6.0 Ecology

6.1 Introduction

This Chapter has been produced by WYG. It presents the baseline ecological information of the study area and its environs and assesses the likely impacts of the proposed development upon important ecological receptors identified within its zone of influence.

Appendices	Title
Appendix F1	Ecological Appraisal
Appendix F2	GCN Summary Report
Appendix F3	Reptile Summary Report
Appendix F4	Breeding Bird Report
Appendix F5	Barn Owl Letter Report
Appendix F6	Nightjar Report
Appendix F7	Bat Roost Assessment of Trees & Hibernation Survey
Appendix F8	Bat Emergence / Return Summary Report
Appendix F9	Bat Activity Summary Report
Appendix F10	Hazel Dormouse Report
Appendix F11	Badger Letter Report (Confidential)
Appendix F12	Terrestrial Invertebrate Survey
Appendix F13	Aquatic Invertebrate Survey
Appendix F14	White-Clawed Crayfish Survey
Appendix F15	Otter and Water Vole Survey
Appendix F16	Fungus Survey
Appendix F17	NVC Woodland Survey
Appendix F18	Ecological Mitigation and Management Plan
Appendix F19	Combined Ecological Mitigation and Management Principles
Appendix F20	Lighting Assessment
Appendix F21	Biodiversity Net Gain Assessment
Appendix F22	NVC Grassland Survey
Appendix F23	NVC Arable Plants Survey
Appendix F24	2019 Survey Summary

6.2 Scoping and Consultation

The scope of the Ecology Chapter can be summarised as assessment of potential effects on: designated sites; ecologically important habitats; and protected or notable species.

West Berkshire Council has previously provided a Scoping Opinion (*Appendix B2*) in connection with planning application reference 15/02300/OUTMAJ for the Sandleford Park strategic site allocation. Particular reference was made to the River Enborne and its protection in this Scoping Opinion.

The Local Planning Authority ecologist was fully involved with discussions relating to the application for the full strategic site allocation through attendance at design team meetings and liaison with WYG ecologists through email and telephone conversations and commented on the ecological surveys and the Ecology ES Chapter for that project. Meetings also took place with the Berks, Bucks and Oxon Wildlife Trust (31st March 2015 and 24th June 2015) in relation to that project. All of these previous comments are relevant to this planning

application and have been taken into consideration in this assessment of likely significant effects.

The Scoping Opinion also included a consultation response from Natural England who confirmed that the potential impacts upon features of nature conservation interest should be included within the assessment following the Chartered Institute for Ecology and Environmental Management's (CIEEM) Guidelines for Ecological Impact Assessment[1], hereafter referred to as the 'CIEEM guidelines'. The Natural England consultation response raised the potential for adverse effects upon Greenham Common SSSI as a key receptor which will be considered in the assessment.

In 2018, West Berkshire Council commissioned BSG Ecology to complete an initial ecology review of documents submitted for the Sandleford Park (18/00764/OUTMAJ) and Sandleford Park West (18/00828/OUTMAJ) planning applications. This ES Chapter addresses the comments received from BSG ecology (on the 21st May and 29th October 2018) as follows:

- National Planning Policy Framework (2019) – BSG ecology commented that it is now specified in the updated National Planning Policy Framework that development must deliver biodiversity net gain. Furthermore, the potential for those development proposals to achieve biodiversity net gain was recognised. It is considered that this potential has not changed for the development proposals assessed in this chapter.
- Quantitative assessment of net gain – It was identified that no formal objective / measurable assessment was made to quantify biodiversity net gain. This has now been completed as is included as *Appendix F21* to this chapter.
- Impacts on ancient woodland have now been re-assessed in line with new guidance from the Forestry Commission and Natural England published in 2018[2] (see *Section 6.6.1*).
- Additional information has also been provided regarding detailed botanical surveys of the marshy grassland, and the potential for hydrological impacts on springs and seepages, as well as specific measures of filtration and trapping of silts and pollutants (in accordance with *Chapter 11 – Water Resources*).

In addition, comments made within the Reasons for Refusal for earlier applications (see *Chapter 1*) have also been taken into consideration.

6.3 Assessment Methodology

The impact assessment for ecology has been carried out in accordance with the CIEEM guidelines.

The starting point for the assessment of impacts is to determine which features should be subject to detailed assessment. These will be ecological receptors considered to be important and likely to be affected by the project.

[1] CIEEM, (2018), Guidelines for Ecological Impact Assessment in the UK and Ireland: Terrestrial, Freshwater, Coastal and Marine version 1.1, CIEEM: Winchester.

[2] Forestry Commission and Natural England, (2018), Ancient woodland, ancient trees and veteran trees: protecting them from development, [online] Available at https://www.gov.uk/guidance/ancient-woodland-and-veteran-trees-protection-surveys-licences, Accessed December 2018.

This approach is consistent with the 2011 EIA Regulations, which only require investigation of likely significant effects. A summary of the key points from the relevant guidance, as relevant to this assessment, is provided below.

6.3.1 Geographic Context

The CIEEM guidelines recommend that the value of ecological receptors or features is determined based on a geographic frame of reference that includes the following levels:

- International – Special Protection Areas (SPA), Special Areas of Conservation (SAC), Ramsar Sites, etc;
- National – Sites designated at UK level, e.g. Sites of Special Scientific Interest (SSSI);
- Regional – Habitats or populations of species of value at a regional (i.e. south England) level;
- County – Designated Sites, such as Wildlife Heritage Sites (WHS) and Sites of Importance to Nature Conservation (SINCs), or habitats / species populations of value at a county (i.e. West Berkshire) level;
- Local – Habitats or species populations of value in a local context.
- Negligible – Habitats or species populations that are not considered to be valuable within the context of this assessment.

6.3.2 Habitats

In accordance with the CIEEM guidelines, the importance of habitats is measured against published selection criteria where available. Reference is also made to the list of habitats of principal importance in England and Wales, Priority Habitats and local Biodiversity Action Plans (BAPs). In accordance with the guidance, where important habitats are in a sub-optimal condition, their potential value should be considered.

6.3.3 Species

In accordance with the CIEEM guidelines, when assigning a level of value to a species, it is necessary to consider its distribution and status, including a consideration of trends based on available historical records. Rarity is an important consideration because of its relationship with threat and vulnerability although since some species are inherently rare, it is necessary to look at rarity in the context of status. A species that is rare and declining should be assigned a higher level of importance than one that is rare but known to be stable.

Reference is also made to the list of species of principal importance in England and Wales and local Biodiversity Action Plans (BAPs). Legally protected species are considered important where there is potential for a breach of relevant legislation.

6.3.4 Predicting and Characterising Ecological Impacts

In accordance with the CIEEM guidelines, when describing impacts, reference is made to the following, where applicable:

- Positive / Adverse – whether an impact improves or reduces the quality of the receptor.

- Extent – the area over which an impact occurs.
- Duration – the time for which an impact is expected to last.
- Magnitude – the size or intensity of the impact.
- Reversibility – a permanent impact is one that is irreversible within a reasonable timescale or for which there is no reasonable chance of action being taken to reverse it; a temporary impact is one from which a spontaneous recovery is possible.
- Timing and frequency – whether impacts occur during critical life-stages or seasons.

6.3.5 Direct and Indirect Ecological Impacts

Both direct and indirect impacts are considered within this assessment. A direct impact is directly attributable to a defined action such as the physical loss of a habitat or the immediate mortality of an individual of a particular species. Indirect impacts are attributable to an action, but which affect ecological resources through effects on an intermediary ecosystem, process or receptor. An example of an indirect effect would be the loss of an important prey species for a predator.

6.3.6 Approaches for Determining Significant Impacts

In accordance with the CIEEM guidelines, a significant impact, in ecological terms, is defined as an impact which either supports or undermines the conservation objectives for important ecological features or for biodiversity in general.

In accordance with the CIEEM guidelines, the approach adopted here aims to determine if an impact is significant or not on the basis of a discussion of the factors which characterise it – i.e. the ecological significance of an impact is not dependent on the value of the feature in question. The value of any feature that will be significantly affected is used to determine the geographical scale at which the impact is significant. For example, an ecologically significant impact on a feature of value at county level is regarded as a significant impact at county level. This in turn is used to determine the implications in terms of legislation, policy and / or development control.

As noted above, impacts are only assessed in detail for receptors of sufficient value where impacts upon them may be significant (in terms of legislation or policy).

Significant impacts remaining after mitigation (the residual impacts), together with an assessment of the likelihood of success in the mitigation, are the factors to be considered against legislation, policy and development control in determining the planning application.

In order to allow this assessment to be compared with the other chapters in this Environmental Statement (as the CIEEM guidelines actively '*avoids and discourages use of the matrix approach*') a subjective matrix to achieve this is shown in *Table 6.1* (for illustrative purposes only).

For the avoidance of doubt, the CIEEM guidelines-based impact statements are the measure by which this assessment should be considered.

Table 6.1 – Significance of Effect							
		Sensitivity of Receptor (geographical)					
		International	National	Regional	County	Local	Negligible
Magnitude of Effect	High	Substantial	Substantial	Substantial	Substantial	Moderate	Negligible
	Medium	Substantial	Substantial	Substantial	Moderate	Minor	Negligible
	Low	Substantial	Substantial	Moderate	Minor	Minor	Negligible
	Negligible	Negligible	Negligible	Negligible	Negligible	Negligible	Negligible

Note that sensitive receptors which have been assessed in detail due to their legal protection only, have been assigned as Nationally sensitive, as that is the level at which the legislation is applicable.

The magnitude of an effect has been determined, based on the following scale:

- **High**: This could comprise, for example, an effect resulting in a permanent change in the condition or favourable conservation status of a receptor; an effect leading to a breach of legislation and / or an effect resulting in a long-term or permanent change in the geographic scale at which a receptor would be valued under CIEEM guidelines.
- **Medium**: This could comprise, for example, an effect resulting in a long-term or temporary change in the condition or favourable conservation status of a receptor; an effect contrary to national biodiversity targets or policy and / or an effect resulting in a short-term or temporary change in the geographic scale at which a receptor would be valued under CIEEM guidelines.
- **Low**: This could comprise, for example, an effect resulting in a short-term (reversible) change in the status of a receptor; an effect contrary to local biodiversity targets or policy and / or an effect resulting in no change in the geographic scale at which a receptor would be valued under CIEEM guidelines.
- **Negligible**: An effect not considered to be significant under CIEEM guidelines.

6.4 Baseline Conditions

The site has been subject to a number of desk-based, floral and faunal surveys between 2008 and 2019. Surveys have been completed by WYG over an 11-year period, providing a robust understanding of the ecological receptors within the site. Factual reports presenting the full details of the most recent surveys are provided in the appendices. However, a summary of their key findings is presented in this chapter to inform the valuation of important receptors and impact assessment.

