10 BIODIVERSITY

Introduction

10.1 This chapter of the ES assesses the likely significant effects of the Development on the environment in respect of biodiversity. The chapter identifies the potential effects on ecological designations, habitats and fauna within both the construction phase and operational phase, and the residual effects identified following mitigation and enhancement measures under the Development. Cumulative effects are also considered in relation to biodiversity within this chapter.

10.2 The chapter has been prepared by Aspect Ecology Ltd (see Appendix 1.2 Statement of Expertise).

10.3 This chapter should be read in conjunction with the following figures and appendices:

- Figure 10.1: Zones of Influence;
- Figure 10.2: Ecological Designations;
- Figure 10.3: Habitats, Ecological Features and Photographs;
- Figure 10.4: Bat Survey Results;
- Figure 10.5: Breeding Bird Survey Results;
- Figure 10.6: Reptile Survey Results;
- Figure 10.7: Brown Hairstreak Survey Results;
- Appendix 10.1: Aspect Ecology's report entitled '*Land at North West Bicester. Preliminary Baseline Ecological Appraisal*' dated April 2020
- Appendix 10.2: Cherwell Council Ecologist Survey Scoping Communication;
- Appendix 10.3: Cherwell Council Ecologist Scoping Response;
- Appendix 10.4: Environment Agency Scoping Response;
- Appendix 10.5: Natural England Scoping Response;
- Appendix 10.6: Cherwell Swifts Scoping Response;
- Appendix 10.7: Campaign to Protect Rural England (CPRE) Scoping Response.

Policy Context

National Planning Policy

National Planning Policy Framework[i]

10.4 The Government published a revised version of the National Planning Policy Framework (NPPF)

in February 2019. Paragraph 170 of the NPPF states that "*Planning policies and decisions should contribute to and enhance the natural and local environment by:*

> *a) protecting and enhancing valued landscapes, sites of biodiversity or geological value and soils (in a manner commensurate with their statutory status or identified quality in the development plan); and*
>
> *b) recognising the intrinsic character and beauty of the countryside, and the wider benefits from natural capital and ecosystem services – including the economic and other benefits of the best and most versatile agricultural land, and of trees and woodland."*

10.5 Paragraph 170 of the NPPF also states that:

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

10.6 With regard to planning applications and biodiversity, Paragraph 175 of the NPPF states that:

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

10.7 In Paragraph 180, the NPPF advises that *"Planning policies and decisions should also ensure that new development is appropriate for its location taking into account the likely effects (including cumulative effects) of pollution on health, living conditions and the natural environment, as well as the potential sensitivity of the site or the wider area to impacts that*

could arise from the development. In doing so they should: c) limit the impact of light pollution from artificial light on local amenity, intrinsically dark landscapes and nature conservation."

10.8 Further guidance on national planning policy is set out within the Office of the Deputy Prime Minister (ODPM) Circular 06/2005 entitled 'Biodiversity and Geological Conservation – Statutory Obligations and their Impact within the Planning System'[ii], which is referenced in the NPPF. The Circular provides guidance on the application of law relating to planning and nature conservation, including statutory designations, protected species, and other ecological features such as Priority Habitats.

10.9 National planning policy therefore recognises the importance of biodiversity and that with sensitive planning and design, development and conservation of natural heritage can co-exist and benefits can, in certain circumstances, be obtained.

Planning Practice Guidance[iii]

10.10 The national Planning Practice Guidance (PPG) 2019 provides further guidance to local authorities on planning for biodiversity. The PPG contains information on the requirement for ecological surveys to inform planning applications, how developments should be encouraged to protect and enhance biodiversity, and guidance on the use of the 'mitigation hierarchy' to avoid, mitigate, or compensate for significant harm to biodiversity.

10.11 The PPG therefore explains the need to protect biodiversity through the planning system, but equally to consider the opportunities for development to enhance biodiversity, which should be led by a local understanding of ecological networks.

Local Planning Policy

10.12 Local Policy is provided by Cherwell District Council (CDC) and comprises (i) The Cherwell Local Plan 2011-2031 (adopted 20 July 2015)[iv] and North-West Bicester Supplementary Planning Document (SPD) (adopted February 2016)[v].

The Cherwell Local Plan 2011-2031

10.13 Policies ESD9: Protection of the Oxford Meadows Special Area of Conservation (SAC), ESD10: Protection and Enhancement of Biodiversity and the Natural Environment, ESD11: Conservation Target Areas and Bicester 1: North West Bicester Eco-town relate, at least in part, directly to biodiversity and nature conservation.

Policy ESD9: Protection of the Oxford Meadows SAC

10.14 Policy ESD9 sets out a number of requirements that need to be met by developers in order to avoid adverse effects during construction or operation to the Oxford Meadows SAC where this is appropriate to a site. The Policy sets out the following:

> *"Developers will be required to demonstrate that:*
>
> - *During the 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; and*
> - *Run-off rates of survey water from the development will be maintained at greenfield rates."*

Policy ESD10: Protection and Enhancement of Biodiversity and the Natural Environment

10.15 Policy ESD10 sets out a number of points to be achieved in order to provide protection and enhancement to biodiversity and the natural environment. The Policy sets out:

> *"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; and*
- *A monitoring and management plan will be required for biodiversity features on site to ensure their long term suitable management."*

10.16 In addition to the above, although outside the main policy text, a requirement of Policy ESD10, as set out in paragraph B.237, is that:

> *"All developments around Bicester will require surveys carried out for the brown hairstreak butterfly. Surveys should include considerations of the site's value as a wildlife corridor and the contribution it makes to ecological networks".*

Policy ESD11: Conservation Target Areas

10.17 Policy ESD11 sets out requirements for where developments are proposed within or adjacent to Conservation Target Areas and states that:

> *"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."

Policy Bicester 1: North West Bicester Eco-Town

10.18 Policy Bicester 1 sets out a number of requirements for the Site given that it forms part of the allocated area covered by the policy. The relevant sections of Policy Bicester 1 which set out requirements any development must meet with regard to biodiversity and nature conservation are set out below:

- *"Development that respects the landscape setting and that demonstrates enhancement, restoration or creation of wildlife corridors to achieve a net gain in biodiversity;*
- *Preservation and enhancement of habitats and species on site, particularly protected species and habitats and creation and management of new habitats to achieve an overall net gain in biodiversity including the creation of a local nature reserve and linkages with existing BAP habitats; and*
- *A Landscape and Habitats Management Plan to be provided to manage habitats on site and to ensure this is integral to wider landscape management."*

North-West Bicester SPD

10.19 The North-West Bicester SPD expands upon Policy Bicester 1 of the Local Plan. There are a number of "*Development Requirements*" and "*Development Principles*" which relate, at least in part, directly to biodiversity and nature conservation. These include: Development Requirement 9 'Green infrastructure and landscape', Development Principle 9(a)- Tree planting, Development Requirement 9(b) – Development edges, Development Requirement 9 (c) – Hedgerows, dark buffers and stream corridors and Development Requirement 9 (e) – Biodiversity.

Development Requirement 9 – Green infrastructure and landscape

10.20 Development Requirement 9 sets out a number of requirements of planning applications in relation to greenspace and landscape requirements under this policy. Paragraph 4.189 is of particular relevance to biodiversity and sets out:

"There should be areas where biodiversity is the principal outcome, such as the nature reserve, parts of the country park, and wildlife corridors and buffers. In addition, opportunities to maximise biodiversity in other green spaces should be taken."

Development Principle 9 (a) – Tree planting

10.21 Development Principle 9 (a) sets out a number of considerations and requirements regarding tree planting within any site. A range of landscaping considerations are set out which are indirectly of relevance to biodiversity, however it is considered that paragraph 4.191 of the Development Principle is of particular relevance to biodiversity and sets out:

> *"To reflect the Biodiversity Strategy, native trees and shrubs should be planted on the site particularly within woodland, the country park, the nature reserve, and ecological buffers and corridors but also as a proportion of other plantings."*

Development Requirement 9 (b) – Development edges

10.22 A number of Development Requirements in relation to development edges are set out in paragraphs 4.204 – 4.209 of the SPD, with a particular emphasis on hedgerows and stream corridors. The development requirement paragraphs and excerpts of direct relevance to biodiversity (4.205-4.206 and 4.208-4.209) set out:

> *"…The alignment of some hedgerows also provides linkages/connections within the site and between the existing town and surrounding countryside for people and wildlife. A block of broadleaved semi-natural woodland west of Home Farm will be retained within a buffer zone of semi-natural habitat linked to the green space along the water courses. Key strategic hedges are identified on the green infrastructure framework (figure 12).*
>
> *The Bure and its tributaries are important local watercourses. The stream corridors and field boundaries provide further structure and detail to the masterplan having multi-functional roles in the provision of green space, habitat, biodiversity gain, sustainable drainage, recreation and health, movement and access. They are intrinsic to the site as a whole…*
>
> *…The masterplan uses the existing field boundaries and hedgerows to give the layout of the proposed development structure. Hedgerows define the site layout recognising their landscape importance and contribution to biodiversity and habitat. They provide natural corridors throughout the site for wildlife but also for residents as part of the comprehensive cycling and walking network…*
>
> *…The hedgerows would be managed in accordance with a Local Management and Habitats Plan (LMHP) to ensure that they provide habitat suitable for the fauna that were recorded on the site prior to development, in particular, nesting birds (non-farmland specialists), mammals and invertebrates, including the hair streak butterfly and other notable invertebrates. They would also provide wildlife corridors."*

Development Requirement 9 (c) – Hedgerows, dark buffers and stream corridors

10.23 A number of Development Requirements for hedgerows, stream corridors and associated dark

buffers are set out within development requirement 9 (c). The paragraphs and exerts of direct relevance to biodiversity are 4.212 – 4.215, which state that:

> *"Hedgerow loss should be minimised and mitigated for and existing hedges retained as part of the landscape framework and breaches of the hedges minimised in designing the layout of development. Retained hedgerows identified on the masterplan will be enriched by semi-natural vegetation in buffer zones, a minimum of 10m either side of the hedgerow in accordance with the Green Infrastructure and Landscape Strategy.*
>
> *The establishment of a minimum 60m corridor to the watercourse (30m each side of the centre line) shall be provided to create a strong landscape feature in the scheme and secure the opportunity for biodiversity net gain from the development...*
>
> *…Connectivity between habitats and ecosystems must be planned and protected. The resilience of the ecosystems in and around North West Bicester depends on maintaining connectivity for the full range of wildlife and plants. All planning applications should provide plans showing how wildlife corridors of all sorts will be maintained within the site and also connect with neighbouring sites in accordance with the North West Bicester masterplan and Biodiversity Strategy. A plan showing protected dark corridors across the site must be included.*
>
> *A 20m buffer along either side of the designated hedgerows recognised for their ecological value will be provided to create a 'dark corridor' for nocturnal species such as bats. The hedgerow buffers should be provided in accordance with the Green Infrastructure and Landscape Strategy. The lighting scheme for the development will avoid disturbance to these dark areas."*

Development Requirement 9 (e) – Biodiversity

10.24 Development Requirement 9 (e) focuses on biodiversity mitigation and enhancement and net gains. The paragraphs and exerts of direct relevance (4.227 – 4.232) are set out below:

> *"Biodiversity mitigation and enhancement shall be incorporated into development proposals to provide a net biodiversity gain. As it is not possible to mitigate for the impact of farmland birds on the site, offsite mitigation measures should be provided and all applications within the masterplan area should contribute to the provision of off-site mitigation.*
>
> *Proposals must demonstrate inclusion of biodiversity gains within the built environment for example through planting, bird, bat and insect boxes and the inclusion of green roofs.*
>
> *A biodiversity strategy which is part of an approved strategy for the whole masterplan area, shall accompany all planning applications. It should include an accepted numerical metric to show that a net gain in biodiversity will be achieved…*
>
> *…A detailed Landscape and Habitats Management Plan including a comprehensive ecological monitoring programme will be required for all reserved matters and full planning applications."*

National and Local Biodiversity Action Plans

10.25 The UK Biodiversity Action Plan (BAP), published in 1994[vi], was the UK Government's response to signing the Convention on Biological Diversity (CBD) at the 1992 Rio Earth Summit. This has now been replaced by the UK post-2010 Biodiversity Framework which focuses on the four individual countries of the UK.

10.26 Within England, the latest biodiversity strategy is entitled 'Biodiversity 2020: A strategy for England's wildlife and ecosystem services', published by Defra on 19 August 2011 with a progress update provided in July 2013[vii]. This provides a comprehensive picture of how England is implementing its international and EU commitments and sets out the strategic direction for biodiversity policy up to 2020. Post-2020 the upcoming Environment Bill and a post-2020 framework for biodiversity under the CBD is being developed which will set out a new legal foundation for government action to improve the environment[viii].

10.27 The approach is informed by the list of species and habitats of 'Principal Importance' under Section 41 of the Natural Environment and Rural Communities (NERC) Act 2006[ix] which largely reflects those species and habitats previously listed under the UK BAP that occur in England.

10.28 A number of local BAPs have also been produced, identifying priorities and targets for action at a local level. This includes Oxfordshire's BAP[x].

10.29 Reference to habitats and species listed as Priority Habitats and Species under Section 41 of the NERC Act and local BAPs is made where relevant in the following sections of this chapter.

Legislative Context

10.30 The applicable legislative framework for biodiversity is summarised as follows:

- The Conservation of Habitats and Species Regulations, 2017 (as amended)[xi];
- Wildlife and Countryside Act, 1981 (as amended)[xii];
- The Natural Environment and Rural Communities Act, 2006;
- The Countryside and Rights of Way Act, 2000[xiii];
- Town and Country Planning (Environmental Impact Assessment) Regulations, 2017[xiv];
- The Hedgerows Regulations, 1997[xv];
- The Protection of Badgers Act, 1992[xvi]; and
- The Wild Mammals (Protection) Act, 1996[xvii].

10.31 Discussion of this legislation is provided in relation to particular ecological features and fauna

in the relevant sections of this chapter and the Preliminary Baseline Ecological Appraisal Report (see Appendix 10.1).

Assessment Methodology

Consultation

Cherwell District Council

10.32 The ecological survey work undertaken to inform the assessment has been scoped and agreed in principle with the CDC Ecologist. A response to the proposed scope of survey work at the Site was received from the CDC Ecologist on 13 July 2020, which stated that this scope is generally what would be expected on a greenfield site in absence of proposal details (upon the basis of proposed residential development in principle ahead of provision of the proposed site layout at the time of discussion) with the only further survey flagged as possibly being required being for butterflies. The response also highlighted the importance of the on-Site woodland as potential Section 41 Priority habitat and Badger *Meles meles* habitat and that an overall net gain would be sought at the Site, with 10% being sought as calculated by a metric. These points have all been given consideration and a Brown Hairstreak, Badger and range of other faunal survey work has been undertaken. A copy of the consultation response is provided at Appendix 10.2.

10.33 Comments were received on the EIA Scoping Report submitted to CDC on 16 November 2020 with regard to biodiversity from the CDC Ecologist which confirms that the approach to the topic is 'agreed' but makes reference to the need for ecological enhancements and biodiversity net gain through the use of a biodiversity impact assessment tool. Reference is also made to the need for consideration of the cumulative impacts in relation to green infrastructure and wildlife corridors, to complement adjacent developments. All of the points raised above have been given due consideration and are addressed in this chapter. The CDC Council Ecologist's response is set out at Appendix 10.3.

Environment Agency

10.34 The Environment Agency (EA)'s response to the EIA Scoping Report (Appendix 10.4), dated 05 January 2021, includes comments on biodiversity. The response requests that consideration is given to soil compaction on habitats to be retained and created and close to watercourses during the construction phase, and that consideration is given to potential disturbance from residents and pets in relation to habitats at the operational stage. The response also notes that regard should be given to the potential spread of invasive, non-

native species. All of the above potential impacts and appropriate mitigation measures where required have been set out within this chapter.

Natural England

10.35 Natural England's response to the EIA Scoping Report, dated 11 December 2020 (Appendix 10.5) sets out that it does not appear that the Development will affect any nationally designated geological or ecological sites or landscapes or have significant impacts on the protection of soils. General standing advice on what Natural England expect to be included in the ES is set out within Annexes to the response.

Cherwell Swifts

10.36 A response on the EIA Scoping Report was received from the group Cherwell Swifts, dated 30 November 2020 (Appendix 10.6). Cherwell Swifts recommend that Swift *Apus apus* nest bricks are incorporated into the structure of the buildings. Recommendations for such enhancements have been made within this assessment.

Campaign to Protect Rural England (CPRE) Oxfordshire

10.37 A response was also received on the EIA Scoping Report from the group CPRE Oxfordshire, dated 18 December 2020 (Appendix 10.7). CPRE Oxfordshire request with regard to biodiversity that important ecological features are surveyed, to include botanical surveys and faunal surveys, in addition to effective mitigation measures. Particular attention is drawn to the need for Brown Hairstreak surveys, contribution to wildlife corridors and provision of net gains for biodiversity. All of the relevant botanical and faunal surveys (including for Brown Hairstreak) have been undertaken whilst mitigation strategies have also been put forward including the provision of wildlife corridors and net gains for biodiversity.

