Act 1981 (as amended) barn owl, fieldfare *Turdus pilaris* and redwing *Turdus iliacus*. The closest record of these species was a barn owl recorded 230 m to the south of the Site in 2012. A further 45 records corresponded to 15 species listed as SPI. The closest record is of a breeding yellowhammer 150 m to the south of the Site in 2014. Of these records, the Site has suitability for 17 breeding species which are summarised in Table A3.1 in Appendix 3.

4.19 The remaining species included 28 which are not SPI but are of conservation concern (listed as Amber or Red on the UK Red List; Eaton *et al,* 2021),

4.20 The Site is unlikely to be an important winter foraging area due to the intensive arable management. This is likely to limit the available food resources for birds, and is typical of the surrounding area, suggesting that birds are unlikely to particularly favour the Site or be present in the surrounding area in large numbers.

4.21 The breeding bird survey recorded a total of 16 bird species within the Site, all of which were recorded defending territories, comprising a total of 58 territories mapped (see Figure 9 and Table A3.2, Appendix 3). The greatest density of territories and other activity were associated with the broadleaved woodland at the northern and eastern Site boundaries. No territories or other activity were recorded at Hedgerows H1 and H3.

4.22 No territories of Schedule 1 protected species were noted either on or adjacent to the Site. There were territories of two SPI species within the Site comprising one territory of song thrush *Turdus philomelos* (also an Amber listed species of conservation concern) within the woodland and four territories of skylark *Alauda arvensis* within the arable field. The remaining territories on (or directly adjacent) to the Site included three Amber listed species of conservation concern (Eaton *et* al, 2021), dunnock, wren, woodpigeon, and several common and widespread species.

4.23 Of the remaining records from the survey, the majority relate to common and widespread species defending territories offsite (Table A3.2 Appendix 3).

Invertebrates

4.24 A total of nine records were returned for invertebrates corresponding to three species (see Table 15). Both the black hairstreak butterfly *Satyrium pruni* and the roman snail *Helix (Helix) pomatia* are protected from possession, killing and injury under Schedule 5 of the WCA 1981 (as amended). The black hairstreak butterfly is additionally on the IUCN Red list and considered endangered in the UK and pinhole borer *Platypus cylindrus* is listed as Nationally Notable. The closest record was for roman snail recorded 1.4 km to the south-east of the Site in 2012. None of these species were recorded within the Site itself.

Table 15: Desk study records of invertebrates within 2 km of the Site.

Taxon Group	Common name	Taxon name	Most recent record	No. records	Conservation status
Beetles	Pinhole Borer	*Platypus cylindrus*	2016	2	Nationally notable
Butterflies	Black Hairstreak	*Satyrium pruni*	2015	5	WACA Sch5, Red List
Molluscs	Roman Snail	*Helix (Helix) pomatia*	2012	2	WACA Sch5

4.25 It is considered unlikely that black hairstreak would be present at the Site given this species' preference for blackthorn thickets within woodlands and dense scrub. Similarly, roman snail is unlikely to be present at the Site due to their preference for well-drained lime-rich soils, either chalk or limestone, in relatively undisturbed grassy or scubby habitats. The oak trees within the woodland may support pinhole borer. None of these species were noted at the Site.

4.26 Overall, the habitats at the Site are likely to be of limited value to invertebrates given the intensively farmed arable field and regularly managed and species-poor grassland field margins, with the woodland holding most interest for invertebrates. The woodland was recorded to support some deadwood, albeit this was typically on smaller trees and was not situated in an open parkland setting such that it is unlikely to host saproxylic species listed as designated interest for the Blenheim Park SSSI.

Plants

4.27 Records of 21 plant species were returned by the desk study within 2 km of the Site. Bluebell and lizard orchid *Himantoglossum hircinum* are protected under Schedule 8 of the Wildlife and Countryside Act 1981 from intentional picking, destruction or sale. In addition, grape-hyacinth *Muscari neglectum,* is an SPI. Plant species recorded within 2 km of the Site are listed in Table 16. A number of these species are found in habitats similar to those on Site such as corn mint and hoary plantain in arable field margins, or crosswort and field scabious at the base of hedgerows. From these records only one record relates to the Site itself, which is for bluebell recorded in 2014 along Hedgerow H2.

Table 16: Desk study records of plants within 2 km of the Site.

Common name	Taxon name	Most recent record	No. records	Conservation Status
Bluebell	*Hyacinthoides non-scripta*	2018	8	WACA-Sch8
Grape-hyacinth	*Muscari neglectum*	2016	1	SPI; Oxfordshire scarce plant; Nationally rare; Red list
Common Valerian	*Valeriana officinalis*	2018	2	Near Threatened; Red list
Corn Mint	*Mentha arvensis*	2017	2	Near Threatened; Red list
Crosswort	*Cruciata laevipes*	2012	4	Near Threatened; Red list
Field Scabious	*Knautia arvensis*	2017	1	Near Threatened; Red list

Common name	Taxon name	Most recent record	No. records	Conservation Status
Hoary Plantain	*Plantago media*	2017	1	Near Threatened; Red list
Large-leaved Lime	*Tilia platyphyllos*	2015	1	Nationally Scarce
Lizard Orchid	*Himantoglossum hircinum*	2019	5	WACA-Sch8; Nationally scarce; Red list- Near threatened; Oxfordshire rare plant.
Narrow-fruited Water-starwort	*Callitriche palustris*	2017	1	Nationally rare; Red list- Vulnerable
Ragged-Robin	*Silene flos-cuculi*	2018	1	Near Threatened; Red list
Stinking Hellebore	*Helleborus foetidus*	2019	1	Nationally Scarce
Thin-spiked Wood-sedge	*Carex strigosa*	2018	2	Oxfordshire scarce plant
Tormentil	*Potentilla erecta*	2015	1	Near Threatened; Red list
Wild Strawberry	*Fragaria vesca*	2017	1	Near Threatened; Red list
Wood-sorrel	*Oxalis acetosella*	2016	1	Near Threatened; Red list

4.28 None of the plant species returned in the desk study were recorded at the Site during the Phase 1 habitat survey. However, a small stand of bluebell was identified along the southern section of Hedgerow H2 in 2016 (BSG Ecology, 2016).

4.29 The Site is of limited value for plant species due to the intensively farmed arable field and regularly managed and species-poor grassland field margins, with botanical interest limited to the woodland and hedgerow habitats.

Evaluation

Important receptors

4.30 Of the designated sites, habitats and species listed above, those included in Table 17 below have been evaluated for their conservation importance and are considered to be of sufficient importance to warrant them being carried through to the impact assessment stage.

Table 17: Ecological receptors that have the potential to be impacted by the Proposed Development.

Receptor	Importance	Justification
Oxford Meadows SAC	High	SACs are European designated sites strictly protected under the EC Habitats Directive with habitat types and/or species that are considered to be most in need of conservation at a European level. This SAC is included in this assessment because of its sensitivity to impacts, and relative proximity to the Site.

Receptor	Importance	Justification
Blenheim Park SSSI	High	SSSIs are nationally designated sites, which are protected for their biological or geological interest under the Wildlife & Countryside Act (1981). This SSSI is included in this assessment because of its proximity to the Site.
Sansoms Green Lane WS	Medium	This WS is of local importance in the Cherwell district and contains HPI, protected species and SPI. This WS is included in this assessment because of its proximity to the Site.
Glyme and Dorn Valleys CTA	Medium	CTAs represent some of the most important areas for wildlife. This CTA is included in this assessment because of its proximity to the A44 and potential for impacts from changes in air quality.
Blenheim and Ditchley Parks CTA	Medium	CTAs represent some of the most important areas for wildlife. This CTA is included in this assessment because of its proximity to the A4095 and potential for impacts from changes in air quality.
Blenheim Park – New Park and part of Great Park pLWS	Medium	This pLWS is adjacent to the Blenheim Park SSSI. This pLWS is included in this assessment because of its proximity to the A44 and potential for impacts from changes in air quality.
Woodstock Water Meadows LWS	Medium	Woodstock Water Meadows LWS contains HPI habitat and various protected species. This LWS is included in this assessment because of its proximity to the A44 and potential for impacts from changes in air quality.
Broadleaved semi-natural woodland	Low	Mixed deciduous woodland is an HPI in England. However, the woodland is relatively small size and relatively common nationally, although less widespread locally. This habitat contributes to local ecological networks suitable for mammals, birds, amphibians, reptiles and invertebrates.
Hedgerows	Low	All hedgerows at the Site are HPI however they have a limited species diversity and are relatively widespread nationally and within the county. Hedgerows at the Site as a whole likely contribute to local ecological connectivity for mammals, birds, amphibians, reptiles and invertebrates.
Badger	Low	Badger receives legal protection through national legislation. It is a legally protected species (on animal welfare grounds). It is not of particular conservation significance, being common and widespread in the UK. Badger setts and evidence of foraging and commuting are present within the Site, therefore appropriate mitigation measures will be necessary to ensure that development proceeds in accordance with wildlife law.
Bats	Medium	The Site is relatively unlit with foraging and commuting habitat limited to boundary features including hedgerows and woodland. These habitats provide habitat connectivity to the wider landscape to the north. There is very good habitat in the nearby vicinity of the Site, including Blenheim Park and the River Glyme and their associated habitats. Guidance from Wray et al. (2010) was referred to in order to assess the geographic importance of the Site for bats, based

Receptor	Importance	Justification
		on survey data from bat activity surveys undertaken in 2021. However, it should be noted that this guidance dates from a time before automated bat detectors were in wide use and it is therefore likely to overestimate the significance of sites that support small numbers of rare bat species. Based on this guidance, it was established that the Site is important at the County scale for most of the species present. The Site is important at the Local scale for brown long-eared bat and three rarer species of bats (serotine, Leisler's and Nathusius' pipistrelle) due to a very limited number of records. In addition, the Site is of Regional importance for barbastelle which, despite the limited number of records, are very rare bats and so this elevates the Site's importance. The Site is overall considered to be of County value for bats.
Dormouse	Medium	A precautionary approach is adopted here: as although dormouse have not been recorded within the Site during the most recent surveys, they were present at the Site in 2014. As such, all suitable habitat at the Site (woodland and hedgerows with connectivity to other suitable habitat) are assumed to support dormouse in low densities. Dormice are a European protected species, and an SPI.
Reptiles	Low	The grassland, hedgerows and woodland at the Site provides suitable habitat for common reptile species, all of which are protected against intentional killing or injury, and are SPI. A small population of common lizard were recorded at the Site. Surveys at the Site in 2014 recorded a small population of slow-worm in the fields north of the Site.
Breeding birds	Low	The assemblage of breeding birds at the Site is considered typical for the habitats present. Survey work recorded 20 breeding species, comprising 58 territories. This included four territories of skylark, a ground nesting bird, within the Site, and one territory of a song thrush within the woodland; both are SPI and species of conservation concern. The remainder of the records relate to common and widespread species, which typically nest in scrub, trees, hedges or woodland. There was no evidence of Schedule 1 species breeding at the Site.

Receptors not considered important

4.31 Of the designated sites, habitats and species outlined in this report, those included in Table 18 below have been evaluated and found not to be important in the context of this assessment, meaning that they are not considered of conservation importance or they do not have potential to be significantly affected by the Proposed Development. These designated sites, habitats and species have therefore been scoped out of further assessment.

Table 18: Receptors not considered important in this assessment

Receptor	Importance	Justification
Shipton-on-Cherwell and Whitehill Farm Quarries SSSI	High	This site is not present within or adjacent to the Site. It does not exhibit a high level of ecological connectivity with habitats on the Site or share populations of important species with the Site. Increases in recreational pressure on this site are considered unlikely as there are no PRoW

Receptor	Importance	Justification
		within the SSSI. Air pollution impacts are also considered unlikely given the distance to the Site.
Weavely Furze Firewood Allotments WS	Medium	This site is over 1 km from the Site. Increases in recreational pressure are considered unlikely given its distance from the Site. Air pollution impacts are also considered unlikely given the distance to the Site.
Lower Cherwell Valley CTA	Medium	This site is over 1 km from the Site. Increases in recreational pressure are considered unlikely given its distance from the Site. Air pollution impacts are also considered unlikely given the distance to the Site.
Langford Meadows LWS	Medium	This site is over 1 km from the Site. Increases in recreational pressure are considered unlikely given its distance from the Site. Air pollution impacts are also considered unlikely given the distance to the Site.
Bladon Heath LWS	Medium	This site is over 1 km from the Site. Increases in recreational pressure are considered unlikely given its distance from the Site. Air pollution impacts are also considered unlikely given the distance to the Site.
Bunker's Hill Quarry LWS	Medium	This site is over 1 km from the Site. There are no PRoW through the site and increases in recreational pressure are considered unlikely. Air pollution impacts are also considered unlikely given the distance to the Site.
Arable	Low	The arable habitat at the Site is of an intensive nature. This habitat is common and widespread locally and nationally and is of low inherent ecological value. It does not conform to any of the habitat descriptions in Maddock (2011). No significant impact is anticipated in relation to this habitat and therefore it is excluded from further assessment.
Poor semi-improved grassland	Low	A common and widespread habitat of limited inherent ecological value. It does not conform to any of the habitat descriptions in Maddock (2011). No significant impact is anticipated in relation to this habitat and therefore it is excluded from further assessment.
Wintering birds	Low	Although wintering birds such as geese and waders may be present within the Site, the habitats are common nationally and locally and the resource is likely to be of limited value.
Brown hare	Medium	Although this species is likely present within the Site, it is likely in only very low (non-significant) numbers.
Hedgehog	Low	Although this species is possibly present within the Site, it is likely in only very low (non-significant) numbers.
Otter	NA	This species is not considered to be present at the Site.
Polecat	Low	Although this species is possibly present within the Site, with records relating to casualties on Upper Campsfield Road and A44, it is likely in only very low (non-significant) numbers.
Water vole	NA	This species is not considered to be present at the Site.
Great crested newts	Low	Great crested newts are likely absent from ponds within 250 m of the Site boundary, confirmed through eDNA surveys undertaken in 2021. Terrestrial habitats at the Site are of limited value to this species and it is unlikely that great crested newts would be present.
Other amphibians	Low	Common frog and smooth newt are protected under Schedule 5 of the 1981 Wildlife and Countryside Act (WCA) for sale only. Neither of these species were recorded within the Site and as for great crested newt,

Receptor	Importance	Justification
		terrestrial habitats are of limited value for these species such that it is unlikely they would be present.
Invertebrates	Low	No protected species or species / assemblages of significant conservation value are likely to be present at the Site.
Plants	Low	No protected species or species / assemblages of significant conservation value are likely to be present at the Site.

