5.0 ECOLOGY

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5.1 INTRODUCTION

5.1.1 This chapter assesses the likely significant effects of the Proposed Development in terms of ecology and nature conservation and is based upon an ecological assessment of desk study information and habitat and species surveys.

5.1.2 The chapter describes the assessment methodology; establishes the baseline conditions currently existing at the application site and surroundings; the likely significant environmental effects; the mitigation measures required to prevent, reduce or offset any significant adverse effects; and the likely residual effects after these measures have been employed.

5.2 LEGISLATION, POLICY AND GUIDANCE

Legislative Framework

5.2.1 The following legislation and European Directives afford protection to wildlife and have been used in particular to inform this assessment:

- Natural Environment and Rural Communities Act 2006 (NERC)
- Wildlife and Countryside Act (1981) (as amended) (WCA)
- The Conservation of Habitats and Species Regulations 2017
- The EC Birds Directive (Directive 79/409/EEC), as translated into UK law by The Habitat and Species Regulations 2017
- The EC Habitats Directive (Directive 92/43/EEC) as translated into UK law by The Habitat and Species Regulations 2017
- The Protection of Badgers Act (1992).

5.2.2 Section 41 of the Natural Environment and Rural Communities Act 2006 places a duty on the Secretary of State to publish, review and revise lists of living organisms and types of habitat in England that are of principal importance for the purpose of conserving English biodiversity, and to consult Natural England before doing so.

5.2.3 The S41 list is used to guide decision-makers such as public bodies, including local and regional authorities, in implementing their duty under section 40 of the Natural Environment and Rural Communities Act 2006, to have regard to the conservation of biodiversity in England, when carrying out their normal functions.

Policy Framework

National Policy

5.2.4 Guidance on nature conservation planning policy is provided in the '*Conserving and enhancing the natural environment*' section of the National Planning Policy Framework (NPPF, 2019).

Conserving and enhancing the natural environment

5.2.5 At Section 15 paragraph 170 states "the planning system should contribute to and enhance the natural and local environment by:

- protecting and enhancing valued landscapes, sites of biodiversity or geological conservation interests and soils;
- recognising the wider benefits of ecosystem services;
- minimising impacts on biodiversity and providing net gains in biodiversity, contributing to the Government's commitment to halt the overall decline in biodiversity, including by

establishing coherent ecological networks that are more resilient to current and future pressures;

- preventing both new and existing development from contributing to or being put at inacceptable risk from or being adversely affected by unacceptable levels of soil, air, water or noise pollution or total instability; and
- remediating and mitigating despoiled, degraded, derelict, contaminated and unstable land where appropriate.

5.2.6 Paragraph 171 states "Local Planning Authorities should distinguish between the hierarchy of international, national and locally designated sites and allocate land with the least environmental or amenity value, where consistent with other policies in this Framework, take a strategic approach to maintaining and enhancing networks of habitats and green infrastructure; and plan for the enhancement of natural capital at a capital at a catchment or landscape scale across local authority boundaries".

5.2.7 Paragraph 175 addresses the conservation and enhancement of biodiversity and requires LPAs to "conserve and enhance biodiversity by applying the following principles;

- if significant harm to biodiversity resulting from development cannot be avoided (through locating on an alternative site with less harmful impacts), adequately mitigated, or as a last resort, compensated for, then planning permission should be refused;
- development on land within or outside a Site of Special Scientific Interest, and which is likely to have an adverse effect on a Site of Special Scientific Interest (either individually or in combination with other developments) should not normally be permitted. The only exception is where the benefits of the development in the location proposed clearly outweigh both its likely impact on the features of the site that make it of Special Scientific Interest and any broader impacts on the National Network of Sites of Special Scientific Interest;

- development resulting in the loss or deterioration of irreplaceable habitats (such as ancient woodland and ancient or veteran trees) should be refused, unless there are wholly exceptional reasons and a suitable compensation strategy exists;
- development whose primary objective is to conserve or enhance biodiversity should be supported; while opportunities to incorporate biodiversity improvements in and around developments should be encouraged, especially where this can secure measurable net gains for biodiversity; and
- The following wildlife sites should be given the same protection as habitats sites;
    - potential Special Protection Areas and possible Special Areas of Conservation;
    - listed or proposed Ramsar Sites; and
    - sites identified, or required, as compensatory measures for adverse effects on habitats sites, potential Special Protection Areas, possible Special Areas of Conservation, and listed or proposed Ramsar Sites.

Planning Practice Guidance (PPG 2016)

5.2.8 Guidance relevant to this Chapter is contained within the 'Natural Environment' Section.

Local Plan Policies & Policy Guidance

The Cherwell Local Plan 1996[1]

5.2.9 Saved policies of the Cherwell Local Plan 1996 remain part of the development plan for the District only insofar as they are up to date and relevant.

[1] Cherwell Local Plan, Cherwell District Council North Oxfordshire (January 2014)

The Adopted Cherwell Local Plan 2011-2031 (July 2015)

5.2.10 Relevant polices in respect of this chapter include:

Policy ESD 7 Sustainable Drainage Systems (SuDS)

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

Policy ESD 17 Green Infrastructure

Policy BAN 4 Bankside Phase 2

Policy BAN 12: Land for the Relocations of Banbury United Football Club

5.3 ASSESSMENT METHODOLOGY AND SIGNIFICANCE CRITERIA

Desk Study

5.3.1 The site and surrounding area has been the subject of a number of ecological surveys conducted in the recent past. This information has been reviewed for relevant information concerning the ecological interest of the site and its wider context. The following information from this period (which can be provided on request) has been reviewed for baseline information regarding the site and its setting:

- Environmental Statement: College Fields, Banbury (FPCR 2005) and, in particular, Chapter 6: Ecology, which also includes the results of bat, badger, bird and odonata surveys for land to the west.
- Ecological Appraisal College Fields, Banbury (FPCR 2012), which updated the survey of the college field site.
- Ecological Appraisal (FPCR 2007, 2010, 2013, 2016 and 2019), which focused on the current site boundary
- Badger Survey Report (FPCR 2016)

5.3.2 In order to compile existing baseline information, relevant ecological information was requested from both statutory and non-statutory nature conservation organisations for the purposes of this appraisal, including:

- Multi Agency Geographic Information for the Countryside (MAGIC) website[2]
- Berkshire Buckinghamshire and Oxfordshire Wildlife Trust
- The Thames Valley Environmental Records Centre (TVERC)
- Oxfordshire Bat Group
- Oxfordshire Badger Group

5.3.3 Further inspection, using colour 1:25,000 OS base maps (www.ordnancesurvey.co.uk) and aerial photographs from Google Earth (www.maps.google.co.uk), was also undertaken in order to provide additional context and identify any features of potential importance for nature conservation in the wider countryside.