Defining the Zone of Influence

10.38 To inform the scope of the assessment, consideration has been given to the zone of influence of the Development. Zones of influence are defined as the area over which important ecological features may be affected by the biophysical changes caused by the Development and associated activities during both the construction and operational phases of the Development.

10.39 It is difficult to define a specific zone of influence which captures all potential effects arising from the Development. Accordingly, two broad zones have been identified as described below

and shown on Figure 10.1.The zones of influence have been established using the considerations in Box 10 of the Chartered Institute of Ecology and Environmental Management (CIEEM) guidelines[xviii], which considers important ecological features, sensitivities and activities which may generate ecological impacts. In this respect, the zones of influence have been selected on the basis of site-specific circumstances with regard given to the surrounding ecological designations. This is in line with the CIEEM guidance which states in paragraph 2.21 "*the zones of influence will vary for different ecological features depending on their sensitivity to environmental change*." The extent of such changes will typically reduce over distance from the Development, and whether effects are experienced is dependent on the sensitivity of individual habitats, species or other ecological features.

Primary Zone of Influence

10.40 The primary zone of influence is defined as the land within the Site itself and the surrounding land within 50m. This incorporates habitats and associated species which would be directly affected by the Development footprint and associated works (in terms of habitat loss or damage) that have been identified. This zone also includes areas which would be affected by factors such as noise, vibration, lighting, dust and pollution, the effects of which will be focused within the nearby surrounds (i.e. within 50m) of the Site. As such, survey work has specifically focused on the primary zone of influence to allow an assessment of habitats and species which may be directly affected by the Development.

Secondary Zone of Influence

10.41 Beyond the primary zone, a wider (or secondary) zone of influence has been identified, where ecological features may be subject to wider scale effects, such as recreational disturbance, air pollution from traffic or water pollution within the wider watercourse networks. The assessment of features within this zone is largely based on background information identifying ecological designations or known habitats and/or species populations of importance which could be sensitive to such wider scale effects. Based on the above, the secondary zone of influence is defined as land between 50m and 2km from the Site for all possible receptors, with the exception of European designations for which the zone of influence is 25km to capture any wider scale effects such as recreational pressures.

Methodology – Survey Work

10.42 The methodology utilised for the survey work can be split into three main areas: a desktop study, habitat survey and faunal surveys. In addition, the assessment has been informed by a review of previous ecological survey work undertaken within the Exemplar scheme which

covers part of the Site (see below). The methodology was scoped with CDC's Ecologist as set out above.

Previous survey work

10.43 The central and eastern sections of the Site, in addition to a much wider area within the Exemplar scheme to the south of the Site, were surveyed in 2010 to 2013[xix]. Survey work undertaken included a Phase 1 Habitat Survey and botanical survey using the National Vegetation Classification (NVC) methodology[xx], and faunal surveys for bats, Otter *Lutra lutra*, Water Vole *Arvicola amphibius*, Badger, Dormouse *Muscardinus avellanarius*, breeding birds, wintering birds, invertebrates (including specific butterfly surveys and White-Clawed Crayfish *Austropotamobius pallipes* surveys), reptiles and Great Crested Newt *Triturus cristatus*.

Desktop study

10.44 In order to compile background information on the Site and its immediate surroundings, Thames Valley Environmental Records Centre (TVERC) was contacted, with data returned on the basis of an approximate minimum search radius of 2km from the Site. Background information on non-statutory designations was also obtained from TVERC[xxi].

10.45 Information on statutory designations was obtained from the online Multi-Agency Geographic Information for the Countryside (MAGIC) database[xxii], which utilises data provided by Natural England. Other data sources checked as part of the desktop study included the Woodland Trust database of notable, veteran and ancient trees[xxiii]. The statutory and non-statutory designations are shown on Figure 10.2 and further detail is provided in the Preliminary Baseline Ecological Appraisal Report at Appendix 10.1.

Habitat Survey

10.46 The Site was subject to a Phase 1 Habitat Survey in May 2020 in order to ascertain the ecological value of the land contained within the boundaries of the Site and to identify the main habitats and ecological features currently present.

10.47 The Site was surveyed based on the standard Phase 1 Habitat Survey methodology[xxiv], whereby the habitat types present are identified and mapped, together with an assessment of the species composition of each habitat. This technique provides an inventory of the basic habitat types present and allows identification of areas of greater potential which require further survey. Any such areas identified can then be examined in more detail through Phase 2 surveys. This method was extended, in line with the Guidelines for Preliminary Ecological

Appraisal[xxv], to record details on the actual or potential presence of any notable or protected species or habitats.

10.48 Using the above method, the Site was classified into areas of similar botanical community types, with a representative species list compiled for each habitat identified, the habitat types identified are shown on Figure 10.3. The nomenclature used for plant species is based on the Botanical Society for the British Isles (BSBI) Checklist[xxvi].

Faunal Survey

10.49 General faunal activity, such as new mammal field signs, birds observed visually or by call or invertebrates observed during the course of the surveys detailed below were also recorded, so as to establish the baseline conditions at the Site.

10.50 A summary of specific faunal survey work undertaken to inform this application is set out at Table 10.1 below. Further detail on survey methodologies is provided in the Preliminary Baseline Ecological Appraisal Report at Appendix 10.1.

Table 10.1 Summary of Phase 2 Faunal Surveys undertaken at the Site

Faunal Group	Survey Methodology	Date of Latest Surveys	Guidance
Bats (visual inspection surveys)	There are no buildings present within the Site. Trees within the Site were assessed for their potential to support roosting bats based on the presence of features such as holes, cracks, splits or loose bark. The suitability category for roosting bats for each tree was rated based on relevant guidance as; Known or Confirmed Roost, High suitability, Moderate suitability, Low suitability or Negligible suitability. Any roost features were also inspected for signs of possible use where accessible.	May 2020	'Natural England Standing Advice: Bats'; 'Bat Mitigation Guidelines' (English Nature, 2004); 'Bat Surveys for Professional Ecologists – Good Practice Guideline' (Bat Conservation Trust, 2016)
Bats (manual activity surveys)	Based upon the previous third-party survey work undertaken, background data records and the Phase 1 Habitat survey, the site is considered to be of low suitability for foraging and commuting bats. Two dusk activity surveys were undertaken at the Site to gather information on its use by foraging and commuting bats. These involved surveyors walking a planned transect route from sunset for at least 2 hours with 5 minute set listening points, recording all bat activity as shown	06/08/2020 Dusk 22/09/2020 Dusk Spring 2021 Dawn (yet to be completed)	

	on Figure 10.4. The transect route was designed to cover all potentially suitable habitat for commuting/foraging within the Site. A third survey is proposed for spring 2021 which will be undertaken 2hours prior to sunrise.		
Bats (automated activity surveys)	Song Meter 4 (SM4) detectors were positioned within the Site at two different locations over two months for a period of eight nights per deployment. The detectors were positioned alongside watercourses, treelines and woodland edges as shown at Figure 10.4. A third deployment of the static bat detectors is proposed for spring 2021.	August 2020 September 2020 Spring 2021 (yet to be completed)	
Badger	The Site and its immediate surrounds were surveyed for evidence of Badger setts and activity, including presence of well-worn paths, push-throughs, snagged hair, footprints, latrines and foraging signs.	May 2020	'Natural England Standing Advice: Badger'; 'Occasional Publication No. 9 – Surveying Badgers' (Mammal Society, 1989)
Water Vole	Watercourses (as shown on Figure 10.3) adjacent to the Site were searched for signs of Water Vole including latrines, tunnels, lawns, feeding signs and footprints. The banks of the watercourses were examined thoroughly from both sides (where accessible) and from the watercourse itself where scrub and water depth allowed.	June 2020 September 2020	University of Oxford Wildlife Conservation Research Unit (2011) 'Water Vole Conservation Handbook', 3rd Edition Dean M et al (2016) 'The Water Vole Mitigation Handbook (The Mammal Society Mitigation Guidance Series).' The Mammal Society
Otter	Watercourses adjacent to the Site (as shown on Figure 10.3) were searched for the presence of Otter field signs, including holts, feeding signs, slides, footprints and spraints.	June 2020 September 2020	Life in UK Rivers (2003) 'Monitoring the Otter - Conserving Natura 2000 Rivers' Monitoring Series No.10
Breeding Birds	Breeding bird surveys involved walked transects of the Site under suitable weather conditions. Observations of all bird species were noted and any evidence of breeding recorded as shown at Figure 10.5. One further survey is due to be carried out in May 2021.	June 2020 April 2021 May 2021 (yet to be completed)	'Natural England Standing Advice: breeding birds'; 'British Trust for Ornithology (BTO) Common Bird Census' (Gibbons et al., 1994) Baille et al. RA (2010) 'Breeding Birds in the Wider Countryside: their conservation status', BTO Research Report No. 385, BTO, Thetford
Reptiles	Presence/likely absence surveys were carried out of habitats potentially suitable for reptiles comprising seven survey visits in suitable weather conditions using artificial refugia at a density of over 10 per ha as shown on Figure 10.6.	September 2020	Froglife Advice Sheet 10 Reptile Survey - an introduction to planning, conducting and interpreting surveys for snake and lizard conservation (1999); Gent, T. and Gibson, S. (2003) Herpetofauna Workers Manual. Joint Nature Conservancy Council: Peterborough.
Great Crested Newt	Waterbodies within 250m of the Site where holding water, accessible and not separated by a major dispersal barrier	May 2020	Oldham RS, Keeble J, Swan MJS & Jeffcote M (2000) 'Evaluating the suitability of habitat for the Great

	were subject to a Habitat Suitability Index (HSI) assessment to determine their potential to support Great Crested Newts.		Crested Newt (Triturus cristatus)'. Herpetological Journal 10 (4), 143-155 Amphibian & Reptile Groups of the UK (2010) 'ARG UK Advice Note 5: Great Crested Newt Habitat Suitability Index
	Following the HSI assessment, the single waterbody within 250m of the Site not separated by a major dispersal barrier and with suitability to support Great Crested Newt was subject to an environmental DNA (eDNA) survey. Water samples were taken in accordance with published guidelines which were then analysed for the presence of Great Crested Newt DNA in a laboratory.	June 2020	Biggs J, Ewald N, Valentini A, Gaboriaud C, Griffiths RA, Foster J, Wilkinson J, Arnett A, Williams P and Dunn F (2014). 'Analytical and methodological development for improved surveillance of the Great Crested Newt. Defra Project WC1067.Freshwater Habitats Trust: Oxford
Brown Hairstreak *Thecla betulae* butterfly	Hedgerows, treelines, woodland edges and scrub within and adjacent to the Site were surveyed for the presence/absence of Blackthorn and its suitability to support Brown Hairstreak egg laying such that habitat quality of each feature could be classified. Brown Hairstreak eggs were searched for and identified across the Site as shown at Figure 10.7.	December 2020	UK Butterfly Monitoring Scheme (2016) ' NG3: Brown Hairstreak Egg Count Guidance Notes.' Butterfly Conservation and The Centre for Ecology and Hydrology, Wareham.

Methodology – Assessment

Evaluation of Ecological Baseline

10.51 The evaluation of the importance of the identified ecological features and resources is based on professional judgement whilst also drawing on the latest available industry guidance and research. The approach taken in this chapter is based on that described in 'Guidelines for Ecological Impact Assessment in the UK and Ireland' published by CIEEM in 2018 (most recently revised in September 2019) whereby important ecological features are identified, and these are considered within a defined geographical context using the following frame of reference in relation to their level of importance:

- International and European;
- National;
- Regional;
- County;
- District;
- Local; and
- Site (not of elevated importance at a local level).

10.52 Further details on this approach and the criteria used for evaluation are provided in the Preliminary Baseline Ecological Appraisal at Appendix 10.1.

10.53 As set out in Chapter 2 of this ES, the sensitivity of a receptor is based on the relative importance of the receptor using the scale below:

- High – The receptor/resource has little ability to absorb change without fundamentally altering its present character, or is of international or national importance;
- Moderate – The receptor/resource has moderate capacity to absorb change without significantly altering its present character, or is of high importance; and
- Low – The receptor/resource is tolerant of change without detriment to its character or is of low or local importance.

Characterising Ecological Impacts

10.54 The impact assessment draws on information provided in other chapters where appropriate, for example the assessment of likely significant changes on Air Quality is set out in Chapter 7 of the ES, the assessment of the likely significant effects of the Development on Water Resources and Flood Risk is set out in Chapter 14 of the ES, and the assessment of the likely significant effects of the Development on Noise and Vibration in Chapter 8 of the ES and considers these in relation to ecological receptors.

10.55 The approach for the assessment of impacts follows the CIEEM Guidelines 2018 which set out a methodology for the assessment of potential effects arising from development. These methods are summarised below.

10.56 Based on the description of the Development as set out in Chapter 3, likely effects of the Development are determined with reference to aspects of the ecological structure and function on which the feature or resource depends. This includes factors such as the available resources, ecological processes, human influences, historical context, ecological relationships, ecological role or function, and ecosystem properties. Based on this context, the nature of the effect is characterised and considered under the following parameters:

- Positive or negative or neutral – will the activity lead to an adverse, beneficial or neutral effect;
- Extent – the size or amount of an impact, the area of habitat or number of individuals affected;
- Duration – the time for which the impact is expected to last prior to recovery or

replacement, i.e. short-term, medium term or long-term;

- Reversibility – an effect may be irreversible in that recovery is not possible within a reasonable timescale or there is no reasonable chance of action being taken to reverse it, i.e. permanent or temporary; and
- Timing and frequency – some changes may only cause an impact if they coincide with critical life-stages or seasons, whilst frequent events may cause a greater effect than a single event.

10.57 Based on these parameters, the scale of effect (or magnitude) can be summarised as shown in Table 10.2 below. This summary is in relation to adverse effects, although the same scale should be applied to beneficial effects.

Table 10.2 Assessment of Scale (or Magnitude) of Effect

Scale of Impact	Nature of Effect
Major	Total loss or major/substantial alteration to key elements/features of the baseline (pre-Development) conditions such that the post Development character/composition/attributes of the baseline/receptor or its conservation status will be fundamentally changed.
Moderate	Loss or alteration to one or more key elements/features of the baseline conditions such that post Development character/composition/attributes of the baseline/receptor or its conservation status will be materially changed.
Minor	A minor shift away from receptor baseline conditions. Change arising from the loss/alteration will be discernible/detectable but not material. The underlying character/composition/attributes of the receptor baseline condition or its conservation status will be similar to the pre-Development circumstances/situation.
Negligible	Very little change from receptor baseline conditions. Change barely distinguishable, approximating to a 'no change' situation.

Determining Significance of Ecological Effects

10.58 Based on the nature of the effect, an assessment is then made as to whether the effect on a habitat or species is likely to be ecologically 'significant'. The CIEEM Guidance defines a 'significant effect' as:

> *"an effect that either supports or undermines biodiversity conservation objectives for 'important ecological features' or for biodiversity in general', [going on to state that] 'significant effects encompass impacts on structure and function of defined sites, habitats or ecosystems and the conservation status of habitats and species (including extent, abundance and distribution)."*

10.59 Significance is also assessed at an appropriate geographic scale. For example, a significant effect on a Site of Special Scientific Interest (SSSI) could be of national significance. Notwithstanding this however, consideration is also given to whether an effect is significant at a scale below the geographic context in which the feature is considered important.

10.60 For some ecological features (notably designations), there may be an existing statement of the conservation status of a feature and objectives and targets against which the effect can be judged. For example, SSSI's are assessed under six condition categories, comprising 'favourable', 'unfavourable recovering', 'unfavourable no change', 'unfavourable declining', 'part destroyed', and 'destroyed'. An effect that exerts a change between these condition categories would be considered as significant.

10.61 Where no existing statement of conservation status is available, an assessment is made against the existing status and condition of the habitat or species population, as recorded by survey data and background information, taking into account the level of ecological resilience or existing conditions that a habitat or species is currently subject to. An effect resulting in a long-term change to the existing background population trend or status at a given geographical level would be considered as significant. In this regard, a significant beneficial impact could be defined as one that prevents or slows an existing decline in the favourable conservation status of a habitat or population as much as one that permitted a population or habitat area to increase. Where the magnitude of change is considered to be of no significance/negligible, the other assessment parameters such as duration/sensitivity/nature of change and permanence do not apply, as no effect is predicted. Accordingly, in these instances the overall evaluation of significance would be non-significant. A significant effect on the other hand is an effect that can change the conservation objectives or status of an ecological feature as set out at paragraph10.58 above.

Limitations and Assumptions

10.62 All of the species that occur in each habitat would not necessarily be detectable during survey work carried out at any given time of the year, since different species are apparent during different seasons. The habitat survey work, undertaken in May 2020, was undertaken within the optimal seasonal period for botanical work. As such, it is considered that the broad habitat types could be identified and an adequate assessment of the intrinsic ecological interest of the Site could be made.

10.63 Attention was paid to the presence of any invasive species listed under Schedule 9 of the Wildlife and Countryside Act 1981 (as amended)[xxvii]. However, the detectability of such species varies due to a number of factors, e.g. time of year, Site management, etc., and hence the absence of invasive species should not be assumed even if no such species were detected during the Phase 1 survey, or other subsequent Site visits.

10.64 A small number of reptile refugia were destroyed by farm machinery during the survey period, however these were replaced and left to "bed in" before surveys continued. As such this is

considered unlikely to have affected the robustness of the survey results.