Future baseline

4.32 The Site predominantly comprises arable land, with poor semi-improved grassland margins and hedgerows and woodland at the boundaries. In the absence of the Proposed Development, it is likely that the future baseline conditions of the Site would remain unchanged and agricultural practices would continue.

5 Effects of the proposals during construction

Development design mitigation

5.1 During the design evolution for the Proposed Development, the initial findings of the ecology work were carefully considered and the mitigation hierarchy of avoid, mitigate and compensate was used to minimise impacts. The masterplan for the Site has therefore been developed so as to avoid and/or minimise the loss of important habitats and features within the Site and seeks to incorporate and enhance these through the provision of new habitats and a network of green infrastructure. The outline landscape plan (TOR, 2022; Appendix 4) sets out proposed green infrastructure of the future development. This enables a clear understanding of which habitats will be retained and where new ones will be provided.

5.2 A good proportion of the Proposed Development will comprise open space in the form of formal and informal semi-natural habitat. The total Proposed Development area is 48.65 ha, of which 32.78 ha is proposed to be open space.

5.3 The masterplan has been designed to allow the retention of certain ecologically valuable habitats, in particular those that support protected species and species of conservation concern. In addition, the scheme design has built-in features that include both compensation for the loss of certain habitat types and enhancement of habitat for protected and notable species. Measures and features that have been incorporated into the scheme design for ecological protection of the identified receptors as well as ecological enhancement are summarised below and shown in Appendix 4.

5.4 In the following sections consideration is given to the likely impact of the Proposed Development on a range of ecological receptors. Mitigation measures incorporated into the development design together with other proposed mitigation and compensation measures are taken into account in determining the likely impact of the Proposed Development.

5.5 However, some ecological effects are still anticipated as a result of construction and the development post-construction, and these are outlined within the following sections.

Habitat retention and protection

5.6 The main habitats of conservation value will be retained throughout the Site:

- The majority of broadleaved semi-natural woodland along the northern and eastern boundaries, although a section measuring approximately 0.39 ha will be removed for the new access road.
- Hedgerows H1 and H2 will be largely retained, although removal of approximately 11 m for footpaths through H1 and 24 m for the link road and footpaths through H2 will occur. Hedgerow H3 will be retained in full.

Habitat creation and enhancements

5.7 Biodiversity is a key focus for the Proposed Development and enhancements will be provided for a number of species presently at the Site and to provide habitat for those which are not. Extensive areas of green space have been incorporated into the Site and boundary features largely retained to ensure that connectivity within the Site and to the surrounding habitats for wildlife is provided (Appendix 4). It includes the creation of a number of habitats that will strengthen and enhance many of the retained habitats detailed above.

5.8 The landscape design will;

- Provide an overall increase in area of habitats of conservation value within the Site including, hedgerows, species-rich grassland, trees, woodland and scattered scrub.

- Provide a mosaic of habitats, rather than individual habitats in discrete locations, to benefit a range of different species within the Site during different stages of their life cycles and throughout the year.

- Provide improved functional ecological corridors throughout the Site for commuting, foraging and dispersal by a range of species to provide a continuous linkage for biodiversity within the area.

Pollution control measures during construction

5.9 Standard pollution prevention measures will be implemented during the construction phase, such as the Environment Agency's 'Pollution Prevention for Business' guidance (DEFRA and Environment Agency, 2016) to ensure habitats, and in particular water courses, are protected from any pollution that could arise from the construction of the Proposed Development.

Assessment of effects

5.10 Potential significant effects on important ecology and nature conservation receptors resulting from the construction of the Proposed Development are listed in Table 19 below.

Table 19: Potential significant effects

Effect	Possible causes/mechanisms
Habitat loss	Intentional or accidental felling of trees, removal or disturbance of vegetation or soils by heavy plant, materials storage / stockpiling etc. during site preparation and construction.
Habitat degradation	Pollution by dust, fuels, lubricants, hydraulic fluid, cement or silt resulting in toxic effects to plants/animals. Damage to soils or vegetation by physical damage, soil compaction (resulting in changes in flora), changes in air quality and/or changes in hydrology resulting in the drying of wetland areas or reductions in local populations of wetland animals or plants.
Habitat fragmentation	Temporary or permanent reduction in habitat connectivity through severance of habitat corridors or isolation of patches of habitats, e.g. by severance of hedgerows or the removal/felling of woodland, installation of features or land-use that presents a barrier or hostile environment (such as a roads and urban areas).
Killing, injury, or disturbance of animals	Digging, vegetation/tree removal, movement of vehicles/heavy plant, and entrapment of animals in trenches, pits or pipes.
Displacement of animals	Visual, noise or vibration-related disturbance from vehicles/heavy plant, lighting, digging or piling. Habitat loss and degradation (see above) may also displace resident animals.

5.11 Table 20 describes the potential significant effects resulting during the construction of the Proposed Development for each of the sensitive receptors identified previously in Table 17.

Table 20: Potential effects resulting from the construction phase of the Proposed Development.

Receptor	Potential effect	Relevant development activity	Detail of ecological effects from Construction Phase	Assessment of impact and effect
Oxford Meadows SAC	Habitat degradation	Site clearance and construction	There is no anticipated direct loss of, or damage to, SAC habitat as a result of the construction of the Proposed Development, as the SAC is not within or directly adjacent to proposed works.	Negligible impact, negligible effect, not significant
		Dust emissions	The construction works at the Site are not anticipated to create significant dust emissions. Therefore, no adverse effect is anticipated on this designated site.	
		Air pollution	The construction works at the Site are not anticipated to create significant levels of air pollution, such as nitrogen oxides (NO_x), nor give rise to a significant increase in construction traffic. Therefore, no adverse effect is anticipated on this designated site.	
		Water pollution	Given the standard pollution prevention measures that will be implemented during the construction phase, the Proposed Development is not anticipated to cause water pollution. Given this, and the distance of the Site from the SAC, no adverse effect is anticipated on this designated Site from water pollution.	
Blenheim Park SSSI	Habitat degradation	Site clearance and construction	There is no anticipated direct loss of, or damage to, SSSI habitat as a result of the construction of the Proposed Development as the SSSI is not within or directly adjacent to proposed works.	Negligible impact, negligible effect, not significant
		Dust emissions	The construction works at the Site are not anticipated to create significant dust emissions. Therefore, no adverse effect is anticipated on this designated site.	
		Air pollution	The construction works at the Site are not anticipated to create significant levels of air pollution, such as NO_x, nor give rise to a significant increase in construction traffic. Therefore, no adverse effect is anticipated on this designated site.	
		Water pollution	Given the standard pollution prevention measures that will be implemented during the construction phase, the Proposed Development is not anticipated to cause water pollution. Given this, and the distance of the Site from the SSSI, no adverse effect is anticipated on this designated Site from water pollution.	
Sansoms Green Lane WS	Habitat degradation	Site clearance and construction	There is no anticipated direct loss of, or damage to, WS habitat as a result of the construction of the Proposed Development, as the WS is not within or directly adjacent to proposed works.	Negligible impact, negligible effect, not significant
		Dust emissions	The construction works at the Site are not anticipated to create significant dust emissions. Therefore, no adverse effect is anticipated on this site.	

Receptor	Potential effect	Relevant development activity	Detail of ecological effects from Construction Phase	Assessment of impact and effect
		Air pollution	The construction works at the Site are not anticipated to create significant levels of air pollution, such as NO_x, nor give rise to a significant increase in construction traffic. Therefore, no adverse effect is anticipated on this designated site.	
		Water pollution	Given the standard pollution prevention measures that will be implemented during the construction phase, the Proposed Development is not anticipated to cause water pollution. Given this, and the distance of the Site from the WS, no adverse effect is anticipated on this designated Site from water pollution.	
Glyme and Dorn Valleys CTA	Habitat degradation	Site clearance and construction	There is no anticipated direct loss of, or damage to, CTA habitat as a result of the construction of the Proposed Development, as the CTA is not within or directly adjacent to proposed works.	Negligible impact, negligible effect, not significant
		Dust emissions	The construction works at the Site are not anticipated to create significant dust emissions. Therefore, no adverse effect is anticipated on this site.	
		Air pollution	The construction works at the Site are not anticipated to create significant levels of air pollution, such as NO_x, nor give rise to a significant increase in construction traffic. Therefore, no adverse effect is anticipated on this designated site.	
		Water pollution	Given the standard pollution prevention measures that will be implemented during the construction phase, the Proposed Development is not anticipated to cause water pollution. Given this, and the distance of the Site from the CTA, no adverse effect is anticipated on this designated Site from water pollution.	
Blenheim and Ditchley Parks CTA	Habitat degradation	Site clearance and construction	There is no anticipated direct loss of, or damage to, CTA habitat as a result of the construction of the Proposed Development, as the CTA is not within or directly adjacent to proposed works.	Negligible impact, negligible effect, not significant
		Dust emissions	The construction works at the Site are not anticipated to create significant dust emissions. Therefore, no adverse effect is anticipated on this site.	
		Air pollution	The construction works at the Site are not anticipated to create significant levels of air pollution, such as NO_x, nor give rise to a significant increase in construction traffic. Therefore, no adverse effect is anticipated on this designated site.	
		Water pollution	Given the standard pollution prevention measures that will be implemented during the construction phase, the Proposed Development is not anticipated to cause water pollution. Given this, and the distance of the Site from the	

Receptor	Potential effect	Relevant development activity	Detail of ecological effects from Construction Phase	Assessment of impact and effect
			CTA, no adverse effect is anticipated on this designated Site from water pollution.	
Blenheim Park – New Park and part of Great Park pLWS	Habitat degradation	Site clearance and construction	There is no anticipated direct loss of, or damage to, pLWS habitat as a result of the construction of the Proposed Development, as the pLWS is not within or directly adjacent to proposed works.	Negligible impact, negligible effect, not significant
		Dust emissions	The construction works at the Site are not anticipated to create significant dust emissions. Therefore, no adverse effect is anticipated on this site.	
		Air pollution	The construction works at the Site are not anticipated to create significant levels of air pollution, such as NO_x, nor give rise to a significant increase in construction traffic. Therefore, no adverse effect is anticipated on this designated site.	
		Water pollution	Given the standard pollution prevention measures that will be implemented during the construction phase, the Proposed Development is not anticipated to cause water pollution. Given this, and the distance of the Site from the pLWS, no adverse effect is anticipated on this designated Site from water pollution.	
Woodstock Water Meadows LWS	Habitat degradation	Site clearance and construction	There is no anticipated direct loss of, or damage to, LWS habitat as a result of the construction of the Proposed Development, as the LWS is not within or directly adjacent to proposed works.	Negligible impact, negligible effect, not significant
		Dust emissions	The construction works at the Site are not anticipated to create significant dust emissions. Therefore, no adverse effect is anticipated on this site.	
		Air pollution	The construction works at the Site are not anticipated to create significant levels of air pollution, such as NO_x, nor give rise to a significant increase in construction traffic. Therefore, no adverse effect is anticipated on this designated site.	
		Water pollution	Given the standard pollution prevention measures that will be implemented during the construction phase, the Proposed Development is not anticipated to cause water pollution. Given this, and the distance of the Site from the LWS, no adverse effect is anticipated on this designated Site from water pollution.	
Broadleaved semi-natural woodland	Habitat loss. degradation	Tree felling	The Proposed Development will result in the loss of approximately 0.39 ha of broadleaved semi-natural woodland for the main access road off Upper Campsfield Road at the eastern boundary. The remainder of the woodland and trees within hedgerows will be retained such that there will be minimal direct habitat loss.	Small impact, slight effect, not significant, adverse