6.4.1 Designated Sites

Desk-based consultation was updated in December 2017 with Thames Valley Environmental Records Centre (TVERC) and Hampshire Biodiversity Information Centre (HBIC). The MAGIC database was consulted for details of statutory designated sites within 20km of the site, and records of granted EPSL.

A range of legally protected and locally designated sites and legally protected and priority species records were returned for a 2km radius surrounding the centre of the site. The full

details are provided in *Appendix F1*. The relevant records for designated sites are summarised below (statutory sites are given in *Table 6.2* and non-statutory sites in *Table 6.3*). Species records are summarised in the subsequent species-specific sections.

Table 6.2 - Statutory Designated Sites

Site Name	Distance / direction	Reason for designation	Value
Greenham & Crookham Commons SSSI	400m east of the site	This site comprises an extensive complex of heathland, grassland, gorse scrub, broadleaved woodland and alder-lined gullies. The site also includes one large ancient coppiced woodland, Peckmoor Copse. The heathland and acid grassland at this site make up the single largest tract of these habitats in Berkshire.	National
River Kennet SSSI	1.8km north of the site	As well as having a long history of being managed as a chalk stream predominantly for trout, the Kennet has been further modified by the construction of the Kennet and Avon Canal. The flora of the River Kennet is species-rich and diverse, having the highest average number of species per site surveyed of any other lowland river in Britain. Aquatic invertebrates are abundant and the Kennet is especially noted for its large hatches of mayflies (Ephemeroptera).	National
Avery's Pightle SSSI	3km north-east of the site	Avery's Pightle consists of a small, flat, low-lying field supporting a species-rich unimproved meadow community *(Cynosurus cristatus-Centaurea nigra)* meadow and pasture community. A total of 24 species of grass and 113 species of herb have been recorded from this small field. Of these 12 are plants normally confined to ancient grasslands within southern England.	National
Redhill Wood SSSI	3.6km west of the site	Redhill Wood has a diverse range of stand-types. A narrow band of lowland birch-pedunculate oak woodland, in which sweet chestnut is a major component at the southern edge, grades into acid birch-ash-lime woodland on the lower slopes the largest example of this stand type in Berkshire. The flora is exceptionally rich. Over 120 species of woodland vascular plants have been recorded. Lower plants are well represented, and the moss and liverwort flora are thought to display affinities with woodlands in both the New Forest and the Weald.	National
Kennett Valley Alderwoods SSSI	2.5km north-west of the site	These woodlands are the largest remaining fragments of damp, ash-alder woodland in the Kennet floodplain. The SSSI includes two woods, the Wilderness and part of Ryott's Plantation. The woods are important because they support a great diversity of plants associated with this woodland type and display a complete transition from open water and swamp through to relatively dry woodland. Floodplain woodlands exhibiting this complete transition are rare throughout Europe.	National

Herbert Plantation LNR	1.6km south of the site	Herbert Plantation is a mixed woodland of oak, birch, alder and pine. It provides a public amenity for nature conservation, quiet recreation and education.	Regional
Thatcham Reedbeds LNR	3km north-east of the site	An emblematic species for the site is the tiny and nationally rare Desmoulin's whorl snail which is thriving in the reed-fen areas of the reserve. The Reedbeds are also important for a number of breeding birds including the recent British colonist Cetti's warbler. Over 14 species of dragonfly and damselfly have been seen in the reedbeds and at least six are thought to breed here. These include migrant hawkers, emperor and four-spotted chaser dragonflies, as well as common blue, azure and red-eyed damselflies.	Regional
North Wessex Downs AONB	2.27km south-west of the site	Covering the arable farmland of the Marlborough Downs with their beech wood topped knolls and sheltered chalk river valleys, the intimate and secluded woodland of Chute and Savernake Forests, and the low-lying land of the Thames Basin Heaths with a rich mosaic of woodland, pasture, heath and common land.	National

Table 6.3 - Non-Statutory Designated Sites

Site Name	Distance / direction	Reason for designation	Value
High Wood complex – Barn Copse Wildlife Heritage Site (WHS) (ancient woodland)	On site	Barn Copse comprises sycamore invaded oak woodland and some wet alder woodland. Sessile oak is present in this woodland. This woodland is an ancient broadleaved semi-natural woodland.	County
High Wood complex – Gorse Covert WHS	On site	Gorse Covert has a typical flora for an acidic woodland with oak, ash, birch, rowan, as well as sycamore, bracken and gorse at the edges and species such as foxglove and wood sage.	County
High Wood complex – Crook's Copse WHS (also ancient woodland)	On site	Crook's Copse is oak and ash woodland with extensive sycamore invasion and a shrub layer of holly and hazel. There is an area of wet alder woodland along a stream and flushes are found in this area along with wet woodland species such as opposite leaved golden saxifrage. This woodland is an ancient broadleaved semi-natural woodland.	County
High Wood complex – High Wood WHS (also ancient woodland)	On site	High Wood is dominated by oak and birch with sycamore present in places, some sweet chestnut coppice and some conifer plantation. There are also a number of wet flushes, and alder buckthorn has been recorded in one near the southern edge. High Wood is ancient broadleaved semi-natural woodland.	County
High Wood complex – Dirty Ground Copse WHS (also ancient woodland)	On site	Dirty Ground Copse has a similar composition to the other woods and has abundant sycamore, and wet flushes. This woodland is an ancient broadleaved semi-natural woodland.	County

High Wood complex – Slockett's Copse WHS (also ancient woodland)	On site	Slockett's Copse is also an ancient oak woodland with some birch, some mature ash and sycamore some of which has been coppiced. Springs and flushes are also present on the valley sides.	County
High Wood complex – Waterleaze Copse WHS (also ancient woodland)	On site	This site is an area of semi-natural woodland with the central area included as ancient woodland on the Ancient Woodland Inventory. There is a wet alder woodland adjacent to the River Enborne and extending northwards along a stream in the east. These areas also have ash, sycamore, downy birch and crack willow. The eastern area has some oak, beech and hornbeam. The drier parts of the site are largely acidic oak woodland with birch and sycamore. The understory is dense holly, rowan and hazel and the ground flora is dominated by bracken and creeping soft-grass with honeysuckle, wood sorrel and wood sage. The eastern areas are less acidic and there is some ash and sycamore dominated woodland with hornbeam.	County
Corporation Copse WHS	Directly west of the site	This small, open copse lies to the south of Newbury and is within the close vicinity of several other small copses, of which, one is marked on the Ancient Woodland Inventory as Ancient and Semi-natural woodland. A defunct wire fence surrounds the copse with a ditch and shallow stream to the east and west, and the River Enborne forms part of the southern boundary. The canopy is open with relatively young silver birch with oak and an understorey of hazel. The field layer appears acidic with creeping soft-grass, bluebell and wood sorrel. Towards the south, alder is present.	County
Brickkiln Copse WHS	On site	A broadleaved copse lying to the south of Newbury with an area of wet woodland and a south-running stream. The main canopy species varies with dry acidic areas with oak, silver birch and rowan, and a field layer of creeping soft grass, bracken and foxglove. Other areas have hornbeam and beech in the canopy with hazel. Further south the copse becomes wet where alder is present with some wetland species including small stands of lesser pond sedge and wood-club rush. The wet woodland areas have affinities to both W7 and W5 NVC communities. Twenty-three ancient woodland indicators have been recorded at the copse, including bluebell, primrose, hard fern, yellow pimpernel and opposite-leaved golden saxifrage.	County
Falkland Farm Meadow East SINC (Site of Importance for Nature Conservation)	Directly south of the site	Comprising agriculturally unimproved grasslands and fens, flushes, seepages, springs, inundation grasslands etc. that support a flora and fauna characteristic of unimproved and waterlogged (seasonal or permanent) conditions.	County
Oakleaze Farm Meadow SINC	Directly south of the site	Comprising agriculturally unimproved grasslands and fens, flushes, seepages, springs, inundation grasslands etc. that support a flora and fauna characteristic of unimproved and waterlogged (seasonal or permanent) conditions.	County

Falkland Farm Meadow 5 SINC	320 m south west of the site	Comprising agriculturally unimproved grasslands and fens, flushes, seepages, springs, inundation grasslands etc. that support a flora and fauna characteristic of unimproved and waterlogged (seasonal or permanent) conditions	County
Wood Fen, Oakleaze Farm SINC	100 m south of the site	Comprising agriculturally unimproved grasslands and fens, flushes, seepages, springs, inundation grasslands etc. that support a flora and fauna characteristic of unimproved and waterlogged (seasonal or permanent) conditions	County
Alder Field Fen SINC	100 m south of the site	Comprising agriculturally unimproved grasslands and fens, flushes, seepages, springs, inundation grasslands etc. that support a flora and fauna characteristic of unimproved and waterlogged (seasonal or permanent) conditions	County
Enborne Meadow SINC	90 m south of the site	Comprising agriculturally unimproved grasslands and fens, flushes, seepages, springs, inundation grasslands etc. that support a flora and fauna characteristic of unimproved and waterlogged (seasonal or permanent) conditions	County
Un-named woodland (ancient woodland)	On site	National Inventory Habitat & Priority Habitat	County

6.4.2 On-site Habitats

An Extended Phase 1 Habitat Survey was originally conducted in June 2008 in accordance with Joint Nature Conservation Committee guidelines[3]. This has been subsequently updated a number of times; May 2011, April 2013; August 2016 and November 2017. Due to the potential for notable plant species to be present in the woodland and grassland, a woodland botanical and grassland botanical survey of the site was completed during May and July 2014 respectively. These surveys were supplemented by botanical surveys for arable plants, grassland and woodland habitats in 2018. All accessible areas of the site were investigated including a 50m radius where access was possible. Full descriptions of the habitats found are provided in *Appendix F1*, *F17*, *F22* and *F23*. In summary, the following Phase 1 habitat types were recorded on site (listed in order of size with largest habitat type first):

- Semi-natural broadleaved woodland – All woodlands are 'lowland mixed deciduous woodland' HPI with the exception of an area of 'wet woodland' HPI within the floodplain. All are designated at a county level as Wildlife Heritage Sites (WHS).
- Dense scrub.
- Scattered scrub.
- Bracken.
- Marshy grassland (a small area of 'purple moor grass and rush pastures' HPI has been identified during 2018 update surveys).
- Neutral semi-improved grassland.
- Acidic semi-improved / improved grassland.

[3] JNCC, (2003), Handbook for Phase 1 habitat survey – a technique for environmental audit, JNCC: Peterborough.