5.3.4 The search area for biodiversity information was related to the significance of sites and species and potential zones of influence, as follows:

- 5km around the application area for sites of International Importance (e.g. Special Area of Conservation, Special Protection Area, Ramsar site)
- 2km around the application area for sites of National/ Regional (e.g. Sites of Special Scientific Interest,)
- 1km around the application area for sites of County Importance species records (e.g. protected, Local Wildlife Sites or UK BAP and notable species).

[2] http://www.magic.defra.gov.uk/

Flora

5.3.5 The area of survey encompassed the application site and some other areas of adjacent habitat.

5.3.6 Habitats within the Site have been classified using the standard Phase-1 Habitat Survey methodology[3]. This survey was initially completed on 4th September 2013 and updated on 13th November 2014, 21st of July 2016 and 30th July 2018 to identify any changes to the ecological baseline. Target notes were used to record habitats or features considered as being of greatest nature conservation interest. Species lists were compiled for representative habitats. Suitably qualified and experienced botanists, who are members of the Institute of Ecology and Environmental Management (IEEM), undertook all botanical survey work.

5.3.7 Where areas of relatively homogenous vegetation occurred further detailed botanical survey was undertaken in order to provide information on the relative cover of species.

Tree Survey

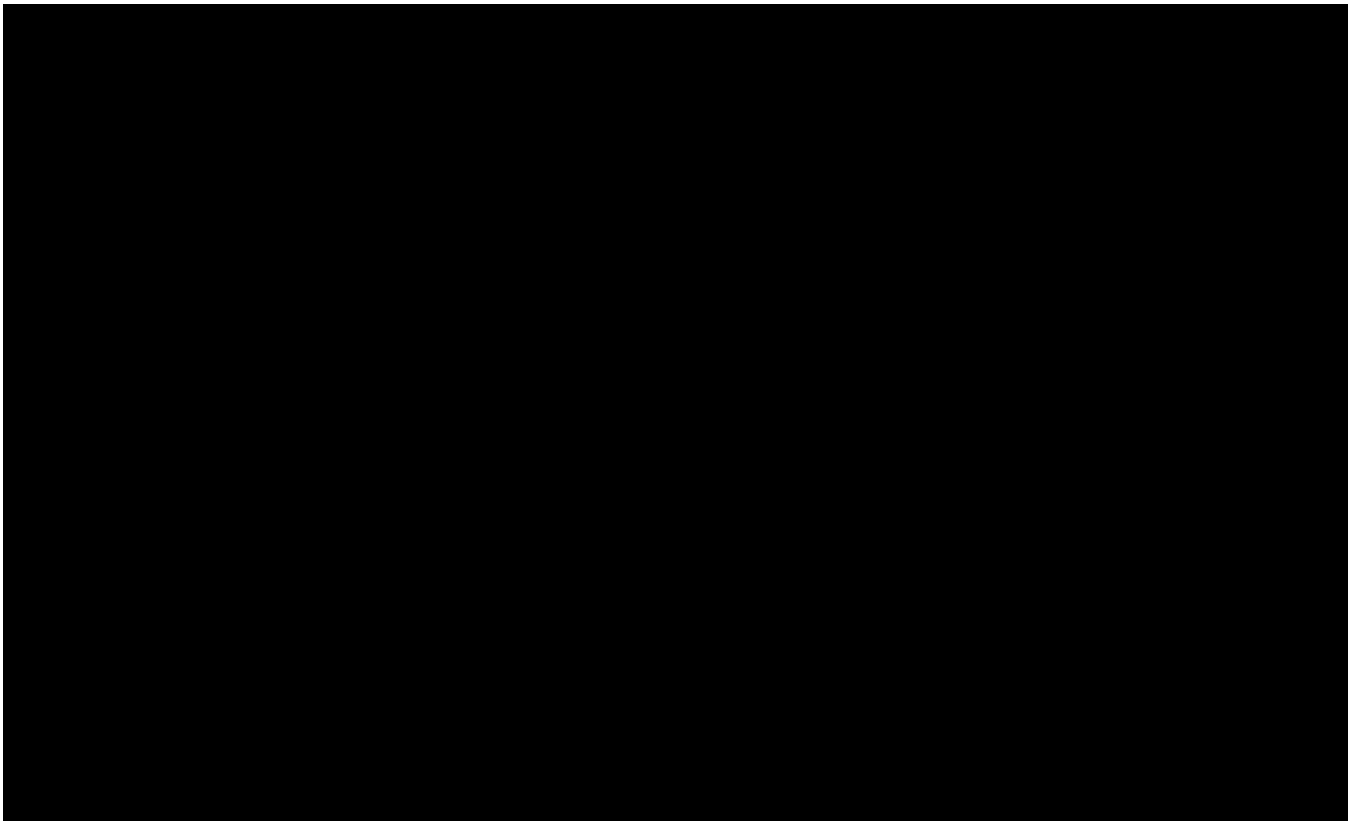
5.3.8 In addition to the habitat surveys, which focused at determining ecological value, a survey of trees has also been carried out in accordance with the criteria set out in Chapter 4 of BS5837. The survey has been undertaken by a suitably qualified and experienced arboriculturalist and has recorded information relating to all those trees within the site and those adjacent to the site which may be of influence to any proposals. Trees were assessed for their arboricultural quality and benefits within the context of the Proposed Development. It should be noted that this does not confer any particular or specific ecological value.

[3] Handbook for Phase 1 habitat survey, a technique for environmental audit, JNCC, 2010

Fauna

5.3.9 Faunal surveys were undertaken for a number of groups during the above walkover. All methodologies, are provided below and followed published guidelines as accepted by statutory and non-statutory agencies including Natural England and CIEEM.

[redacted]



Amphibians

5.3.11 Throughout the initial walkover survey of the site consideration was given to the presence of habitats considered to be suitable for both the terrestrial and aquatic phases of the amphibian life cycle.

Bats

5.3.12 All trees within the site were inspected for their potential to support roosting bats in March 2009 and July 2018. Features considered suitable comprised the following:

- thick loose bark,
- cavities, fissures,
- rot holes,
- wood pecker holes
- and standing dead wood.
- In addition, the presence of dense ivy cover can conceal the above mentioned features or evidence of bat occupation such as dropping or urine staining. However it should be noted that that generally ivy covered trees must be sufficiently large or mature to have any potential for roosting bats.

Birds with Assessment of Trees for Barn Owl

5.3.13 Throughout the surveys of the site casual observations of birds observed or heard were noted in order to assess any requirement for further surveys, such as in cases where significant impacts could occur on any notable avian interests (e.g. S41 list species, specially protected or otherwise rare/vulnerable species).

5.3.14 All trees within the site were also visually assessed for the existence of large cavities of potential use by barn owl for nesting or roosting. Additional signs, such as pellets and faecal splashing were also searched for on or around potential perches.