Receptor	Potential effect	Relevant development activity	Detail of ecological effects from Construction Phase	Assessment of impact and effect
	Habitat degradation	Encroachment of root zones, and/or arboricultural works	The Proposed Development is not anticipated to result in the encroachment of root zones of mature trees. There is some potential for accidental encroachment by machinery during construction and landscaping works.	
		Accidental physical damage during site clearance and construction	Without adequate fencing protection there is some (low) risk of accidental damage to the mature trees by machinery during construction, leading to damage.	
Hedgerows	Habitat loss, degradation	Accidental physical damage during site clearance and construction	The Proposed Development will retain the majority of hedgerow habitat, other than a breach of approximately 24 m for the link road and footpaths through H2, and 11 m for footpaths through H1, therefore minimal direct habitat loss is anticipated. However, without adequate fencing protection there is some (low) risk of accidental incursion by machinery during construction, leading to damage to hedgerow soils and vegetation.	Small impact, slight effect, not significant, adverse
		Dust emissions	Construction works at the Site are not anticipated to create significant dust emissions. Hedgerows are not considered to be particularly susceptible to impacts from soil dust. Therefore, no adverse effect is anticipated from dust emissions on this habitat.	Negligible impact, negligible effect, not significant
		Changes to hydrological regime resulting from construction and drainage schemes	Hedgerows are not considered to likely be groundwater dependent. The roots of trees and shrubs forming hedgerows are likely to depend entirely on soil moisture. Therefore, no hydrological impacts on the hedgerows are anticipated.	
Badger	Habitat loss	Site clearance and construction	There is evidence that badgers use the Site for foraging and commuting. There will be a loss of lower-suitability foraging and commuting habitat for the badgers through the loss of arable fields. However, the hedgerow network and woodland will be largely retained (apart from the sections removed for the main access road and footpaths). Given that badgers are mobile species and there is suitable foraging and commuting habitat off-site which the badgers can utilise, there is not considered to be any adverse effect on the badgers from loss of habitat.	Negligible impact, negligible effect, not significant

Receptor	Potential effect	Relevant development activity	Detail of ecological effects from Construction Phase	Assessment of impact and effect
	Killing or injury of a nationally protected species	Site clearance and construction	Badger setts present within the Site will be retained, the closest of which is located approximately 15 m from the likely construction area. Digging woks in close proximity could damage the sett or kill, injure or disturb badgers, resulting in offences under the Protection of Badgers Act 1992. Works causing noise or vibrations could also cause disturbance and hence, an offence. There is the possibility that badgers may become trapped in open trenches, pits or pipework. This is an offence under the Protection of Badgers Act 1992. There is not considered to be any effect on the local conservation status of badger (since it is common locally, regionally and nationally) during the construction phase, but without appropriate mitigation there is potential for breaches of wildlife legislation.	Small impact, slight effect, not significant, adverse
Bats	Reduction in population of European Protected species by habitat loss, degradation and fragmentation (through reduction in foraging and commuting opportunities)	Site clearance and construction	The Proposed Development will result in the replacement of arable fields with areas of urban development and loss of 0.57 ha of woodland to the main access. However, the majority of arable will be replaced with areas of green space, including wildflower grassland, woodland and trees which are of elevated value to bats and there is therefore likely to be an increase in the availability of foraging habitat as a result of the Proposed Development. The Proposed Development will retain the majority of habitats of particular value to foraging bats (the hedgerow network and woodland), although small losses of these habitats will occur to create the main access and footpaths. However, the provision of new habitats of value to bats within the Proposed Development means there is likely to be minimal fragmentation of foraging and commuting habitats for bats.	Small impact, slight effect, not significant, adverse
		Increased light spillage onto bat foraging and commuting habitats due to floodlighting during construction	Without adequate mitigation, in the form of a lighting strategy, light spillage from floodlighting used during construction on to retained habitats has the potential to reduce the value of these habitats as bat foraging and commuting habitat. Given that this foraging and commuting habitat has been valued at the County scale, this effect could potentially affect bat populations at the County scale.	Medium impact, moderate effect, significant, adverse

Receptor	Potential effect	Relevant development activity	Detail of ecological effects from Construction Phase	Assessment of impact and effect
	Reduced population of European Protected species through reduction in roosting opportunities	Tree felling or arboricultural works	A number of trees within the woodland in the east of the Site will be removed to create the main access, nine of which have been identified as having bat roost potential (six low potential, three moderate potential). Should any bat roosts be present in these trees, there would be a loss of roosting opportunities. None of the trees have suitability to be used as maternity or important hibernation sites. Given the species of bats known to use the Site, this effect could potentially affect bat populations at the County scale.	
		Light spillage onto mature trees from floodlighting during construction	Without adequate mitigation, in the form of a lighting strategy, light spillage onto potential tree roosts in the woodland from floodlighting during construction could cause a loss of a relatively small number of tree roosts, which could potentially be of significance at the County scale.	
	Reduced population of European Protected species caused by killing and injury of individuals	Tree felling	Nine trees with bat roost potential (six low and three moderate potential) will be removed for the main access in the east of the Site. As such, there is a risk of killing or injury of bats when these trees are felled.	
Dormouse	Reduced population of European Protected Species through habitat degradation	Pollution or physical damage during site clearance and construction.	Without adequate protection or buffer zones during construction there is some risk of physical damage to retained habitats suitable for this species.	Medium impact, moderate effect, significant, adverse
Reptiles	Reduced population size of SPIs through habitat loss	Site clearance and construction	Small areas of suitable reptile habitat, namely poor semi-improved grassland, hedgerows and woodland edge, will be lost within the Proposed Development. There is the potential for a reduction in the population within the Site, however given that the majority of suitable habitats are retained, the effect on reptiles is likely to be minimal.	Small impact, slight effect, not significant, adverse
	Reduced population of SPIs through	Site clearance and construction	Without adequate fencing protection around retained habitat features during construction there is some risk of physical damage to retained habitat suitable for this group of species.	

Receptor	Potential effect	Relevant development activity	Detail of ecological effects from Construction Phase	Assessment of impact and effect
	habitat degradation			
	Reduced population of SPIs caused by habitat fragmentation	Site clearance and construction	Habitat connectivity for reptiles at the Site is provided mainly by the poor semi-improved grassland that forms the arable field margins at the Site, which is largely retained except for a small area in the east of the Site to create the main access. As such, there is likely to be minimal fragmentation of habitats for reptiles.	
	Reduced population of a SPIs caused by killing and injury of individuals	Site clearance and construction	Clearance of vegetation (primarily poor semi-improved grassland that forms the arable field margins) could cause the killing or injury of reptiles. Killing or injury of reptiles could have an adverse effect on the population of this group of species at the local level and will lead to a breach of wildlife legislation.	
Breeding birds	Reduction in breeding habitat at the Site	Site clearance and construction	The Proposed Development will retain habitats of importance to breeding birds including the majority of hedgerow, woodland and trees. There will however be small losses of hedgerow and woodland which could form small areas of breeding bird habitat. In addition, the arable field supports four skylark breeding territories. There is the potential for a reduction in the populations within Site.	Small impact, slight effect, not significant, adverse
	Killing or injury of individual birds and damage or destruction of active nests	Site clearance and construction	There is potential for the killing and injury of individual birds and damage or destruction of their nests during vegetation clearance (i.e. of hedgerows and woodland) or other works to trees. This will lead to a breach of wildlife legislation. There is negligible potential for breaches of legislation relating to species listed on Schedule I of the Wildlife and Countryside Act 1981 (as amended).	

6 Effects of the proposals post-construction

6.1 Potential significant effects on important ecology and nature conservation receptors resulting from the development post-construction are listed in Table 21 below.

Table 21: Potential significant effects resulting from post-construction of the Proposed Development

Effect	Possible causes/mechanisms
Habitat degradation	Increased recreational pressure (e.g. damage to vegetation and compaction/disturbance of soils through additional footfall, dog fouling) on habitats. Management/gardening of vegetation close to gardens (causing damage to habitats). Fly tipping of litter or polluting materials by new residents. Introduction of invasive species by new residents. Light spillage from street lighting or other artificial lighting. Air and water pollution from vehicles. Hydrological changes due to increased hard surface areas.
Habitat fragmentation	Reduction in habitat connectivity through road traffic, permanent changes of land use and permanent structures or barriers. Light spillage from street lighting or other artificial lighting.
Killing, injury, or disturbance of animals	Killing or injury of animals by collisions with traffic. Additional traffic, new roads and paths. Increased predation or disturbance from cats and dogs.
Reduction in animal populations	Permanent loss of habitat. Increased predation or disturbance from cats and dogs.
Displacement of animals	Visual (especially lighting), noise or vibration-related disturbance. Habitat loss and degradation (see above) may also displace resident animals. Light spillage from street lighting or other artificial lighting.

6.2 Table 22 describes the potential significant effects resulting from the operational phase of the Proposed Development for each of the sensitive receptors identified previously in Table 17.

Table 22: Potential effects resulting from the operational phase

Receptor	Potential Effect	Relevant development activity	Detail of ecological effects from operational phase	Assessment
Oxford Meadows SAC	Habitat degradation	Increased recreational pressure	This European designated site is located approximately 5.2 km south of the Site and would be accessed via car on the A44 and potentially the A40 and A34, three major road networks in the area. The SAC has PRoW through the lowland hay meadow habitat for which it is designated for, and impacts may arise from trampling of ground flora, littering, fly tipping and dog fouling. The Habitats Regulations Assessment (HRA) (Atkins, 2018) sets out that parking provision at Oxford Meadows SAC is limited and references previous studies which identified that the majority of visitors are from Oxford, walking up to 1.9 km to the SAC. Given the distance of the Proposed Development from the SAC and presence of major roads (i.e. A34, A40, A44 and A4165) surrounding the SAC, visitors from the Proposed Development are likely to be deterred from visiting the SAC. Further, Policies ESD17, BSC10 and BSC11 of the Local Plan (Cherwell District Council, 2015) require developments to provide public open space over and above that typically required. Accordingly, large areas of Public Open Space are included in the Proposed Development, with a number of on-site recreational footpaths incorporated. This is likely to ameliorate any increase in visitors to the SAC. SAC. The HRA concluded that the Local Plan 'will not have an effect on the integrity of the Oxford Meadows SAC either alone or in-combination with other projects and plans.' It is therefore considered that recreational pressure on the SAC from the development will be negligible.	Negligible impact, negligible effect, not significant
		Air pollution	There is potential that increased levels of traffic resulting from the development on main roads within 200 m of the SAC (i.e., sections of the A34 and A40) may negatively impact the integrity of the SAC due to increased air pollution. The main pollutants of concern are nitrogen oxides (NO_x), ammonia (NH_3) and nitrogen which can have a directly toxic effect upon vegetation and lead to greater rates of nitrogen deposition in soils, increasing soil fertility and thus having a deleterious effect on the quality of semi-natural, nitrogen-limited terrestrial habitat. Nitrogen oxide emissions are	Negligible impact, negligible effect, not significant

Receptor	Potential Effect	Relevant development activity	Detail of ecological effects from operational phase	Assessment
			dominated by the output of vehicle exhausts. Vehicle exhaust emissions also include ammonia, but these are very small compared to agricultural sources which dominate ammonia emissions.. The deposition of airborne oxides upon habitats in excess of their recognised critical load, are likely to have a significant effect upon those habitats. A number of habitats (including some found in Oxford Meadows SAC) are dependent upon low nitrogen levels. Traffic modelling carried out for the Proposed Development indicates that increases to Average Annual Daily Traffic (AADT) resulting from the Proposed Development are predicted to be 559 on the A34 south of the A40 and 0 on the A40 west of Oxford. These values (which account for all additional traffic) are well below Natural England's screening threshold for adverse effects of road traffic emissions (Natural England, 2018) and any increases in emissions associated with an increase in road traffic will be negligible. This is reflected in the air quality assessment (WSP, 2022) in that the critical levels of NOx and ammonia are not exceeded within the SAC, and although the upper critical load for nitrogen deposition is exceeded in places, the increases are relatively small and equate to less than 1% of the critical load. Therefore, there is no scope for the Proposed Development, considered alone, to cause a significant adverse effect on Oxford Meadows SAC. The increase in AADT as a result of the Proposed Development in combination with other committed development is also predicted to be 559 on the A34 south of the A40 and 0 on the A40 west of Oxford. However, air quality modelling predicts changes in NOx, ammonia and nitrogen deposition that equate to more than 1% of the critical level/load as a result of the Proposed Development, in combination with other committed developments. Therefore, there is potential for a significant adverse effect on Oxford Meadows SAC from the Proposed Development in combination with other plans and projects. A shadow appropriate assessment has been completed, which has concluded that the Proposed Development will not have an adverse effect on the integrity of the Oxford Meadows SAC alone or in-combination with other plans and projects. This is because although in-combination the critical	