10.65 Densely vegetated habitats within the Site have the potential to reduce the detectability of field signs for faunal species such as Badger. A detailed survey was able to be completed for the majority of the Site. Although dense woodland is present within the Site, no field signs of Badger were identified at the accessible sections of the woodland or at the woodland edge whilst this habitat will be retained and it is considered that the survey results do provide an accurate baseline of the Site for Badger.

10.66 It should be noted that bats are a group of species with a range of dynamic behaviours and as such, bats can roost in different locations, forage in different areas and preferentially commute along different routes in response to a number of changing physical and environmental factors. The bat data collected during the bat surveys shows the number of contacts for different bat species. It is important to note that the number of contacts does not equate to number of individual bats, as several contacts can be generated by one bat flying past the surveyors several times. Instead, the number of contacts provides an index of bat activity, which can be used to identify areas of habitat of greater or lesser importance for bats.

10.67 Species identification by sonogram is limited to a certain extent by similarities in call structure parameters for certain species. All bats modulate their calls according to the habitats they are navigating and their behaviour. This imposes limitations on reliable identification of bats to species level for species of the same genus, and specifically for *Plecotus* sp.*, Myotis* sp. and 'big bat' (*Nyctalus* and *Epstesicus*) bats. Due to the location of the Site and known range of *Plecotus* bats, every *Plecotus* bat recorded was assumed to be Brown Long-eared bat *Plecotus auritus*. 'Big bat' species were separated where possible but grouped where call parameters overlapped and prevented reliable identification to species.

10.68 The third manual and automated bat surveys and the third breeding bird survey are yet to be undertaken due to seasonal constraints and the proposed submission timings. The results of these surveys will be submitted following submission and during determination of the outline planning application. This will be submitted as further information to the ES under Regulation 25 of the 2017 EIA Regulations, as amended. It is not anticipated that these surveys will be constrained in any way and precautionary mitigation measures are set out within this chapter based on the two manual and automated bat surveys and two breeding bird surveys undertaken to date.

Baseline Conditions

Ecological Designations

10.69 There are no ecological designations within the Site or primary zone of influence. Ecological designations that occur within the secondary zone of influence are represented on Figure 10.2. Those designations which are assessed in the Preliminary Baseline Ecological Appraisal (Appendix 10.1) as important ecological features are described below in Table 10.3 and have been considered in this chapter.

Table 10.3: Statutory and Non-Statutory Designations forming Important Ecological Features within the Secondary Zone of Influence

Name	Status	Description	Approx. distance and direction from Site	Level of Importance
Statutory Designations				
Bure Park	Local Nature Reserve (LNR)	It is designated on the basis of grassland meadow, broad-leaved woodland, hedgerows, scrub, the River Bure and a pond known to support Great Crested Newts.	0.7km south	Local
Ardley Cutting & Quarry	SSSI	The SSSI is designated on the basis of geological interest as well as ecological interest associated with limestone grassland, scrub, ancient woodland and wetland habitats. The SSSI also supports a range of notable invertebrate fauna and Great Crested Newt populations	1.3km west (the Site falls within the SSSI Impact Risk Zone (IRZ) of the SSSI)	National
Oxford Meadows	SAC	The SAC is designated on the basis of Annex I habitat lowland hay meadows (*Alopercurus pratensis, Sanguisorba officinalis*) and Annex II species Creeping Marshwort *Apium repens*. The SAC includes vegetation communities that are perhaps unique in the world in reflecting the influence of long-term grazing and hay-cutting on lowland hay meadows whilst Port Meadow of Oxford Meadows is the larger of only two known sites in the UK for Creeping Marshwort. The SSSI components of the SAC are not considered given their separation from the Site.	17.1km south-west	International
Non-statutory Designations				
Twelve Acre Copse	Oxfordshire Local Wildlife Site (LWS)	The LWS is designated on the basis of its ancient woodland habitat and that it supports protected and notable species such as Bluebell *Hyacinthoides non-scripta* as well as species typical of long established woodland.	1.1km north-west	Local
Skimmingdish Lane Balancing Pond	Cherwell District Wildlife Site (DWS)	It is designated on the basis of being an area of unimproved grassland (with remnant lowland meadow) and remnant lowland fen Section 41 Habitats of Principle Importance.	1.2km south-east	Local

Habitats and Ecological Features

10.70 A full description of habitats and ecological features within the Site is given in Section 4 of the Preliminary Baseline Ecological Appraisal at Appendix 10.1, whilst the location of habitats and ecological features are represented on Figure 10.3.

10.71 A summary of the habitats and ecological features considered to be of ecological importance occurring within and adjacent to the Site (i.e. within the primary zone of influence) is given in Table 10.4 below. Other habitats recorded within the Site are not considered to form important ecological features and are therefore not brought forward for assessment in this Chapter (as described in Appendix 10.1). These habitats include arable, scrub, dry ditch, pond P1 (now a dry hollow) and hardstanding.

Table 10.4 Summary and Evaluation of Important Habitats and Ecological Features present within Primary Zone of Influence

Habitat type	Description	Level of Importance
Semi-improved Grassland	This habitat dominates the Site, supports a relatively low diversity of common and widespread species and is subject to relatively infrequent management, with exception of field F7 and some field margins which were subject to frequent mowing to a short-sward height. Tall ruderal and herbaceous species were recorded throughout the grassland sward, particularly in fields F1-F4 within which a high incidence of Cow Parsley *Anthriscus sylvestris* was recorded to be present.	Site
Hedgerows and Treelines	A total of 12 hedgerows and four treelines are present within or adjacent to the Site. These features were generally unmanaged/infrequently managed, with exception of the arable field hedgerows which were subject to winter flailing. Hedgerows and treelines were generally dominated by native species and several contain standard trees. Hedgerows H2, H3, H6, H8 and H9 and treelines TL3 and TL4 are considered likely to qualify as 'Important' under the Hedgerow Regulations 1997, and all hedgerows and treelines (with exception of TL1) are considered likely to qualify as Priority Habitat.	Local
Scattered Trees	Scattered trees which fall outside of treelines, hedgerows and woodland (discussed separately) are largely associated with the south-eastern field (F7) and the north-eastern boundary of field F6 lining the off-site access road. A number of native species are present and trees are generally mature to semi-mature in nature.	Site
Woodland	Two areas of woodland fall within the Site (W1 and W2), both of which are mapped as and likely qualify as UK Priority Habitat Deciduous Woodland. The woodlands support a range of semi-mature to mature native species forming a largely closed canopy to 16m in height and support a varied understorey and ground flora.	Local
Off-site Watercourses	The stretches of watercourses that run adjacent to small portions of the Site boundary (WC1 and WC2) are largely heavily shaded such that there is an absence of aquatic and marginal vegetation in a significant proportion of these features. The watercourses were also noted to be seasonally dry for much of the summer. Nonetheless they do form linear corridors at portions of the Site boundaries.	Local

Faunal Use of the Site

10.72 A range of faunal surveys were undertaken at the Site. Based on the survey work undertaken as set out at Table 10.1, on an assessment of habitats on-Site and on background information gathered, a number of species / species groups are not considered to form important ecological features or are likely to be absent from the Site (as described in Appendix 10.1), and are therefore not brought forward for further assessment in this Chapter. This includes Otter, Water Vole, Dormouse, Great Crested Newt and invertebrates (including aquatic invertebrates).

10.73 Full details of this survey work are included in the Preliminary Baseline Ecological Appraisal at Appendix 10.1, whilst a summary of faunal species/ groups considered to be of ecological importance occurring within the Site and the primary zone of influence are set out in Table 10.5 below.

Table 10.5 Summary and Evaluation of Important Faunal Species Present within the Primary Zone of Influence

Faunal species	Description	Level of Importance
Bats – Roosting (trees)	A number of semi-mature and mature trees are present within and adjacent to the Site. Four trees with bat roosting potential (comprising one low potential tree (T7), two moderate potential trees (T6 and T8) and one high potential tree (T5)) were identified within the Site boundary, as shown on Figure 10.3. The trees will be retained and sit within a retained greenspace buffer under the Development and therefore further emergence/re-entry survey work to identify whether a roost is present is not necessary. Four off-Site trees were considered to offer bat roosting potential (three low (T1-T3) and one moderate (T4)).	Site
Bats – Foraging / Commuting	The manual activity surveys recorded low to moderate levels of activity across the Site associated with linear habitats (particularly hedgerows H8, H7 and H3) and woodland as shown at Figure 10.4. At least six species were recorded comprising Common Pipistrelle *Pipistrellus pipistrellus,* Soprano Pipistrelle *Pipistrellus pygmaeus, Myotis* sp., Noctule *Nyctalus noctula* and 'Big Bat' (those that could be attributed to Serotine *Eptesicus serotinus* or Leisler's Bat *Nyctalus leisleri*) species and Brown Long-eared Bat. Higher levels of activity were recorded in September than were recorded in August. Two static detectors were deployed in August and September 2020. SD1 was located in the eastern field boundary and SD2 adjacent to the treeline and watercourse. A minimum of seven species were recorded, as set out above in addition to Nathusius' Pipistrelle *Pipistrellus nathusii*. A significantly higher number of registrations were recorded at SD2.	Likely Local (to be confirmed)

Faunal species	Description	Level of Importance
	Overall, general activity levels are considered to be low (at largely less than 1 registration per hour for most species across the Site), with only location SD1 in September and location SD2 in August recording more than five registrations per hour for 'big bat' species and Common Pipistrelle respectively. This indicates a lack of sustained foraging activity for the most part, and as such the linear features within and adjacent to the Site appear likely to be used to a greater extent for commuting. These low levels of activity reflect the largely open nature of the Site set in an arable and suburban context. Previous survey work undertaken by the third party consultancy in the wider area which covers part of the Site, reported a similar assemblage of species and levels of activity suggesting that the results of the most recent survey work undertaken in 2020 are representative of the value of the Site to foraging and commuting bats.	
Badger	No Badger setts were recorded within the Site or its immediate vicinity during survey work undertaken. However, areas of the on-Site woodland were inaccessible and a number of records within the local area were returned from TVERC and previous survey work undertaken. The Site also offers some suitable foraging and commuting habitat for Badger, particularly within the woodland. It is considered parts of the Site could form part of a Badger territory within the wider area.	Site
Other Mammals	Due to the habitats present on Site, it is likely that the Site offers foraging opportunities and cover for a number of UK Priority mammal species such as Hedgehog *Erinaceus europaeus* and Polecat *Mustela putorius* for which records have been received from the surrounding area. A number of common and widespread species including Deer sp., Grey Squirrel *Sciurus carolinensis*, Wood Mouse *Apodemus sylvaticus* and Rabbit *Orytolagus cuniculus* were recorded incidentally during survey work undertaken, however these species do not receive specific legislative protection in a development context.	Site
Breeding Birds	Several common species of bird were observed within the Site during the Phase 1 survey and incidentally during other faunal survey work throughout the year including Wood Pigeon *Columba palumbus*, Jackdaw *Corvus monedula*, Red Kite *Milvus milvus (*flyover*)*, Swallow *Hirundo rustica*, Blue Tit *Cyanistes caeruleus*, Chaffinch *Fringilla coelebs,* Blackbird *Turdus merula,* Carrion Crow *Corvus corone*, Song Thrush *Turdus philomelos*, Pheasant *Phasianus colchicus,* Greenfinch *Carduelis chloris,* Great Tit *Parus major,* Robin *Erithacus rubecula*, Wren *Troglodytes troglodytes,* Buzzard *Buteo buteo,* Goldfinch *Carduelis carduelis* and Greater Spotted Woodpecker *Dendrocopos major*. Third-party survey work undertaken in 2010-2011 also recorded Barn Owl *Tyto alba* nesting within the on-Site woodland, survey work in 2020 and 2021 identified Barn Owl nest boxes but these did not appear to be in use. The first two of three proposed breeding bird surveys undertaken also recorded a total of 27 species within the Site in June 2020 and April 2021, 16 of which were breeding or probably breeding and five considered to be possibly breeding, as shown at Figure 10.5. These species included Wood Pigeon, Great Tit, Chiffchaff *Phylloscopus collybita*, Whitethroat *Sylvia communis*, Blackcap *Sylvia atricapilla*, Wren, Blackbird, Song Thrush, Robin, Chaffinch, Goldfinch, Red-legged Partridge *Alectoris refa*, Greater Spotted	Likely Local (to be confirmed)

Faunal species	Description	Level of Importance
	Woodpecker, Magpie *Pica pica* Carrion Crow, Blue Tit, Long-tailed Tit *Aegithalos caudatus*, Goldcrest *Regulus regulus*, Dunnock *Prunella modularis*, Linnet, Bullfinch *Pyrrhula pyrrhula* and Grey Heron *Ardea cinerea*. The remaining 6 species were recorded either adjacent to the site, flying over the site, or were represented by non-breeding individuals, including Red Kite, Grey Heron, Jackdaw, Skylark, Starling, and Meadow Pipit *Anthus pratensis*. Activity was dominated by common and widespread species, with activity focussed around the two patches of woodland, Site boundaries and mature hedgerows. Territory numbers and distribution of the above species will be confirmed following completion of the final survey. Barn Owl and Red Kite are listed as Schedule 1 species under the Wildlife and Countryside Act 1981 (as amended) whilst Song Thrush is UK Priority Species and a Red Listed Bird of Conservation Concern (BoCC). Skylark, a Red Listed BoCC, was recorded in adjacent arable land to the Site, however, no evidence of their presence within the Site was recorded. Based on the survey work carried out to date, the Site is considered to be of importance to breeding birds at no more than a Local level.	
Reptiles	The Site offers suitable reptile habitat, largely in the form of grassland fields. Specific reptile survey work undertaken recorded a peak count of four Common Lizard *Zootoca vivipara* and a single adult Grass Snake *Natrix natrix* that was recorded on one instance only. Reptiles were recorded in fields F1, F2, F3 and F7 only with locations shown at Figure 10.6. Populations of Common Lizard and Grass Snake are classed as Low under current guidance.	Local
Common Amphibians	A HSI assessment and eDNA survey of the only waterbody within 250m of the Site boundary was undertaken in 2020 which found Great Crested Newt to be absent, as such Great Crested Newt is not considered to be an important ecological feature. However, during reptile survey work undertaken the UK Priority Species Common Toad *Bufo bufo* as well as Common Frog *Rana temporaria* were recorded on Site.	Site
Brown Hairstreak	Specific survey work was undertaken for the UK Priority Species Brown Hairstreak in December 2020. Habitat within the Site was surveyed for its suitability to support egg laying opportunities for the species and Brown Hairstreak eggs were also searched for. The survey recorded that hedgerows H3, H6 and H8 were considered to be of high suitability for the species, hedgerows H7 and H9 and treeline TL4 were considered to offer moderate suitability and hedgerow H4, woodland W2 edge and scrub patch S1 were considered to offer low suitability to the species. A total of 13 Brown Hairstreak eggs were recorded within the Site on hedgerows H3, H4, H6, H7, H8 and scrub patch S1 as shown on Figure 10.7.	Local

Future Baseline

10.74 In the absence of the Development, if the current level of management, comprising occasional grass cutting and hedge flailing (particularly adjacent to arable field margins) within the Site were to continue, which is not undertaken to benefit biodiversity, the value of the habitats would likely remain the same or deteriorate. There is evidence that the longer-sward grassland areas are subject to infrequent management, however should this management continue to be increasingly infrequent then it is likely that tall ruderal habitat and scrub would colonise the grassland, reducing suitability for some species groups such as reptiles. The current management practices for the hedgerows, particularly associated with the arable field will continue to have negative effects on Brown Hairstreak butterfly, destroying large sections of new Blackthorn growth which may be supporting Brown Hairstreak eggs and potentially removing all suitable habitat on a yearly basis. Other habitats and opportunities for species would likely remain in a similar condition. Therefore in the absence of the Development, the overall sensitivity of the Site may decrease, as for example it may no longer be suitable for reptiles due to a deterioration in habitat quality. As such, the Development presents the opportunity to secure the future baseline of the Site by bringing retained and new habitats into active management to benefit biodiversity.

Likely Significant Effects

Inherent Design Mitigation

10.75 The Development has been assessed in terms of likely significant effects on biodiversity and has been developed following an iterative process of design, with a number of inherent mitigation measures incorporated as part of the Development as set out in Chapter 3 of the ES (Site and Development Description), such as the provision of Sustainable Drainage Systems (SuDS) and green infrastructure.

10.76 A key inherent mitigation measure is the retention of key habitats, wildlife corridors and networks around and across the Site in addition to the creation of new wildlife corridors by incorporating green infrastructure into the proposals. This includes retention of watercourses running adjacent to the Site boundary, woodland and hedgerows and treelines (with the exception of small access gaps). A 15m buffer to the woodland which will also extend along the south-western boundary of the Site is part of the inherent design mitigation, this will also function as part of the 20m 'dark corridor' buffer which will comprise the 15m buffer and associated retained woodland and watercourse habitat. A small section of the 20m dark corridor will be formed by off-Site land between the Site and the watercourse where this lies away from the Site boundary. All existing treelines and hedgerows will also be retained and

buffered with a minimum 10m buffer zone (with exception for occasional access gaps). Watercourses that lie adjacent to the Site will also be retained and buffered with a minimum 30m buffer zone. All retained features and buffer zones are shown on the 'Parameters Plan: Multi-functional Green Space'.