Other Fauna

5.3.15 The presence of other statutory and non-statutory species not listed above has also been considered, as part of the on-going assessment. This includes species protected under the Wildlife and Countryside Act 1981 (as amended) and the Conservation (Natural Habitats & c.) Regulations 1994 or those listed in Red Data Books (RDB), and local and national Biodiversity Action Plans (BAP).

Assessment Methodology

5.3.16 Reference has been made to the Guidelines for Baseline Ecological Assessment (1995) and to the Institute of Ecology and Environmental Management (IEEM) *Guidelines for Ecological Impact Assessment in the UK And Ireland Terrestrial, Freshwater and Coastal (September 2018*). These guidelines aim to give a degree of consistency in approach to evaluating the importance of the ecological features within the Site and any effects or impacts a scheme will have upon them.

5.3.17 The activities associated with the construction and implementation of the Proposed Development has been identified, together with the likely range within which their influence will be felt, given the nature of the area. The ecological features, which may be affected by such activities, have been evaluated within a geographical framework which is based on the ecological status of the features, but which also reflects a wide range of legislation and governmental guidance.

Evaluation

5.3.18 An assessment of the nature conservation value of the application site (sensitivity) was made following the criteria suggested in IEEM (2016) as follows; International, National, Regional, County, District and Local. A summary is also provided in Table 5.01.

Table 5.01: Evaluation of Nature Conservation Importance

V	Examples
International	An internationally designated site or candidate site (SPA, pSPA, SAC, cSAC, pSAC , Ramsar site, Biogenetic Reserve) or an area which meets the published selection criteria for such designation, irrespective of whether or not it has yet been notified. A viable area of a habitat type listed in Annex I of the Habitats Directive or smaller areas of such habitat which are essential to maintain the viability of a larger whole. Any regularly occurring population of an internationally important species, which is threatened or rare in the UK (i.e. it is a UK Red Data Book species or listed as occurring in 15 or fewer 10km squares in the UK, of uncertain conservation status or of global conservation concern. A regularly occurring, nationally significant population/number of any internationally important species.
National	A nationally designated site (SSSI, NNR, Marine Nature Reserve) or a discrete area, which meets the published selection criteria for national designation (e.g. SSSI selection guidelines) irrespective of whether or not it has yet been notified. Any regularly occurring population of a nationally important species which is threatened or rare in the region or county (local BAP). A regularly occurring, regionally or county significant population/number of any nationally important species.
Regional	Viable areas of key habitat identified in the Regional BAP or smaller areas of such habitat which are essential to maintain the viability of a larger whole. Viable areas of key habitat identified as being of Regional value in the appropriate Natural Area profile. Any regularly occurring, locally significant population of a species listed as being nationally scarce which occurs in 16-100 10km squares in the UK or relevant Natural Area on account of its regional rarity or localisation. A regularly occurring, locally significant number of a regionally important species. Sites which exceed the County-level designations but fall short of SSSI selection guidelines, where these occur.

V	Examples
County / Metropolitan	Semi-natural ancient woodland greater than 0.25 ha. County/Metropolitan sites and other sites which the designating authority has determined meet the published ecological selection criteria for designation, including Local Nature Reserves selected on County / metropolitan ecological criteria (County/Metropolitan sites will often have been identified in local plans). A viable area of habitat identified in County BAP. Any regularly occurring, locally significant population of a species which is listed in a County/Metropolitan "red data book" or BAP on account of its regional rarity or localisation. A regularly occurring, locally significant number of a County/Metropolitan important species.
Loc	Areas of habitat considered to appreciably enrich the habitat resource within the context of the Parish or neighbourhood (e.g. species-rich hedgerows). Local Nature Reserves selected on Parish ecological criteria.

5.3.19 Features with a value of local or above was considered to represent a '*Valued Ecological Receptor'* (VER). Those features not meeting the criteria for VERs were classified as having either site level or negligible ecological value.

Impact assessment

5.3.20 The impacts of the proposals have been predicted, taking into account different stages and activities within the development process. The significance of likely effects was determined by identifying those receptors likely to be affected. The features were evaluated to identify the important ones, i.e. those which, if their level of value reduced, national or local policies (or in some cases legislation) would be triggered. The nature of the individual and combined impacts were characterised on each important feature, to determine the longevity, reversibility and consequences for the feature in terms of ecological structure and function. Where it was concluded that an effect would be likely to reduce the value given to an important feature, it was described as significant. Therefore, the

ecological significance of these impacts has then been assessed based upon the likely effect on the integrity or conservation status of each feature. The assessment of impact significance is done both to identify the need for mitigation and also to assess residual impacts.

Significance Criteria

5.3.21 The ecological significance of these impacts has then been assessed, based upon the likely effect on the integrity or conservation status of the feature. The assessment of impact significance is done both to identify the need for mitigation and also to assess residual impacts.

5.3.22 The significance of likely effects was determined by:

- Identifying those ecological features likely to be affected;
- Evaluating them to identify the important ones (i.e. those which, if their level of value reduced, national or local policies (or in some cases legislation) would be triggered); and
- Characterising the nature of the individual and combined impacts on each important feature, to determine longevity, reversibility and consequences for the feature in terms of ecological structure and function.

5.3.23 Where it was concluded that an effect would be likely to reduce the value given to an important feature, it was described as significant.

5.4 BASELINE CONDITIONS AND EVALUATION

Statutory Designations

5.4.1 The site is not covered by, or adjacent to, any site of international importance. The closest site of statutory nature conservation interest is Adderbury Lakes Local Nature Reserve (LNR) which is

c.1.6km from the southern site boundary. The site is designated for its lakes and trees with associated faunal interest.

Table 5.02: Statutory Sites within Search Area

Site Name	Designation	Distance and bearing from site
Adderbury Lakes LNR	According to Natural England: *'Ornamental Lakes created in 18th century as part of Adderbury House grounds. Two lakes with paths alongside and a small area of woodland.* *The lakes area contains a wide diversity of insects, birds, mammals and plant life. The tree cover is extensive with some of the trees dating back to the early circa 18th century.*	c.1.6km south of site boundary

Non-Statutory Designations

5.4.2 No local wildlife sites occur in close proximity to the Site or are likely to be significantly affected either directly or indirectly by proposals.