- Running water – The River Enborne and flowing water on site qualifies as a habitat of principal importance (HPI).
- Standing water.
- Arable.
- Species-poor hedgerows.
- Species-rich hedgerows – two hedgerows are likely to be considered Important under Hedgerow Regulations 1997[4] (see Hedgerow A and F, Figure 1, Appendix A of *Appendix F1*).
- Buildings.

Semi-natural broadleaved woodland

The woodlands on site (Crook's Copse, Barn Copse, Slockett's Copse, High Wood, Dirty Ground Copse, Gorse Covert and Waterleaze Copse) conform to W10 Pedunculate Oak – Bracken – Bramble Woodland although Waterleaze Copse also contains a stand of W6 Alder – Stinging Nettle Woodland alongside the River Enborne.

All of the woodland areas have previously been designated as Wildlife Heritage Sites and they still merit this designation as all still qualify as Ancient Woodland. The numbers of ancient woodland indicator species per woodland are as follows:

- Crook's Copse – 22
- Barn Copse – 16
- Slockett's Copse – 15
- High Wood – 14
- Dirty Ground Copse – 17
- Gorse Covert – 8
- Waterleaze Copse – 25
- Brickkiln Copse – 24

Two plant species were recorded that have restricted distributions in Berkshire: thin-spiked wood sedge was recorded in Dirty Ground Copse and Waterleaze Copse whilst lateral cryphaea (a species of moss) was recorded in the latter woodland (see *Appendix F17*). The 2018 surveys did not record any substantive changes to habitats, when compared with survey data from 2017 (see *Appendix F17*).

As such, all the woodlands on site are considered to be of value at a **County** level.

Dense scrub/scattered scrub/bracken

These habitats have some suitability to support protected or notable species such as nesting birds, however they are not botanically diverse and comprise common and widespread

[4] The National Archives, (1997), The Hedgerow Regulations, [online] Available at http://www.legislation.gov.uk/uksi/1997/1160/contents/made, Accessed December 2018.

species. They do not qualify as HPIs and are considered to be of **Negligible** value for the purposes of this assessment.

Marshy grassland

The surveys of marshy grassland areas in 2014 found that the habitats present did not directly conform with HPI definitions (A*ppendix F1*). These areas were resurveyed in 2018 (see *Appendix F22*).

The 2018 surveys found that the marshy grasslands included some uniform species-poor Yorkshire fog dominated grasslands on the drier ground, mixed soft rush pastures on the wetter ground and diverse sharp-flowered rush stands on the flat valley bottoms on the wettest soils.

The sharp-flowered rush stands were representative of the vegetation type M23 *Juncus effusus/acutiflorus* (rush species) – *Galium palustre* (marsh bedstraw) rush-pasture which forms part of the Purple Moor Grass and Rush Pastures HPI. The other marshy grassland types were generally regarded as a modified grassland types of lower botanical interest.

The small area of Purple Moor Grass and Rush Pastures HPI along the valley bottoms at Sandleford (0.445 ha) contains 16% of the known Berkshire resource of this habitat. This is therefore assessed as being of **County** importance.

Neutral semi-improved grassland

The neutral semi-improved grassland present along the eastern boundary of the site is semi-improved grassland and not typically species-rich for a hay meadow and hence is not considered to qualify as an HPI (*Appendix F18*). It is therefore considered to be of **Negligible** value for the purposes of this assessment.

Acidic semi-improved grassland

The acidic grassland at the site has generally been modified and degraded from intensive grazing and hence does not meet the 'lowland acidic grassland' HPI criteria (*Appendix F18*). However, it does have the potential for recovery given suitable management and is therefore considered to be of value at a **Local** level.

Running water

The River Enborne and flowing streams on site are likely to qualify as HPIs under the 'rivers' criteria. As such they are considered to be of value at a **Local** level. Included in this feature valuation is the ditch network on the site, which would also be of Local importance.

The site also supports springs and seepages. These are not valued as receptors but are considered as abiotic factors in *Chapter 11* (Water Resources) and in this chapter regarding the habitats they create and support i.e. marshy grassland.

Standing water

Eight ponds are located on site with a further four within 500m of the site. Ponds are listed as an HPI, as such the standing water on site is considered to be of value at a **Local** level.

Arable

Surveys for arable weeds have been completed in 2011, 2014 and 2018. A combined summary of all the previous results is provided in *Appendix F23*.

The results show that the 10 arable fields within the site have been found to support a total of 13 species of arable weed as categorised by Wilson and King (2003), with a maximum of five in any one field. None of the species found are protected under Schedule 8 of the Wildlife and Countryside Act 1981 (as amended)[5]. Four of the species are listed in the Rare Plant Register for Berkshire[6] (great brome *Anisantha diandra*, sharp-leaved fluellin *Kickxia elatine*, field madder *Sherardia arvensis* and field pansy *Viola arvensis*). Furthermore, one species has an IUCN threat category of greater importance than Least Concern. This is field woundwort (*Stachys arvensis*) which is Near Threatened.

The combined results show that the site is not rich in arable weeds and would be of **Local** value.

Species-poor and species-rich hedgerows

A large number of hedgerows are present on site. These form the boundaries of most fields across the site. The majority of hedgerows were species-poor and many were heavily managed through regular cutting. Two hedgerows, A and F (Figure 1, *Appendix F1*) were considered likely to be 'Important' under the Hedgerow Regulations due to the presence of an average of seven woody species in a 30m section and qualify as HPIs under 'hedgerows' criteria.

Due to the presence of species-rich and 'Important' hedgerows, the hedgerow network is considered to be of value at a **Local** level.

6.4.3 Protected and Notable Species

Great crested newt (including other amphibians)

There are two records of palmate newt and 16 records of great crested newt within 2km radius of the site. The closest record of a great crested newt is at Greenham Common SSSI, approximately 720 metres to the east of the site. Great crested newts are an EPS and SPI.

Great crested newt presence / likely absence surveys were completed for six ponds considered suitable in 2011 and 2013. These were undertaken in accordance with the

[5] The National Archives, (1981), Wildlife and Countryside Act 1981, [online] Available at https://www.legislation.gov.uk/ukpga/1981/69/schedule/8, Accessed December 2018.

[6] Crawley, M.J., (2005), Rare Plant Register: Berkshire and South Oxfordshire, V.C. 22., [online] Available at http://bsbi.org/wp-content/uploads/dlm_uploads/Berkshire_RPR_2005.pdf, Accessed December 2018.

methodology outlined in the Great Crested Newt Mitigation Guidelines[7]. This was supplemented by an Environmental DNA (eDNA) survey in 2017 in accordance with Natural England approved survey protocol (see *Appendix F2*).

The eDNA surveys were repeated in 2019 and were followed by six population estimate surveys following a positive result from Pond 1. The population estimate surveys were all negative for great crested newt and so the eDNA test result was considered to be a false positive. The details of the 2019 surveys and justification for the concluding that the eDNA test result from Pond 1 was erroneous are included in *Appendix F24*.

No great crested newts were recorded on any survey. Therefore, they are not currently considered to be present on the site and it is of **Negligible** value for the species.

Reptiles

All four common species of reptiles have been recorded within 2km of the site; these include slow worm, common lizard, grass snake and adder. All these species are protected under the W&CA and recognised as Species of Principal Importance (SPI). The closest record of slow worm is approximately 0.4km to the north of the site and the closest records of common lizard, grass snake and adder derive from approximately 1km to the north-east of the site.

Reptile presence / likely absence surveys were completed on site in 2011 2014, 2017, 2018 and 2019. The 2019 surveys were of the area known as DPN1 only. These were undertaken in accordance with the guidance outlined in the Herpetofauna Workers' Manual[8] and Advice Sheet 10 – Reptile Survey[9]. This consisted of placement of artificial refuges in suitable habitat followed by seven survey visits (*Appendix F3* and *Appendix F24*).

In 2011, low populations of slow worms and grass snakes were recorded at the site. The same size of slow worm and grass snake populations were again recorded in 2014, however a low population of common lizards was also found. In 2017, a low population of grass snake was recorded to the north of the site. In 2018, surveys found breeding but low populations of grass snake and slow worm. The results from the 2019 survey described in *Appendix F24* also found low populations of grass snake in DPN1.

The reptile population on the site is considered to be Negligible value given that there is a large amount of similar habitat connected to the site, the number of previous records within 2km and because reptiles are considered to be widespread in the south of England (as per Natural England's Standing Advice Species Sheet, 2011). However, reptiles are considered an important receptor at a **National** level due only to the potential for a breach of legislation (W&CA).

Birds

Seventeen records of bird species within 2km of the site were returned by HBIC and TVBRC. Of these, one species, kingfisher is protected under Schedule 1 of the W&CA (excluding barn

[7] English Nature, (2001), Great Crested Newt Mitigation Guidelines, English Nature: Peterborough.

[8] Gent, T. and Gibson, S., (2003), Herpetofauna Workers' Manual, JNCC: Peterborough.

[9] Froglife, (1999), Froglife Advice Sheet 10: Reptile Survey – An introduction to planning, conducting and interpreting surveys for snake and lizard conservation, [online] Available at http://www.froglife.org/wp-content/uploads/2014/01/FAS_10.pdf, Accessed December 2018.

owl which was assessed separately); and several are Birds of Conservation Concern (BoCC) Red species and SPI; tree pipit, European nightjar, spotted flycatcher, willow tit, marsh tit, song thrush and house sparrow.

Breeding bird surveys were completed in 2011, 2013, 2015 and 2018. Each consisted of four visits between March and June based on a combination of the Common Birds Census (CBC) and Breeding Bird Survey (BBS) as described by Gilbert *et al.* (1998)[10] (*Appendix F4*).

There were 63 species recorded on site during the 2011-2015 surveys, 38 of which were considered to be breeding on site.

- Three WCA Schedule 1 species were recorded within the survey area:
    - Woodlark – no breeding confirmed although two singing males recorded during the first survey in April 2015.
    - Kingfisher – no breeding confirmed but individual seen searching for a nest site in April survey 2015.
    - Red Kite – suspected breeding due to frequent presence, not proven.
- Although not recorded during the breeding bird surveys breeding barn owls were confirmed in 2011 and 2013 (see separate section on barn owl below).
- Nine red list BoCC species (Eaton *et al.*, 2015)[11], were recorded within the survey area, of which five were considered to be breeding: lapwing, linnet, skylark, song thrush and starling. All of these species are SPI.
- Seventeen amber list BoCC species were recorded within the survey area, of which ten were considered to be breeding: dunnock, bullfinch, green woodpecker, kestrel, little grebe, stock dove, mistle thrush and mallard. Red kite is also considered likely to be breeding. Dunnock and bullfinch are both SPI.
- Thirty green listed BoCC species were recorded on site of which twenty five were considered to be breeding: blackbird, blackcap, robin, wren, blue tit, great tit, nuthatch, treecreeper, jackdaw, rook, carrion crow, jay, woodpigeon, pied wagtail, chaffinch, long-tailed tit, chiffchaff, coot, little grebe, moorhen, magpie, goldcrest, great spotted woodpecker, goldfinch, tawny owl, greenfinch and sparrowhawk.
- Three species recorded are not classified under the BoCC, there are: Egyptian goose, pheasant and red-legged partridge of which pheasant and red-legged partridge are considered to be breeding but are artificially reared and released on site
- There were 42 species recorded during the 2018 surveys, 33 of which were found to be breeding on site. These comprised 12 notable breeding species and 21 widespread and common species. There was one new species recorded in 2018 compared to previous survey results. This was garden warbler which is a common and widespread species with no legal protection or elevated conservation status. This increased the total number of breeding species for the site to 39. This does not represent a significant change in the species assemblage for the site.