10.77 Also part of the inherent design mitigation is a new green corridor running along the north-western boundary which will be created on what is currently arable land. As such, connectivity across the Site will be maintained and in part enhanced. A number of SuDS basins also form part of the inherent design mitigation which will offer new habitats and opportunities for faunal species.

10.78 The retention and design of corridors throughout the Site are linked to off-Site adjacent habitats and further afield such that these corridors can be used as commuting routes for a range of species including bats, Badger, other mammals, reptiles and invertebrates.

Identifying Potential Effects

10.79 This section sets out the potential significant effects of the construction and operational phases of the Development on the identified important ecological features and assesses their significance. Table 10.6 below identifies potential effects of the Development which have been scoped in for assessment in terms of important ecological features.

Table 10.6 Summary of Potential Effects on Important Ecological Receptors Arising from the Development

Receptors	Potential Effects							
	Construction Phase (temporary effects)				Operational Phase (permanent effects)			
	Temporary land-take / damage (construction)	Disturbance (visual, noise)	Hydrology and pollution (dust generation, run-off)	Lighting (construction)	Permanent land-take	Anthropogenic effects / disturbance	Hydrological effects and pollution	Permanent lighting
Ecological Designations			X			X	X	X
Habitats	X		X		X	X	X	
Roosting Bats (trees)	X	X		X	X			X
Commuting and Foraging Bats	X			X	X			X
Badger	X	X		X	X	X		X

Receptors	Potential Effects							
	Construction Phase (temporary effects)				Operational Phase (permanent effects)			
	Temporary land-take / damage (construction)	Disturbance (visual, noise)	Hydrology and pollution (dust generation, run-off)	Lighting (construction)	Permanent land-take	Anthropogenic effects / disturbance	Hydrological effects and pollution	Permanent lighting
Other Mammals	X	X		X	X	X		X
Breeding Birds	X	X			X	X		X
Reptiles	X		X		X	X		
Common Amphibians	X		X		X			
Brown Hairstreak	X		X		X			

Note: Effects which are scoped into the assessment are marked 'X'. However, this does not indicate a significant effect.

Construction Phase

10.80 The potential effects considered within this section are those relating to temporary factors arising from the construction process, such as soil movements and land profiling, construction site noise or dust production etc., which will cease to apply following completion of the Development. Thus, loss of habitats through permanent land take for development is an operational phase effect, although the land take actually occurs during the construction phase of the Development.

10.81 This section draws on information provided in other chapters where appropriate, for example in the Air Quality (Chapter 7), Water Resources and Flood Risk (Chapter 14), and Noise & Vibration (Chapter 8) chapters.

Construction Phase Effects on Ecological Designations

Bure Park Local Nature Reserve (LNR)

10.82 Bure Park LNR is located approximately 0.7km to the south of the Site, separated from the Site by the A4095 and a number of arable and pastoral fields. Given the degree of separation between the Site and Bure Park LNR, it is not considered that any of the features which the LNR is designated for will be affected by construction effects such as visual and noise

disturbance, dust generation or lighting.

10.83 However, the off-site watercourses (WC1 and WC2), as shown on Figure 10.3, that run adjacent to small portions of southern and eastern Site boundaries join the River Bure downstream which forms part of the Bure Park LNR. In the absence of mitigation during the construction phase, there is therefore the potential for effects on Bure Park LNR via accidental spills or leaks of contaminants on Site and surface water run-off containing such contaminants/pollutants reaching the watercourses adjacent to the Site boundary and eventually the River Bure where this runs through the LNR. There is also a risk in the absence of mitigation during the construction phase of increased sedimentation entering the watercourses, which in turn could reach the Bure Park LNR. Increased pollutants and sedimentation within the River Bure at Bure Park LNR could reduce water quality and negatively affect the associated flora and fauna, including the population of Great Crested Newt within the pond fed by the River Bure. **As such effects on Bure Park LNR are considered to be moderate, adverse and medium-term, which may be significant at the Local level**.

Ardley Cutting and Quarry SSSI

10.84 Ardley Cutting and Quarry SSSI is located approximately 1.3km west of the Site. The Site falls within the SSSI Impact Risk Zone (IRZ), however, residential development is not listed as one of the risk factors to the SSSI. The SSSI is well separated from the Site by a number of fields and the village of Bucknell and given the degree of separation and the ecological features for which the SSSI is designated for, it is not considered that the SSSI will be affected during construction from visual and noise disturbance, dust generation or hydrological effects or temporary lighting. **As such the effects on Ardley Cutting and Quarry SSSI are considered to be negligible and non-significant**.

Oxford Meadows SAC

10.85 Oxford Meadows SAC is located approximately 17.1km south-west of the Site. Given the degree of separation between the Site and Oxford Meadows SAC it is not considered that the SAC will be affected by visual and noise disturbance, dust generation, hydrological effects or temporary lighting during construction.

10.86 The watercourses adjacent to the Site boundary are so far removed from the SAC that any effects locally to the Site would not reach the SAC. This conclusion is reinforced through the CDC Habitat Regulations Assessment (HRA) (October 2014)[xxviii] which assessed the 76 policies of the Local Plan, including strategic housing allocation sites to include the wider North-West

Bicester allocation/policy (Policy Bicester 1) which includes the Site, and concluded that such developments would not lead to likely significant effects on the Oxford Meadows SAC. It is specifically stated within Appendix B, Table B-1 of the CDC HRA with regard to Policy Bicester 1 which contains the Site:

> *"There are no anticipated impacts on the Oxford Meadows SAC due to decreased water quality at the site. This is because this Eco-Town is not located next to watercourses that flow into the River Thames upstream of the SAC.*
>
> *Furthermore, as added protection for the Oxford Meadows SAC and all other watercourses in the District, Policy ESD9 requires developers to demonstrate that during construction and operation of any new development that there will be no adverse effect on water quality of any adjacent or nearby watercourses".*

10.87 **It is therefore concluded that effects on Oxford Meadows SAC during construction are negligible and non-significant**.

Twelve Acre Copse Oxfordshire LWS

10.88 Twelve Acre Copse Oxfordshire LWS is located approximately 1.1km north-west of the Site such that it is well separated from the Site by a number of fields and Bainton Road which leads to the village of Bucknell. Given the degree separation and the ecological features for which the LWS is designated for, it is not considered that the LWS will be affected by construction effects from the Site such as visual and noise disturbance, dust generation, hydrological effects or temporary lighting. **As such the effects on Twelve Acre Copse Oxfordshire LWS are considered to be negligible and non-significant**.

Skimmingdish Lane Balancing Pond Cherwell DWS

10.89 Skimmingdish Lane Balancing Pond Cherwell DWS is located approximately 1.2km south-east of the Site, located on the other side of existing development in Bicester and the Exemplar scheme. Given the degree of separation and the ecological features for which the DWS is designated for, it is not considered that the DWS will be affected by construction effects from the Site such as visual and noise disturbance, dust generation, hydrological effects or temporary lighting. **As such, the effects on Skimmingdish Lane Balancing Pond Cherwell DWS are considered to be negligible and non-significant**.

Construction Phase Effects on Habitats

10.90 As part of the construction phase, the entire built footprint of the Development will be cleared

of habitat, as shown within the Parameter Plans, which will result in losses of some habitats considered to be important ecological features, the impact of which will be assessed during the operational phase. There will also be an element of temporary land-take for construction purposes whereby small areas of habitat will be temporarily lost during construction. In the absence of mitigation there is also the potential for effects from hydrology and dust deposition on retained habitats within the Site and off-Site habitats (such as the watercourses adjacent to the Site). The habitats that could be affected in the construction phase of Development are discussed below.

Semi-improved Grassland

10.91 The Site is dominated by semi-improved grassland, a proportion of which will be retained as part of the inherent design mitigation in the form of green infrastructure corridors throughout the Site. Some areas of grassland may be temporarily lost during creation of the green infrastructure networks such as to facilitate construction of SuDS features for example, although such areas will be limited in extent. In the absence of mitigation, there is the potential for areas of retained grassland to be affected during construction for example from accidental damage (e.g. vehicle movements and soil compaction) or dust deposition or changes in hydrology which could adversely affect the quality and extent of the habitat.

10.92 **In the absence of mitigation, effects during construction are considered to be minor, adverse and short-term which is significant at the Site level with regard to potential effects on retained areas of semi-improved grassland only whilst the temporary loss of grassland is considered to be non-significant**. Mitigation is proposed below which will reduce the effect to a level which is not significant.

Hedgerows, Treelines and Woodland

10.93 A number of hedgerows and treelines and two woodlands (W1 and W2) are present within the Site boundary as shown at Appendix 10.3. There will be no temporary habitat losses of hedgerows, treelines or woodland associated with construction.

10.94 During the construction phase, hedgerows, treelines and woodland could be accidently damaged through inappropriate storage of materials close to a tree or compaction from vehicles driving within the root protection zone. It is also considered that changes in hydrology, polluted surface-water run-off or dust deposition onto these features could damage them.

10.95 **In the absence of mitigation, accidental damage or indirect effects as set out above**

are considered to be moderate, adverse in the short-term and significant at the Local level. Mitigation is proposed below which will reduce the effect to a level which is not significant.

Scattered Trees

10.96 A number of scattered, semi-mature to mature trees are present in field F7 and along the north-eastern edge of field F6 (as shown on Figure 10.3) which are largely due to be retained under the Development. Potential effects during the construction phase are largely as set out for hedgerows and treelines comprising accidental damage to trees and their root protection zones and any significant changes to hydrology, polluted surface water run-off or dust deposition to these features could damage them.

10.97 **Accidental damage or indirect effects as set out above are considered to be minor adverse in the short-term which is not considered to be significant to the status of scattered trees as a whole at the Site level**.

Off-Site Watercourses

10.98 Two stretches of watercourses run adjacent to small portions of the southern and eastern Site boundaries (WC1 and WC2). As the watercourses lie just off-Site they will not be directly affected during construction and will be buffered from the main construction areas by a green infrastructure buffer, to include existing vegetation, which forms part of the inherent design mitigation of the Site. In the absence of mitigation, indirect effects on the watercourse could result from changes to hydrology, polluted surface water run-off, increased siltation and dust deposition onto bankside vegetation. Increased pollution and sedimentation into the watercourses could reduce water quality both directly adjacent to the Site and further afield and negatively affect associated flora and fauna.

10.99 **The potential for indirect effects on the off-site watercourses are considered to be moderate adverse and medium-term which is significant at the Local level**. Mitigation is proposed below which will reduce the effect to a level which is not significant.

Construction Phase Effects on Fauna

Roosting Bats (Trees)

10.100 A number of semi-mature to mature trees were identified within and in close proximity to the Site that were considered to offer bat roosting potential. These trees will be retained under

the Development layout and will also be buffered from construction activities by green infrastructure corridors as part of the inherent design mitigation.

10.101 Although the above trees will be retained, in the absence of mitigation, such as appropriate demarcation or fencing, the trees on-Site or immediately adjacent to the Site boundary, could be directly affected during construction, for example, from accidental damage by construction vehicles coming in too close proximity to trees, damaging the tree or any overhanging branches. This could result in the killing and injuring of bats and damaging or destroying their roosting places should bats be present at that time.

10.102 If the trees were to support bat roosts, in the absence of mitigation there is also potential for indirect effects in the form of disturbance from noise or poorly positioned construction lighting. Such disturbance to bats or damage to trees should they contain roosts could cause bats to switch roosting sites during the daytime which increases the risk of predation and increases energy expenditure, or could cause bats to abandon the roost. Roosting bats are not expected to be affected by visual disturbance.

10.103 While the above activities have the potential to affect individual bats and roosts if present at the time work is undertaken, given the large size and open nature of the Site and the very small number of trees potentially affected, the likelihood such effects would affect the conservation status of the local bat population is somewhat reduced. **Overall, prior to mitigation, effects are considered to be minor adverse and short-term which would be significant at the Site level only**. Mitigation is proposed below which will reduce the effect to a level which is not significant.

Commuting and Foraging Bats

10.104 As part of the inherent design mitigation of the Development, in-built green infrastructure corridors are incorporated into the Site design, which have taken into account the main bat activity corridors, and as result, no commuting routes will be severed or fragmented during construction.

10.105 Construction will result in the temporary loss of habitats which may provide a prey resource for foraging bats. Given that generally low levels of bat activity were recorded within the Site, and further higher quality habitats (such as the watercourses) are present within the wider off-Site area, it is not considered that a temporary loss of bat foraging habitat as part of the foraging resource in the wider landscape would adversely affect local bat populations.

10.106 It is considered that in the absence of mitigation, poorly positioned lighting associated with

construction activities could potentially affect foraging and commuting bats. This could cause features identified as commuting/foraging routes to be illuminated, which may alter bats commuting/foraging routes and behaviour, potentially resulting in additional energy expenditure and accordingly are considered to be of moderate sensitivity. However, it is likely that lighting within the construction Site would only be required during working hours (typically Monday to Friday 08:00 to 15:30 and Saturday 08:00 to 13:00) in the winter months when there are reduced daylight hours (e.g. lighting may be required from 08:00-09:00 for example). At this time of year, bats would be hibernating and are therefore much less likely to be utilising commuting/foraging routes. As such the potential for adverse effects to occur is significantly reduced, such that it is unlikely that construction lighting would affect the conservation status of the local bat population with regards to commuting/foraging. Negligible effects are anticipated from temporary land-take or damage, disturbance and hydrology and pollution with regard to foraging and commuting bats. **As such, construction effects on foraging / commuting bats are considered to be negligible and non-significant**.

Badger

10.107 Should Badger setts be present within the woodlands or should Badger be using the woodland or hedgerow network for commuting purposes, it is considered that the inherent design mitigation which includes the retention of such features and appropriate buffer zones would ensure Badgers and their key habitats were not at risk of damage or destruction during the construction phase. No setts were identified within the Site at the time of survey in any case. It is therefore also considered unlikely that Badger setts would be affected by disturbance by noise, vibration or lighting given that any Badger in the local area will be far removed from such activities. No visual disturbance to Badger setts is anticipated as Badger would not be able to see construction activities during the day when they would be within their setts.

10.108 It is considered that in the absence of mitigation, poorly positioned lighting associated with construction activities could potentially cause disturbance to foraging and commuting Badgers through illumination of commuting corridors or foraging areas. However, it is likely that lighting within the construction Site would only be required during working hours (typically Monday to Friday 08:00 to 15:30 and Saturday 08:00 to 13:00) in the winter months when there are reduced daylight hours (e.g. lighting may be required from 08:00-09:00 for example). At this time of year, Badgers are less active and are therefore much less likely to be frequently utilising commuting/foraging routes that could be affected. As such the potential for adverse effects to occur is significantly reduced, such that it is unlikely that construction lighting would affect the conservation status of the local Badger population.

10.109 As Badgers are a mobile and wide ranging species, in the absence of mitigation, there is also

the potential for Badgers to enter construction areas at night and become trapped or injured. It is considered highly unlikely they would be injured by construction traffic as this would only occur during normal working hours when Badgers would be in their setts.

10.110 As noted above, green infrastructure corridors have been built into the Development and these will allow Badger to continue to move around and across the Site during construction. In the absence of mitigation, it is possible these corridors may be blocked (for example from inappropriate storage of materials or positioning of security fencing), which could affect Badgers' ability to move around and potentially exit and enter the Site.

10.111 Construction will also involve the temporary loss of habitats likely to be used by Badger for foraging, such as grassland. There are large areas of similar habitats accessible to Badgers within and around the Site and as such, these habitat losses are considered unlikely to affect the conservation status of the local Badger population.

10.112 Overall, **in the absence of mitigation, construction effects on Badgers, should they enter the Site, are considered to be minor adverse and short-term which is significant at the Site level, in relation to construction hazards and temporary land take/damage to commuting corridors and foraging areas**. Mitigation is proposed below which will reduce the effect to a level which is not significant. Negligible and non-significant effects are anticipated in relation to all possible effects on Badger setts and in relation to lighting and disturbance with regard to foraging and commuting Badger.

Other Mammals

10.113 No evidence of any other notable mammal species were recorded on Site. However, due to the habitats present on Site, it is likely that the Site offers foraging opportunities and cover for a number of UK Priority mammal species such as Hedgehog and Polecat for which records have been received from the surrounding area.

10.114 Key habitats for these species comprising woodland and hedgerows are retained under the Development whilst it is considered that any accidental damage would be unlikely to affect such species given that these features likely form part of a much wider habitat range should they make use of the Site.

10.115 Similarly it is considered unlikely that any disturbance to habitats potentially utilised by these species during the construction phase, in the form of visual, noise, vibration or lighting will occur given that similar habitat is present in the wider area. Furthermore both Hedgehog and Polecat are nocturnal species such that any movement across the Site would be at night when

construction activities are not occurring.

10.116 **Overall it is considered that effects on other mammals (primarily Hedgehog and Polecat) during construction are negligible and non-significant**.