Protected Species

5.4.3 Legally protected and notable species information included records for three statutorily protected species and four notable species within the area of search. This information is provided in Table 5.03 below:

Table 5.03: Protected and notable species records

Species	Record	Status
Grass snake *Natrix*	Bodicote (Oct 2003) grid ref: SP 461 381. Located over 500m from the site boundary Bodicote (Aug 2000 & July 2003) grid ref: SP 459 377, 459 375 & SP 463 369. All sites lie over 700m from the site boundary.	Partially protected from killing and injuring Schedule 5 Wildlife and Countryside Act 1981 (as amended (Sch. 5 WCA). UK BAP Priority Species
Water vole *Arvicola terrestris*	Oxford Canal (1980) grid ref: SP 481 382. Lies 1km to south east. Sor Brook (1988) grid ref: SP 450 373 lies 1.5km to south west.	Habitat partially protected (Sch. 5 WCA), Species of principle importance under NERC Act
Western European hedgehog *Erinaceus europaeus*	Bodicote (2015) grid ref: SP 460 375. Lies over 700m west of site.	Species of principle importance under NERC act.
Common pipistrelle *Pipistrellus pipistrellus*	Bodicote (2017) grid ref: SP 461 377. Lies 390m north-west. Bodicote (2009) grid ref: 463 382. Lies 450m west.	Fully protected (Sch. 5 WCA), fully protected under Conservation of Habitats and Species Regulations 2017.
Brown Long-eared bat *Plecotus auritus*	Bodicote (2017) grid refer: SP 462 377. Both lie over 400m west from site.	Fully protected (Sch. 5 WCA), fully protected under Conservation of Habitats and Species Regulations 2017, Species of principle importance under NERC Act. Widespread in Oxfordshire.

Species	Record	Status
Soprano pipistrelle *Pipistrellus pygmaeus*	Bodicote (2017) grid ref: SP 461 377. Lies over 400m west of site.	Fully protected (Sch. 5 WCA), fully protected under Conservation of Habitats and Species Regulations 2017, Species of principle importance under NERC Act. Widespread in Oxfordshire.
Noctule *Nyctalus noctula*	Bodicote (2017) grid ref: SP 461 377. Lies over 400m west of site.	Fully protected (Sch. 5 WCA), fully protected under Conservation of Habitats and Species Regulations 2017, Species of principle importance under NERC Act. Widespread in Oxfordshire.
Myotis sp	Bodicote (2017) grid ref: SP 461 377. Lies over 400m west of site.	Fully protected (Sch. 5 WCA), fully protected under Conservation of Habitats and Species Regulations 2017, Species of principle importance under NERC Act. Widespread in Oxfordshire.
Common toad *Bufo bufo*	Grid ref: SP 459 377 over 700m west.	Species of principle importance under NERC act.
Tortula virescens a moss	Bodicote churchyard grid ref: SP 459 376.	Nationally scarce (recorded from fewer than 100 10km squares in Britain.
Megatoma undata Larder beetle	Oxford Canal (1980) grid ref: SP 470 390.	Notable Nb
Platyrhinus resinosus Fungus weevil	Oxford Canal grid ref: SP 470 390.	Notable Nb
Wall *Lasiommata megera*	Bodicote grid ref: SP 463 379.	Species of Principal Importance under NERC act

Species	Record	Status
Small heath *Coenonympha pamphilus*	Bodicote grid ref: SP 462 374.	Species of Principal Importance under NERC act.

Habitats

Overview

5.4.4 Broad habitat types within the Application Site are identified on **Figure 5.01 Phase 1 Habitat Plan** and further additional species lists and habitat descriptions are provided in **Appendix 5.01**.

5.4.5 The site comprises a series of managed arable field with semi-improved grassland margins 1-2m in width and a small area of species poor grassland. All field compartments currently receive a degree of management in association with their agricultural use.

5.4.6 A small copse of mixed plantation woodland is present outside of the site to the north east. The majority of the field boundaries comprise hedgerows, although a small number comprise treelines, farm roads or post and rail fence. A series of dry ditches and a small area of species poor semi-improved grassland was also present.

Evaluation of Valued Ecological Receptors

Mixed Plantation Woodland

5.4.7 A block of mixed plantation woodland is present outside of the site to the north east of the site. This woodland was dominated by semi-mature Leyland cypress with broad-leaved tree species such as sycamore *Acer pseudoplatanus*, ash, elder and turkey oak *Quercus cerris*. The ground flora was limited in cover due to extensive leaf litter although did include similar species to the grassland margins and arable fields.

5.4.8 Although the woodland was of reasonable extent, in the context of the local area, given its planted nature, predominance of exotic introduced species, limited structure and diversity of associated species this woodland was considered to be of no more than **Local** value.

Mature Trees

5.4.9 An Arboricultural Assessment is included at **Appendix 5.02**. Along the track which heads north from College Farm, a line of 37 trees predominately semi-mature ash *Fraxinus excelsior* with immature specimens of crap apple *Malus sylvestris*, sycamore and English oak were noted.

5.4.10 Mature standard trees associated with hedgerows are rare on site although included occasional English oak, sycamore and ash, one of which one, an English oak (TN2), is likely to be of veteran status due to its size and the presence of characteristic features such as dead wood.

5.4.11 Standard trees were considered to be limited value although the veteran Oak (TN2) is of considerable age and supports a number of important features and is considered to be of **Local** significance.

Poor Semi-improved Grassland

5.4.12 A small area of species poor semi-improved grassland was present in the south-west of the site, frequent grass species noted were cock's-foot *Dactylis glomeratus* and false oat-grass *Arrhenatherum elatius.* Herb species were limited to common and widespread species. As a result of the low diversity of species and lack of other features of note and small extent, this habitat type was considered to be of **Negligible** nature conservation value.

Arable

5.4.13 The dominant land use on site was agricultural, with a mixture of linseed *Linum usitatissimum* and oilseed rape *Brassica napus* crops being sown recently. A range of associated weeds were noted, although all were common and widespread species.

5.4.14 The arable compartments were bordered by margins c.1-2m in width. These were dominated by coarse grasses and herbs. . As a result of the low diversity of species and lack of other features of note, this habitat type was considered to be of **Negligible** nature conservation value.

5.4.15 A small area had apparently been seeded with a wildflower mix, where a mixture of species were noted including common poppy *Papaver rhoeas,* lacy phacelia *Phacelia tanacetifolia* and sunflower *Helianthus annus.* Ruderal species were frequent with patches of creeping *Cirsium arvense*, welted *Carduus crispus* and spear thistle *Cirsium vulgare* and common nettle *Urtica dioica* noted. Although of seeded origin this habitat did provide a foraging and nectar resource for wildlife including a range of largely common butterflies and as a result was considered to be of **Site** nature conservation value.

Hedgerows

5.4.16 Hedgerows form the majority of field boundaries within the site, with a total of five hedges present. All appear to have been relatively regularly managed although are generally between 1-2m wide and 2-4m tall. Canopy species diversity was generally moderately high and of mixed composition and, although mature standard trees were infrequent with oak present only rarely, they do appreciably increase the structural and species diversity of the local area. All hedgerows dominated by native species (i.e. >80%) qualify as habitat of principle importance and listed under S41 of the NERC Act. As a result are considered to be of **Local** nature conservation value.