[10] Gilbert, G., Gibbons, D.W. and Evans, J., (1998), Bird Monitoring Methods, RSPB: Bedfordshire.

[11] Eaton, M., Aebischer, N., Brown, A., Hearn, R., Lock, L., Musgrove, A., Noble, D., Stroud, D. and Gregory, R., (2015), Birds of conservation concern 4: the population status of birds in the UK, Channel Islands and Isle of Man, British Birds, 108:708-746.

Fuller (1980)[12] described a method for assessing the ornithological interest of sites, whereby the importance of a site is defined by the number of breeding species present. Since the publication of this method, further declines of bird species have been recorded causing an adaption to the level of importance to be issued. This adapted criterion is shown in *Table 6.4*.

Table 6.4 - Site importance by number of breeding bird species

Number of breeding bird species	Site Importance
<25	Local
26-49	District
50-69	County
70-84	Regional
>85	National

Thirty-nine native bird species were confirmed or probably breeding within the site boundaries (two more confirmed breeding were non-native). According to *Table 6.4* above the assemblage would be assessed at the District level. However, this is not a recognised frame of reference under the CIEEM 2018 EcIA Guidelines, therefore for the purposes of this assessment the site is considered to be of **Local** value for breeding birds.

Barn owl

Assessments of potential barn owl nesting sites have been carried out in 2011, 2013, 2016, 2017, 2018 and 2019. Barn owl activity surveys have been completed in 2011, 2013, 2014, 2018 and 2019. Surveys were based on methods recommended in the RSPB Bird Monitoring Methods guidance (Gilbert *et al.*, 1998)[13] (*Appendix F5* and *Appendix F24*).

Six trees on site have been assessed as having potential for barn owl and three have been confirmed as being occupied at some time during the 2011 – 2019 activity surveys.

Whilst barn owl has been included within the breeding bird assessment, they also merit consideration in their own right and the site is considered to be of **Local** value for barn owls.

European nightjar

European nightjar surveys were completed in 2011, 2014 and 2018 in accordance with methods recommended in the RSPB Bird Monitoring Methods guidance (*Appendix F6*).

No nightjars were recorded during the surveys and habitat within the site was considered sub-optimal for breeding nightjars. As such the site is considered to be of **Negligible** value for nightjar.

[12] Fuller, R.J., (1980), A method for assessing the ornithological interest of sites for conservation, Biological Conservation, 17(3) :229-239.

[13] Gilbert, G., Gibbons, D.W. and Evans, J., (1998), Bird Monitoring Methods, RSPB: Bedfordshire.

Bats

There are 59 records of bats within 2km of the site, which are for the following: Daubenton's, whiskered, Natterer's, noctule, common pipistrelle, brown long-eared, serotine and unspecified *Myotis* and long-eared species. Both noctule and brown long-eared bats are SPI.

Manual bat activity transect surveys were completed in 2011, 2013, 2016 and 2017 (in accordance with relevant guidelines at the time of the surveys – now Collins, 2016[14]). These surveys included placement of automated detectors (Song Meter SM2 and Anabat Express).

Trees have been subject to a series of ground-level (2012, 2014, 2016 and 2017) and climbed tree inspections (2015, 2016 and 2018) between 2012 and 2018. These have identified 57 trees on site with suitability for roosting bats (11 high, 10 moderate and 36 low).

Dusk emergence / dawn return surveys were completed for suitable trees in 2012, 2014 and 2016 (in accordance with relevant guidelines at the time of the surveys – now Collins, 2016). Following these surveys nine trees have been identified which support roosting bats (all small numbers of common or soprano pipistrelle).

Surveys were also completed in 2019, as described in *Appendix F24*. These have comprised ground level survey of trees, dusk emergence / dawn return surveys of trees and bat activity surveys including transect and deployment of automatic static detectors. The results from the 2019 surveys recorded assemblages of roosting, commuting and foraging bats that were not significantly different to those previously recorded.

Based on the criteria within 'Valuing Bats in Ecological Impact Assessment' (Wray *et al.*, 2010)[15] the site is considered to be of **Local** value for roosting bats and **County** level for foraging and commuting bats.

Hazel dormice

There are no records of hazel dormice within 2km of the site. Nest tube surveys were completed in 2011, 2012, 2014, 2017 and 2019. Surveys followed the methodology set out in the Dormouse Conservation Handbook (Bright *et al*., 2006)[16] (*Appendix F11*).

Hazel dormice were recorded in Barn Copse and Slockett's Copse in 2014. None were recorded during 2017. Hazel dormice can persist with large territories and at low population density, even in high quality habitat (Bright *et al.*, 2006). As such they are considered to be either absent from the site or present at extremely low population density.

Results from 2019 surveys (see *Appendix F24*) were consistent with these findings, whereby only one hazel dormouse was recorded from Barn Copse. Therefore, the site is considered to be of **Local** value for hazel dormice.

[14] Collins, J. (ed.), (2016), Bat Surveys for Professional Ecologists: Good Practice Guidelines, 3rd Edition, The Bat Conservation Trust: London.

[15] Wray, S., Welss, D., Long, E. & Mitchell-Jones, T. (2010). Valuing bats in ecological impact assessment, In Practice, No 70, pp 22-25.

[16] Bright, P.W., Morris, P.A. and Mitchell-Jones, A., (2006), Dormouse Conservation Handbook, 2nd Edition, English Nature: Peterborough.

Badgers

There is a record of a badger sett within the site – details on location are provided in the confidential Badger Report (Confidential *Appendix F12*). There are five other records of setts within 2km of the site. There is also a record of a badger record of a road mortality on the A339 which lies approximately 0.89km to the south-east of the site.

Badger surveys have been completed on site in 2011, 2013, 2014, 2016, 2017, 2018 and 2019 (*Appendix F12* – Confidential).

These surveys have recorded one active main sett and one active subsidiary sett on site, along with 11 outlier setts (only one of which was active). Surveys in 2019 were consistent with these findings, as described in *Appendix F24*.

The site is considered to be of **Local** value for badgers.

Invertebrates

There are five records of white-clawed crayfish, three of which were recorded from the River Enborne which lies directly adjacent to the southern boundary of the site.

Off-site records exist of white-clawed crayfish to the east and west of the site. The closest record is from the A34 bridge, 0.3 km to the east of the site.

There are several nationally notable species and SPI recorded within 2km of the site. No records were from within the site itself.

Terrestrial invertebrate surveys were completed in 2011, 2014 and 2018 consisting of visual searching, sweeping and beating, grubbing, pitfall trapping and light traps for moths (*Appendix F13*). Aquatic invertebrate surveys were completed in 2011, 2014 and 2018 consisting of kick sampling and netting (*Appendix F14*). White-clawed crayfish surveys were completed in 2011 and 2013 comprising refuge searches, trapping and nocturnal torchlight surveys (*Appendix F15*).

Terrestrial invertebrate surveys recorded one Red Data Book and six Nationally Scarce species (two further Red Data Book and Nationally Scarce species were recorded but no longer fulfil the relevant criteria due to expansions in range and frequency). The moth surveys recorded 36 species, of which seven species are listed as SPI.

Aquatic invertebrate surveys assessed the water on site as poor to good quality and recorded the locally important golden-ringed dragonfly (considered to be probably breeding). White-clawed crayfish surveys were negative and the presence of signal crayfish was confirmed in 2013, as such white-clawed crayfish are likely to be absent.

The site is considered to be of **County** value to terrestrial invertebrates (including moths), of **Local** value to aquatic invertebrates and of **Negligible** value for white-clawed crayfish.

Otters

There are no records of otters within 2km of the site.

Otter surveys were completed in 2013 and 2018 in accordance with the National Otter Survey techniques (Chanin, 2003)[17] (*Appendix F16*).

No evidence of otter was recorded within the site; however, they have been confirmed within the River Enborne along the southern boundary of the site. Therefore, the site is considered to be of **Local** value for otter.

Water voles

There are 13 records of water voles within 2km of the site. There are records of water voles 1.2km to the east of the site and 650 metres to the west of the site within the River Enborne.

Water vole surveys were completed in 2013 and 2018 in accordance with the Water Vole Conservation Handbook (Strachan, 2011)[18] (*Appendix F16*).

Evidence of water vole within the site was recorded in 2018. The evidence comprised footprints along the northern bank of the River Enborne. No burrows, latrines or evidence of feeding has been recorded within the site. However, latrines were recorded in 2011 on the banks of the River Enborne outside the boundary of the site in 2011. According to Morris *et al.* (1998)[19], water vole populations can be estimated using an equation based on the number of latrines. Based on this calculation the population on site is estimated to be around two individuals, a density of 0.24 per 100m. The Water Vole Conservation Handbook states that population density can range from 2.4 – 14 per 100m, as such the population on site is considered to be low. The site is therefore considered to be of **Local** value for water vole.

Brown hare

There are two records of brown hare within 2km of the site.

A number of sightings were made during the protected species surveys between 2011 and 2014. Brown hare are an SPI and the site is considered to be of importance at a **Local** level.

West European hedgehog

There are three records of hedgehog within 2km of the site, but no records exist for the site itself. Hedgehogs are an SPI. No sightings were made during protected species surveys, however there is suitable habitat on site. Given the lack of records and sightings, and conservation status of hedgehog, the site is considered to be of **Negligible** value for hedgehog.

[17] Chanin, P., (2003), Monitoring the Otter Lutra lutra, Conserving Natura 2000 Rivers Monitoring Series No. 10, English Nature: Peterborough.

[18] Strachen, R., (2011), Water Vole Conservation Handbook, Wildcru: Oxford.