Receptor	Potential Effect	Relevant development activity	Detail of ecological effects from operational phase	Assessment
			level/load of NOx, ammonia and nitrogen deposition will be exceeded in places within the SAC, this is not considered likely to prevent the conservation objective for the SAC to reduce nitrogen deposition to below critical loads being met. The reasons for this are that the relative contribution of nitrogen from road traffic made to nitrogen deposition on the SAC is calculated by the APIS website as less than 10%. With over a third of total nitrogen deposition coming from agricultural sources this is a much more significant nitrogen source that must be reduced to achieve the conservation objective for the SAC. In addition, nitrogen deposition from traffic sources has been and is continuing on a downward trajectory to 2034. It is in this context that it is concluded that the insignificant contribution to nitrogen deposition alone and the in-combination deposition can be considered as unlikely to prevent the conservation objective for nitrogen deposition from being met. Traffic contributions are heading in a positive direction and additional traffic contributions are not likely to reverse the downward trend. The past and continuing reduction in nitrogen deposition from road traffic would occur regardless without the development and the area affected by such changes as a percentage of the total area of the SAC is relatively small Full details of this assessment are provided in the Report to inform a Habitats Regulations Assessment (BSG Ecology, 2022a).	
		Water pollution	A SUDS system has been developed the Site to manage water discharge from the Site to the wider area. This will also filter any pollutants which may occur so they are not discharged to any water courses. The SAC is 5.2 km from the Proposed Development and is therefore at a distance where any water pollution would not impact the SAC. Therefore, there is unlikely to be water pollution to the SAC as a result of the Proposed Development.	Negligible impact, negligible effect, not significant
		Hydrological effects	The SAC is at a distance where any hydrological changes results from the Site are not likely to impact the SAC.	
Blenheim Park SSSI	Habitat degradation	Increased recreational pressure	This designated site is located 1.5 km from the Site via the shortest walking routes, on paved paths. There are PRoW routes through the woodland sections of the SSSI. The closest of these is 3.3 km from the Site.	Negligible impact, negligible

Receptor	Potential Effect	Relevant development activity	Detail of ecological effects from operational phase	Assessment
			Woodland habitat is not considered especially susceptible to recreational impacts (unlike for example heathland that supports ground nesting birds and more sensitive ground flora), although there is some potential for trampling of ground flora, littering and fly-tipping. Dogs are permitted in this woodland and therefore there may be an increased incidence of dog fouling. Despite the distance of the accessible areas of the SSSI from the Proposed Development, Blenheim Park is a well-known popular destination in the local area as well as for tourists. There is therefore potential for increased public access to the woodland and hence a resulting increase in recreational pressure at this site, potentially resulting in physical damage to the woodland ground flora. However, footpaths and tarmacked tracks are present throughout the woodland areas of the SSSI, reducing the likelihood of trampling of ground flora. Lake habitat is not considered especially susceptible to recreational impacts, although there is some potential for pollution by littering. In addition, there may be disturbance of waterfowl using, and breeding next to, the lake, by dogs. Dogs are however encouraged to be on leads within the Blenheim Estate, reducing the likelihood of increased disturbance by dogs. Large areas of Public Open Space are also included in the Proposed Development, with a number of on-site recreational footpaths incorporated. This is likely to ameliorate any increase in visitors to the SSSI.	effect, not significant
		Air pollution	There is potential for increased deposition of air pollutants, such as NOx, ammonia and nitrogen, arising from traffic associated with the Proposed Development. Traffic modelling carried out for the Proposed Development indicates that increases to AADT resulting from the Proposed Development are predicted to be 438 on the A4095 through Bladon, 359 on the A44 Oxford Road and 98 on the A44 Manor Road. These values (which account for all additional traffic) are well below Natural England's screening threshold for adverse effects of road traffic emissions (Natural England, 2018) and any increases in emissions associated with an increase in road traffic will be negligible. This is reflected in the air quality assessment (WSP, 2022) in that NOx levels are well below the critical level for broadleaved, mixed and yew woodland (30µg/m^3) for which the SSSI is designated. This is the case for the	Negligible impact, negligible effect, not significant

Receptor	Potential Effect	Relevant development activity	Detail of ecological effects from operational phase	Assessment
			Proposed Development both alone and in combination with other committed development. Two locations (BP T2 and BP T3) equate to a change of 1% of the critical level, however these areas are at the roadside and will not impact the qualifying features of the SSSI. In combination, changes in NOx over the 1% critical level are predicted between 50 m and 100 m from the A44 and A4095. However, these increases are small and do not exceed the critical level of 30µg/m^3. For ammonia, modelling shows that the Proposed Development will not significantly increase ammonia deposition within the SSSI, as the predicted increases are generally than less than 1% of the critical level. One location, BP T3, is precited to result in a change in ammonia that equates to more than 1% of the critical level. However, this is at the roadside and remains at less than the critical level of 3 µg/m^3. In combination, changes in ammonia over the 1% critical level are predicted between 0 m and 30 m from the A44 and A4095. However, these increases are small and do not exceed the critical level of 3 µg/m^3. Air quality modelling for the Site (WSP, 2022) shows that nitrogen deposition rates are already exceeding the upper and lower limits of the critical load for broadleaved, mixed and yew woodland within the SSSI, regardless of the Proposed Development. Road traffic generated by the Proposed Development will not significantly increase the nitrogen deposition within the SSSI, as the predicted increases are all less than 1% of the critical load except at the roadside at BP T2 and T3. In addition, the lake, for which the SSSI is partly designated for, is a eutrophic water body. Nitrogen deposition is unlikely to be very harmful to eutrophic standing waters (APIS, 2016) and therefore the impact of NO_x pollutants resulting from the Proposed Development is considered to be negligible. The woodland areas of the SSSI are, at their closest point, over 1.2 km from the nearest major road (the A44, where most traffic from the Proposed Development is considered likely to travel along). Studies have shown that beyond 200 m, pollution levels from vehicle emissions are not significant (Natural England, 2018).	

Receptor	Potential Effect	Relevant development activity	Detail of ecological effects from operational phase	Assessment
			It is therefore considered that air pollution on the SSSI from the Proposed Development will be negligible.	
		Water pollution	A SUDS system has been developed for the Site to manage water discharge from the Site to the wider area. This will also filter any pollutants which may occur so they are not discharged to any water courses, including those within the SSSI. Therefore, there is unlikely to be water pollution to the SSSI as a result of the Proposed Development.	Negligible impact, negligible effect, not significant
		Hydrological effects	A SUDS system has been developed for the Site to manage surface water discharge to the wider area. The Site is 1.1 km at its closest point from the River Glyme, which feeds into the lake in the SSSI, and separated by existing residential development. There is therefore unlikely to be a significant increase or decrease in water flow at the SSSI as a result of the Proposed Development. The water levels within the lake are controlled through a weir and therefore any hydrological changes can be easily mitigated.	
Sansoms Green Lane WS	Habitat degradation	Increased recreational pressure	This designated site is located 0.6 km from the Site via the shortest walking routes, on paved paths proposed as park of the adjacent Park View development. A PRoW is present between the species-rich hedgerows. This habitat is not considered especially susceptible to recreational impacts (unlike for example heathland that supports ground nesting birds and more sensitive ground flora), although there is some potential for trampling of ground flora, littering and fly-tipping. Dogs are permitted in the WS and therefore there may be an increased incidence of dog fouling. There is potential for increased public access to this area and hence a resulting increase in recreational pressure at this site, potentially resulting in physical damage to the ground flora. There is however a marked footpath present through the WS, reducing the likelihood of trampling of ground flora. Large areas of Public Open Space are also included in the Proposed Development, with a number of on-site recreational footpaths incorporated. This is likely to ameliorate any increase in visitors to the WS.	Negligible impact, negligible effect, not significant
		Air pollution	There is potential for increased deposition of air pollutants, such as NOx, ammonia and nitrogen, arising from traffic associated with the Proposed Development. No specific traffic models for the WS have been completed as there are no habitats in the WS considered to be highly sensitive to NOx,	

Receptor	Potential Effect	Relevant development activity	Detail of ecological effects from operational phase	Assessment
			ammonia and nitrogen deposition within 50 m the Site or 50 m of the roads used by development traffic. It is therefore considered that air pollution impacts on the WS from the development will be negligible.	
		Water pollution	A SUDS system has been developed for the Site to manage water discharge from the Site to the wider area. This will also filter any pollutants which may occur so they are not discharged to any water courses. There are no significant water courses in the WS. Therefore, there is unlikely to be water pollution to the WS as a result of the Proposed Development.	
		Hydrological effects	There are no major water courses in the WS. There is therefore unlikely to be a significant increase or decrease in water flow at the WS as a result of the Proposed Development.	
Glyme and Dorn Valleys CTA	Habitat degradation	Increased recreational pressure	This designated site is located 1.5 km from the Proposed Development via the shortest walking routes, on paved paths. Small sections of the CTA have PRoW through lowland meadow, parkland and woodland. These habitats are not considered especially susceptible to recreational impacts (unlike for example heathland that supports ground nesting birds and more sensitive ground flora), although there is some potential for trampling of ground flora, littering and fly-tipping. Dogs are permitted and therefore there may be an increased incidence of dog fouling. There is limited potential for increased public access to these areas given the distance from the Site on foot, and therefore a significant increase in recreational pressure at this site is unlikely. Further, marked footpaths are present in the CTA, reducing the likelihood of trampling of ground flora. Large areas of Public Open Space are also provided in the Proposed Development, with a number of on-site recreational footpaths incorporated. This is likely to ameliorate any increase in visitors to the CTA.	Negligible impact, negligible effect, not significant
		Air pollution	There is potential for increased deposition of air pollutants, such as NOx, ammonia and nitrogen, arising from traffic associated with the Proposed Development. No specific traffic models for the CTA have been completed as there are no habitats in the CTA considered to be highly sensitive to NOx, ammonia and nitrogen deposition within 50 m of the Site or 50 m of the roads used by development traffic. It is therefore considered that air pollution impacts on the CTA from the development will be negligible.	

Receptor	Potential Effect	Relevant development activity	Detail of ecological effects from operational phase	Assessment
		Water pollution	A SUDS system has been developed for the Site to manage water discharge from the Site to the wider area. This will also filter any pollutants which may occur so they are not discharged to any water courses, including those within the CTA. Therefore, there is unlikely to be water pollution to the CTA as a result of the Proposed Development.	
		Hydrological effects	A SUDS system has been developed for the Site to manage water discharge from the Site to the wider area. The Site is 1.1 km at its closest point from the River Glyme and separated by existing residential development. There is therefore unlikely to be a significant increase or decrease in water flow at the CTA as a result of the Proposed Development.	
Blenheim and Ditchley Parks CTA	Habitat degradation	Increased recreational pressure	This designated site is located 1.9 km from the Site via the shortest walking routes, on paved paths. There are PRoW routes through the CTA which traverse through historic parkland/wood pasture with veteran trees as well as areas of broadleaf woodland. Woodland and parkland habitat is not considered especially susceptible to recreational impacts (unlike for example heathland that supports ground nesting birds and more sensitive ground flora), although there is some potential for trampling of ground flora, littering and fly-tipping. Dogs are permitted in the CTA and therefore there may be an increased incidence of dog fouling. Despite the distance of the CTA from the Proposed Development, Blenheim and (and to a lesser extent) Ditchley Park are well-known popular destinations in the local area as well as for tourists. There is therefore potential for increased public access to the woodland and parkland and hence a resulting increase in recreational pressure at this site, potentially resulting in physical damage to the ground flora. However, footpaths and tarmacked tracks are present throughout the CTA, reducing the likelihood of trampling of ground flora. Large areas of Public Open Space are also included in the Proposed Development, with a number of on-site recreational footpaths incorporated. This is likely to ameliorate any increase in visitors to the CTA.	Negligible impact, negligible effect, not significant
		Air pollution	There is potential for increased deposition of air pollutants, such as NOx, ammonia and nitrogen, arising from traffic associated with the Proposed	

Receptor	Potential Effect	Relevant development activity	Detail of ecological effects from operational phase	Assessment
			Development. No specific traffic models for the CTA have been completed as there are no habitats in the CTA considered to be highly sensitive to NOx, ammonia and nitrogen deposition within 50 m of the Site or 50 m of the roads used by development traffic. It is therefore considered that air pollution impacts on the CTA from the development will be negligible.	
		Water pollution	A SUDS system has been developed for the Site to manage water discharge from the Site to the wider area. This will also filter any pollutants which may occur so they are not discharged to any water courses. There are no significant water courses in the CTA within the vicinity of the sites. Therefore, there is unlikely to be water pollution to the CTA as a result of the Proposed Development.	
		Hydrological effects	A SUDS system has been developed for the Site to manage water discharge from the Site to the wider area. There are no major water courses in the CTA within the vicinity of either site. There is therefore unlikely to be a significant increase or decrease in water flow at the CTA as a result of the Proposed Development.	
Blenheim Park – New Park and part of Great Park pLWS	Habitat degradation	Increased recreational pressure	This designated site is located 1.7 km from the Site via the shortest walking routes, on paved paths. There are PRoW routes through the pLWS which traverse through historic parkland/wood pasture with veteran trees as well as areas of ancient woodland. Woodland and parkland habitat is not considered especially susceptible to recreational impacts (unlike for example heathland that supports ground nesting birds and more sensitive ground flora), although there is some potential for trampling of ground flora, littering and fly-tipping. Dogs are permitted in the pLWS and therefore there may be an increased incidence of dog fouling. Despite the distance of the pLWS from the Proposed Development, Blenheim Park is a well-known popular destination in the local area as well as for tourists. There is therefore potential for increased public access to the woodland and parkland and hence a resulting increase in recreational pressure at this site, potentially resulting in physical damage to the ground flora. However, footpaths and tarmacked tracks are present throughout the pLWS, reducing the likelihood of trampling of ground flora.	Negligible impact, negligible effect, not significant