5.4.17 Two further domestic hedgerows occur within the site in the west. These are dominated by ornamentals including Leyland cypress, garden privet *Ligustrum ovalifolium* and snowberry and are of **Negligible/Site** nature conservation value only.

Ditches

5.4.18 Two dry ditches (no signs of visible water) were present within the site boundary. Both supported similar vegetation to the arable field margins and were consequently considered to be of **Negligible** nature conservation value.

Scrub

5.4.19 Small patches of scrub (with associated ruderal species) were recorded throughout the site in association with boundary features. These areas were dominated by species such as bramble, blackthorn and hawthorn with common nettle also frequent. Given their limited extent they were considered to be of **Negligible** nature conservation value.

Fauna

5.4.20 In additional to desk study information, which included only limited information concerning protected species, a range of further faunal surveys were conducted within the site. A summary of identified potential receptors is outlined below.

[redacted]

Bats

5.4.24 A number of bat records were provided for the area of search this included records of bats collected during previous surveys of the College Fields site. None of these records relate directly to the site. The nearest record is for common pipistrelle to the north west of the site.

5.4.25 Outside of roosting potential, the site habitats were of suboptimal value for bats due to the predominance of arable land and relative lack of linear features that could be used as dispersal corridors. The site is also isolated from good quality foraging habitats. As a result of the above the site was scoped out of requiring further surveys for this group and is considered to be of **Local** value at most.

Potential Bat Roost Habitat – Trees

5.4.26 Throughout the survey of the site, consideration was given to the potential presence of bat roost habitat.

5.4.27 No evidence of occupation of any tree was noted, however three trees supported splits, cracks and/or rot and animal holes and as a result were considered to have the potential to support roosting bats. Further details are provided in Table 5.04 and their locations indicated in **Figure 5.01**. Further detail is also provided in **Appendix 5.01**.

Table 5.04: Bat tree descriptions 2014

Tree ref #	Description/Features	Potential	Evidence?
T1	A mature oak on northern boundary, knot hole on south-east at 2m and east aspect at 5m.	Moderate	None
T2	A mature oak with knot hole on south aspect at 4m, branch split at 4m on south aspect and 5m on west aspect.	Moderate	None
T3	A mature oak on the east boundary with a knot hole at 5m on the west aspect, horizontal split at 5m on south-west aspect and at 6m on north-west aspect.	Moderate	None

Herpetofauna

5.4.28 The habitats on site were considered unsuitable for use by reptile species due to the structurally homogenous vegetation structure that is unlikely to provide the close juxtaposition of suitable basking, foraging and feeding areas.

5.4.29 The site supported no aquatic habitat suitable for amphibians and no ponds appear in close proximity to the site. Only a single pond, which appeared to be dry at the time of survey, is noted approximately 220m to the east of the site on OS maps. It is isolated from the site by extensive arable land that is largely devoid of suitable dispersal habitat or corridors. Furthermore habitats within the site are of poor quality, being dominated by intensively managed agricultural land.

5.4.30 As a result of the above the site was scoped out of requiring further surveys and is not considered to be of value to herpetopfauna, including both reptiles and amphibians.

Breeding birds

5.4.31 Few bird species were recorded within the site during the walkover surveys of the site and those that were observed were typical of farmland habitats generally.

5.4.32 Nevertheless a number of common and widespread but declining species (i.e. appear on the BoCC Red / Amber list and / or are listed as a NERC Priority Species) included single yellowhammer *Emberiza citrinella*, linnet *Carduelis cannabina,* dunnock *Prunella modularis*, song thrush *Turdus philomelos* and bullfinch *Pyrrhula*. Further to this, a range of generalist species were recorded including whitethroat *Sylvia communis*, blackcap *Sylvia atricapilla*, blackbird *Turdus merula*, wood pigeon *Columba palumbus* and wren *Troglodytes. Buzzard Buteo* and green woodpecker *Picus viridis* were also both noted.

5.4.33 As a result of poor assemblage noted the site was scoped out of further breeding birds surveys and the assemblage considered to be no more than **Site** value for breeding birds.

Other Fauna

5.4.34 Further evidence of mammals included high levels of rabbit *Oryctolagus cuniculus* and fox *Vulpes* activity associated with hedgerows within the site

5.4.35 The small patch of annual wildflowers supported a range of foraging butterflies including green veined *Pieris napi* and small whites *Pieris rapae* and a single clouded yellow *Colias croceus.*

Summary of Valued Ecological Receptors

5.4.36 Features with a value of local or above are considered to represent a 'Valued Ecological Receptor' (VER) or one that could lead to significant effects arising, should impacts be sufficiently adverse. Those features not meeting the criteria for VERs were classified as having either site level or negligible ecological value.

5.4.37 A summary of VERs identified within or within the potential zone of influence are identified in Table 5.05 below.

Table 5.05: Summary value of Ecological Receptors

Valued Ecological Receptor	Nature Conservation Significance	Rationale
Designated Sites		
Adderbury Lakes Local Nature Reserve (LNR)	County	Provide an important wildlife and recreational resource at the district spatial scale. Supports a range of habitats and species of local interest.
Other Habitats		
Plantation woodland	Local	Supports a range of largely exotic species, although is relatively undisturbed and uncommon resource in the context of the site
Mature trees - general - veteran	Local	Appreciably enriches the site and provides additional structural and habitat diversity that can be utilised by a range of local fauna. Veteran trees support range of additional features that can be used by additional species but by their nature require long continuity within the landscape
Hedgerows	Local	Important and species rich resource providing a potentially important dispersal function through the site
Wildflower margin	Site	

Valued Ecological Receptor	Nature Conservation Significance	Rationale
Fauna		
Badgers	Local	Habitat including hedgerows, woodland and field margins are likely to be used for dispersal, foraging and sett creation and are a localised resource both within the site and wider area.
Bat assemblage	Local	Suitable habitats within the site are generally isolated, of limited extent and not of high quality; either as a foraging resource or as dispersal corridors
Breeding birds	Site	Habitats within the site were of limited value to birds and few species were noted during the scoping survey.

5.5 IMPACT ASSESSMENT

5.5.1 The Regulations requires that attention be paid to all likely forms of effects. These may be:

- Direct or indirect;
- Short or long-term;
- Intermittent, periodic or permanent;
- Cumulative.

5.5.2 Potential effects prior to mitigation include:

- Direct loss of habitats and associated flora and fauna within the application site boundary, interruption of wildlife corridors, decrease in value to wildlife through reduction in species and / or habitats
- Indirect effects on retained vegetation within and bordering the application site, through increase disturbance and through local changes in soils, drainage and hydrology
- Potential effects upon protected and scarce species through disturbance
- Operational effects such as pollution incidents from chemical spills, pollution of streams and fragile habitats from runoff and incorrect storage of materials
- Long-term beneficial effects arising as a result of the favourable restoration of the application site to beneficial after-use

5.5.3 From the outset and following review of the ecological baseline the potential effects arising as a result of the design of the Proposed Development have been reviewed in order that, where possible, potential impacts can be avoided through an alteration in design, layout or working methods.