Breeding Birds

10.117 A range of common and widespread birds have been recorded within the Site. Construction activities will involve the removal of a small number of areas of nesting bird habitat comprising sections of hedgerow, treeline and woodland to facilitate the completed Development and the temporary removal of nesting bird habitat (such as tree/scrub removal for enhanced greenspace areas).The effect of such losses on birds during the breeding season (March-August) within the construction phase could result in direct damage or loss of active nests. Retained habitats (such as hedgerows and woodland) could also be accidentally damaged (e.g. by machinery) if not adequately protected, which may also cause the loss of active nests. The extent of the areas where habitat loss is likely to occur during the construction phase is small, albeit any damage/loss of an active nest would result in a direct effect on local populations and would also constitute an offence under the Wildlife and Countryside Act 1981 (as amended), which affords protection to wild birds and their eggs.

10.118 Construction activities could also result in noise and visual disturbance to nesting birds in close proximity to construction areas, albeit these effects are likely to be highly localised.

10.119 Although it is considered that the birds present on Site have a low sensitivity to the effects described above, there is a small chance that the removal of vegetation during the breeding season could kill/injure individual birds and eggs/chicks, or damage or destroy active nests, although this is considered unlikely to affect the conservation status of birds recorded within the Site. Nonetheless, a precautionary approach has been taken in the absence of the outstanding breeding bird survey (due to be undertaken in May 2021). **Accordingly, prior to mitigation, construction effects on breeding birds are likely to be minor adverse and short-term with effects significant at the Local level**. Mitigation is proposed below which will reduce the effect to a level which is not significant.

Reptiles

10.120 The Site offers suitable reptile habitat, largely in the form of grassland fields. Largely, the locations in which reptiles were recorded will be incorporated into the green infrastructure corridors and will therefore be retained and protected during construction. Some temporary losses of suitable reptile habitat may occur, for example where constructing new habitats (i.e.

SuDS features) within the green infrastructure. Where this occurs, in the absence of mitigation there is a risk of killing or injuring individual reptiles during the construction phase.

10.121 Grass Snake and Common Lizard are not considered to be particularly vulnerable to changes in habitat quality resulting from indirect effects which may arise from construction, for example dust deposition or hydrological changes.

10.122 Overall it is considered that as the vast majority of habitat where reptiles were recorded will be retained during construction, the conservation status of reptiles can be readily maintained at the Site. **However, as there is a risk of killing/injuring individuals where some small areas of habitat require removal to facilitate construction, overall effects on reptiles are considered to be minor adverse and short-term which is not significant**.

Common Amphibians

10.123 Common Toad were recorded in areas which will largely be incorporated into the green infrastructure corridors and will therefore be retained and protected during construction. Some temporary losses of suitable Common Toad habitat may occur, for example where constructing new habitats (i.e. SuDS features) within the green infrastructure. Where this occurs, in the absence of mitigation there is a risk of killing or injuring individual Common Toads.

10.124 Toads are considered to be making use of terrestrial habitats on Site and as such are not considered to be particularly vulnerable to changes in quality of such habitats resulting from indirect effects which may arise from construction, for example dust deposition or hydrological changes.

10.125 Overall it is considered that as the vast majority of habitat where Common Toad were recorded will be retained during construction, such that the conservation status of common amphibians (including Common Toad) can be readily maintained at the Site. However, as there is a risk of killing/injuring individuals where some small areas of habitat require removal to facilitate construction, **overall effects on common amphibians/Common Toad are considered to the minor adverse and short-term which would not significantly affect such species conservation status**.

Brown Hairstreak

10.126 Specific survey work was undertaken for the UK Priority Species Brown Hairstreak and the majority of Brown Hairstreak habitat identified within the Site (hedgerows, woodland edge

and scrub) will be retained and protected during the construction phase within the green infrastructure of the Development, with small losses for access points/footpaths only. However, in the absence of mitigation there is potential for retained habitats to be affected during construction through accidental damage or pollution such as dust deposition onto eggs within such habitats, thereby reducing habitat quality and availability or by causing direct damage to the species. Any hydrological changes during the construction phase are not considered likely to affect Brown Hairstreak or their habitat.

10.127 The above identified effects are considered relatively unlikely given that the eggs are usually sparsely distributed through the habitat and a large proportion of suitable habitat (comprising Blackthorn and Ash which are key for various Brown Hairstreak life stages) is present on Site such that should accidental damage occur in a small area, the overall conservation status locally of the species would be unlikely to be affected.

10.128 **Given the above, effects on Brown Hairstreak butterfly are considered to be negligible and non-significant**.

Completed Development

10.129 The potential effects considered within this section are those relating to the completed Development or operational phase of the Development. This includes the loss of habitats through permanent land-take in addition to potential effects resulting from the operation of the completed Development on ecological designations, habitats and fauna such as traffic increases, changes in hydrology, or noise and light disturbance.

Completed Development Phase Effects on Ecological Designations

Bure Park LNR

10.130 Bure Park LNR is located approximately 0.7km south of the Site, separated from the Site by the A4095 and a number of arable and pastoral fields such that permanent lighting from the completed Development is not considered likely to affect the features for which the LNR is designated for. The habitats for which Bure Park LNR is designated for are not considered to be particularly sensitive to changes in air quality, the Air Quality Chapter (Chapter 7) concludes effects as a result of the Development will be negligible and the LNR is located 0.7km from the site, and accordingly effects in relation to air quality would not occur. Hydrological effects or pollution events negatively affecting habitats for which the LNR is designated (i.e. River Bure) are unlikely at the completed Development phase due to the provision of SuDS features as part of the inherent design mitigation for the Development.

Given consideration to the above **it is considered permanent lighting, hydrological effects and pollution (both aquatic and air) during the completed Development phase will be negligible and non-significant**.

10.131 As set out above, Bure Park LNR lies approximately 0.7km south of the Site such that it is considered possible that residents of the completed Development could use the LNR for recreational use and dog walking. If residents were to use the LNR, it would be a minimum of a c.20minute walk (40 minute round trip) from the closest part of the Development to the top entrance of the LNR (which is considered the most likely option given that there is no parking provision at the LNR) before residents actually started walking within the LNR. Public access within the LNR is well provided for with a series of surfaced roads and nature trails and the area is actively managed for both the use by the public and for nature conservation. There is a small risk that people could stray off paths or that there could be an increase in dog-fouling, both of which could negatively affect the flora and fauna present. However, given that the Development contains sizeable areas of multi-functional green infrastructure which will contain a number of footpaths as part of the inherent design mitigation it is considered that the vast majority of new residents would make use of these on-Site areas on a daily basis, as these areas would be much more accessible than reaching the LNR via a minimum 20minute walk. Additionally, the provision of new greenspace within the Development could also be used by existing residents in the local area that currently make use of the LNR, offsetting any minimal effects of new residents on the LNR. Given the above and that Bure Park is already well provisioned to accommodate visitors, **it is considered that any small increase in the number of visitors would result in a negligible and non-significant effect on the LNR**.

Ardley Cutting and Quarry SSSI

10.132 Ardley Cutting and Quarry SSSI is located approximately 1.3km west of the Site. The Site falls within the SSSI IRZ, however, residential development is not listed as one of the risk factors to the SSSI.

10.133 The Air Quality Chapter concludes the effects of the Development would be negligible and the SSSI is well separated from the Site by a number of fields and the village of Bucknell, in addition to the M40 for much of the designated area. On that basis, effects in relation to air quality would not occur.

10.134 A number of public footpaths are present throughout the SSSI which link to a number of further public footpaths in the surrounding area. However, if residents of the completed Development were to walk from the Site to reach the SSSI, it is considered it would take a

minimum of c.30minutes to reach the edge of the SSSI and would involve some use of main roads. The alternative to reach the SSSI would be to drive, however, review of The Wildlife Trust website[xxix] for access details to the SSSI suggests there is no specific parking provision, with a road verge suggested. Review of Google Streetview of the suggested location, shows it appears big enough for no more than two to three cars, whilst a review of aerial imagery offers no alternative parking provisions to the SSSI. With the provision of green infrastructure provision provided by the inherent design mitigation of the Site and areas of open space more locally, **it is considered that Ardely Cutting and Quarry SSSI would not see any measurable increase in visitors as a result of the completed Development and as such that recreational effects on the SSSI are considered to be negligible and non-significant**.

Oxford Meadows SAC

10.135 Oxford Meadows SAC is located approximately 17.1km south-west of the Site.

10.136 The CDC Habitats Regulations Assessment (October 2014)[xxx] which assessed the 76 policies of the Local Plan, including strategic housing allocation sites to include the wider North-West Bicester allocation/policy (Policy Bicester 1), which includes the Site and the Partial Review of the Cherwell Local Plan 2011-2031 (Part 1): Oxford's Unmet Housing Needs (August 2018)[xxxi] concluded that such development would not lead to likely significant effects on Oxford Meadows SAC.

10.137 With regard to hydrology and pollution, it is specifically stated within Appendix B, Table B-1 of the CDCHRA with regard to Policy Bicester 1 which contains the Site that there are no anticipated impacts on the Oxford Meadows SAC and that developers are required to demonstrate during operation that there will be no adverse effect of water quality to any adjacent or nearby watercourses (as set out in full at paragraph 10.86 above).

10.138 Given the degree of separation between the Site and Oxford Meadows SAC it is not considered that the SAC will be affected by lighting or pollution associated with the operational Development. The off-site watercourses adjacent to the Site boundary are so far removed from the SAC that any potential effects locally to the Site would not reach the SAC. In addition, as part of the inherent design mitigation, SuDS features are proposed in accordance with the above requirements, which will maintain water quantity, quality and hydrological regimes locally. Furthermore, it is concluded within the CDC HRA and Partial Review document that there will not be any significant effects from a deterioration of air quality as a result of development proposed within the Local Plan, this has been informed through traffic and air quality assessments and is further confirmed within the Air Quality Chapter which concludes the effects of the Development in relation to air quality are negligible. **It is therefore**

concluded that hydrological effects and pollution on Oxford Meadows SAC during the completed Development phase are negligible and non-significant.

10.139 Considering potential recreational effects on Oxford Meadows SAC during the completed Development phase, as stated above, the Site is located some distance (17.1km) from the SAC which equates to an approximate 20 minute drive (40minute round trip), such that it is not considered to be particularly local to the Site. Recreation is not currently listed on the Natura 2000 Data Form as a risk for the SAC, however, consideration is given if recreation generally within the Cherwell District could affect the conservation status and qualifying features of the SAC. With regard to recreational effects generated from the Site, it is considered that driving would be the only route to the SAC given the distance and it is noted that parking provision at the Oxford Meadows SAC is rather limited, whilst previous studies have identified that the majority of visitors to the SAC access it on foot from Oxford. Furthermore, the SAC's location, bound by major A-roads are considered a deterrent to visitors, including dog walkers. Policy requirement for open space within the Site, as demonstrated by the inherent green infrastructure will help to retain people in the local area rather than having to travel further afield for recreational purposes. No adverse effects were identified on Oxford Meadows SAC within the Partial Review HRA document. **Overall it is therefore concluded that it is considered that recreational effects on Oxford Meadows SAC during the completed Development phase are negligible and non-significant**.

Twelve Acre Copse Oxfordshire LWS

10.140 Twelve Acre Copse Oxfordshire LWS is located approximately 1.1km north-west of the Site, separated by a number of fields and Bainton Road which leads to the village of Bucknell. Given the degree of separation and the ecological features for which the LWS is designated for, it is not considered that the LWS will be affected by hydrological effects, air pollution or lighting during the operational phase of the Development. The LWS is small in size and does not support or connect to any public footpaths such that, given the degree of publicly accessible open space to be included within the Site and its immediate area, it is considered unlikely new residents would visit the LWS for recreational purposes. **As such the effects on Twelve Acre Copse Oxfordshire LWS are considered to be negligible and non-significant**.

Skimmingdish Lane Balancing Pond Cherwell DWS

10.141 Skimmingdish Lane Balancing Pond Cherwell DWS is located approximately 1.2km south-east of the Site, located the other side of existing development in Bicester and areas of the

Exemplar scheme. Given the degree of separation, the ecological features for which the DWS is designated for and the small size of the dws it is not considered that the DWS will be affected by hydrological effects, air pollution, lighting or recreational effects during the completed Development phase. **As such, the effects during the completed Development phase on Skimmingdish Lane Balancing Pond Cherwell DWS are considered to be negligible and non-significant**.

Completed Development Phase Effects on Habitats

10.142 The effects on habitats in the absence of mitigation during the completed Development phase are assessed in this section. This includes habitats to be lost to the completed development and retained habitats, which in the absence of mitigation, could be affected.

Semi-improved Grassland

10.143 The Site is dominated by semi-improved grassland, a large proportion of which will be permanently lost where it lies under the footprint of the Development plots, roads and where other features are required within the green infrastructure corridors (i.e. footpaths, play areas, allotments).

10.144 Retained, enhanced and new areas of semi-improved grassland within the completed Development could potentially be affected in the long-term, from a lack of/inappropriate management (such as an inappropriate mowing regime), anthropogenic effects (e.g. trampling/littering) or hydrology/surface water run-off, which could cause deterioration of the quality of the grassland, such as reduced species diversity.

10.145 SuDS form part of the inherent design mitigation of the Site such that it is considered effects from hydrology/surface water run-off on the semi-improved grassland are negligible. **However, in the absence of mitigation, permanent land-take, lack of/inappropriate management and anthropogenic effects to semi-improved grassland are considered to be minor adverse and long-term which is significant at the Site level**. Mitigation is proposed below which will reduce the effect to a level which is not significant.

Hedgerows, Treelines and Woodland

10.146 The majority of hedgerows and treelines identified within and adjacent to the Site, of which all (with the exception of treeline TL1) are considered likely to qualify as UK Priority Habitat and a number are considered to be 'Important' under the Hedgerow Regulations 1997, are due to be retained under the Development. Existing gaps in hedgerows and treelines will be

utilised where possible for new footpaths and roads, however some small losses will occur. This is expected to comprise small access gaps for roads at hedgerows H4, H7, H8 and TL4 and for footpaths at hedgerow H6 and treeline TL4 which, particularly in the case of roads, may have the potential to fragment such habitats. It is considered where new gaps for access roads will be required at hedgerows H4, H8 and TL4 these will be approximately 10m wide, whilst at hedgerow H7 it is considered that the existing gap can be widened slightly. Gaps for footpaths (potentially at two locations on TL4 and two locations at hedgerow H6) are considered unlikely to be much wider than 2m.

10.147 Woodland within the Site comprising woodlands W1 and W2, is mapped as Priority Habitat 'Deciduous Woodland', as shown at Appendix 10.3, and will be retained under the Development. A footpath will run through the woodlands in addition to a small outdoor education clearing which will lie within a fenced off area of the woodland, inaccessible to the public. These features will likely require some selective clearance to facilitate, however if undertaken sensitively and with careful consideration, such clearance may bring about some benefits to the woodland opening up sunny glades and allowing the establishment of woodland ground flora at the edges of such areas.

10.148 In addition to direct habitat losses, there is potential for retained hedgerows, treelines and woodland to be indirectly affected. As previously mentioned, due to the inclusion of SuDS as part of the inherent design mitigation of the Development, it is considered that hydrology/surface-water run-off and pollution effects are negligible and non-significant. This is confirmed within Chapter 7 (Air Quality) and Chapter 14 (Water Resources and Flood Risk).

10.149 With regard to anthropogenic effects/disturbance of such habitats it is considered that the woodland, which is not currently under any active management, could in the long-term, through an ongoing lack of/inappropriate management, be subject to a reduction in habitat quality. This could comprise changes in species composition or structure due to continued scrubbing over of areas for example. Furthermore, increased, unmanaged recreational use of the woodland could result in trampling, littering and dog fouling.

10.150 **In the absence of mitigation, direct habitat loss and indirect anthropogenic effects/disturbance are considered to be moderate adverse in the long-term and significant at the Local level**. Mitigation is proposed below which will reduce the effect to a level which is not significant.

Scattered Trees

10.151 A number of scattered, semi-mature to mature trees are present in field F7 and along the

north-eastern edge of field F6 (as shown on Figure 10.3) which are due to be retained under the completed Development and are unlikely to be affected by anthropogenic disturbance. The trees appear to have been previously planted and are already set in close proximity to the existing access road and B4100. As such, in combination with the SuDS which will be incorporated into the inherent design mitigation, it is not considered retained trees would be vulnerable to changes in hydrology or polluted surface water run-off. Similarly any new trees would be selected appropriately in terms of species, size and situation and planted to specification, the details of which will be set out at the reserved matters stage and an indication of which is set out in the landscape section of the Design and Access Statement (DAS).

10.152 **Accordingly, effects are considered to be negligible and non-significant**.

Off-site Watercourses

10.153 Two stretches of watercourses run adjacent to small portions of the southern and eastern Site boundaries (WC1 and WC2). As they lie just off-Site they will be retained and buffered from the built development by a green infrastructure buffer forming part of the inherent design mitigation of the Site.

10.154 As previously mentioned, the risk of impacts to the watercourse through changed hydrology or pollution are already mitigated for during the completed Development phase through the inclusion of SuDS as part of the inherent design mitigation. Anthropogenic effects such as littering or from dog walkers are considered unlikely given that the stretches of watercourse that fall adjacent to the Site boundary are largely buffered from greenspace likely to be used by the public by existing hedgerows and treelines which are due to be retained under the completed Development.

10.155 **On that basis, the potential for direct or indirect effects on the off-site watercourses is considered to be negligible and non-significant**.