Receptor	Potential Effect	Relevant development activity	Detail of ecological effects from operational phase	Assessment
			Large areas of Public Open Space are also included for the Proposed Development, with a number of on-site recreational footpaths incorporated. This is likely to ameliorate significant increase in visitors to the pLWS.	
		Air pollution	There is potential for increased deposition of air pollutants, such as NOx, ammonia and nitrogen, arising from traffic associated with the Proposed Development. No specific traffic models for the pLWS have been completed as there are no habitats in the pLWS considered to be highly sensitive to NOx, ammonia and nitrogen deposition within 50 m of the Site or 50 m of the roads used by development traffic. It is therefore considered that air pollution impacts on the pLWS from the Proposed Development will be negligible.	
		Water pollution	A SUDS system has been developed for the Site to manage water discharge from the Site to the wider area. This will also filter any pollutants which may occur so they are not discharged to any water courses. There are no significant water courses in the pLWS. Therefore, there is unlikely to be water pollution to the pLWS as a result of the Proposed Development.	
		Hydrological effects	A SUDS system has been developed for the Site to manage water discharge from the Site to the wider area. There are no major water courses in the pLWS. There is therefore unlikely to be a significant increase or decrease in water flow at the pLWS as a result of the Proposed Development.	
Woodstock Water Meadows LWS	Habitat degradation	Increased recreational pressure	This designated site is located 1.7 km from the Site via the shortest walking routes, on paved paths. PRoW are present through the wet meadow, neutral grassland and wet woodland. These habitats are not considered especially susceptible to recreational impacts (unlike for example heathland that supports ground nesting birds and more sensitive ground flora), although there is some potential for trampling of ground flora, littering and fly-tipping. Dogs are permitted in the LWS and therefore there may be an increased incidence of dog fouling. There is limited potential for increased public access to these areas given the distance from the Site on foot, and therefore a significant increase in recreational pressure at this site is unlikely. Further, marked footpaths are present in the LWS, reducing the likelihood of trampling of ground flora. Large areas of Public Open Space are also provided in the Proposed Development, with a number of on-site recreational footpaths incorporated. This is likely to ameliorate any increase in visitors to the LWS.	Negligible impact, negligible effect, not significant

Receptor	Potential Effect	Relevant development activity	Detail of ecological effects from operational phase	Assessment
		Air pollution	There is potential for increased deposition of air pollutants, such as NOx, ammonia and nitrogen deposition arising from traffic associated with the Proposed Development. Potential air quality impacts were assessed, which included an assessment of development traffic at a location on the A44 road closest to the LWS (Transect WM LWS T1 in WSP, 2022). This assessment found background NOx concentrations to be 14.8 to 14.4 ug/m³ in 2019. With the influence of road traffic operating on the network considered from the development in combination with other committed development, the results indicate NOx concentrations will be 9.8 to 9.6 ug/m³ at 170 m to 200 m from the A44. This is well below the critical level for the habitat types within the LWS (30 ug/m³). The influence of road traffic emissions on total pollutant concentrations will rapidly reduce with distance from the road. The sensitive habitats within the LWS are set back from the road, with the closest open meadow being 166 m from the road's edge. At a distance of 170m to 200 m from the A44, the predicted increase in NOx concentrations due to the Proposed Development is 0.02 µg/m³ (0.1% of the critical level). For ammonia, the critical level for higher plants is 3 µg/m³. The modelling (WSP, 2022) shows that increases in ammonia as a result of the Proposed Development are negligible, being the same both with and without the development, and the critical level will not be exceeded. For nitrogen deposition, the critical load for floodplain grazing marsh (short vegetation) at the LWS is 20-30 kg N ha/ha/yr. The results of the modelling show that the Proposed Development is predicted to result in negligible increases in nitrogen deposition at the LWS, both alone and in-combination. It is therefore considered that air pollution impacts on the LWS from the Proposed Development will be negligible.	Negligible impact, negligible effect, not significant
		Water pollution	A SUDS system has been developed for the Site to manage water discharge from the Site to the wider area. This will also filter any pollutants which may occur so they are not discharged to any water courses, including the River Glyme with flows adjacent to the LWS. Therefore, there is unlikely to be water pollution to the LWS as a result of the Proposed Development.	Negligible impact, negligible effect, not significant

Receptor	Potential Effect	Relevant development activity	Detail of ecological effects from operational phase	Assessment
		Hydrological effects	The LWS runs adjacent to the River Glyme; the Site is 1.1 km away. The LWS is subject to hydrological changes from the River Glyme. This river feeds into the lake within the Blenheim Park SSSI. The water levels within the lake are controlled through a weir and therefore any hydrological changes can be easily mitigated. A SUDS system has been developed for the Site to manage water discharge from the Site to the wider area. There is therefore unlikely to be a significant increase or decrease in water flow at the LWS as a result of the Proposed Development.	
Broadleaved semi-natural woodland	Habitat degradation	Increased levels of arboricultural management	Trees may be subject to increased arboricultural management due to the health and safety concerns of management authorities.	Negligible impact, negligible effect, not significant
Hedgerows	Habitat degradation	Poor management	Without a suitably detailed conservation management regime for retained and new hedgerows, there is a risk of lack of management (eventually resulting in tall spindly shrubs, offering little cover near ground level, which will reduce their biodiversity value) or excessive (i.e. annual) cutting which will largely prevent fruiting or flowering, and will limit their structural complexity.	Small impact, slight effect, not signficant
Badger	Reduced population of a protected species caused by killing and injury of individuals	Increased numbers of collisions with road vehicles	Badgers are a common and widespread species, protected for reasons of animal welfare rather than for reasons of nature conservation. Any increase in deaths or injury caused by increased numbers of collisions with road vehicles is not anticipated to have a significant effect on local badger populations.	Negligible impact, negligible effect, not significant
Bats	Reduced population of European Protected species through degradation of foraging, roosting or commuting habitat	Increased levels of light pollution due to external lighting	Currently, light pollution at the Site is limited due the lack of buildings or street lighting. The development post-construction will have inclusion of house and street lighting and without specific mitigation to minimise light spill from external lighting (especially from street lighting), a reduction in the value of commuting and foraging corridors is likely to occur. This light spill may be from surrounding residential areas and also from the main access roads.	Medium impact, moderate effect, significant, adverse

Receptor	Potential Effect	Relevant development activity	Detail of ecological effects from operational phase	Assessment
	Reduced population of European Protected species caused by killing and injury of individuals	Increased numbers of collisions with road vehicles	The development post-construction will result in an increased level of traffic through the Site. The main access roads pass through the centre of the proposed residential and development areas, thus limiting the potential for bats (foraging and commuting along green corridors) to come into contact with vehicles. The main road will however pass through the woodland in the east of the Site and through Hedgerow H2 in the west of the Site. The average speeds of these roads are low and traffic volumes are expected to be limited since these roads will serve solely the Proposed Development. No effect on bat populations is anticipated from collisions.	Negligible impact, negligible effect, not significant
Dormouse	Reduced population of European Protected species through habitat degradation	Increased levels of light pollution due to external lighting	Currently, light pollution at the Site is limited, due the lack of buildings or street lighting. The development post-construction will have inclusion of house and street lighting and without specific mitigation to minimise light spill from external lighting (especially from street lighting), a reduction in the value of suitable habitat for dormouse is likely to occur. This light spill may be from surrounding residential areas and also from the main access roads. There is potential for light pollution to affect existing and new habitats suitable for dormouse (i.e. woodland and hedgerows) at the Site. This has the potential to reduce the population of dormouse at the Site (if present).	Medium impact, moderate effect, significant, adverse
	Reduced population of European Protected species caused by killing and injury of individuals	Increased predation pressure from increased populations of domestic cats	Where new and retained habitat suitable for dormouse is present in proximity to the residential area, there is likely to be a small increase in predation rate by domestic cats. Deaths of dormouse caused by predation by cats is considered likely to be rare enough not to have an effect on the size of the local population.	Negligible impact, negligible effect, not significant
Reptiles	Reduced population of SPIs caused by killing and injury of individuals	Increased predation pressure from increased populations of domestic cats	Where new and retained habitat suitable for reptiles is present in proximity to the residential area, there is likely to be a small increase in predation rates by domestic cats. Deaths of reptiles caused by predation by cats is considered likely to be rare enough not to have an effect on the size of the local population.	Negligible impact, negligible effect, not significant
Breeding birds	Reduced population of SPI birds caused by killing	Increased predation pressure from increased	Where the residential area will be in proximity to retained/new habitat, and in particular to retained or new areas of rough grassland, woodland, trees and hedgerows, there is likely to be an increased predation rate by domestic cats. Considered in isolation, this effect could possibly reduce the local populations	Medium impact, slight effect, not significant, adverse

Receptor	Potential Effect	Relevant development activity	Detail of ecological effects from operational phase	Assessment
	and injury of individuals	populations of domestic cats	of generalist bird species, which will be nesting/foraging in proximity to developed areas (particularly songbirds, and including SPIs such as dunnock).	
	Reduced population of SPI birds caused by killing, injury or displacement of individuals	Increased recreational pressure	Recreational disturbance is not considered likely to affect tree and hedgerow nesting bird species.	Negligible impact, negligible effect, not significant

7 Mitigation and monitoring

CDM Regulations

7.1 Elements of work at the Site fall within the definition of a construction project and the Construction (Design and Management) (CDM) Regulations 2015 will apply to these elements. This may bring BSG Ecology into the position of designer for some specific elements of the design.

7.2 When BSG Ecology designs construction work, as defined in the CDM Regulations, we will comply with our statutory duties. Where our design is not construction work, as defined, we do not have any CDM duties. BSG Ecology will not be responsible for any design undertaken by other companies whether they are a 'designer' or a contractor. BSG Ecology will attend site to review the quality of the works and resolve any issues arising out of unforeseen circumstances but will not "control the way in which any construction work is carried out by a person at work" (CDM Regulations 25(2)). BSG Ecology will not carry out construction work (as defined).

Mitigation hierarchy

7.3 As mentioned in paragraphs 5.1 – 5.5, during the evolution of the development, there has been careful consideration of the initial findings of the ecology work, allowing avoidance measures to be incorporated into the Proposed Development.

7.4 Considering the identified effects on sensitive receptors during construction in Table 20, and post-construction outlined in Table 21, the mitigation hierarchy proposed by CIEEM (CIEEM, 2022) has been employed to alleviate adverse effects. This has been outlined below for each sensitive receptor.

Mitigation for Construction Effects

7.5 A Construction Method Statement (CMS) should be produced with input from a professional ecologist subject to a planning condition and approved by Cherwell District Council. The CMS must describe ecology mitigation works (excluding habitat creation which will be provided a part of a Landscape Environmental Management Plan (LEMP)) that will precede and accompany the construction phase of the Proposed Development.

Designated Sites

7.6 No impact is anticipated on any designated site during the construction phase.

7.7 Standard pollution prevention measures will be implemented during the construction phase, such as the Environment Agency's 'Pollution Prevention for Business' guidance (DEFRA and Environment Agency, 2019) to ensure habitats, and in particular water courses, are protected from any pollution that could arise from the construction of the Proposed Development.

Habitats

7.8 Habitats including woodland, hedgerows and poor semi-improved grassland.

7.9 Protective fencing, such as Heras fencing, will be installed prior to any clearance or construction work around any retained semi-natural habitats (woodland, hedgerows and grassland). Fencing around individual trees and hedgerows will provide a root protection zone in accordance with BS 5837.

7.10 Standard pollution prevention measures will be implemented during the construction phase, such as the Environment Agency's 'Pollution Prevention for Business' guidance (DEFRA and Environment Agency, 2019) to ensure habitats are protected from any pollution that could arise from the construction of the Proposed Development.

Woodland

7.11 New areas of native broadleaved woodland will be planted either side of the main access in the east of the Site and to the south and west of the residential area. This will enhance commuting and foraging networks south-east to north-west for a range of species, including bats, other mammals, reptiles, birds and invertebrates.

7.12 Retained woodland will be enhanced through native scrub planting along the southern and western edges and infill tree planting provided within the woodland. This will strengthen the existing wildlife corridor formed by the woodland, particularly to the north and north-west, for a range of species.

Hedgerows

7.13 Minimal direct hedgerow loss is anticipated at the Site, with impacts limited to a breach for the main access road through H2 and minor losses through H1 and H3 for footpaths. Hedgerows to be lost will be reinstated through new hedgerow planting along the south-eastern boundary adjacent to the offsite residential property. The hedgerow will be native and species-rich and enhance habitat connectivity between H1 and the woodland. The Site will also incorporate hedgerow planting in and around the built form and more landscaped public open space areas of the development, with these hedgerows typically being single species, native hedgerows (where possible). The approximate total length of planted hedgerow is 120m.

7.14 The retained hedgerows will be enhanced through infilling and bulking out with native tree species and there will be grassland and species-rich ground flora planting/sown along the margins.

7.15 The hedgerows at the Site will enhance commuting and foraging networks for a range of species, including bat, dormouse, other mammals, amphibians, reptiles, birds and invertebrates.

Badger

7.16 The main badger sett is more than 30 m from the proposed area of residential development and the outlier sett approximately 15 m away, therefore neither sett will be impacted by ground works. Heras fencing is being provided at a minimum of 30 m from the main badger sett and 15 m from the outlier sett and this will provide protection to badgers and their setts from any construction vehicles. Heras fencing will extend from protection of the badger setts and encompass the woodland and grassland surrounding the setts in all directions and will be open at either end to ensure badger have a commuting corridor between setts and to the wider area.

7.17 A pre-construction badger survey will be completed to check there has been no expansion or relocation of the setts closer to the residential development area.