5.5.4 The assessment of potential impacts has been made with reference to the description of development, the Parameters Plan (FPCR Drwg. No. 6394-P-01 rev AD) and design principles as set out in the Design and Access Statement.

Construction Phase

Potential Construction Impacts on Designated Sites

5.5.5 No statutory designated sites of nature conservation significance would be either directly or indirectly affected by the proposals.

Potential Impacts through Habitat Loss

5.5.6 Semi-natural habitats of significant nature conservation value are rare within the site due to the predominance of intensive agriculture. As a result the vast majority of built development (including residential development, highway infrastructure and playing fields) will occur on arable land of negligible nature conservation value. This would not give rise to significant effects through habitat loss.

5.5.7 The site does support a relatively continuous network of hedgerows that are of nature conservation interest at a Local spatial scale.

5.5.8 While the length of hedgerows lost has been minimised as part of the developmental design of the site, some inevitable loss and disruption would be unavoidable. This includes:

- the loss of small sections of hedgerow H4 totalling c.10-15m in two locations to provide internal access;
- the loss of c. 20-30m of hedgerow H5 adjacent to Oxford Road to provide site access.

5.5.9 No further losses of habitats at any more than site value would occur.

Effect on Fauna through Habitat loss and Disturbance

[redacted]

[redacted]

[redacted]

[redacted]

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[redacted]

[redacted]

Bats

5.5.14 The loss of trees is avoided and no potential roost habitat will be affected.

5.5.15 The small losses of hedgerow to allow access (i.e. up to 20m stretches) are unlikely to affect bat corridor routes as these distances are regularly crossed by members of this group. However, the use of high intensity lighting can impact on bats during the construction phase of works, particularly where lighting is close to important habitat such as that used for foraging and as corridors of movement by some of the slower flying species such as the *Myotis* and brown long-eared bat species. While this is unlikely to significantly affect the viability of any local population, it could lead to their displacement from some areas or decline in foraging efficiency in the short-term during construction. Other species, including *Pipistrellus* sp are likely to benefit from the increase in floodlighting as they feed on the insects attracted to the light.

Birds – General

5.5.16 The site was not considered to potentially provide any particularly valuable habitat for breeding bird species, predominantly due to the dominance of intensively managed arable land. As a result it was not considered likely to support any particularly rare or vulnerable species. However, the site is likely to provide a habitat for a range of common and widespread farmland bird species such as those identified within the site.

5.5.17 The effect of habitat loss on the breeding bird assemblage, which, given the nature of habitats on site is considered unlikely to lead to a major reduction in the species richness of the site, although a change in the assemblage could occur through the provision of a greater range of habitats.

5.5.18 Nevertheless, construction works, such as initial ground and vegetation clearance, have the potential to disturb breeding birds and potential cause the loss or abandonment of nest. Whilst there is unlikely to be any major impact on local bird populations, it should be noted that all birds, their nests and eggs are protected by law and it is an offence, with certain exceptions, to intentionally:

- Kill, injure or take any wild bird,
- Take damage or destroy the nest of any wild bird while it is in use or being built,
- Take or destroy the egg of any wild bird,
    - and, in the case of birds listed on Schedule 1 (barn owl), disturb any bird while it is nest building or is at or near a nest with young; or disturb the dependant young of such a bird.

Operational Impacts

5.5.19 Operational impacts include the increased disturbance of wildlife resulting from the operation and use of the site by residents. This potential is, however, greatly limited by the nature of the site which is intensively farmed and does not support any species of assemblage of particular note.

5.5.20 Many species will benefit from the Green Infrastructure proposals, which include the provision of a balancing pond in the north-east, additional hedgerow and woodland planting on the northern, eastern and southern boundaries. Some operational impact may occur through the severing of corridor habitats and vehicular use of the site and through the disturbance of the Green Infrastructure (GI) by both occupants of the development and their pets. Many of the impacts associated with the use of GI habitats can be mitigated by the operation of appropriate site management.

5.5.21 An important requirement will be to maximise the potential benefits of the GI to biodiversity wherever possible and as such a range of measures can be incorporated into the design of the scheme.

5.5.23 With an increase in domestic animals it would be expected that wildlife, including birds and small mammals associated with retained habitats, might be subject to increased predation and disturbance from cats and dogs. While this impact may affect the local distribution of some species it is considered to be of minor significance; offset by the substantial increase in garden habitats, which will occur, alongside structural landscaping.

5.5.24 Any lighting around retained habitat used by bats as corridor of foraging habitat can lead to a reduction in use by this group, some species such as *Myotis* and brown long-eared bats, which are generally slower flying, are particularly sensitive to lighting and will avoid heavily lit areas as a predator avoidance strategy leading to a minor adverse effect in a very local context.

5.6 MITIGATION AND ENHANCEMENT MEASURES

General Impact Avoidance Measures

5.6.1 From the outset and following review of the ecological baseline the potential effects arising as a result of site design have been reviewed in order that, where possible, potential impacts can be avoided through an alteration in design, layout or working methods. As a result the majority of potential Valued Ecological Receptors identified in the survey area have been avoided through sensitive design.

5.6.2 The potential for impacts on retained habitats outside of the immediate working area during construction activities would be minimised by retaining and protecting all unaffected habitats within the site to ensure that disturbance is kept to a minimum. All existing hedgerows and, where relevant, associated ditches will be retained where possible, with the exception of where vehicular or pedestrian access may be necessary and a single hedgerow that is isolated with an arable field. Each would either be included within a retained green corridor or buffered by at least 5m. Similarly, works beneath the canopy/within the Root Protection Area (RPA) of any retained trees would be avoided or, if necessary, mitigated for (refer to **Appendix 5.02**: Arboricultural Assessment: FPCR, 2017).

5.6.3 Retained habitats would also be set back from the built development and garden habitats. Where existing hedgerows are becoming wide with much lateral outward growth, they would be protected and development plots/gardens would be set back and fenced to ensure that they remain intact both during and following development.

5.6.4 The buffer strip management will be sympathetic to their current interest and agreed with interested parties. The potential for the tipping of garden waste into and around retained habitat would be

reduced through the careful design of the development, which would not only include the provision of a wide buffer strip but also by ensuring that most immediately adjacent properties do not have private gardens backing onto buffer strips.

5.6.5 In order to prevent indirect effects through an alteration in water chemistry or siltation of ditches/stream and the consequent smothering of flora and fauna appropriate measures will be implemented in line with best practice.