[19] Morris, P.A., Morris, M.J., MacPherson, D., Jefferies, D.J., Strachan, R. and Woodroffe, G.L., (1998), Estimating Numbers of the Water Vole, Arvicola terrestris – a Correction to the Published Method, Journal of Zoology, 246: 61-62

Invasive species

A stand of Japanese knotweed was present on the eastern boundary of the site adjacent to the waste recycling centre. A relatively small area of Himalayan balsam was present within Waterleaze Copse to the south of the two ponds and along the River Enborne corridor. New Zealand pygmyweed *Crassula helmsii* was present within the large pond, in addition, a single plant of Himalayan cotoneaster *Cotoneaster simonsii* was noted at Slockett's Copse during the 2018 woodland survey (Figure 1, *Appendix F1*).

All these species are listed on Schedule 9 of the W&CA and are therefore of **National** value due to the potential for a breach of legislation.

6.5 Mitigation Measures

The impacts will be assessed against the proposals for the site including the inherent and standard mitigation measures described below. These measures have been 'designed-in' to the development proposals to reduce the ecological impacts of the scheme or are standard construction measures.

6.5.1 Inherent Mitigation Measures

The scheme design has evolved in response to the findings of the baseline studies that were completed on the site and through consultation with the design team during a number of meetings. The following measures have been incorporated into the design to avoid impacts on valuable features:

- All of the existing blocks of locally designated (and non-designated) woodland valued as County level importance, will be retained with a 15m buffer. This is in accordance with Forestry Commission and Natural England ancient woodland guidance published in 2018.
- The central valley and HPI grasslands of Local value will be retained, albeit with a road crossing that will be elevated to reduce impacts on the grassland and wetland habitats beneath (resulting in the loss of approximately 0.03 ha). This will be mitigated by the compensatory planting within the valley and SuDS area.
- There will be no works within 8m of the River Enborne, which runs along the south of the site.
- The southern section of the site will become a Country Park, providing both a net gain for biodiversity and an area for informal recreation to minimise off site trips. This will include creation of new grassland and hedgerow habitats. A quantified assessment of the biodiversity net gain that development will deliver has been completed and forms *Appendix F21* to this chapter. This found that there will be a net gain of 111.48 units of non-linear habitat (17.23%) and 11.88 units of linear habitat (9.36%). Based on these calculations the proposed development will achieve a net gain for biodiversity.
- Mature trees and hedgerows have been retained within the development proposals wherever possible. This includes those considered to be veteran trees. These have been retained either due to landscape value, or due to their potential or actual value to protected species e.g. barn owl or bat roosting features that they support. Where works cannot avoid works to veteran trees, works would therefore be supervised by an ecologist from a protected species compliance perspective and only in consultation with an arboriculturalist.

- A sustainable drainage system will be incorporated to treat all surface water prior to discharge into watercourses or ponds, this will minimise impacts on springs / seepages, marshy grassland and ancient woodland.
- A sensitive operational lighting strategy will be incorporated to avoid disturbance of nocturnal species. This will avoid light spill of above 1 lux upon the following habitats: woodland edge, hedgerows, running water and standing water (see *Appendix F20*).
- Currently known badger setts will be retained with a buffer between them and development (30m for main setts).

6.5.2 Standard Mitigation Measures

A draft Construction Environmental Management Plan is included in *Appendix D1* which includes the following measures (and construction phase measures detailed in the EMMP, *Appendix F18*):

- Construction-phase surface water drainage strategy including methods of sediment and hydrocarbon filtration prior to discharge;
- No construction within 8m of watercourses, with the exception of proposed vehicle crossing;
- Spill kits to be available and used immediately should a pollution incident occur;
- Adherence to best practice pollution prevention and control guidance;
- Fencing specification (Heras or similar) to protect retained ecological features during construction;
- Construction-phase lighting plan to prevent illumination of retained ecological features; and
- Measures to protect wildlife moving across the Site (provision of escape routes from trenches, capping pipes, secure storage of chemicals and spoil, storage of materials on pallets etc.).

6.5.3 Actionable Mitigation Measures

Construction Phase

Woodland

All woodlands will be retained, together with 15m buffer zones (or larger in the Country Park). These buffer zones will be clearly fenced using Heras style fencing to prevent impacts to this habitat, such as those arising from inappropriate storage of materials during the construction phase. The SuDS measures outlined in the Water Resources Chapter (*Chapter 11*) seek to avoid adverse impacts due to changes in water quality or quantity.

Connections between woodlands, e.g. along hedgelines have been retained and enhanced wherever possible within the proposals.

Full details are provided within the EMMP (*Appendix F18*).

Arable

Two skylark plots (4m x 5m) will be created within the Country Park. Seeds will be collected of the three notable arable plants in development areas (green pigweed, green field speedwell and subspecies of fool's-parsley) and these seeds will be sown in the skylark plots. The soil containing the seed bank within the receptor site will managed to stimulate seed germination. Full details are provided within the EMMP (*Appendix F18*).

Marshy grassland

The small area of marshy grassland considered to qualify as HPI will be almost completely retained within the proposals (approximately 0.056ha will be lost), with mitigation outlined in the EMMP (*Appendix F18*). Detailed design of the road crossing and paths at the reserved matters stage shall be informed by accurate mapping of the small area of Purple Moor Grass and Rush Pastures Habitat of Principal Importance along the valley bottoms at Sandleford Park.

As noted in the Water Resources Chapter (*Chapter 11*), it is considered that the seepages and springs that support the creation of marshy grassland are fed from a combination of surface run off and infiltration to ground. The immediate areas surrounding the spring locations as well as the existing downstream streams will be unaffected by the development and surface run off from these areas will be maintained. Similarly, feeds from the wider catchment beyond the development will also be unaffected. The surface water management proposals will incorporate unlined source control, secondary and tertiary SuDS drainage features to allow infiltration of run off wherever possible to maximise infiltration and recharge, and will minimise the hydrological impacts to existing springs and streams as well as mitigating the effects on groundwater recharge.

Species-rich hedgerows

In order to compensate for the anticipated net loss of hedgerow, it is proposed that retained hedgerows are reinforced with additional planting. This will improve the structure of existing hedgerows and fill in gappy sections which are present. This chiefly relates to Hedgerows C and H (see Figure 1, *Appendix F18*). Infilling will comprise native species including hawthorn, hazel, blackthorn, field maple and elder.

Reptiles

Construction-phase mitigation for reptiles is detailed within the EMMP (*Appendix F18*). The full details of timings, locations etc. will be confirmed at the reserved matters stage once construction phasing and timings are known.

Parts of the Country Park will be established as a reptile receptor site to allow in-situ displacement.

Barn owl

As nesting barn owls are protected from disturbance, no construction works should be carried out within approximately 100-150m of a barn owl nest site during the nesting period (March to September inclusive). If nests are identified, a buffer zone will be set up inside which no construction work may be undertaken until the young have fledged and cease to return to the nest. The size of the buffer will depend on the nature of the disturbance and should be advised

by a suitably qualified ecologist but it is likely to be 100-150m. To avoid this constraint, it is recommended that construction works within 150m of potential nest sites are preceded by a survey by a licenced barn owl surveyor to confirm whether an active nest is present. If works are already underway and birds choose to nest nearby, then it may be assumed that the disturbance is not significant, but works should not encroach upon the nest site.

Bats

No trees with confirmed roosts are proposed to be lost. An update bat roost assessment will be completed to inform detailed design and layout for each reserved matters application and prior to construction works in each phase of development. This will cover any trees with potential to be impacted by the phase and any trees with bat roosting suitability will be subject to climbed tree inspections and dusk emergence / dawn return surveys (where necessary) in accordance with current best practice guidelines at the time of the survey to determine presence / likely absence or to characterise the roost.

If any bat roosts are confirmed that will be affected, the EMMP for that Phase will set out appropriate mitigation measures, including need for an EPSL to enable the development to proceed lawfully.

Tree **T127** and **T130** have been recorded as supporting roosting bats. These trees are recommended for felling or pollarding in the Arboricultural Assessment (Barrell Tree Care, 2018). The Arboricultural Assessment also identifies several other trees with moderate or high potential to support roosting bats, but where surveys for roosting bats have been negative. However, these recommendations do not form part of the proposals, and if, in the future arboricultural works are required, these will need to be informed by up to date survey information, and potentially licence applications.

Badgers

Prior to the commencement of any works on each phase of development, the EMMP for that phase will require that a badger survey be undertaken throughout and within 50m of the site to establish the status of known setts, and whether any further setts have been created.

In the event that badger setts are present and the proposed development will affect them, a Natural England development licence may be required; however, this is not considered likely at this stage.

Hazel dormice

In order to mitigate for potential fragmentation of hazel dormouse habitat, vegetated connections will be provided where any breaches of retained hedgerows occur. These will be created by planting suitable trees each side of the breach to allow the canopies to meet and create a continuous arboreal link.

Detailed guidelines for the removal of suitable habitat for hazel dormice are outlined in the EMMP (*Appendix F10*).

Terrestrial invertebrates

In order to mitigate loss of habitat, a translocation of the host plant of the Nationally Scarce picture-winged fly *Orellia falcata* will be completed. The larvae develop in the roots and stems of goat's–beard, which was abundant in one field, but scarce or absent from the rest of the survey area. Translocation of goat's–beard plants to areas within the Country Park, which lie within close proximity of the existing location, or alternatively collection of seed from the existing location and scattering it in fields within the Country Park will allow the host plant to successfully establish in these areas. This will take place prior to development occurring to increase the chances of success and will also need the ground to be disturbed prior to seed set to ensure seed penetration and successful germination.

Occupation Phase

Woodland

Access to woodlands will be controlled, and buffer zones will be managed to enhance the woodland edge. Full details are provided within the EMMP (*Appendix F18*).

Acidic semi-improved grassland

Further detail of the proposed path routes within the Country Park and their future management will be defined within the reserved matters phases. These will be located along desire lines but away from notable habitats and species. Footpaths will be constructed using no-dig methods to provide defined footpath routes and to prevent trampling of surrounding habitat.

Signage and interpretation boards will be installed providing information to the public of the importance of the grassland habitat for wildlife.

The EMMP (*Appendix F18*) sets out proposals for the management and monitoring to be undertaken for the after the commencement of grassland management. This will help determine the success of the management and set out remedial measures to be taken should it be required, such as reduction of aggressive weed cover or soil erosion. Longer term monitoring is recommended in partnership with local volunteer conservation organisations.

Species-rich hedgerows

The EMMP (*Appendix F18*) includes proposed management measures for hedgerows which will be followed through into detailed phase-specific EMMPs at the reserved matters stage. Pruning will take place biennially on a rotation (only one side cut each year) to make sure that fruit is produced each year. Colonisation of invasive exotics (e.g. butterfly bush) will be prevented by removing saplings. Herbaceous vegetation will be encouraged to grow up around the bases of shrubs and hedges. Plants which have failed to establish will be replaced during the dormant season (November to March) for the first five years post-construction.