7.18 A precautionary method statement, which will include supervision of works by an Ecological Clerk of Works (ECoW), will be produced to ensure the works between 15 m to 30 m of the badger setts (such as residential housing and the swale) does not impact the badger sett. If at any stage any disturbance to the badger sett is considered likely works will cease and a badger licence from Natural England will be sought to allow works to proceed.

7.19 Badger protection measures will be put in place during the construction of the Proposed Development to protect them from killing or injury as a result of entrapment. This will include:

- Where possible, all trenches, pits and other diggings at the Site will be sealed before nightfall. Where these must be left over night, they should be completely covered with boards, or an escape ramp should be provided using boards or suitably compacted earth.
- All pipework and ironworks larger than 35 mm will be sealed or covered overnight.
- Alternatively, such trenches pipes or other workings may be fenced off to prevent badgers coming into contact with them.

7.20 The Proposed Development will result in the enhancement of the woodland and hedgerow networks at the Site as well as new woodland, hedgerows, scrub and native wildflower meadow. These will provide good opportunities for badger commuting and foraging across the Site.

Bats

7.21 The Proposed Development includes the retention of the majority of habitats of particular value to foraging and commuting bats. This includes most of the woodland, hedgerow network and grassland margins.

7.22 Trees with low to moderate bat roosting potential are to be removed to allow the construction of the main access road in the east of the Site. For trees with moderate potential, a tree climbing survey and/or two emergence/re-entry surveys (Collins, 2016) will be undertaken prior to felling to determine whether any bat roosts are present. If evidence of roosting bats is discovered within the tree, an appropriate European Protected Species Mitigation (EPSM) licence from Natural England for the loss of the roost will be applied for. Any mitigation required under this licence (e.g., the installation of replacement roost in the form of bat boxes) will be followed. Trees with low potential will be soft-felled under the supervision of a licensed bat ecologist.

7.23 New areas of native broadleaved woodland will be planted either side of the main access in the east of the Site and to the south and west of the residential area as detailed above. This will enhance and provide high quality commuting and foraging networks for bats, as well as potential roosting features once the woodlands have become established (minimum of 15 years).

7.24 The small sections of hedgerow to be lost to facilitate access roads and paths will be minimal and unlikely to disrupt bat activity, and these hedgerows will be enhanced by filling and bulking out with native tree species. New hedgerows will also be created as identified above, creating new foraging and commuting opportunities for bats. In combination, these hedgerow networks will create good quality foraging and commuting habitat for bats once established (likely within five years).

7.25 Lighting will be sensitively used during the construction phase along and around these features to minimise disruption to bats through habitat degradation and abandonment of roosting sites. Lighting will face directly downwards or away from the boundaries of the Site, using directional shields where required. Particular care will be taken to minimise light spill onto the retained and newly created vegetation. Reference to current good practice guidance should be made such as that provided by the BCT and ILP (2018).

Dormouse

7.26 Although dormouse has not been confirmed as present on the Site, a precautionary approach is being taken given the nearby desk study results, 2014 survey results and the suitable habitat at the Site in the form of hedgerows and woodland. Therefore, dormouse are assumed present in low densities in suitable habitat. Due to the small breaches of Hedgerows H1 and H2 and loss of woodland at the eastern boundary, precautionary measures will be adopted during the clearance of these habitats. A non-licenced precautionary method statement will be prepared, outlining timings of works and the sensitive removal of suitable habitat to prevent the killing or injury of dormouse.

7.27 Enhancements for dormouse will be provided in the form dormouse nest boxes within the retained woodland. A minimum of 10 boxes will be provided. Their positioning should be advised by an ecologist.

7.28 The retained hedgerows at the Site will be enhanced by filling and bulking out with native tree species. New hedgerows, scrub and woodland will also be created as identified above, creating new habitat for dormouse and creating habitat connectivity across Site and to the wider landscape.

7.29 The combination of the enhanced hedgerow network and woodland areas and newly created habitats will create good quality foraging and commuting habitat for dormouse once established.

7.30 Lighting will be sensitively used during the construction phase along and around these features of value for dormouse to minimise disruption to dormouse through habitat degradation. Lighting will follow that prescribed for bats above.

Reptiles

7.31 A small population of common lizard is present at the Site. Small areas of suitable terrestrial habitat (i.e. some of the field margins, hedgerows and woodland edge) are proposed to be removed and therefore it is recommended that a phased approach to vegetation clearance is undertaken rather than a trapping and translocation exercise. Vegetation clearance is to take place outside of the hibernation period (i.e. from March – October; weather dependent) and where applicable in accordance with the dormouse precautionary method statement).

7.32 A precautionary method statement will be prepared, outlining timings of works and the sensitive removal of suitable habitat to prevent the killing or injury of reptiles. In summary, the first phase of vegetation clearance would be for the ecologist to advise a contractor on the areas of suitable reptile habitat at the Site. This habitat would then require strimming down to a height of approximately 10-15 cm. The second phase would be undertaken a minimum of two days later and would involve further strimming (down to 5 cm) and, in highly suitable areas, stripping the turf to make the habitat unsuitable for reptiles. This mitigation strategy can only be adopted in suitable weather conditions when reptiles are considered to be active.

7.33 If vegetation clearance is planned in the winter (November – February), when reptiles are hibernating, then the focus would be on avoiding harm to reptiles by avoiding clearance of materials which reptiles could use for hibernation purposes such as rubble piles/bunds and hedgerow bases where gaps are present. An appointed ecologist will advise the contractors what vegetation and material can and cannot be cleared during the hibernation period.

7.34 The creation of new wildflower grassland, rough grassland and scrub and enhancement of retained habitats will significantly enhance the Site for reptiles and provide greater connectivity both within the Site and to the wider landscape. Arisings from hedgerow and woodland removal will be used to create log and brash piles in close proximity to new and retained hedgerows, scrub and woodland to create refugia for reptiles. The measures will also benefit other reptile and amphibian species should they move into the Site from surrounding habitats in the future.

Breeding birds

7.35 Hedgerows and the woodland within the Site provide nesting opportunities for birds. In addition, the arable field has been found to support breeding skylark. Standard precautions will be taken during clearance works to avoid impacts to any of these areas which require clearance to facilitate the construction of the Site. Such precautions will include carrying out vegetation clearance outside the bird breeding season (March to August inclusive). If clearance during the breeding season cannot be avoided, it may be possible for a suitably experienced ecologist to search vegetation for nesting birds prior to clearance. If nesting birds are found, the nest (and a suitable buffer around the nest) would need to be retained until any young have fledged or the nest is otherwise disused.

7.36 Creation of new habitat, such as hedgerows, scrub and woodland, as described above, will provide new areas of habitat for general bird species. In addition, newly created areas of native wildflower meadow and rough grassland will provide enhanced foraging habitats for a range of bird species.

7.37 With regards to skylark, it is unlikely that suitable measures can be provided within the scheme to adequately mitigate for the loss of this resource as the species requires open ground to breed. Therefore, provisions for this species will be implemented through creation of skylark plots within arable land elsewhere within the Blenheim Estate's wider land holding. This will provide open areas for skylark to forage in even once the main crop has become dense in latter part of the growing season. A shift to types of crop known to be more favourable for the species (such as growing spring-sown cereals instead of oilseed rape) should also be considered. This is likely to increase the numbers of skylark present in arable farmland areas offsite as well as increasing the reproductive success of these populations, mitigating for the loss of the resource on Site.

Hedgehog and other small mammals

7.38 The protection measures put in place to prevent entrapment of badger, as discussed above, will also be beneficial for hedgehogs and other small mammals.

7.39 The Proposed Development will result in the enhancement of the hedgerow and woodland network at the Site as well as the creation of new woodland, hedgerows, scrub, native wildflower meadow and rough grassland. These will provide good opportunities for hedgehog and other small mammals commuting and foraging across the Site.

Mitigation for post-construction effects

7.40 A Landscape Environmental Management Plan (LEMP) will be produced to describe habitat creation works (as identified above) that will precede or accompany the construction phase of the Proposed Development, and detail habitat management and monitoring works that will follow the completion of the construction phase (as outlined below).

Designated sites

7.41 No impact is anticipated on any designated site during the post-construction phase.

Habitats

Woodland

7.42 The newly created woodland areas and infill tree planting of retained areas will be managed to ensure that the newly planted trees become established to provide a benefit to biodiversity, as detailed below.

Hedgerow

7.43 Retained and created hedgerows will be managed to maintain their biodiversity value. These will be managed through strategic cutting in order to improve and maintain shape and size. A maximum of one third of the hedgerow network within the completed development will be trimmed in any one winter which will allow flowering and fruiting across the majority of hedgerows each year.

Grassland

7.44 A mowing regime for the grasslands, including of the native wildflower meadows and rough grassland, will be established to ensure their biodiversity value is maintained. Areas will be set aside which are to be left uncut within the completed development, and the areas left uncut will be changed on a rotational basis, to provide continual cover and provision of resources of rough grassland for various species, including reptiles, small mammals and invertebrates.

7.45 Amenity grassland identified within the Public Open Space areas in the completed development will be managed as such.

7.46 Any arisings will be removed from the Site. There will be no use of herbicides or fertilizers in these grassland areas.

7.47 Access will be restricted within certain areas of grassland to maintain their value and prevent disturbance to wildlife. This will be enforced through provision clearly identifiable hard substrate and mown footpaths. The nature of the grassland (rough uncut) will also discourage regular use by pedestrians.

Protected species

7.48 Protected species including badger, bats, dormouse, reptiles and breeding birds.

7.49 The habitat creation and enhancement outlined in the mitigation for construction effects, and the management regimes in the completed development, will provide an increase in suitable habitat available for a range of protected species (as listed above), likely resulting in an increase in their populations. This increase will likely outweigh the possible decrease in populations resulting from predation from domestic cats.

Badger

7.50 Upon completion of the development the existing fence marking the edge of the woodland along the northern and north-eastern band of woodland will be retained and scrub planted around the areas close to the badger setts to create a wider buffer between the setts and publicly accessible areas. This will significantly reduce the likelihood of badgers being disturbed by people and also dogs.

7.51 The Proposed Development will result in the enhancement of the woodland and hedgerow network at the Site as well as new woodland, scrub, hedgerows, native wildflower meadow and rough grassland. These will provide good opportunities for badger commuting and foraging across the Site.

Bats

7.52 A woodland, hedgerow and grassland management regime has been outlined above which will maintain habitat corridors for commuting and foraging bats.

7.53 A sensitive lighting strategy will be produced and agreed with Cherwell District Council prior to development with input from the project ecologist. The strategy will be designed to minimise its spread and the illumination of features including woodland, scrub, hedgerows and trees to ensure that habitats potentially used by foraging and commuting bats remain unlit. Where it is not possible to avoid lighting in these areas (i.e. for safety reasons), lighting will be of a low level bollard or sunken surface design, either facing directly downwards or away from the boundaries of the Site, using directional shields where required, to avoid light spillage into habitats to minimise the risk of disturbance to bats. Reference to current good practice guidance should be made such as that provided by the BCT and ILP (2018). This complies with paragraph 185 of the National Planning Policy Framework (NPPF) which states that *'decisions should limit the impact of light pollution from artificial light on local amenity, intrinsically dark landscapes and nature conservation.'*

7.54 As an enhancement, roosting opportunities in the form of bat boxes will be provided within the completed development. Their positioning will be advised by an ecologist and approximate locations identified within the LEMP.

7.55 This will take two forms:

1. Minimum of 15 integrated bat boxes within the new dwellings.

2. Minimum of 10 bat boxes on trees within the retained woodland and newly created woodland south and west of the residential area.

Dormouse

7.56 A hedgerow management regime has been outlined above which will maintain habitat corridors for commuting, foraging and nesting dormouse.

7.57 A sensitive lighting strategy as above will be produced and agreed with Cherwell District Council prior to development with input from the project ecologist.

7.58 A minimum of 10 dormouse nesting boxes will be provided as per the Mitigation for Construction Effects; Dormouse section. Their positioning will be advised by an ecologist and approximate locations identified within the LEMP.

Reptiles

7.59 The management regimes in the completed development outlined for grassland areas, hedgerows and woodland above will ensure continued provision of habitat and resources for reptiles including common lizard and will likely result in an increase in population and possibility of new species moving into the Site.

Breeding birds

7.60 Vegetation management as described above will be completed at appropriate times of year (i.e. between September and February) so as not to impact nesting birds.

7.61 As an enhancement, nesting opportunities in the form of bird boxes will be provided within the completed development. Their approximate locations will be identified in the LEMP and positioning will be advised by an ecologist.

7.62 This will take two forms:

1. Minimum of 20 integrated bird boxes on new dwellings, particularly for sparrows, swifts and starlings.

2. Minimum of 15 bird boxes on trees within the retained woodland and newly created woodland south and west of the residential area.

Hedgehog and other small mammals

7.63 The habitat piles to be created as part of the mitigation and compensation for reptiles will be beneficial for hedgehogs and other small mammals and they will provide suitable hibernation features.

7.64 The Proposed Development will result in the enhancement of the hedgerow network as well as new woodland, scrub, native wildflower meadow and rough grassland. These will provide good opportunities for hedgehog and other small mammals commuting and foraging across the Site.

7.65 To enhance and facilitate hedgehog commuting and foraging, 15 cm diameter gaps beneath fences between gardens with connections to open greenspace will be created.