5.6.6 The relevant Pollution Prevention Guidelines listed below will be adhered to, to ensure construction works are undertaken in an environmentally responsible manner. Any environmentally hazardous material used will be kept in dedicated stores and storage tanks will have appropriate bunding.

PPG1: General Guide to the Prevention of Pollution;

PPG2: Above Ground Oil Storage Tanks;

PPG3: Use and Design of Oil Separators in Surface Water Drainage Systems;

PPG5: Works in, Near, or Liable to Affect Watercourses;

PPG6: Working at Construction and Demolition Sites;

PPG21: Pollution Incident Response Planning;

PPG23: Maintenance of Structures over Water

Mitigation for Habitat Loss and Disturbance to Fauna

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Bats

5.6.15 During the operational phase of the Project losses of small length of hedgerows to allow access (i.e. up to 20m stretches) are proposed. These hedgerows crossing the site are likely to provide dispersal corridors through the site.

5.6.16 All hedgerows will be maintained within a suitable buffer (exceptions being the requirement for pedestrian or vehicular access) which in addition to the retention of all trees is likely to reduce the potential for any impacts. To further minimise the potential impact to foraging routes when the hedgerow linkages within the completed site are broken, the retained hedgerow will be reinforced with native species planting. Where the proposed breach of the hedgerow exceeds 10m in length the planting will also include the implementation of standard trees adjacent to the road/footpath which will grow to be above the level of vehicle movement. The lower branches of such trees should be regularly pruned back to the trunk in order to ensure that the most suitable flight line is above the maximum traffic height (where applicable low-level lighting columns may also be used in this instance to reduce the likelihood of the bats using the lower tree regions). The implementation of such 'hop-overs' will allow continued echolocation across the break thereby allowing continued usage of the hedgerow as a foraging/commuting area.

5.6.17 Whilst the hop-overs will take a little while to establish, the tree standards to be used shall be of an appropriate size and will be planted early in the development cycle. Whilst the breach will be present during the construction period until the hop-over is established due to the small size of the proposed breaches the impacts upon bats potentially commuting along them is considered to be minor.

5.6.18 The other key impact considered is the potential effect of lighting across the site. In addition to the implementation of the 10m buffer, it is considered that the scale of this potential impact will be significantly reduced through the use of low-level light or directional lighting. Street- and flood-lighting will also use directional lighting where possible. The lighting proposed will minimise light spill onto the potential foraging routes (including the proposed flood attenuation facilities) and minimise potential disturbance caused through lighting of these corridors of movement.

5.6.19 A large number of the hedgerows are being retained as a result of the proposals, with large areas of habitat currently considered unsuitable for bat commuting or foraging being enhanced as a result

of the proposals. It is therefore considered that the proposals could have a positive impact on the available foraging/commuting habitat within these areas.

Birds

5.6.20 To avoid disturbance to breeding birds, where vegetation is to be removed it will be removed prior to the bird-breeding season (March to August/Sept). If this is not possible, vegetation will be checked prior to removal by an experienced ecologist. If active nests are found, vegetation will be left untouched until all birds have fledged. Specific advice will be provided prior to undertaking the clearance. This would be a statutory requirement due to the protection of all nesting birds and their nests under the Wildlife and Countryside Act, 1981. A suitably qualified ecologist would supervise this.

5.6.21 If an active bird nest is found in vegetation or other feature/habitat to be removed, the area would be retained and clearance operations would recommence only when the nest is no longer in use.

Management Plan

5.6.22 A biodiversity management plan will be produced for all habitats retained and created for nature conservation purposes. The plan will be produced in consultation with the LPA and statutory and non-statutory consultees to ensure that all aspects of site management are included within the plan. Where possible the long-term management of the site will be carried out in consultation with an organisation with a proven track record of managing areas to maximise their nature conservation potential.

Habitat Enhancement

5.6.23 The proposals include the provision of a Green Infrastructure package, which incorporates the majority of existing hedgerows and includes significant additional planting in the east and north of the site. Further benefit will be achieved through the creation of swales and a surface water detention basin in the north east.

5.6.24 Habitat creation and enhancement opportunities presented within the GI are driven by a number of factors including:

- a requirement to compensate for very minor loss of habitat and, where possible, ensure that there is a net gain in biodiversity arising as a result of the development
- a desire to benefit Local Biodiversity Action Plan targets;
- the maintenance of habitat corridors through the site and incorporation of significant additional habitat links around the site;
- and the presence of existing features of interest that would benefit through sympathetic management.

5.6.25 The nature of the site being intensively managed arable land provides a significant opportunity to provide enhancement through the creation of a greater variety of habitat types. The following habitats will be created as part of the proposals and should be read in conjunction with the Landscape Framework plan.

Woodland, Scrub and Hedgerows

5.6.26 New hedgerows and scrub habitat would be created within public open space and within the GI, located in the north and east of the site, which will provide a habitat corridor around the site. Shrub

species would be based on the composition of existing hedgerows bounding and within the site. Existing hedgerows would be maintained as they provide sheltered corridors for wildlife to move along; encouraging dispersal throughout a site. Hedgerows already provide good structural diversity and associated under-storey vegetation adds more variety to the habitat. This may be sustained through appropriate management with the aim of maintaining continuous hedgerows at least 3-4m wide.

5.6.27 Hedgerow planting, based on the mix below would use a range of fruit bearing species particularly attractive to flocks of winter thrushes and foraging mammals. Hedgerows would be planted to ensure at least five species per 30m stretch and to ensure that the total length of hedgerow within the site is increased. As these are to be species rich hedgerows, they would more than compensate for those loses within the site.

5.6.28 Hedgerows management would be of low intensity and carried out during late winter to allow wildlife to take advantage of fruits and berries.

5.6.29 New woodland/structure planting will be undertaken in order to increase connectivity the existing woodland. The planting mix would be representative of local woodlands and based on ground/soil conditions. Little management would be undertaken initially to ensure that the area is as little disturbed as possible although some thinning/coppicing/pollarding may be required in time to encourage the development of structurally diverse woodland.

5.6.30 Where new tree and shrub planting within the structural landscaping and GI is to be undertaken, native species will be used wherever possible to ensure target for the creation of native woodland. Where possible, all tree and shrub plant material would be sourced locally to ensure the retention of genetic diversity unique to the area.

5.6.31 The creation of significant areas of woodland and scrub is likely to lead to be of beneficial impact at a local scale.

Grassland

5.6.32 Grassland habitats would be created in the north east of the site in association with and around surface water detention basins. The grassland would be created using a neutral grassland wildflower mix based on the NVC MG5 community or, if subject to more water-logged conditions, the NVC MG4 community. Once seeded the grassland will be left to develop naturally under a sympathetic cutting regime.