Breeding birds

As discussed under *acidic semi-improved grassland*, it is proposed that footpaths and signage within the Country Park are designed to manage recreation and minimise disturbance on habitats and species. In addition, it is recommended that skylark plots are protected by fencing (post and wire mesh) to prevent access by visitors or dogs during the breeding season.

Although it is not possible to prevent residents from keeping cats, a number of mitigation measures are proposed within the EMMP (*Appendix F18*). Predation will be mitigated by cats as far as possible with open spaces screened and buffered by roads, and dwellings fronting on to open space, rather than back gardens. Homeowners will be provided with information to encourage further measures to reduce predation such as keeping cats inside at night. The EMMP (*Appendix F18*) includes details of proposed nest box provision totalling 59 boxes for small birds. The provision of these additional nest sites, along with the proposed additional habitat creation, is anticipated to increase the resilience of the breeding bird assemblage to any residual predation.

Badgers

Recreational routes have been designed to avoid badger setts. At the reserved matters stage, detailed proposals will be informed by up to date surveys to identify any new setts which may have been created. If necessary, above ground fencing (with badger access gates) will be installed to prevent access or disturbance from recreation.

At present, no measures to prevent mortality are considered necessary as no active setts will be isolated by the proposed road network. If update surveys identify new setts with a potential risk of mortality at the reserved matters stage, mitigation will be proposed as part of the relevant EMMP. If required this could include mammal underpasses below roads, exclusion fencing and lighting to deter badgers from crossing roads.

Hazel dormice

Proposed management of hedgerows is discussed under *species-rich hedgerows* to maximise the availability of foraging and nesting habitat.

General measures to reduce the risk of cat predation are discussed under *breeding birds.* In addition, it is proposed that 20 dormouse nest boxes are installed in retained woodland habitat on site. This will provide suitable nesting sites which are secure from predation.

Terrestrial invertebrates

The EMMP sets out the proposed management of the Country Park, including grassland areas and mitigation areas for terrestrial invertebrates. As discussed under *acidic semi-improved grassland* this includes a period of monitoring to allow for corrective action to be implemented, for example to control scrub encroachment. It is proposed that footpaths and signage within the Country Park are designed to manage recreation and minimise disturbance on habitats and species.

Brown hare

The EMMP sets out the proposed management of the Country Park, including grassland areas to be managed as tall or rough grassland suitable for brown hare. As discussed under *acidic semi-improved grassland* it is proposed that footpaths and signage within the Country Park are designed to manage recreation and minimise disturbance on habitats and species.

6.6 Assessment of Environmental Impacts

6.6.1 Impact Assessment

As stated above, impacts are only assessed in detail for features both of sufficient value that impacts upon them may be significant and also potentially vulnerable to significant impacts arising from the development. Consequently, impacts have only been assessed in detail for those receptors that are of at least local value or are subject to legal protection.

This detailed assessment will therefore concentrate on the likely impacts in respect to the following receptors only:

- Designated sites (National value)
- Non-statutory designated sites (County value)
- Semi-natural broadleaved woodland (County value)
- Marshy grassland (County value)
- Arable (Local value)
- Acidic semi-improved grassland (Local value)
- Running water (Local value)
- Standing water (Local value)
- Species-rich hedgerows (Local value)
- Invasive species (National – based on potential for legal offence only)
- Reptiles (National – based on potential for legal offence only)
- Breeding birds (Local value, legally protected)
- Barn owl (Local value, legally protected)
- Bats (Local value – roosting, County value – foraging / commuting, legally protected)
- Badgers (Local value, legally protected)
- Dormouse (Local value, legally protected)
- Terrestrial Invertebrates (County value)
- Aquatic Invertebrates (Local value)
- Water vole (Local value, legally protected)
- Otter (Local value, legally protected)
- Brown Hare (Local value)

Construction Phase

Statutory Designated sites

Greenham Common SSSI is approximately 800m from the nearest area and separated from the site by the major A339 road. The air quality impact of traffic (at a distance from the road centre) diminishes exponentially to zero at 200m (Highways Agency, 2007). During the construction phase of the development, the air quality chapter of this ES (*Chapter 15*) predicts the overall effects of the proposed development are negligible with respect to nitrogen

dioxides, and negligible with respect to PM10. With respect to NO_2 exposure, the significance of effects from the proposed development site on the Newbury AQMA is predicted to be negligible, based on assumptions detailed throughout the report. Following the adoption of the recommended mitigation measures, the development is not considered to be contrary to any of the national, regional or local planning policies. As such, there is considered to be **no significant adverse effect** to this national level feature during the construction phase in respect of air quality. Using the matrix (*Table 6.1*) this equates to a **negligible** effect (negligible magnitude, national sensitivity).

During construction, it is likely that noise and vibration attributable to specific works will be of short-term duration. Through standard measures implemented in the CEMP, noise and vibration levels off site are considered unlikely to be significant given the distance from the construction zone within the site to the SSSI (approximately 800m) and the current background noise levels resulting from the presence of the A339 between the site and the SSSI. Therefore, there is considered to be **no significant adverse effect** to this national level feature during the construction phase in respect of noise and vibration. Using the matrix (*Table 6.1*) this equates to a **negligible** effect (negligible magnitude, national sensitivity).

It is considered that there will be no significant adverse effects during the construction phase on non-aquatic SSSIs in the wider area such as Kennett Enborne Copse SSSI, Redhill Wood SSSI, Highclere Park SSSI, Bowdown and Chamberhouse Woods SSSI due to the significant separation distances involved and the absence of potential pathways between the site and the SSSIs. There are SSSIs in the wider area with aquatic connectivity such as the River Kennett SSSI, Kennett and Lambourn Floodplain SSSI, Kennett Valley Alderwoods SSSI, and Thatcham Reedbeds SSSI. Through standard measures implemented in the CEMP (for example to avoid potential for pollution or siltation) there is considered to be **no significant adverse effects** to these national level features during construction. Using the matrix (*Table 6.1*) this equates to a **negligible** effect (negligible magnitude, national sensitivity).

Non-statutory designated sites

There is potential for adverse effects on sites within and adjacent to the site from noise and vibration during construction. This will be temporary and variable as the level of noise and associated impact will be dependent on the location of the construction activities on a daily basis and the equipment being used. Through standard measures implemented in the CEMP, it is considered that noise and vibration levels will be adequately controlled and minimised in proximity to sensitive features. Therefore, there is considered to be **no significant adverse effect** to these county level features during the construction phase in respect of noise and vibration during construction. Using the matrix (*Table 6.1*) this equates to a **negligible** effect (negligible magnitude, county sensitivity).

Of the non-statutory sites on or near the site, only Waterleaze Copse contains areas of wet woodland. However, due to the topography of the site which drains towards the centre, all of these areas have the potential to be affected by changes in hydrology or water quality during construction. This may include increases in rate and volume of runoff and potential contamination by hydrocarbons, sediment and construction materials. Measures to control and treat surface water during the construction phase are included in the CEMP and following these measures it is considered that there will be **no significant adverse effect** on these county value features in respect of water quality during construction. Using the matrix (*Table 6.1*) this equates to a **negligible** effect (negligible magnitude, county sensitivity).

The air quality chapter (*Chapter 15*) includes an assessment of potential adverse effects upon non-statutory sites on-site, in particular as a result of dust from earthworks, construction and

track-out. It concludes that following the implementation of measures for controlling dust, there will be **no significant adverse effect** on these county value features in respect of air quality during construction. Using the matrix (*Table 6.1*) this equates to a **negligible** effect (negligible magnitude, county sensitivity).

As part of the proposed Country Park, a large amount of additional woodland planting is proposed, the majority as an extension to Waterleaze Copse. This will result in an increase of c.3.12ha of broadleaved woodland or 14% and a **significant permanent positive effect** at the **County** level. Using the matrix (*Table 6.1*) this equates to a **moderate beneficial** effect (medium magnitude, county sensitivity).

Semi-natural broadleaved woodland

The semi-natural broadleaved woodland on site falls within the numerous Wildlife Heritage Sites. The potential impacts are assessed above under *Non-statutory designated sites.*

Arable

All of the arable land at the site will be lost to development (including the creation of the Country Park) totalling c.45.4ha. In the absence of actionable mitigation, this is likely to have a **significant permanent adverse effect** at a **Local** level. Using the matrix (*Table 6.1*) this equates to a **substantial adverse** effect (high magnitude, county sensitivity).

Marshy grassland

A small amount of marshy grassland will be lost during the construction phase to accommodate attenuation features (as part of the SuDS system) and valley crossing (0.056ha). This includes potential loss of value of the grassland shaded by the valley crossing. However, additional areas of marshy grassland are proposed, in particular in the areas around the SuDS.

The Strategic Landscape and Green Infrastructure Plan (*Figure 4.3*) shows an increase of approximately 2ha or 14%. Therefore, there is likely to be **no significant adverse effect** in the short-term and a **significant permanent positive effect** in the long-term at a **Local** level. Using the matrix (*Table 6.1*) this equates to a **negligible** effect (negligible magnitude, local sensitivity) in the short-term and a **moderate beneficial** effect (high magnitude, local sensitivity) in the long-term.

Potential effects during construction from construction traffic, changes in hydrology or pollution will be controlled through measures included in the CEMP and it is likely that there will be **no significant adverse effect** on this local value feature. Using the matrix (*Table 6.1*) this equates to a **negligible** effect (negligible magnitude, local sensitivity).

Acidic semi-improved grassland

There will be a loss of a small area of grassland on the valley bottom considered to qualify as a ‘Habitat of Principle Importance’ (approx. 0.03 ha) to facilitate the central valley crossing. This will be compensated for by planting within the valley and around the SuDS area designed and carried out at the detailed stage. Following implementation of this mitigation, there is likely to be **no significant adverse effect** on this local value feature. Using the matrix (*Table 6.1*) this equates to a **negligible** effect (negligible magnitude, local sensitivity).

There is also potential for air quality impacts from dust during construction. However, as discussed under *Non-statutory designated sites*, following the measures included within the CEMP there is likely to be **no significant adverse effect** on this local value feature. Using the matrix (*Table 6.1*) this equates to a **negligible** effect (negligible magnitude, local sensitivity).

Running water

As discussed under *Non-statutory designated sites,* the site drains towards the centre where the running water feature flows south east before discharging into the River Enborne. As with other valuable features, this has the potential to suffer adverse effects on hydrology and water quality during construction. Compared to features such as semi-natural broadleaved woodland, the potential effects upon running water are less severe due to the lower value of the feature; the higher inherent resilience of running water to contaminants (which do not persist within the habitat but are washed downstream) and the filtering effect of intervening habitats (such as woodland). As with other features, the proposed measures to control and treat surface water during the construction phase within the CEMP will protect the running water and following these measures it is considered that there will be **no significant adverse effect** on this local value feature in respect of water quality during construction. Using the matrix (*Table 6.1*) this equates to a **negligible** effect (negligible magnitude, local sensitivity).