Completed Development Phase Effects on Fauna

Roosting Bats (Trees)

10.156 A number of semi-mature to mature trees were identified within and in close proximity to the Site that were considered to offer bat roosting potential as shown on Figure 10.3.

10.157 The on-Site trees offering potential for roosting bats are located within hedgerows and

treelines which will be retained and are set within buffer zones free of built development as part of the inherent design mitigation. As such it is considered disturbance to roosting bats, should they be present, would be minimal. For example, it is considered roosting bats would not be subject to noise disturbance from resident and visitor traffic given the buffer between roads and features offering roosting potential.

10.158 However, despite the buffer zones incorporated as part of the inherent Site mitigation, there is still some residual risk of bat roosts (if present) being affected by operational lighting through illumination of potential roosting features. Given that a very small number of trees offering bat roosting potential could be affected and giving consideration to the buffer zones incorporated as part of the inherent design mitigation, it is not considered such effects would affect the conservation status of the local bat population. **Accordingly effects on roosting bats in trees during the completed Development phase are considered to be minor adverse, long-term and non-significant**.

Commuting and Foraging Bats

10.159 Manual and automated activity surveys at the Site recorded a minimum of seven species across the Site and generally low activity levels with details shown at Appendix 10.1 and on Figure 10.4.

10.160 As part of the inherent design mitigation of the Development in-built green infrastructure corridors and buffer zones, including a key dark buffer zone, are incorporated into the Site design, which have taken into account the main bat activity corridors. As a result, commuting routes will largely be maintained. It is considered that the gaps required to facilitate new access roads and footpaths would not be wide enough to sever or fragment commuting routes to an extent which would be significant or that would change how the bats can move around the Site during the completed Development phase. The hedgerows in question already support a number of existing gaps and still support foraging and commuting bats.

10.161 The completed Development will result in the permanent loss of some habitats which would support an invertebrate prey biomass for foraging bats, such as semi-improved grassland. Given that generally low levels of bat activity were recorded within the Site, it is considered that habitats within the Site do not form an important part of the bats foraging resource and as such are not considered likely to affect the conservation status of the local bat populations.

10.162 In the absence of mitigation, there is the potential for poorly designed lighting outside of the key dark buffer zone incorporated as part of the inherent design mitigation, to affect commuting and foraging bats, for example by illuminating commuting routes. Additional

lighting is likely to be required within the Development plots and alongside new roads, which if poorly designed could cause light spill onto habitats which are not already illuminated by existing lighting (i.e. hedgerows adjacent to the B4100 or existing development to the north). These could potentially affect the conservation status of local bat populations by changing foraging/commuting behaviour or cutting off access to foraging routes.

10.163 In the absence of suitable long-term management, it is also possible the retained habitats within the Site may deteriorate in quality such that they become less suitable for commuting and foraging bats, or for example inappropriate vegetation removal may open up gaps in commuting routes to an extent that bats would not cross them.

10.164 **Therefore in the absence of mitigation, effects on commuting and foraging bats during the completed Development phase are considered to be moderate adverse and long-term which is significant at the Local level**. Mitigation is proposed below which will reduce the effect to a level which is not significant.

Badger

10.165 Should Badger setts be present within the woodlands or should Badgers be using the woodland or hedgerow network for commuting purposes, it is considered that the inherent design mitigation which includes the retention and buffering of these features would ensure these features were not at risk of being lost or damaged as a result of the completed Development. No setts were identified within the Site at the time of survey in any case. It is therefore also considered unlikely that Badger setts would be affected by disturbance for example by noise given that any Badger in the local area will be far removed from such activities.

10.166 The completed Development will result in the permanent loss of Badger foraging habitat, such as semi-improved grassland, should they be making use of the Site. However, no evidence was recorded during the survey work undertaken and in any case, large areas of similar habitat is accessible to Badger within and around the Site and as such, these habitat losses are considered unlikely to affect the conservation status of the local Badger population.

10.167 In the absence of mitigation, there is the potential for poorly designed lighting to affect commuting and foraging Badger, for example by illuminating retained green corridors and the woodland edge. Additional lighting is likely to be required within the Development plots and alongside new roads, which if poorly designed could cause light spill onto such habitats. This could adversely affect the individual Badgers, should they utilise the Site, but would not affect the conservation status of any local Badger population utilising the Site.

10.168 **Overall, effects on Badger during the completed Development phase are considered**

to be minor adverse, long-term and non-significant, in relation permanent lighting and lack of/inappropriate long-term management of foraging habitats only. All other effects are considered to be negligible and non-significant.

Other Mammals

10.169 Key habitats for UK Priority mammal species such as Hedgehog and Polecat that may make use of the site, comprising woodlands and hedgerows, are largely retained under the Development and set within buffer zones as part of the inherent design mitigation. Any small losses for access roads and footpaths are considered unlikely to affect the conservation status of such species that will be acclimatised to an urban fringe habitat in the surrounding area in any case. Similarly, the conservation status of such species is also unlikely to be significantly affected by increased disturbance given that they are likely already acclimatised to a sub-urban habitat and key habitats are buffered from the Development.

10.170 There is the potential for poorly designed lighting to affect commuting and foraging Hedgehog and Polecat, for example by illuminating retained green corridors and the woodland edge, although this is not considered likely to affect the conservation status of the local populations. In the absence of suitable long-term management, it is also possible the retained habitats within the Site may deteriorate in quality such that they become less suitable for foraging Hedgehog.

10.171 **Overall, effects on other mammals (primarily Hedgehog and Polecat) during the completed Development phase are considered to be minor adverse, long-term and non-significant, in relation permanent lighting and lack of/inappropriate long-term management of habitats only**.

Breeding Birds

10.172 A range of common and widespread birds have been recorded within the Site. The majority of nesting/breeding bird habitats, comprising woodlands, hedgerows and treelines, will be retained under the completed Development. However, small sections of such habitat will be removed to facilitate new roads and footpaths such that there will be some loss of breeding bird habitat. Losses will likely comprise gaps in hedgerows for new access roads approximately 10m in width at hedgerows H4, H8 and TL4 and widening of hedgerow H7 only such that additional losses are considered likely to be less than several metres. Several small gaps (likely two 2m footpath gaps) in treeline TL4 and hedgerow H6 will also be required. Some tree clearance will be required to facilitate creation of new footpaths within the woodland.

10.173 No ground nesting farmland birds of conservation concern have been recorded on-Site during the most recent survey work undertaken to date, whilst the Site was recorded to be dominated by long-sward grassland for much of the year, bound by hedgerows, treelines and woodland, all of which is not typically favoured by ground nesting birds. As such, the loss of semi-improved grassland and the small area of arable habitat is not considered likely to affect the conservation status of local bird populations.

10.174 Inappropriate long-term management of retained and new habitats during the completed Development phase could result in direct damage or loss of active nests during the breeding bird season (March – August). Any such damage/losses would also constitute an offence under the Wildlife and Countryside Act 1981 (as amended), which affords protection to wild birds and their eggs.

10.175 Operational activities resulting in anthropogenic effects such as new residents using footpaths adjacent to/within retained habitats used by birds, are considered unlikely to significantly affect birds using the Site as there is considerable further vegetation which will be retained away from public footpaths and retained suitable nesting habitats will be buffered, as part of the inherent design mitigation, from the roads/housing. Further, nesting birds are likely habituated to some level of disturbance given the Sites sub-urban nature, proximity to roads etc. There is a minor risk of increased predation by cats, the number of which will likely increase within the local area due to the increase in residential development. However, it is considered highly unlikely that any increase in predation by cats as a result of the completed Development would affect the conservation status of the local bird populations.

10.176 There is a small risk that should Barn Owl be recorded to be nesting within the retained woodland, in the absence of mitigation, they could be significantly affected by lightspill from the completed Development, or should chicks fall from the nest, they could be predated on by cats from the new residential Development.

10.177 It is considered that although permanent small losses of nesting bird habitat will occur, the Site is committed to the provision of new greenspace within the inherent design mitigation that will offer new nesting opportunities to birds. Based upon the survey work undertaken to date, effects on nesting birds are considered to be minimal during the completed Development and unlikely to affect the conservation status of species recorded. However, in the absence of complete survey data, at this stage a precautionary approach is taken to ensure the worst-case scenario is assessed. **Based upon this precautionary approach, it is considered that effects on nesting birds during the completed Development are minor adverse, long-term and significant in relation to long-term management, anthropogenic effects (disturbance/predation) and operational lightspill. The assessment**

conclusion will be re-visited upon completion of the final breeding bird survey whilst the mitigation measures set out below are done so using a precautionary approach.

Reptiles

10.178 The Site offers suitable reptile habitat, largely in the form of grassland fields. There will be some permanent loss of this reptile habitat in the form of long-sward grassland under the built Development footprint. However, largely, the locations in which reptiles were recorded within the Site will be incorporated into the green infrastructure corridors proposed within the inherent design mitigation. Given the very small numbers of reptiles recorded during survey work undertaken, it is considered that the reptile population can be readily maintained at the Site. However, new and retained habitats could be adversely affected by a lack of/inappropriate management, which for example could cause areas of grassland to scrub over. This has the potential to decrease the suitability of the Site for reptiles in the long-term.

10.179 Common Lizard and Grass Snake are not considered to be particularly vulnerable to lighting, pollution or anthropogenic effects.

10.180 **As such, effects on reptiles during the completed Development phase are considered to be minor adverse and long-term with regard to a lack of ongoing management to retained/new habitats which is considered to be significant at the Local level**. Mitigation is proposed below which will reduce the effect to a level which is not significant.

Common Amphibians

10.181 Common Toad were recorded in areas which will generally be incorporated into the green infrastructure corridors and will therefore be retained during the completed Development. Some permanent losses of suitable Common Toad habitat will occur, for example the loss of semi-improved grassland to the built Development, however it is considered that despite the loss of such habitat, the Common Toad population can be readily maintained at the Site and within the local area.

10.182 The small numbers of Common Toad considered to be making use of terrestrial habitats on Site are not considered to be particularly vulnerable to anthropogenic, hydrology, pollution or lighting effects, whilst in any case the SuDS incorporated as part of the inherent design mitigation are considered likely to mitigate for hydrological or pollution effects.

10.183 Overall it is considered that as the vast majority of areas where Common Toad were recorded

will be retained during the completed Development, such that the conservation status of Common Toad can be readily maintained at the Site, although there will be some permanent loss of suitable habitat. **As such the effects on common amphibians during the completed Development are considered to be minor adverse, long-term and non-significant**.

Brown Hairstreak

10.184 The majority of Brown Hairstreak habitat within the Site (hedgerows, woodland edge and scrub) will be retained as part of the completed Development within the green infrastructure set out as part of the inherent design mitigation of the Development. However, small sections of suitable habitat will be permanently lost under the footprint of new roads and pedestrian access routes (as previously set out), which in the absence of mitigation will have a detrimental effect on the species, causing hedgerows to become more fragmented in nature, although this is considered unlikely to have a significant effect on the species given that gaps are unlikely to be more than 10m wide and infrequent. Furthermore, in the absence of mitigation there is potential for retained and newly created habitats to be damaged through a lack of/inappropriate management. Should hedgerows and woodland edge not be subject to appropriate management for the species, these features are likely to become unsuitable to support egg laying which consequently could result in the loss of suitable habitat and presence of Brown Hairstreak butterfly within the Site.

10.185 Anthropogenic, pollution, hydrology and lighting effects are considered unlikely to significantly affect Brown Hairstreak during the completed Development phase.

10.186 **Given the above, in the absence of mitigation the effects on Brown Hairstreak butterfly are considered to be moderate adverse and in the long-term and significant at the Local level in relation to inappropriate management only**. Mitigation is proposed below which will reduce the effect to a level which is not significant. **Minor adverse, long-term and non-significant effects are anticipated with regard to habitat loss**.

Mitigation Measures

Construction Phase

10.187 In the absence of mitigation or compensation, the assessment has identified likely significant effects during the construction phase in relation to the following important ecological features:

- **Bure Park LNR** – accidental spills or leaks and surface water run-off containing contaminants/pollutants and increased sedimentation from the Site reaching the River Bure and associated flora and fauna within the LNR;
- **Semi-improved Grassland –** potential indirect effects on retained grassland (e.g. accidental damage, dust deposition, changes in hydrology);
- **Hedgerows, Treelines and Woodlands –** accidental damage and changes in hydrology, polluted surface-water run-off or dust deposition;
- **Off-site Watercourses** - changes to hydrology, polluted surface water run-off and increased siltation and dust deposition onto bankside vegetation;
- **Roosting Bats (trees) –** accidental damage resulting in killing and injury of bats, switching roost sites during the day or roost abandonment and disturbance through noise, vibration and lighting which could result in switching roosts during the day or roost abandonment;
- **Badger -** temporary land take/damage to commuting corridors and foraging areas and in the form of construction hazards to individual Badgers; and
- **Breeding Birds –** killing/injuring birds, chicks and eggs and damaging/destroying active nests.

10.188 Other effects identified which are not significant, but for which mitigation is still required (e.g. to comply with legislation or as part of environmental best practices) include:

- **Scattered Trees –** accidental damage and changes in hydrology, polluted surface-water run-off or dust deposition;
- **Reptiles -** risk of killing/injuring individuals during removal of reptile habitat to facilitate construction and effects on retained reptile habitat (e.g. accidental damage);
- **Common Amphibians** - risk of killing/injuring individuals during removal of suitable habitat to facilitate construction and effects on retained habitat (e.g. accidental damage).

Mitigation for Likely Significant Effects – Construction

Bure Park LNR

10.189 In order to minimise adverse effects on Bure Park LNR via accidental spills or leaks of contaminants on Site and surface water run-off containing such contaminants/pollutants or increased sedimentation reaching the watercourses adjacent to the Site boundary and eventually the River Bure where this runs through the LNR, standard pollution prevention mitigation measures, informed by the former (withdrawn in 2015) Environment Agency Pollution Prevention Guidelines[xxxii] will be put in place across the entire Site during the

construction phase, including:

- Contaminating substances, such as, fuels, oils and chemicals should be stored in leak-proof containers in a secure location from which they are safe from spillage, or vandalism;
- Washing plant and vehicles should take place in designated areas at least 10m from ditches and watercourses;
- Mixing and washing areas for concrete and cement should be located at least 10m from ditches and watercourses. If water is to be reused, appropriate settlement and re-circulation systems should be used;
- Exposed soil should be minimised and avoided wherever possible and spoil from soil stripping should be stored away from ditches and watercourses;
- Site roads should be kept free from dust and mud;
- Vegetated buffers should be left around watercourses and ditches;
- Liquid applications of herbicides, which may runoff into the ditches and watercourses, should not be used within 2m of such features where possible; and
- Petrol/water interceptors and temporary silt traps, should be used where appropriate.

10.190 The above measures are considered likely to reduce the risk of pollution and excess siltation into watercourses adjacent to the Site and consequently the habitats and faunal species within Bure Park LNR which could be sensitive to such changes as a result of this to a negligible level. The measures will be secured via a planning condition for a Construction and Environmental Management Plan (CEMP) (or similar).

Habitats

10.191 In order to minimise potential effects on habitats from accidental damage, changes to hydrology, polluted surface water run-off and increased siltation and dust deposition, particularly with regard to habitats upon which significant effects have been identified (semi-improved grassland, hedgerows, treelines, woodland and the off-site watercourses), a number of mitigation measures are set out.

10.192 The pollution prevention measures set out above for Bure Park LNR would reduce hydrological and pollution effects on retained habitats. In addition, a Dust Management Plan (DMP) would be produced to detail measures which would be implemented to minimise the creation of dust, for example by damping down dust sources and covering loose materials to reduce drift and dust deposition upon nearby habitats. A DMP could be implemented as part of a CEMP, secured via a planning condition.

10.193 Construction traffic will also be routed away from sensitive areas wherever possible to avoid

damage to retained habitat and root protection zones. Furthermore, all trees/hedgerows to be retained during construction will be protected in line with standard arboriculturalist best practice (BS5837:2012) or as otherwise directed by a suitably competent arboriculturalist. This will involve the use of protective fencing or other methods appropriate to safeguard the root protection areas of retained trees/hedgerows/woodland. It is further recommended that all areas of the Site designated as green infrastructure/buffer zones will be demarcated with fencing and signage. No entry will be permitted into the area unless absolutely necessary for landscaping works, construction of SuDS, construction of play and allotments (should these areas fall within green infrastructure), or habitat and faunal enhancements.

10.194 The above measures are considered to reduce adverse effects on habitats to a negligible level. The measures will be secured via a planning condition for a CEMP (or similar).

Roosting Bats (Trees)

10.195 **Tree Protection**: All trees identified as offering bat roosting potential are due to be retained under the Development such that they will not be lost during the construction phase. It is considered that the above tree protection measures as set out at paragraph 10.193, including the use of protective fencing around trees and green infrastructure buffer zones, will achieve avoidance of accidental damage to trees including those with potential to support roosting bats. In the event that trees with bat roosting potential require removal/ trimming, a suitably qualified and experienced ecologist would be contacted for advice. Trees with low bat roosting potential would likely need to be 'soft-felled' under an ecological watching brief and left on the ground for 24hours, whilst should trees with moderate or high roosting potential be identified and require removal, further survey work and potentially the need for a Natural England European Protect Species development licence would be required (if a bat roost was confirmed).