5.6.33 The aim of grassland enhancement will be to allow the development of a varied species-rich sward to develop over time. Management should generally of a low intensity throughout much of the area allowing the development of a patchy network of grasslands of varying sward heights. This will provide the structural and microhabitat diversity required by a range of species including a number of the invertebrates and small mammals.

5.6.34 As with neutral grassland areas within the main body of the site, road verges will be seeded with with an appropriate flowing lawn mix such as the Emorsgate Flowering Lawn Mix EL1 or a fine grass mix to allow natural establishment of a more diverse sward. Mowing regimes will vary between a once annual, twice annual and more frequent cutting regime where required.

SUDS Wetland

5.6.35 The primary function of the surface water drainage system will be to control flows and reduce the potential for pollution of the aquatic environment. However, It is important that SUDS are

considered holistically and that each element is recognised as part of a network of habitats and potential wildlife corridor.

5.6.36 A significant opportunity exists in association with surface water attenuation proposals to provide a range of habitats. Principles followed will include:

- Where possible, SUDS will be located so plants and animals can naturally colonise new features, such as by siting next to existing linear features or ditches.
- Well vegetated shallow bays will be created allowing the establishment of areas of marsh.
- Smoothly finished surfaces would be avoided; although they give the impression of tidiness they provide less micro habitat diversity for plants and animals.
- If planting is essential, such as for the earlier phases ensure only native plants of local origin are used.

5.6.37 The attenuation facilities and other wetland feature should ideally include permanent open water set within a mosaic of adjacent habitats. The ponds should be shaped to provide a range of bank angles and heights. Gradients will vary from 15º - 25º from horizontal and will be enhanced by the excavation of small embayments. This will create differing conditions of light and temperature and will thus encourage diversification in the flora and associated fauna. Variations in water depth will be created from shallows to deeper pools (50mm – 1000mm) to enhance nature conservation value and to maximise the development of biodiversity. The shallowest areas will grade into an expanse of seasonally wet mud that may attract a variety of invertebrates and plants, which will, in turn, attract other fauna including birds and mammals.

5.6.38 The attenuation pond will largely be supplied by rainfall and surface water run-off and thus would allow for seasonal variations in water level. It is envisaged that a range of peripheral communities including wet grassland, marsh and wet (carr) woodland will be established, and provide a gradual transition to drier habitats. The greater habitat diversity and extent of edge habitat is likely to

provide good invertebrate habitat throughout the season and therefore provide a potentially important foraging resource for wildlife.

5.7 ASSESSMENT OF RESIDUAL AND CUMULATIVE EFFECTS

5.7.1 The residual effects consider the effects after the incorporation of mitigation measures. In the context of ecological assessment, many of these measures are incorporated as an integral part of the scheme design. This iterative process has resulted in the Proposed Development being designed and modified to take account of the surveys and assessments undertaken. This has enabled the extent and scale of the potential adverse effects to be continually appraised as part of the evolving masterplan and scheme design.

5.7.2 The design approaches adopted have included measures to avoid or reduce potentially significant adverse effects arising from the Proposed Development, such as through the incorporation of all hedgerows and only limited losses for site access. Significant additional planting and habitat creation is also proposed to ensure that the further nature conservation value of the site is enhanced above that associated with it current agricultural state.

5.7.3 As a result of the above no significant adverse impacts are anticipated for the site.

Cumulative Ecological Effects

5.7.4 Cumulative effects arise as a result of a number of different factors and combined changes. These generally fall into two categories;

- Cumulative effects arising from a range of developments, occurring at different locations. Separately, such individual projects may not create an unacceptable degree of adverse impact but collectively the results may potentially be significant - simultaneous effects

- Cumulative effects caused by the Proposed Development in conjunction with other developments that occurred in the past, present or are likely to occur in the foreseeable future – successive effects

5.7.5 As identified in the first point above, cumulative or combined effects are principally those that are likely to arise when the development is considered in relation to other foreseeable developments either located in the immediate vicinity or that have a relationship with a similar environmental resource. Individually the impact of a development may be of minor magnitude but when combined with the impact from other developments could increase the overall significance of an effect on an environmental resource.

5.7.6 Cumulative effects require an understanding of the capacity of the receiving environment and whether critical thresholds would be exceeded by the combination of projects. Geographical limits and time implications are more important in assessing the cumulative effects than in assessing the specific environmental effects of the Proposed Development. Administrative boundaries are less important than those relating to the natural environment e.g. watersheds.

5.7.7 The results of this process would enable the local planning authority to ensure that this and future developments are mutually compatible and remain within the environmental capacity of the area considered.

5.7.8 The following sites have been considered:

- Bankside Phase 1 (Planning Ref. 05/01337/OUT) Land north east of Oxford Road, west of Oxford Canal and east of Bankside Banbury Oxon. Application for a spine road and associated drainage infrastructure accompanied by an Ecological Assessment (Aspect Ecology May 2014). No particularly valuable habitats or notable species were identified and no significant ecological effects were highlighted.

- Banbury 2 (Planning Ref. 13/0158/OUT) Land adjoining Foxhill and west of Southam Road Banbury. No ecological information reviewed.
- Banbury 2 (Planning Ref. 13/0159/OUT) Hardwick Farm east of Southam Road Banbury. No ecological information reviewed.
- Banbury 5 (Planning Ref. 12/01789/OUT) Land off Warwick Road north of Hanwell Fields Banbury Oxfordshire.
- Planning Ref. 13/01528/OUT OS Parcel 0063 north east of Crouch Hill Farm Adjoining Broughton Road.
- Banbury 3 (Planning Ref. 13/00444/OUT) Land north of Withycombe Farm west of Edinburgh Way Banbury.
- Banbury 6 (Planning Ref. 14/00066/OUT) Land off Dukes Meadow Drive, Hanwell Fields (North) Banbury.
- Planning Ref. 14/01188/OUT OS Parcels 1200 3100 2000 1981 south of Salt Way Bloxham Road Banbury.
- Planning Ref. 14/02156/OUT Land South of Cotefield Business Park Oxford Road Bodicote.
- Planning Ref. 14/01932/OUT OS Parcel 7400 adjoining and South of Salt Way Banbury.
- Planning Ref. 15/013266/OUT OS Parcels 6741 And 5426 west of Cricket Field north of Wykham Lane Bodicote Oxfordshire.
- Planning Ref. 16/00472/OUT S Grundon Services Ltd Merton Street.
- Planning Ref. 18/00293/OUT Caravan Park Station Approach, Banbury.

5.7.9 Consented development at Bankside Phase 1 is situated immediately to the north west of the site. The likely effects of the Proposed Development have been considered within the context of the completed Bankside Phase 1 and no significant cumulative effects are anticipated.

5.7.10 No other future projects allocated within development plans, having planning permission or awaiting consent have been identified during the preparation of this ES that would increase the likely significant effects of the Proposed Development.