Standing water

These features are retained in the masterplan within the proposed Country Park or retained woodland and as such direct impacts during the construction phase are considered unlikely. Following the measures included within the CEMP there is likely to be a **no significant adverse effect** on this local value feature during the construction phase. Using the matrix (*Table 6.1*) this equates to a **negligible** effect (negligible magnitude, local sensitivity).

Species-rich hedgerows

Existing hedgerows have been retained wherever possible. However, there will be a loss of c. 521m to facilitate the development. This will be compensated for by the enhancement of 2322m of hedgerow habitats. This includes thickening of existing hedges, filling in gaps and replanting of defunct hedges and field boundaries that currently do not constitute hedges. These comprise inherent mitigation measures and are considered likely to result in **no significant adverse effect** on these local level features. Using the matrix (*Table 6.1*) this equates to a **negligible** effect (negligible magnitude, local sensitivity).

Invasive species

It is an offence under the W&CA to cause or permit Japanese knotweed, Himalayan balsam, Himalayan cotoneaster or New Zealand pygmy weed to spread in the wild. If vegetation clearance or ground disturbance works are carried out in the areas where these species occur (without any mitigation in place), it is likely that this would lead to an offence. However, all of these species have been recorded in areas to be retained where it is unlikely that works will be undertaken which will result in accidental spreading. Furthermore, measures are included in the CEMP to avoid the accidental spread of invasive species following which there is likely to be **no significant adverse effect**. Using the matrix (*Table 6.1*) this equates to a **negligible** effect (negligible magnitude).

Reptiles

A low population of reptiles has been recorded on site. During the construction phase the development will result in the loss of some areas of habitat used by foraging, commuting and basking reptiles. Whilst the buffers which include the most suitable habitat have largely been retained, there is some construction proposed in these areas. New areas of suitable habitat are proposed within the Country Park resulting in a net increase of c. 12.3ha or 57%. This is likely to result in **no significant adverse effect** (as the receptor has been assessed as having negligible value). Using the matrix (*Table 6.1*) this equates to a **negligible** effect (high magnitude, negligible sensitivity).

Construction activities within areas of suitable reptile habitat, such as stripping of vegetation, storage and vehicle injure and/or kill reptiles present in the absence of suitable mitigation. This would be a contravention of the W&CA and would result in a significant adverse effect. However, measures outlined within the EMMP (*Appendix F18*) and the CEMP have sought to reduce the potential for accidental killing and injury, following which there is likely to be **no significant adverse effect**. Using the matrix (*Table 6.1*) this equates to a **negligible** effect (negligible magnitude, negligible sensitivity).

Breeding birds

The site as a whole supports a wide range of bird species, notably within the woodland and hedgerow habitats, of value at the Local level. As discussed above, there will be a loss of c. 521m of hedgerow to allow for proposed access roads and residential development. In addition there will be a loss of c. 1ha of scrub which although not assessed as a valuable receptor, is suitable for use by breeding birds. Although the majority of birds recorded were associated with woodland and hedgerow, skylark were recorded breeding within arable land (all of which will be lost). *Figure 4.3* includes the creation of suitable breeding bird habitat including a gain of c. 3.12ha of broadleaved woodland and c. 2.7ha of parkland and scattered trees within the proposed Country Park. Furthermore, although recorded within arable habitat on site, skylark also breed within grassland of which there will be a net gain of c. 21.8ha. It is therefore considered that there is likely to be **no significant adverse effect** on breeding birds as a result of habitat loss. Using the matrix (*Table 6.1*) this equates to a **negligible** effect (negligible magnitude, local sensitivity).

Disturbance during the construction phase (as a result of noise, vibration etc.) are discussed under *Non-statutory designated sites* (which comprise the majority of the breeding bird habitat to be retained) and were considered to have **no significant adverse effect**. Using the matrix (*Table 6.1*) this equates to a **negligible** effect (negligible magnitude, local sensitivity).

All active bird nests are legally protected from damage or destruction under the W&CA, therefore vegetation clearance and ground works could result in an offence. The CEMP includes standard measures to avoid this (timing of works to avoid the nesting season, use of an Ecological Clerk of Works, temporary protection of nests) following which there will be **no significant adverse effect**. Using the matrix (*Table 6.1*) this equates to a **negligible** effect (negligible magnitude, local sensitivity).

Barn owl

Barn owls have been recorded foraging within grassland in the north west of the site, to the north of High Wood and towards the eastern extent of the site. All habitat that barn owls have been recorded foraging over are being retained. The proposed Country Park will result in a c. 57% increase in grassland (semi-improved not amenity) and a large increase in suitable

foraging habitat for barn owl. As such there is considered to be **no significant adverse effects** in the short-term and a **significant positive effect** in the long-term from habitat creation. Using the matrix (*Table 6.1*) this equates to a **negligible** effect (negligible magnitude, local sensitivity) in the short-term and a **moderate beneficial** effect (high magnitude, local sensitivity) in the long-term.

As a Schedule 1 species, in addition to damage and destruction of nests, the disturbance of nesting barn owl is an offence under the W&CA. Any construction activity within 150m of an active nest is likely to cause disturbance. The three nesting sites identified on site will be retained, and measures to avoid disturbance are included within the CEMP. Therefore it is likely that there will be **no significant adverse effects** as a result of disturbance. Using the matrix (*Table 6.1*) this equates to a **negligible** effect (negligible magnitude, local sensitivity).

Bats

Many species of bat recorded at the site are typically woodland feeding species, including long-eared, Natterer's, noctule and the pipistrelle species (particularly common and soprano pipistrelle). The main commuting and foraging activity was recorded around the blocks of deciduous woodland within the site. The proposed development will retain all optimal foraging habitat (woodlands), and 15m buffers around the woodland have also been retained. As discussed above there will also be a gain in optimal foraging habitat in the form of broadleaved woodland (c. 3.12ha) and wetland (c. 0.15ha of SuDS). The proposed grassland creation within the Country Park is (c. 12.3ha) is also likely to be of higher quality for foraging than the existing arable land. Although there is potential for construction activities to result in impacts to bats as they commute between roosting and foraging areas as a result of lighting, control measures are included within the CEMP. Therefore, there is likely to be **no significant adverse effect** to foraging and commuting bats in the short-term and a **significant permanent positive effect** in the long-term at a **Local** level as a result of habitat creation. Using the matrix (*Table 6.1*) this equates to a **negligible** effect (negligible magnitude, local sensitivity) in the short-term and a **moderate beneficial** effect (high magnitude, local sensitivity) in the long-term.

Nine trees have been identified as being used by roosting bats. All are proposed to be retained within the proposals. However there is potential for remedial works such as pruning or pollarding to be required for those within the proposed Country Park, as proposed within the arboricultural assessment (Barrell Tree Care, 2018), although this does not form part of the planning application. Furthermore, bats are highly mobile species and hence further roosts may be occupied on site prior to construction. Any damage (through removal of trees) or disturbance (from noise, vibration or lighting) to a bat roost would be a breach of the Habitat Regulations. Therefore, there in the absence of mitigation there is likely to be a **significant adverse effect** at a Local level upon roosting bats as a result of roost loss. Using the matrix (*Table 6.1*) this equates to a **moderate adverse** effect (high magnitude, local sensitivity).

Badgers

Known badger setts are to be retained and protected through the construction phase and the CEMP includes standard measures to avoid construction-phase impacts upon mobile species such as badgers (use of ramps in trenches, capping of pipes etc.) However, badgers are highly mobile and additional setts may be created prior to construction commencing. In the absence of mitigation this could result in disturbance or damage/destruction to setts, or disturbance, killing or injury to badgers as a result of construction activities. Therefore, in the absence of actionable mitigation, there is potential for a **significant adverse effect** at a Local level. Using

the matrix (*Table 6.1*) this equates to a **moderate adverse** effect (high magnitude, local sensitivity).

Hazel dormouse

Hazel dormice are associated with broadleaved woodland and hedgerow habitats on site. Although *Figure 4.3* shows a c. 521m loss in hedgerows it also shows that c. 2322m of hedge would be improved and there would be a c. 3.12ha gain in broadleaved woodland suitable for hazel dormice. Therefore, there is likely to be **no significant adverse effect** in the short-term and a **significant permanent positive effect** in the long-term at a **Local** level as a result of habitat creation. Using the matrix (*Table 6.1*) this equates to a **negligible** effect (negligible magnitude, local sensitivity) in the short-term and a **moderate beneficial** effect (high magnitude, local sensitivity) in the long-term.

The majority of vegetated links between the woodland parcels are retained within the parameter plans, with any breaches in hedgerows designed for footpaths only which will not disrupt connectivity. Therefore there are no barriers to prevent dispersal of hazel dormice and likely to be **no significant adverse effect** due to fragmentation. Using the matrix (*Table 6.1*) this equates to a **negligible** effect (negligible magnitude, local sensitivity).

Hazel dormice are also protected from killing, injury and disturbance under the Habitat Regulations. As discussed above, a small amount of suitable dormouse habitat is to be removed during construction, however, following control measures outlined in the CEMP (*Appendix D1*) there is likely to be **no significant adverse effect.** Using the matrix (T*able 6.1*) this equates to a **negligible** effect (negligible magnitude, local sensitivity).

Terrestrial Invertebrates

Most of the habitat found to support rare or notable invertebrates (woodland and marshy grassland) is to be retained. However, notable terrestrial invertebrates have been recorded throughout the site and the development will result in the loss of some habitat. In particular the Nationally Scarce picture-winged fly *Orellia falcata* which was recorded within the field to the south of Dirty Ground Copse, scheduled for development within the current proposals. In the absence of mitigation, this direct loss of some areas of suitable habitat will have a **significant permanent adverse effect** at a County level on the conservation status of the invertebrate population. Using the matrix (*Table 6.1*) this equates to a **moderate adverse** effect (medium magnitude, county sensitivity).

Aquatic Invertebrates

The aquatic invertebrate assemblage on site is associated with running water and marshy grassland habitats. No change to the running water on site is proposed however *Figure 4.2* shows an increase of approximately 2ha or 14% of marshy grassland. Therefore, there is likely to be **no significant adverse effect** in the short-term and a **significant permanent positive effect** in the long-term at a **Local** level as a result of habitat creation. Using the matrix (*Table 6.1*) this equates to a **negligible** effect (negligible magnitude, local sensitivity) in the short-term and a **moderate beneficial** effect (high magnitude, local sensitivity) in the long-term.