10.196 **Sensitive Positioning of Temporary Lighting.** To avoid adverse effects of poorly positioned lighting during the construction phase, the following measures will be implemented during construction in relation to lighting:

- Avoid locating site compounds and parking areas in proximity to trees with bat roosting potential (where not already illuminated by the lighting i.e. along the adjacent main road);
- Use the minimum amount of temporary lighting necessary for safe working and the minimum brightness;
- Angle any temporary lighting downwards to illuminate the work areas and avoid light spill; and

- Avoid illuminating any buildings or trees (i.e. moving temporary lighting further away or angling further downwards.

10.197 These measures should be further developed at the detailed design stage with any additional survey requirements or mitigation identified if necessary. The measures will be secured via a planning condition for a CEMP (or similar) and implementation of the measures would reduce effects to a negligible level.

Badger

10.198 **Pre-construction Update Badger Survey.** Badgers are dynamic animals and levels of Badger activity can rapidly change at a site, with new setts being created at any time. Given the records of Badger in the immediate area, an update survey will be carried out prior to commencement of Site works in order to confirm the current status of Badgers at the Site. As development is likely to come forward in phases over a number of years, it is likely several surveys will be required. Should a Badger sett(s) be identified, within or in close proximity to the Site, additional mitigation and licensing may be required.

10.199 **Construction Safeguards.** In order to safeguard Badgers should they enter the Site during construction works, the following measures will be implemented:

- Any lighting required during construction will not illuminate retained green infrastructure corridors or setts (should they be recorded during any update survey work);
- Any trenches or excavations within the Site that are to be left open overnight will be provided with a means of escape should a Badger enter. This could simply be in the form of a gently graded ramp or roughened plank of wood placed in the trench as a ramp to the surface. This is particularly important if the trench fills with water;
- Any temporarily exposed open pipes (>150mm outside diameter) should be blanked off at the end of each working day so as to prevent Badgers gaining access as may happen when contractors are off-Site;
- Any trenches/pits will be inspected each morning to ensure no Badgers have become trapped overnight. Should a Badger become trapped in a trench it will likely attempt to dig itself into the side of the trench, forming a temporary sett. Should a trapped Badger be encountered a suitably qualified ecologist will be contacted immediately for further advice;
- The storage of topsoil or other 'soft' building materials in the Site will be given careful consideration. Badgers will readily adopt such mounds as setts. So as to avoid the adoption of any mounds, these will be kept to a minimum and any essential mounds subject to daily inspections with consideration given to temporarily fencing of any such

mounds to exclude Badgers;

- Careful consideration should be given to the placement of building materials and fencing such that the green corridors throughout the Site are unobstructed to allow continued passage through, in and out of the Site to key off-site habitats;
- The storage of any chemicals at the Site will be contained in such a way that they cannot be accessed or knocked over by any roaming Badgers;
- Fires will only be lit in secure compounds away from areas of Badger activity and not allowed to remain lit during the night; and
- Unsecured food and litter will not be left within the working area overnight.

10.200 The above measures will be secured via a planning condition for a CEMP (or similar) and implementation of the measures would reduce the effects to a negligible level.

Breeding Birds

10.201 **Timing of Works.** To avoid a potential offence under the relevant legislation, no clearance of suitable vegetation should be undertaken during the bird-nesting season (1st March to 31st August inclusive). If this is not practicable, any potential nesting habitat to be removed will first be checked by a competent ecologist in order to determine the location of any active nests. Any active nests identified would then need to be cordoned off (minimum 5m buffer) and protected until the end of the nesting season or until the birds have fledged. These checking surveys would need to be carried out no more than three days in advance of vegetation clearance. These measures can be secured via a planning condition for a CEMP (or similar) and implementation of the measures would reduce the effects to a negligible level..

Mitigation for Non-significant Effects – Construction

Habitats

10.202 The above assessment identified non-significant effects on scattered trees during the construction phase. The mitigation measures set out above at paragraph 10.191 – 10.194 in relation to likely significant effects on habitats are considered to also address the identified non-significant effects on scattered trees and would reduce effects on habitats to a negligible level.

Reptiles

10.203 To avoid an offence under Section 9 of the Wildlife and Countryside Act 1981 (as amended)

with regard to reptiles, it is considered the most appropriate approach is to displace reptiles from the construction areas into suitable retained habitat within retained green infrastructure corridors and retained and enhanced areas of open space, using phased vegetation removal under ecological supervision. Given that such low numbers of reptiles were recorded at the field margins (a peak count of four Common Lizard and one Grass Snake), a translocation exercise is not considered necessary or proportionate.

10.204 The exact details of the reptile mitigation strategy will be set out at the detailed design stage and incorporated into a CEMP (or similar), secured via condition. In summary, the exercise would involve a systematic search of areas of suitable habitat where reptiles had been recorded and which are to be lost during the construction phase. As part of the systematic search of suitable habitat (i.e., brash piles and semi-improved, long-sward grassland) by a suitably qualified and experienced ecologist, a search and removal by hand of any refugia or rubbish would also be undertaken. Once the supervising ecologist gives consent a carefully controlled and ecologically supervised vegetation strip of reptile habitat would be carried out under ecological supervision. Vegetation would be cut to no less than 10-15cm before being taken down to ground level. This creates controlled and directed disturbance which causes any remaining reptiles to endeavour to escape, allowing them to be captured by the supervising ecologist. Any reptiles captured would be relocated to retained on-site habitat, which should be subject to some enhancement measures (i.e. placement of hibernacula and log piles) prior to receiving reptiles. Once the vegetation has been physically removed from the Development area, no suitable reptile habitat would remain on the Site and Development can safely commence.

10.205 The displacement exercise would be carried out during the reptile active season and during suitable weather conditions with any reptiles captured relocated to suitable retained habitat within the Site.

10.206 All relevant contractors will be briefed as to the possible presence of reptiles within the Site, in the form of a toolbox talk with particular reference to the implications of legislation.

10.207 The construction safeguards in relation to habitats set out above will safeguard retained reptile habitat from accidental damage during construction, whilst the key 'receptor' area where any reptiles found are moved to will be largely fenced off to provide further safeguarding measures.

10.208 Implementation of the above measures would reduce the effects to a negligible level.

Common Amphibians

10.209 The measures set out above for reptiles will also be employed and mitigate for common amphibians including the UK Priority Species Common Toad and would therefore reduce the effects to a negligible level.

Completed Development

10.210 In the absence of mitigation or compensation, the assessment has identified significant effects during the completed Development phase for the following important ecological features:

- **Semi-improved Grassland** – permanent loss of a proportion of the on-Site resource, anthropogenic effects (e.g. trampling/littering) and lack of/inappropriate long-term management;
- **Hedgerows, Treelines and Woodlands** – permanent habitat loss and anthropogenic effects/disturbance;
- **Foraging and Commuting Bats** – operational lighting, lack of/inappropriate long-term management of foraging and commuting habitat;
- **Breeding Birds** – Inappropriate long-term management, anthropogenic effects (disturbance/predation) and operational lighting;
- **Reptiles** – lack of/inappropriate long-term management;
- **Brown Hairstreak** – lack of/inappropriate long-term management.

10.211 Other effects are identified which are not significant, but mitigation is still required (e.g. to comply with legislation or as part of environmental best practice) including:

- **Roosting Bats (trees)** – operational lighting;
- **Badger** – operational lighting, lack of/inappropriate long-term management of foraging habitat;
- **Other Mammals** – operational lighting, lack of/inappropriate long-term management of foraging habitat;
- **Common Amphibians** – permanent loss of habitat.
- **Brown Hairstreak** - permanent loss of habitat.

10.212 The assessment identified negligible effects on several important ecological features at the completed Development phase. These comprise Bure Park LNR, Ardley Cutting SSSI, Oxford Meadows SAC, Twelve Acre Copse LWS, Skimmingdish Lane Balancing Pond DWS, scattered trees and the off-site watercourses.

Mitigation for Likely Significant Effects – Completed Development

Habitats

10.213 **Habitat Creation/Enhancement.** Permanent habitat loss under the completed Development footprint has been identified as a contributing factor to a significant effect on semi-improved grassland and hedgerows, treelines and woodland. To compensate for such losses, new habitat creation and enhancement of existing habitats is proposed. Full details of mitigation measures will be set out at the detailed design stage and will be set out within a Landscape and Ecology Management Plan (LEMP) (or similar) which can be secured via a planning condition. However, any tree or hedgerow removal will be compensated for with new native tree and hedgerow/shrub planting. Where possible and appropriate, hop-over features will be utilised where roads/footpaths bisect hedgerows and treelines to ensure fragmentation of such habitats is minimised. Based upon the Parameter Plan it is considered that such a feature would be most appropriate at hedgerows H4, H7, H8 and treeline TL4 where roads bisect such features with the use of trees at road edges and within a central reservation and also where footpaths bisect such features at hedgerow H6 and treeline TL4 with planting of trees either side of footpaths (if not already present). To compensate for loss of semi-improved grassland, new areas of wildflower grassland will be created and retained areas of semi-improved grassland will be enhanced (further details set out within the enhancement section below).

10.214 **LEMP.** In the absence of mitigation, anthropogenic effects (i.e. through trampling and littering) on retained and newly created habitats, in particular the woodland and grassland were identified. To mitigate against such effects, a number of footpaths will be installed around the Site to encourage directed use of areas of open space. Indicative footpaths are set out on the Parameter Plan. In addition to areas of wildflower grassland, areas of more formal open space, amenity areas and a variety of play spaces will be provided throughout the Site such that new residents will have extensive provisions for access and play throughout the Site away from the more sensitive habitats. Litter, dog bins, signage, artwork and information boards to encourage responsible use of areas will be provided throughout the greenspace within the Site, details of which will be incorporated into the hard landscaping proposals to be secured at the detailed design stage. With regard to the woodland, new landscape planting will include new tree and scrub species at the woodland edge including a variety of species to include some thorny species in addition to linear swales beyond this for much of the woodland edge extent, to provide a natural barrier and deter uncontrolled access into the woodland. The provision of a directed path through the woodlands will direct access within this feature and it is recommended that the path is either fenced or subject to further thorny native shrub planting at its edges to prevent trampling of footpath edges and widening

of the footpath over time. There will also be an area of the woodland which is fenced off from the public and accessed by small educational groups only by specific arrangement.

10.215 The above details will be secured via a planning condition for a LEMP which will allow these measures to be further developed at the detailed design stage. Any LEMP for the Site will include the following key aims as a minimum:

- Introduce and establish new habitats to benefit biodiversity and landscape amenity;
- Contribute to local and national objectives, i.e. create and improve the condition of Priority Habitats and local Priority Species as appropriate; and
- Introduce long-term management to achieve ongoing biodiversity and landscape benefits and ensure opportunities for biodiversity are enhanced under the completed Development.

10.216 Implementation of the above measures would deliver minor beneficial effects (non-significant) for semi-improved grassland, hedgerows, tree lines and woodland as a result of the habitat creation measures and by bringing the site into active management in the long-term.

Foraging and Commuting Bats

10.217 **Sensitive Lighting Scheme.** A key dark corridor is incorporated through the Site as part of the inherent design mitigation. However, to mitigate for the effects on light-sensitive bats (and other nocturnal fauna) across the Site and ensure that dark corridors are maintained, at the detailed design stage a sensitive lighting scheme will be produced for the Site, which will be secured via planning condition. The sensitive lighting scheme shall be produced in accordance with good practice guidance[xxxiii] and the design will incorporate the following measures:

- Appropriate luminaire specifications – consideration should be given to the type of luminaires used, in particular luminaries should lack UV elements and metal halide and fluorescent sources should be avoided in preference for LED luminaries;
- A warm white spectrum (ideally <2,700K) should be adopted to reduce the blue light component;
- Light barriers / screening – new planting (e.g. hedgerows and trees) or fences, walls and buildings can be strategically positioned to reduce light spill;
- Spacing and height of lighting units – increasing spacing between lighting units will minimise the area illuminated and allow bats to fly in the dark refuges between lights. Reducing the height of lighting will also help decrease the volume of illuminated space and give bats a chance to fly over lighting units (providing the light does not spill above

the vertical plane). Low level lighting options should be considered for any parking areas and pedestrian / cycle routes, e.g. bollard lighting, handrail lighting or LED footpath lighting;

- Light intensity – light intensity (i.e. lux levels) should be kept as low as possible to reduce the overall amount and spread of illumination;
- Directionality – to avoid light spill lighting should be directed only to where it is needed. Particular attention should be paid to avoid the upward spread of light so as to minimise trespass and sky glow; and
- Dimming and part-night lighting – lighting control management systems can be used, which involves switching off/dimming lights for periods during the night, for example when human activity is generally low (e.g. 12.30 – 5.30am). The use of such control systems may be particularly beneficial during the active bat season (April to October). Motion sensors can also be used to limit the time lighting is operational.

10.218 **LEMP.** To ensure the ongoing maintenance and management of the retained and new habitats that form key foraging and commuting habitats for bats, a LEMP as discussed above (or similar) will be produced at the detailed stage, which will be secured via condition.

10.219 Implementation of the above measures would reduce the predicted effects to a negligible level.

Breeding Birds

10.220 **Timing of Works/LEMP**. The identified potential risk to breeding birds through inappropriate long-term management can be avoided by undertaking clearance/trimming of woody vegetation outside of the bird nesting season (March to August inclusive) or if necessary to undertake such works during the nesting bird season, clearance would be preceded by an inspection for nesting birds by a suitably qualified ecologist. Any nests identified would be cordoned off and protected until they cease to be active. It is considered that the minor risk of increased predation by cats, particularly within the woodland, can be discouraged by new native thorny scrub planting at the woodland edge, as set out paragraph 10.213 above, to discourage cats entering this habitat. The above measures will be secured via a planning condition for a LEMP as discussed above (or similar) which will be produced at the detailed stage.

10.221 **Sensitive Lighting Scheme**. To avoid the effects of lighting on nesting birds, particularly should Barn Owl use the woodland given its known presence in the wider area, it is considered the sensitive lighting scheme set out above at 10.215 would mitigate for any adverse effects

on such species.

10.222 Implementation of the above measures would overall deliver a minor beneficial (non-significant) effect as a result of bringing the site into active management and the habitat creation measures which will provide additional nesting opportunities for birds.

Reptiles

10.223 **LEMP.** Appropriate long-term management operations to maintain suitable reptile habitat on-Site (i.e. by maintaining suitable swards and avoiding scrub encroachment, maintaining hibernacula and log-piles as set out in the enhancement section below etc.) will be secured via a planning condition for a LEMP or similar to ensure sufficient suitable reptile habitat is maintained in the long-term within the completed Development. Implementation of the above measures would overall deliver a minor beneficial (non-significant) effect as a result of bringing the site into active management, where specific management prescriptions can be devised within the LEMP to maintain and encourage use of the site greenspace by reptiles.

Brown Hairstreak

10.224 **LEMP.** Ongoing management operations to ensure suitable habitat is available for Brown Hairstreak going forward will be secured via a condition for a LEMP (or similar). Key features of the mitigation strategy and on-going management practices that would be incorporated include:

- Re-planting and re-enforcement of hedgerows as required to fill any gaps which may develop with the use of native species with a high proportion of Blackthorn (used for egg laying and as a larval foodplant) and some Ash (used during the adult life-cycle stage) to mitigate for small hedgerow losses. It is recommended that an ash dieback resistant variety of Ash is used where possible/available; and
- Adoption of appropriate cutting regime of hedgerows, woodland edges and rides i.e. rotational cutting with no more than 1/3 of habitat cut in any one year such that any one section is only cut once every 3 to 5 years, ensuring there are always some uncut sections in different areas. This will allow new Blackthorn growth which is favoured for Brown Hairstreak egg laying.

10.225 Implementation of the above measures will overall result in a minor beneficial (non-significant) effect on Brown Hairstreak as a result of bringing the site into active management, where specific management prescriptions can be devised within the LEMP to maintain and encourage use of the site greenspace by this species.

Mitigation for Non-significant Effects – Completed Development

Roosting bats

10.226 **Sensitive Lighting Scheme.** To avoid effects of operational lighting on roosting bats, adoption of a sensitive lighting scheme as set out above at 10.215 will be implemented which will reduce the predicted effects to a negligible level.

Badger and Other Mammals

10.227 **Sensitive Lighting Scheme**. To avoid the effects of operational lighting on Badgers and other mammals, within commuting corridors and areas of foraging a sensitive lighting scheme, as set out at 10.215 above will be implemented.

10.228 **LEMP.** To maintain suitable foraging and commuting habitat for Badger and other mammals in the long-term, a suitable management regime to maintain retained and newly created habitats that are used by these species (i.e. woodland and semi-improved grassland) will be implemented, secured via a condition for a LEMP (or similar).

10.229 Implementation of these measures will reduce the predicted effects to a negligible level.

Amphibians

10.230 **LEMP.** Effects on common amphibians including the UK Priority Species Common Toad can be mitigated through an appropriate long-term management plan, with measures set out as above for reptiles also providing mitigation for Common Amphibians. The above measures can be secured via a planning condition for a LEMP and implementation would overall result in a minor beneficial (non-significant) effect on amphibians as a result of brining the site into active management in the long-term.