Ecological enhancement – biodiversity gain assessment

7.66 The current and potential future biodiversity value of the Proposed Development was evaluated by use of DEFRA's Biodiversity Metric 3.1.

7.67 The full net gain assessment report and calculator are included at Appendix 5 with methods, results and justification.

7.68 The calculation of the baseline biodiversity value of the Site used habitat type and area data from the Phase 1 habitat survey.

Habitat areas

7.69 The calculation of the post-development biodiversity value of the Site is based on:

- 3.39 ha of current habitats (woodland) will be retained and maintained.
- 45.26 ha of current habitats will be lost (woodland, poor semi-improved grassland and arable).
- 20.69 ha of new (non 'urban') habitat will be created, including 1.24 ha of broadleaved woodland, 16.56 ha of lowland meadows, 1.82 ha of other neutral grassland, 0.79 ha of mixed scrub and 0.28 ha of orchard.
- There will be 27.73 ha of other green areas with modified grassland, introduced shrubs, trees, allotments and gardens.

- There will be 11.49 ha of built-up areas (buildings, roads and other hard infrastructure).

Linear features

7.70 The calculation of the post-development linear biodiversity value at the Site is based on:

- 1.15 km of hedgerow will be retained.
- 0.04 km of hedgerow will be lost.
- 0.12 km of native species rich hedgerows will be created.

Net gain

7.71 The biodiversity calculation using the Defra Metric 3.1 yields the following key results for area-based habitats:

- Baseline habitats score: 164.74 units.
- Proposed score following development: 224.21 units.
- Biodiversity gain for area-based Habitats: +59.47 units.
- Difference (i.e. biodiversity gain or loss) for area-based habitats: 36.10 % net gain.

7.72 The biodiversity calculation using the Defra Metric 3.1 yields the following key results for linear habitats:

- Baseline linear habitats score: 11.85 units
- Proposed score following development: 15.77 units.
- Biodiversity gain for linear habitats: +3.92 units.
- Difference (i.e. biodiversity gain or loss) for linear habitats: 33.09 % net gain.

7.73 The calculations provided an overall 36.10 % net gain for area-based habitats and 33.09 % net gain for linear habitats at the Site post-development, which is in line with paragraph 174 of the NPPF and Policy ESD 10 of the Cherwell Local Plan.

8 Residual effects

8.1 Residual effects are those that are predicted to remain after implementation of the secondary mitigation and enhancement measures described above. The significant residual effects are summarised in Table 22.

Designated sites

8.2 As discussed above, recreational impacts will be reduced on designated sites due to the creation of a large amount of public open space within the Site. Each of the designated sites in question also have public footpaths provided, thereby restricting any potential impacts to discrete areas. Therefore, recreational pressure, and the effects resulting from this (such as littering, dog fouling and trampling), is anticipated to be very limited and not significant.

Habitats

8.3 A net gain in biodiversity will be achieved at the Proposed Development, with a net gain of 36.10 % for area-based habitats and 33.09 % for linear habitats from the current situation (as discussed above). This is a beneficial effect and is significant at the local level.

Mature trees

8.4 It is possible that mature trees may be subject to increased arboricultural management, beyond the control of the Applicant, owing to health and safety concerns. Arboricultural advice, provisions and works are dealt with within the arboricultural reports supporting the Proposed Development. Should an impact to roosting bats be considered likely from the removal of a tree then this will be dealt with under the correct legislation, with an EPSM licence for bats and appropriately mitigated for.

Protected species

8.5 The loss of habitat such as woodland, hedgerows and associated grassland edges will be a short term moderate adverse effect for several species including bats and dormouse and a short term slight adverse effect on badger, reptiles and breeding birds. However, the mitigation provided, enhancement and creation of habitats such as hedgerows, woodland, scrub, and grassland, along with ongoing management of these habitats will result in a beneficial effect for many species post-construction. There will be an increase in the extent of habitats at the Proposed Development and provide a variety of types, structures and conditions and this will lead to a long-term local benefit to protected species currently present at the Proposed Development and within the local area. Table 22 sets out the anticipated significant residual effects.

Table 22: Significant residual ecological effects

Significant residual effect	Importance of receptor	Magnitude of change	Duration	Nature	Degree of effect	Level of certainty
Net gain in biodiversity	Medium/ High	Medium	Long term	Beneficial	Moderate	Reasonable
Net gain in protected species populations	Low/ Medium	Medium	Long term	Beneficial	Slight/ Moderate	Reasonable

9 Cumulative effects

9.1 An assessment of the effects of the Proposed Development with other schemes that are proposed, operational / constructed, consented or for which planning permissions are currently being sought is provided below at Table 23.

9.2 The following table sets out summary information on the twelve schemes within the local area of the Proposed Development which have been considered in relation to cumulative effects. Four of these schemes are consented residential developments and are either under construction or nearly complete (as of 2022); five schemes are residential developments awaiting determination; two are residential developments for which no planning application has been submitted; one is plans for an Oxford Park and Ride site.

Table 23. Planned or proposed developments considered in the cumulative effects assessment

Site and status	Dwellings	Description of cumulative effects	Distance from the Proposed Development
Land East of Woodstock – under construction	Up to 300	No significant residual effects. Mitigation is provided for protected species and habitats at the proposed development and there will be a net gain in biodiversity and also protected species populations. Potential for adverse cumulative effects on Blenheim Park SSSI and Oxford Meadows SAC are considered in this report.	Adjacent to western Site boundary
Oxford Park & Ride	N/A	This is not residential development, and the planned route would be into Oxford and would not bring customers into Woodstock or to any designated sites within the immediate Woodstock area. Furthermore, the Park and Ride is proposed to be near Langford Lane, near Kidlington on the A44. This is close to Woodstock and would reduce traffic coming from Woodstock to directly around Oxford, and therefore reducing air pollution around Oxford. This would result in a potential benefit in reducing air pollution near the Oxford Meadows SAC. As such, cumulative effects are considered likely to be negligible or even beneficial and this site is not considered further.	0.08 km
Land North of Banbury Road, Woodstock – awaiting determination	Up to 250	No significant residual effects. Mitigation is provided for protected species and habitats at the proposed development and there will be a net gain in biodiversity and also protected species populations. Potential for adverse cumulative effects on Blenheim Park SSSI and Oxford Meadows SAC are considered in this report.	0.5 km
Land North of Hill Rise, Woodstock – awaiting determination	Up to 180	No significant residual effects. Mitigation is provided for protected species and habitats at the proposed development and there will be a net gain in biodiversity and also protected species populations. Potential for adverse cumulative effects on Blenheim Park SSSI and Oxford Meadows SAC are considered in this report.	1.5 km

Site and status	Dwellings	Description of cumulative effects	Distance from the Proposed Development
Land at Myrtle Farm, Long Hanborough – no applications submitted, allocated in local plan	50	The allocation is for small scale residential development of an arable field and in ecological terms it is considered to be at a significant distance from the Proposed Development where cumulative effects are considered likely to be negligible. Given the small scale of this development, it is considered that there is unlikely to be any significant increase in recreational pressure, pollution effects or hydrological effects on any of the designated sites. As such, cumulative effects with the Proposed Development are considered to be negligible. This site is not considered further.	3.9 km
Land South of Witney Road, Long Hanborough – almost complete	Up to 169	Mitigation is provided for protected species and habitats and there will be a net gain in biodiversity and also protected species populations. The development is also a significant distance from the Proposed Development in ecological terms and cumulative effects are considered likely to be negligible. Potential for adverse cumulative effects on Blenheim Park SSSI are considered in this report.	4.5 km
Land North of Witney Road, Long Hanborough – application submitted	Up to 150	Whilst no information is formally available this application is also to be made by Blenheim Estate Homes. A review of the draft assessment confirms that this site is dominated by an arable field with higher value habitats comprising broadleaved plantation woodland, semi-improved grassland and ponds, which are largely retained. Mitigation is being provided for protected species and habitats and enhancements to improve the site for biodiversity are also included. The development is also a significant distance from the Proposed Development in ecological terms and cumulative effects are considered likely to be negligible. Potential for adverse cumulative effects on Blenheim Park SSSI and Oxford Meadows SAC are considered in this report.	4.5 km
Salt Cross Garden Village, Eynsham – awaiting determination	2,200	Mitigation is provided for protected species and habitats and there will be a net gain in biodiversity and also protected species populations. The development is also a significant distance from the Proposed Development in ecological terms and cumulative effects on most receptors are considered likely to be negligible, despite the identified adverse residual effects on hedgehog, skylark and arable plant communities.	5.1 km

Site and status	Dwellings	Description of cumulative effects	Distance from the Proposed Development
		Potential for adverse cumulative effects on Blenheim Park SSSI and Oxford Meadows SAC are considered in this report.	
Land between Wychwood House and Malvern Villas, Freeland – almost complete	Up to 41	The development is small in scale (less than 50 dwellings) and in ecological terms it is considered to be at a significant distance from the Proposed Development where cumulative effects are considered likely to be negligible. None of the designated sites included in this assessment were considered in the ecological appraisal for this site. Given the small scale of this development, it is considered that there is unlikely to be any significant increase in recreational pressure, pollution effects or hydrological effects on any of the designated sites. As such, cumulative effects with the Proposed Development are considered to be negligible. This site is not considered further.	5.2 km
East Witney Strategic Development Area – awaiting determination	Up to 495	Mitigation is provided for protected species and habitats and there will be a net gain in biodiversity and also protected species populations. The development is also a significant distance from the Proposed Development in ecological terms and cumulative effects on most receptors are considered likely to be negligible, despite the identified adverse residual effects on hedgehog, skylark and arable plant communities. Potential for adverse cumulative effects on Oxford Meadows SAC are considered in this report.	10.4 km
North Witney Strategic Development Area – awaiting determination	1,400	Two planning applications have been submitted to date totalling up to 310 dwellings, both of which did not identify any designated sites where there would be potential impacts from these developments. Given that the Salt Cross development, which is significantly larger and closer to Blenheim Park SSSI and Oxford Meadows SAC, was assessed as having negligible impacts on these designated sites both alone and in combination, it is considered likely that the completed 1,400 development would also result in negligible effects. Further, the development area as a whole is over 10 km from the Proposed Development which is a significant distance in ecological terms. As such, cumulative effects with the Proposed Development are considered to be negligible. This site is not considered further.	10.8 km

9.3 As detailed in Table 23, seven sites have been considered for cumulative effects on Blenheim Park SSSI and/or Oxford Meadows SAC.

9.4 Land South of Witney Road, Long Hanborough has considered Blenheim Park SSSI within the ecological assessment (AA Environmental, 2014) as it is within 2 km of this site. The assessment identified that the development will not have a negative direct or indirect impact on the Blenheim Park SSSI. Their assessments did not consider Oxford Meadows SAC and, as such, impacts from this development on the SAC are not considered likely. There is therefore not anticipated to be any adverse cumulative effects from this development on either designated site.

9.5 The Land East of Woodstock, Land North of Banbury Road, Land North of Hill Rise, Salt Cross and Land North of Witney Road ecology reports (BSG Ecology, 2016, BSG Ecology, 2021, Stantec, 2020 and BSG Ecology, 2022c) have considered potential impacts the developments may have on Blenheim Park SSSI. Increased recreational visitor pressure has been considered and judged that, whilst there will likely be additional visitor pressure from new residents, the SSSI is part of a wider parkland site that is already subject to high visitor numbers and facilities are in place to not negatively affect the conservation status of the SSSI. The developments include provision of open space which is likely to reduce visitor numbers within the wider area. It was concluded that these developments would not have significant impacts on the SSSI associated with the post-construction phase of the development as a result of increased visitor pressures. No cumulative effects are therefore anticipated from increased numbers of visitors.

9.6 Similarly, increased air pollution impacts from the Land East of Woodstock, Land North of Banbury Road, Land North of Hill Rise and Salt Cross developments post-construction were considered on Blenheim Park SSSI. The ecology report (BSG Ecology, 2016, BSG Ecology, 2021 and Stantec, 2020) found that the critical load for habitats supported by the SSSI would be less than 1% and would not exceed the threshold. This was considered to be an insignificant contribution and would not have an adverse impact on the SSSI either alone or in combination. The current assessment has also considered there would be no adverse impact on the SSSI from increased air pollution. As such there is not anticipated to be any adverse cumulative effects.

9.7 Effects on the Oxford Meadows SAC from increased recreational pressure from the Land East of Woodstock, Land North of Banbury Road, Land North of Hill Rise, Salt Cross, East Witney Strategic Development Area and Land North of Witney Road developments were found to be likely insignificant due to the distances involved (over 5 km), the requirement to travel by car to the SAC, and access being limited to foothpaths along the A40 or using a lay-by on the west bound carriage way of the A40, would consequently result in low numbers of visitors (BSG Ecology, 2016, BSG Ecology, 2021, Stantec, 2020, HM, 2020 and BSG Ecology, 2022c). A negligible impact on the Oxford Meadows SAC has also been concluded from the current assessment, and as such there is not anticipated to be any adverse cumulative effects.

9.8 Similarly, the Land East of Woodstock, Land North of Banbury Road, Land North of Hill Rise, Salt Cross and Land North of Witney Road ecology reports (BSG Ecology, 2021, BSG Ecology, 2016, Stantec, 2020 and BSG Ecology, 2022c) found that there would be no significant impacts on Oxford Meadows SAC as a result of potential reduction in air quality as the predicted increase in NO_x was very small and the predicted change in critical load for the habitat types supported by the SAC was less than 1%. This is an insignificant contribution not considered to have a likely adverse impact on the SAC either alone or in combination. The current assessment has also considered there would be no adverse impact on the SAC from increased air pollution.