Brown Hairstreak

10.231 Habitat loss through small losses of hedgerows and treelines to create new access routes into the Site have been identified as a factor that could have a non-significant effect on Brown Hairstreak during the completed Development phase. New hedgerow planting and re-enforcement of existing hedgerows will be undertaken to mitigate for small hedgerow losses and to fill extant gaps with native species. A high proportion of Blackthorn (used for egg laying and as a larval foodplant) and some Ash (used during the adult life-cycle stage) will be used. An ash dieback resistant variety of Ash will be used where possible/available. The

implementation of these measures will result in a slight beneficial (non-significant) effect for Brown Hairstreak.

Enhancement Measures

10.232 The NPPF encourages new developments to maximise the opportunities for biodiversity through incorporation of enhancement measures. The proposals present the opportunity to deliver ecological enhancements at the Site for the benefit of local biodiversity, thereby making a positive contribution towards the broad objectives of national conservation priorities, the Oxfordshire Biodiversity Action Plan and other local conservation initiatives such as Oxfordshire's "Trees for the Future" programme which aims to double tree cover within the County by 2045. These should be further developed at the detailed design stage and could be set out within the Ecological Mitigation and Enhancements Plan (secured via planning condition). Examples of enhancements which could be included are:

- **Habitats** – Green infrastructure, open space and SuDS basins are all included as part of the inherent design mitigation within the Site. However, enhancements comprising creation of a number of sunny glades within the woodland and the use of appropriate wildflower and wet meadow grassland mixes are recommended. The use of native species of a local provenance within new planting to include Blackthorn and Ash to benefit Brown Hairstreak and nut and fruit bearing species to benefit Badgers and birds are also recommended whist SuDS should be designed to provide both permanently wet areas and seasonally wet areas to provide a range of conditions;
- **Bats** – New bat boxes should be installed upon retained trees within the Site and integrated into a proportion of the new buildings throughout the Site;
- **Hedgehog** – To increase opportunities throughout the Site a number of Hedgehog domes should be included in suitable areas of open space. Hedgehog highways/gaps at the bases of fences should also be incorporated into garden fences to allow Hedgehog to move freely throughout the Site;
- **Birds** - New bird boxes should be installed upon retained trees within the Site including for a range of common garden birds and for Barn Owl and integrated into a proportion of the new buildings throughout the Site (i.e. for swifts);
- **Reptiles and Amphibians** – A number of hibernacula and log-piles should be introduced for the benefit of reptiles and amphibians within suitable habitat;
- **Invertebrates** – Invertebrate hotels and butterfly banks could be included within the completed Development to benefit a range of invertebrate species.

Residual Effects

Construction Phase

10.233 Following implementation of the above mitigation measures combined with the inherent design mitigation, all adverse effects arising out of the Development in respect of the construction phase would be reduced to a negligible level for each ecological receptor. As such, there are no residual effects resulting from the construction phase.

Completed Development

10.234 Following implementation of the above mitigation measures combined with the inherent design mitigation, all adverse effects arising from the Development in respect of the completed Development phase are reduced to a level that is not significant.

10.235 Minor beneficial effects are predicted in relation to semi-improved grassland, hedgerows, treelines and woodland, roosting bats, breeding birds, reptiles, common amphibians and Brown Hairstreak (in addition to invertebrates generally) as a result of the habitat creation and enhancement measures, targeted faunal enhancements and ongoing long-term management. Effects on other ecological receptors are also reduced to a negligible level. As such, there are no residual effects resulting from the completed Development.

Cumulative Effects

10.236 The potential for cumulative effects for the construction and completed Development phases of the Development have been assessed in relation to nine identified cumulative schemes set out in Chapter 2 EIA Methodology.

10.237 Of the nine identified schemes five have been granted and the remainder are under consultation/yet to be determined. The current Site covers part of the wider Bicester Eco Town Exemplar Site Banbury Road B4100 Caversfield and also covers Land North and Adjoining Home Farm Banbury Road B4100 Caversfield such that these areas are not further considered. The remaining area of the Exemplar Site Banbury Road B4100 Caversfield and the remaining identified schemes have not recorded any significant negative residual effects in terms of ecology within their relevant ES chapters, following the implementation of mitigation measures.

10.238 Furthermore, the green corridors put forward as part of the inherent design mitigation of the Site, in addition to further green corridors likely to be brought forward will also maintain and

create new corridors between the Development Site and adjacent development sites such as Bicester Eco Town Exemplar Site Caversfield Oxfordshire. Such corridors and buffer zones will link up across adjacent sites greenspace to provide foraging and commuting corridors to a range of species including bats, Badger, invertebrates and reptiles and bring about further beneficial effects.

10.239 Therefore, as there are no significant adverse residual effects arising from the Development, all of the individually negligible effects arising from the Site and the nine identified schemes do not cumulatively constitute an adverse residual effect.

10.240 In addition, the 'non-significant' effects arising out of the Development are unlikely to generate new significant negative effects, or increase the magnitude of the existing non-significant effects, when considered in-combination with the identified cumulative schemes.

Summary

10.241 An assessment has been undertaken of the likely significant effects of the Development on the environment with respect to biodiversity. Ecological surveys of the Site and adjacent areas has been undertaken, including a desk study, an extended Phase 1 survey and Phase 2 faunal surveys, including specific survey work in respect of bats (inspection and activity surveys), Badger, Water Vole, Otter, breeding birds, reptiles, Great Crested Newt, and Brown Hairstreak. Surveys were carried out in 2020 and 2021 and the Site was most recently visited in April 2021. A single further breeding bird survey and the final bat activity survey are still to be completed in May 2021.

10.242 A number of statutory and non-statutory ecological designations were identified by the desk study, with the closest being Bure Park LNR which lies 0.7km south of the Site boundary. Ardley Cutting SSSI, Twelve Acre Copse LWS and Skimmingdish Lane Balancing Pond DWS also lie within the secondary Zones of Influence (i.e. within 2km of the Site) and consideration is given to the European level designation Oxford Meadows SAC, 17.1km south-west of the Site.

10.243 The Site is dominated by semi-improved grassland with areas of arable and woodland habitat present and is largely bound by hedgerows and treelines. Habitats considered to comprise important ecological features which are assessed in this Chapter include semi-improved grassland, hedgerows and treelines, scattered trees, woodland and off-site watercourses. The habitats within the Site are considered to be of importance at a Site or Local level. Other habitats are present within the Site which do not form important ecological features, including arable, scrub, dry ditch, pond P1 (dry hollow) and hardstanding.

10.244 Surveys of protected species have found that the Site supports potential roosting opportunities for bats in four trees, foraging and commuting bats, opportunities for Badger and other mammals (Hedgehog and Polecat), breeding birds, reptiles, Common Toad and Brown Hairstreak butterfly. These populations are considered to be of importance at the Site and Local level. The final bat activity survey and final breeding bird survey are yet to be completed but the above assessments have been made with the available survey data taking a precautionary approach.

10.245 A number of inherent mitigation measures have been incorporated into the design of the Development, with the key elements being retention of buffer zones around key habitats, the establishment of green infrastructure corridors around and across the Site, specific dark corridors for bats, and new SuDS features. The inherent design mitigation has been designed to protect existing habitats, and maintain habitat connectivity across the entire Site, which will in turn maintain corridors for mobile fauna such as Badgers, commuting and foraging bats and Brown Hairstreak and provide suitable habitat for other species recorded on site such as reptiles.

10.246 In the absence of mitigation, potentially significant effects are predicted at the construction stage for Bure Park LNR, semi-improved grassland, hedgerows, treelines, woodland, off-site watercourses, roosting bats (trees), Badger and breeding birds. Non-significant effects are predicted in relation to scattered trees, reptiles and common amphibians (Common Toad). Mitigation is outlined above and will be fully developed at the detailed design stage and set out via production of a CEMP (or similar) which can be secured via planning condition. The implementation of mitigation reduces the residual effects during construction to a negligible level which is not significant.

10.247 In the absence of mitigation, potentially significant effects are predicted at the completed Development phase for semi-improved grassland, hedgerows, treelines and woodland, commuting and foraging bats, reptiles and Brown Hairstreak. Non-significant effects are predicted in relation to roosting bats (trees), Badger, other mammals, breeding birds and common amphibians (Common Toad). Mitigation and compensation is proposed above, which will be developed further and set out in full in a LEMP (or similar) and a detailed lighting design which will be secured via planning condition. A number of enhancements are also proposed to create and enhance habitats and create new faunal opportunities. The implementation of mitigation, compensation and enhancement measures brings the residual effects during operation to a level which is not significant. Overall, minor beneficial effects are predicted in relation to semi-improved grassland, hedgerows, treelines and woodland, roosting bats, breeding birds, reptiles, common amphibians and Brown Hairstreak (in addition to invertebrates generally) as a result of the habitat creation and enhancement measures,

targeted faunal enhancements and ongoing long-term management.

10.248 As no significant adverse residual effects have been identified as a result of the Development, there would be no potential for it to combine with any other consented or foreseeable schemes to produce cumulative effects.

10.249 Table 10.7 below contains a summary of the assessment.

Table 10.7: Table of Significance – Biodiversity

Potential Effect	Nature of Effect (Permanent/Temporary)	Significance (Major/Moderate/Minor) (Beneficial/Adverse/Negligible)	Mitigation / Enhancement Measures	Geographical Importance*								Residual Effects (Major/Moderate/Minor) (Beneficial/Adverse/Negligible)
				I	UK	E	R	C	D	L	S	
Construction												
Bure Park LNR	Temporary (medium-term)	Moderate adverse	- Pollution prevention measures - Secure measures via condition for a CEMP (or similar)							x		Negligible
Ardley Cutting and Quarry SSSI	N/A	Negligible	N/A		x							Negligible
Oxford Meadows SAC	N/A	Negligible	N/A	x								Negligible
Twelve Acre Copse Oxfordshire LWS	N/A	Negligible	N/A					x				Negligible
Skimmingdish Lane Balancing Pond Cherwell DWS	N/A	Negligible	N/A						x			Negligible
Semi-improved Grassland	Temporary (short-term)	Minor adverse	- Pollution prevention and dust management measures - Routing of construction traffic away from sensitive areas - Secure measures via condition for a CEMP (or similar)								x	Negligible
Hedgerows, Treelines and Woodland	Temporary (short-term)	Moderate adverse	- Pollution prevention and dust management measures - Routing of construction traffic away from sensitive areas - Tree protection in line with arboriculturalist best practice - Secure measures via condition for a CEMP (or similar)							x		Negligible
Scattered Trees	Temporary (short-term)	Minor adverse (non-significant)	- Pollution prevention and dust management measures - Routing of construction traffic away from sensitive areas - Tree protection in line with arboriculturalist best practice - Secure measures via condition for a CEMP (or similar)								x	Negligible

Potential Effect	Nature of Effect (Permanent/Temporary)	Significance (Major/Moderate/Minor) (Beneficial/Adverse/Negligible)	Mitigation / Enhancement Measures	Geographical Importance*								Residual Effects (Major/Moderate/Minor) (Beneficial/Adverse/Negligible)
				I	UK	E	R	C	D	L	S	
Off-site Watercourses	Temporary (medium-term)	Moderate adverse	- Pollution prevention and dust management measures - Routing of construction traffic away from sensitive areas - Secure measures via condition for a CEMP (or similar)							x		Negligible
Roosting Bats (Trees)	Temporary (short-term)	Minor adverse	- Tree protection in line with arboriculturalist best practice - Sensitive positioning of temporary lighting - Secure measures via condition for a CEMP (or similar)								x	Negligible
Commuting and Foraging Bats	N/A	Negligible	None required (although above measures for roosting bats will also benefit commuting and foraging bats)							x		Negligible
Badger	Temporary (short-term)	Minor adverse	- Pre-construction update Badger survey - Construction safeguards - Secure measures via condition for a CEMP (or similar)								x	Negligible
Other Mammals	N/A	Negligible	None required (although construction safeguards for Badger will also benefit other mammals)								x	Negligible
Breeding Birds	Temporary (short-term)	Minor adverse	- Sensitive timings of vegetation clearance works - Secure measures via condition for a CEMP (or similar)							x		Negligible

Potential Effect	Nature of Effect (Permanent/Temporary)	Significance (Major/Moderate/Minor) (Beneficial/Adverse/Negligible)	Mitigation / Enhancement Measures	Geographical Importance*								Residual Effects (Major/Moderate/Minor) (Beneficial/Adverse/Negligible)
				I	UK	E	R	C	D	L	S	
Reptiles	Temporary (short-term)	Minor adverse (non-significant)	- Systematic search and supervised displacement exercise by a suitably qualified and experienced ecologist with relocation of reptiles to suitable retained on-site habitat - Secure measures via condition for a CEMP (or similar)							x		Negligible
Common Amphibians	Temporary (short-term)	Minor adverse (non-significant)	As above for reptiles.								x	Negligible
Brown Hairstreak	N/A	Negligible	None required							x		Negligible
Completed Development												
Bure Park LNR	N/A	Negligible	None required							x		Negligible
Ardley Cutting and Quarry SSSI	N/A	Negligible	None required		x							Negligible
Oxford Meadows SAC	N/A	Negligible	None required	x								Negligible
Twelve Acre Copse Oxfordshire LWS	N/A	Negligible	None required					x				Negligible
Skimmingdish Lane Balancing Pond Cherwell DWS	N/A	Negligible	None required						x			Negligible
Semi-improved Grassland	Permanent (long-term)	Minor adverse	- Mitigation for permanent losses of grassland – habitat creation and enhancement (i.e. wildflower grassland areas) - Provision of footpaths, amenity open space, play space and litter and dog bins to avoid disturbance to important habitats - Long-term management secured via condition for a LEMP (or similar)								x	Minor Beneficial

Potential Effect	Nature of Effect (Permanent/Temporary)	Significance (Major/Moderate/Minor) (Beneficial/Adverse/Negligible)	Mitigation / Enhancement Measures	Geographical Importance*								Residual Effects (Major/Moderate/Minor) (Beneficial/Adverse/Negligible)
				I	UK	E	R	C	D	L	S	
Hedgerows, Treelines and Woodland	Permanent (long-term)	Moderate adverse	- Compensation for permanent losses of hedgerows and trees – habitat creation and enhancement (i.e. new native planting, hop-over features, woodland glades) - Provision of footpaths and natural barriers and post-and-wire fence to avoid disturbance to important habitats - Long-term management secured via condition for a LEMP (or similar)							x		Minor beneficial
Scattered Trees	N/A	Negligible	None required								x	Negligible
Watercourses	N/A	Negligible	None required							x		Negligible
Roosting Bats (Trees)	Permanent (long-term)	Minor adverse (non-significant)	- Sensitive lighting scheme - Long-term management of habitats secured via condition for a LEMP (or similar) - Provision of bat boxes and integrates roost units as enhancements								x	Minor beneficial
Commuting and Foraging Bats	Permanent (long-term)	Moderate adverse	- Sensitive lighting scheme - Long-term management of habitats secured via condition for a LEMP (or similar)							x		Negligible
Badger	Permanent (long-term)	Minor adverse (non-significant)	- Sensitive lighting scheme - Long-term management of habitats secured via condition for a LEMP (or similar)								x	Negligible

Potential Effect	Nature of Effect (Permanent/Temporary)	Significance (Major/Moderate/Minor) (Beneficial/Adverse/Negligible)	Mitigation / Enhancement Measures	Geographical Importance*								Residual Effects (Major/Moderate/Minor) (Beneficial/Adverse/Negligible)
				I	UK	E	R	C	D	L	S	
Other Mammals	Permanent (long-term)	Minor adverse (non-significant)	-Sensitive lighting scheme - Long-term management of habitats secured via condition for a LEMP (or similar) - Provision of Hedgehog domes and Hedgehog highways/fence gaps as enhancements								x	Negligible
Breeding Birds	Permanent (long-term)	Minor adverse	- Sensitive timing of habitat works - Long-term management of habitats secured via condition for a LEMP (or similar) - Sensitive lighting scheme - Provision of new bird boxes and integrated bird boxes as enhancement							x		Minor beneficial
Reptiles	Permanent (long-term)	Minor adverse	-Long-term management of habitats secured via condition for a LEMP (or similar) -Provision of hibernacula and log-piles as enhancements							x		Minor beneficial
Common Amphibians	Permanent (long-term)	Minor adverse (non-significant)	- Long-term management of habitats secured via condition for a LEMP (or similar) -Provision of hibernacula and log-piles as enhancements								x	Minor beneficial
Brown Hairstreak	Permanent (long-term)	Moderate adverse (inappropriate management) Minor adverse (non-significant) (habitat loss)	- New planting to comprise high proportion of Blackthorn and some Ash -Long-term management of habitats comprising rotational cutting of sections, secured via condition for a LEMP (or similar) -Provision of invertebrate hotels and butterfly banks as general invertebrate enhancement							x		Minor beneficial
	Cumulative Effects											
None Identified												

Potential Effect	Nature of Effect (Permanent/Temporary)	Significance (Major/Moderate/Minor) (Beneficial/Adverse/Negligible)	Mitigation / Enhancement Measures	Geographical Importance*								Residual Effects (Major/Moderate/Minor) (Beneficial/Adverse/Negligible)
				I	UK	E	R	C	D	L	S	

*** Geographical Level of Importance**

I = International; UK = United Kingdom; E = England; R = Regional; C = County; D = District; L = Local; S=Site

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