10 Summary

10.1 An ecological assessment of the Site was conducted in 2021, including a desk study, extended Phase 1 habitat survey, and further ecological surveys for protected species.

10.2 The desk study identified that Oxford Meadows SAC, an internationally important site, is within 10 km of the Site. A number of other designated sites are within 2 km of the Site, including Blenheim Park SSSI.

10.3 The extended Phase 1 habitat surveys found the dominant habitat to be arable land, with poor semi-improved grassland field margins, semi-natural broadleaved woodland and hedgerows.

10.4 Surveys for protected species found that the Site supports a small population of common lizard, a breeding bird assemblage of 18 different species and that the site is of Local or County importance for most bat species present, and Regional importance for barbastelle. Badger setts are also present within the Site. A precautionary presence of low densities of dormouse is also assumed due to the presence of suitable habitat, desk study records and previous confirmed presence in 2014.

10.5 The initial findings of the ecology work were carefully considered and the mitigation hierarchy of avoid, mitigate and compensate was used to minimise impacts of the Proposed Development. As such the woodland and hedgerows are to be largely retained (other than small breaches for the main access and footpaths).

10.6 Construction effects and post-construction effects were considered for several identified sensitive receptors which have the potential to be affected by the Proposed Development. Mitigation measures for these effects have been proposed to ensure protection of retained habitats and compliance with relevant protected species legislation.

10.7 In addition, enhancements for biodiversity, both floral and faunal, in the form of hedgerow, woodland, scrub and grassland creation, habitat pile creation and ongoing monitoring and management of these habitats has been proposed. Provision of bat, bird and dormouse boxes for specific species enhancement is also outlined.

10.8 Through the inclusion of mitigation and enhancement measures a Biodiversity Gain calculation was completed. A net gain in biodiversity will be achieved at the Proposed Development, with an increase of 36.10 % for area-based habitats and 33.09 % for linear habitats relative to the current situation for. This increase in biodiversity at the Site will also bring a long-term local benefit to protected species currently present at the Proposed Development and within the local area.

10.9 Following the implementation of mitigation and enhancement measures it is considered that the Proposed Development will not have significant adverse residual effects. There will however be beneficial residual effects as a result of the Proposed Development through a net gain in biodiversity and protected species populations.

11 References

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12 Figures

Legend

Site boundary

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PROJECT TITLE

EAST OF PARK VIEW, WOODSTOCK

DRAWING TITLE

Figure 1: Site location

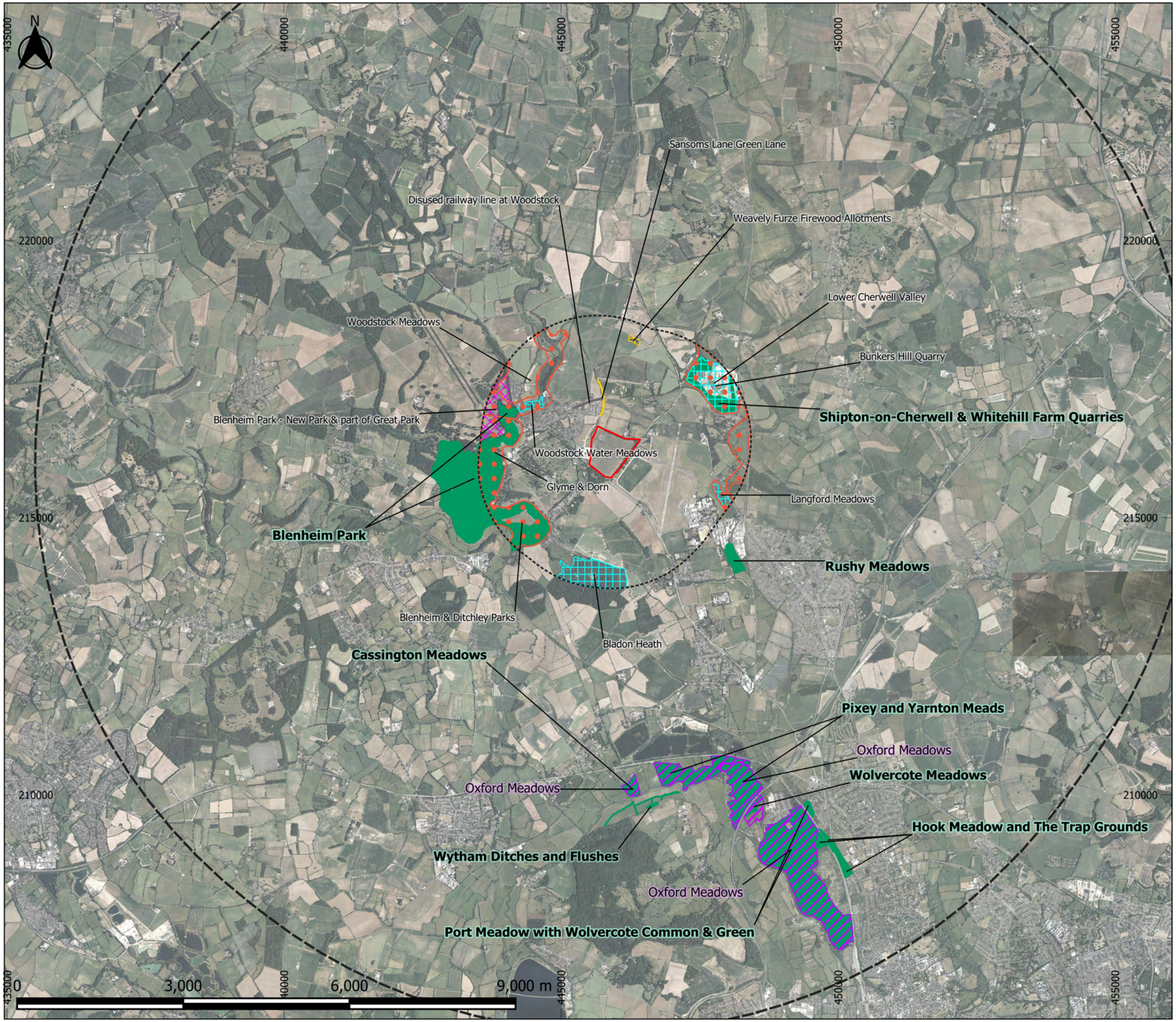
DATE: 19/04/2022 CHECKED: RB SCALE: 1:20,000

DRAWN: MSG APPROVED: TBC VERSION:1.0

Projection: OSGB 1936/British National Grid - EPSG 27700

Sources: BSG Ecology survey data

Graphics Ref. No.: 006539



Legend

Statutory Designated Sites

- Site of Special Scientific Interest (SSSI)
- Special Area of Conservation (SAC)

Non-Statutory Sites

- Cherwell District Wildlife Site
- Conservation Target Area
- Other Oxfordshire site
- Oxfordshire Local Wildlife Site
- Oxfordshire Proposed Local Wildlife Site

- Site boundary
- 2 km buffer
- 10km buffer

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PROJECT TITLE

EAST OF PARK VIEW, WOODSTOCK

DRAWING TITLE

Figure 2: Designated sites

DATE: 19/04/2022 | CHECKED: RB | SCALE: 1:65,000

DRAWN: MSG | APPROVED: TBC | VERSION:1.0

Projection: OSGB 1936/British National Grid - EPSG 27700

Sources: BSG Ecology survey data

Graphics Ref. No.: 00640

Legend

- Target note
- Intact hedge - native species-rich
- Intact hedge - species-poor
- Hedge with trees - native species-rich
- Dry ditch
- Broadleaved woodland - semi-natural
- Poor semi-improved grassland
- Cultivated/disturbed land - arable
- Site boundary

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PROJECT TITLE

EAST OF PARK VIEW, WOODSTOCK

DRAWING TITLE

Figure 3: Phase 1 habitat map

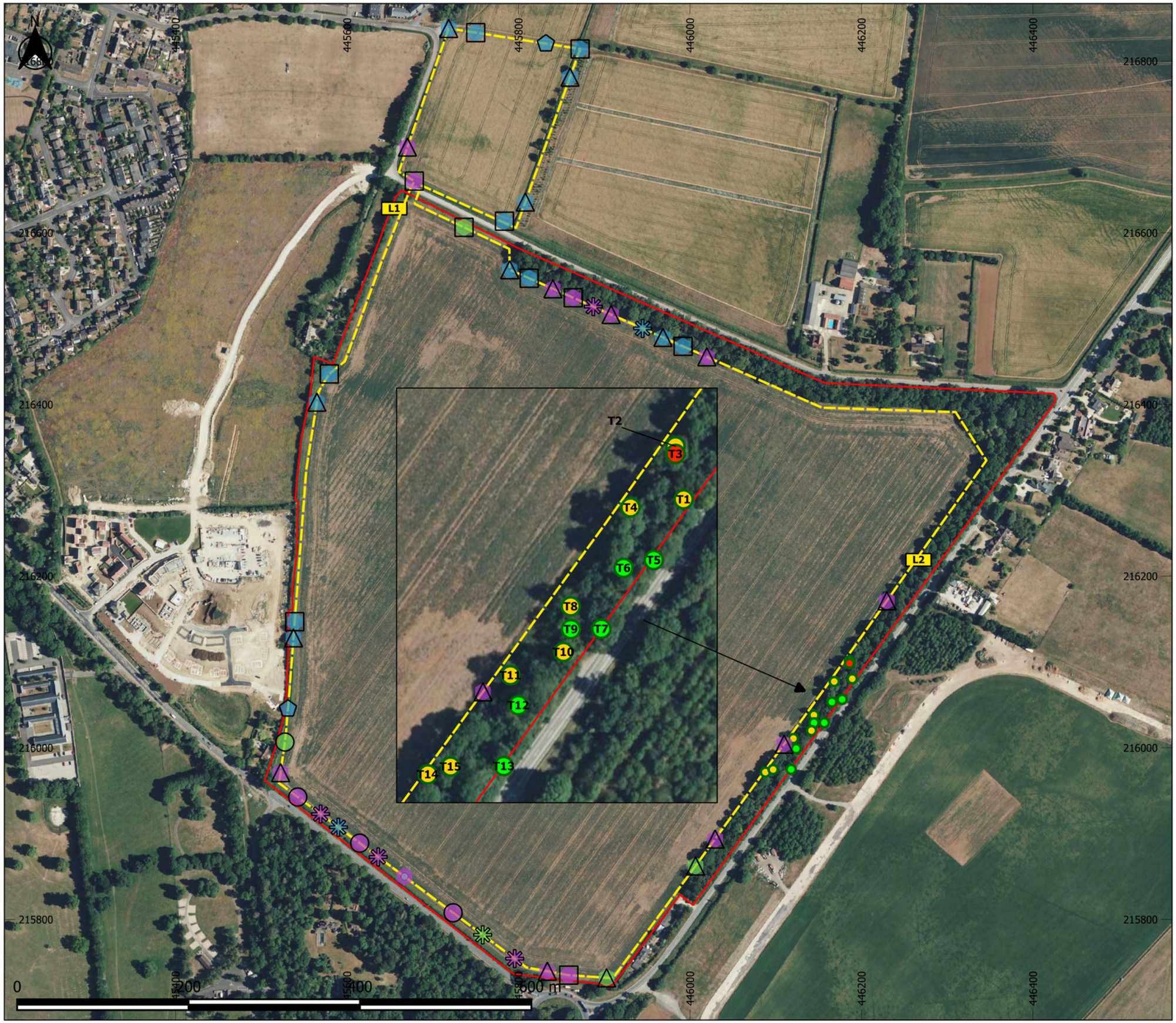
DATE: 04/05/2022 CHECKED: RB SCALE: 1:4,000

DRAWN: MSG APPROVED: TBC VERSION:1.1

Projection: OSGB 1936/British National Grid - EPSG 27700

Sources: BSG Ecology survey data

Graphics Ref. No.: 00641



Legend

- L1 Automated detector locations
- Bat transect route

Bat species

- Common pipistrelle
- Soprano pipistrelle
- Leisler's
- Myotis species
- Noctule

Date of survey

- August
- May
- September

Trees with bat suitability

- High
- Moderate
- Low
- Site boundary

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EAST OF PARK VIEW, WOODSTOCK

DRAWING TITLE

Figure 5: Bat survey transect results and automatic detector locations

DATE: 04/05/2022 CHECKED: RB SCALE: 1:4,200

DRAWN: MSG APPROVED: TBC VERSION:1.1

Projection: OSGB 1936/British National Grid - EPSG 27700

Sources: BSG Ecology survey data

Graphics Ref No.: 0043

Legend

- Dormouse tube locations
- Site boundary

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PROJECT TITLE

EAST OF PARK VIEW, WOODSTOCK

DRAWING TITLE

Figure 6: Dormouse survey results

DATE: 04/05/2022 | CHECKED: RB | SCALE: 1:4,000

DRAWN: MSG | APPROVED: TBC | VERSION:1.1

Projection: OSGB 1936/British National Grid - EPSG 27700

Sources: BSG Ecology survey data

Graphics Ref. No.: 00644