The potential impacts from construction activities are assessed above under *Running water* and *Marshy grassland* and it is concluded that following measures in the CEMP there will be

no significant adverse effect. Using the matrix (*Table 6.1*) this equates to a **negligible** effect (negligible magnitude, local sensitivity).

Water vole

Evidence of water vole (likely a low population) has been recorded along the River Enborne. This lies to the south of the proposed Country Park and no works are proposed in proximity to the river. No evidence of water voles has been recorded within the site. Therefore, it is considered that there will be **no significant adverse effect** on water voles during construction as a result of disturbance, harm or damage to burrows. Using the matrix (*Table 6.1*) this equates to a **negligible** effect (negligible magnitude, local sensitivity).

As water voles are confirmed within the River Enborne, adverse effects on the river from changes in hydrology or pollutants (such as hydrocarbons and sediment) are also likely to impact upon water voles. These potential impacts are assessed above under *Running water* and it is concluded that following measures in the CEMP there will be **no significant adverse effect**. Using the matrix (*Table 6.1*) this equates to a **negligible** effect (negligible magnitude, local sensitivity).

Otter

Evidence of otter has been recorded along the River Enborne. As discussed above, this lies outside the site and no works are proposed in its proximity. No evidence of otters has been recorded within the site and no potential holts or couches have been identified. Therefore, it is considered that there will be **no significant adverse effect** on otters during construction as a result of disturbance. Using the matrix (*Table 6.1*) this equates to a **negligible** effect (negligible magnitude, local sensitivity).

As otters are confirmed within the River Enborne, adverse effects on the river from changes in hydrology or pollutants (such as hydrocarbons and sediment) are also likely to impact upon otters (for example by reducing prey populations). These potential impacts are assessed above under *Running water* and it is concluded that following measures in the CEMP there will be **no significant adverse effect**. Using the matrix (*Table 6.1*) this equates to a **negligible** effect (negligible magnitude, local sensitivity).

Brown Hare

The arable habitats on site have been confirmed to support brown hare. Arable land will be lost to development as discussed above under *Arable.* However, brown hare also use grassland habitats, a large amount of which will be created as part of the proposed Country Park. It is therefore considered that there will be **no significant adverse effect** upon brown hare as a result of habitat loss. Using the matrix (*Table 6.1*) this equates to a **negligible** effect (negligible magnitude, local sensitivity).

Table 6.5 - Summary of Impact Assessment – Construction Phase with Inherent & Standard Mitigation Measures Applied						
Receptor	**Sensitivity/ Importance/ Value**	**Description of Impact**	**Inherent & Standard Mitigation Measures**	**Nature of Effect**	**Type of Effect**	**Significance of Effect**
Statutory designated sites (Greenham Common SSSI)	National	Changes to air quality	Adherence to best practice methods to control dust emissions (detailed in CEMP)	Negligible	N/A	Not significant (Negligible)
	National	Noise and vibration	Adherence to best practice methods to control noise and vibration (detailed in CEMP)	Negligible	N/A	Not significant (Negligible)
Statutory designated sites (Other SSSIs)	National	Changes to water quality	Adherence to construction-phase surface water strategy following best practice (detailed in CEMP)	Negligible	N/A	Not significant (Negligible)
Non-statutory sites	County	Noise and vibration	Adherence to best practice methods to control noise and vibration (detailed in CEMP)	Negligible	N/A	Not significant (Negligible)
	County	Changes to air quality	Adherence to best practice methods to control dust emissions (detailed in CEMP)	Negligible	N/A	Not significant (Negligible)
	County	Changes to water quality	Adherence to construction-phase surface water strategy following best practice (detailed in CEMP)	Negligible	N/A	Not significant (Negligible)
Non-statutory sites (Waterleaze Copse)	County	Habitat creation	Planting of c.4.6ha of broadleaved woodland or 14% increase	Significant positive (medium positive)	Permanent	Significant (Moderate beneficial)
Arable	Local	Habitat loss	Loss of c.45.5ha supporting notable species	Significant adverse (high adverse)	Permanent	Significant (Substantial adverse)

Marshy grassland	County	Habitat creation	Creation of 2ha of aquatic habitat (marshy grassland) or 14% increase	Significant positive (high positive)	Permanent	Significant (Moderate beneficial)
	Local	Changes to water quality	Adherence to construction-phase surface water strategy following best practice (detailed in CEMP)	Negligible	N/A	Not significant (Negligible)
Acidic semi-improved grassland	Local	Habitat loss	Compensatory replanting of a minimum of 0.03ha of acidic semi-improved grassland	Negligible	N/A	Not significant (Negligible)
	Local	Changes to air quality	Adherence to best practice methods to control dust emissions (detailed in CEMP)	Negligible	N/A	Not significant (Negligible)
Species-rich hedgerows	Local	Habitat loss	Loss of c. 521m of hedgerow, in-built replacement and infill planting (2322m)	Negligible	N/A	Not significant (Negligible)
Running water	Local	Changes to water quality	Adherence to construction-phase surface water strategy following best practice (detailed in CEMP) and measures described in Chapter 11 (i.e. SUDs)	Negligible	N/A	Not significant (Negligible)
Standing water	Local	Changes to water quality	Adherence to construction-phase surface water strategy following best practice (detailed in CEMP)	Negligible	N/A	Not significant (Negligible)
Invasive species	Legal offense	Potential spread of invasive species	Adherence to best practice methods to prevent accidental spread of invasive species (detailed in CEMP)	Negligible	N/A	Not significant (Negligible)
Reptiles	National (legal protection)	Potential killing or injury	Adherence to construction-phase mitigation strategy incorporating	Negligible	N/A	Not significant (Negligible)

			avoidance and displacement (detailed in EMMP and CEMP)			
Breeding birds	Local	Habitat loss	A loss of c. 521m of hedgerow and c. 1ha of scrub is anticipated. Also c. 45.4ha of arable land used by skylark. Habitat creation includes c. 3.12ha of broadleaved woodland; c. 2.7ha of parkland and scattered trees and a net gain of c. 21.8ha of grassland.	Negligible	N/A	Not significant (Negligible)
	Local	Disturbance	Adherence to best practice methods to control noise and vibration (detailed in CEMP)	Negligible	N/A	Not significant (Negligible)
	Local	Damage or destruction of nests	Adherence to standard control methods including avoidance of nesting season and pre-commencement nest checks (detailed in CEMP)	Negligible	N/A	Not significant (Negligible)
Barn owl	Local	Habitat creation	Grassland creation within Country Park resulting in c. 57% increase in suitable foraging habitat	Significant positive (high positive)	Permanent	Significant (Moderate beneficial)
	Local	Disturbance	Adherence to standard control methods including avoidance of nesting season and pre-commencement nest checks (detailed in CEMP)	Negligible	N/A	Not significant (Negligible)
Bats	Local	Habitat creation	Increase in suitable foraging habitat – broadleaved woodland (c. 3.12ha); wetland (c. 0.15ha of SuDS) and grassland (c. 21.8ha)	Significant positive (medium positive)	Permanent	Significant (Minor beneficial)

	Local	Roost damage or disturbance	N/A	Significant adverse (high adverse)	Short-term	Significant (Moderate adverse)
Badgers	Local	Sett damage or disturbance	N/A	Significant adverse (high adverse)	Short-term	Significant (Moderate adverse)
Hazel dormice	Local	Habitat fragmentation	In-built mitigation including vegetated arches to maintain connectivity across breaches.	Negligible	N/A	Not significant (Negligible)
	Local	Habitat creation	Planting of c.3.12ha of broadleaved woodland or 10.4% increase	Significant positive (medium positive)	Permanent	Significant (Minor beneficial)
	Local	Potential killing or injury	Adherence to construction-phase mitigation strategy incorporating avoidance and displacement (detailed in EMMP and CEMP)	Negligible	N/A	Not significant (Negligible)
Terrestrial invertebrates	County	Habitat loss	N/A	Significant adverse (low adverse)	Permanent	Significant (Moderate adverse)
Aquatic invertebrates	Local	Habitat creation	Creation of 2ha of aquatic habitat (marshy grassland) or 14% increase	Significant positive (medium positive)	Permanent	Significant (Minor beneficial)
	Local	Changes to water quality	Adherence to construction-phase surface water strategy following best practice (detailed in CEMP)	Negligible	N/A	Not significant (Negligible)
Water vole	Local	Disturbance or damage to burrows	No works to take place in proximity to the River Enborne (minimum 8m buffer)	Negligible	N/A	Not significant (Negligible)

	Local	Changes to water quality	Adherence to construction-phase surface water strategy following best practice (detailed in CEMP)	Negligible	N/A	Not significant (Negligible)
Otter	Local	Disturbance or damage to holts or resting places	No works to take place in proximity to the River Enborne (minimum 8m buffer)	Negligible	N/A	Not significant (Negligible)
	Local	Changes to water quality	Adherence to construction-phase surface water strategy following best practice (detailed in CEMP)	Negligible	N/A	Not significant (Negligible)
Brown hare	Local	Habitat loss	Loss of c. 45.4ha of arable land used by brown hare. Habitat creation a net gain of c. 21.8ha of suitable grassland.	Negligible	N/A	Not significant (Negligible)

Occupation Phase

Designated sites

There is potential for increased recreation within the wider countryside as a result of the proposed development, including on Greenham Common SSSI which is already used by local residents for walking, dog walking, hosting events such as nature walks and nature identification days.

Due to the existing public use (which includes other SSSIs within 2km of the site) it is considered that in-built measures will already be in place within these sensitive areas to minimise the impacts of visitor pressure (such as fencing and formal pathways). Furthermore, the provision of the Country Park to the south of the site will provide an alternative recreational resource for new (and existing) residents which will be closer and more convenient.

Some, limited parking for the Country Park will be provided within the proposed development. However, this has been placed towards the western extent of the Country Park to maximise the distance to the SSSI. Although not part of this application, a new pedestrian link is to be created to the east across the A339 which will increase the ability of residents to walk to Greenham Common SSSI. In correspondence during 2016/2017 regarding earlier planning application submissions for Sandleford, Natural England have confirmed that provided the Country Park is available for use at the time of first occupation, they have no concern over potential recreational effects. The phasing of Country Park delivery will be controlled through planning conditions with 50% proposed alongside Development Parcel 1 North and 50% alongside Development Parcel Central. It is considered that there will be **no significant adverse effect** upon these national level features during operation. Using the matrix (*Table 6.1*) this equates to a **negligible** effect (negligible magnitude, national sensitivity).

Non-statutory designated sites

It is proposed to allow public access into a number of these sites (Barn Copse, Slockett's Copse, High Wood, Dirty Ground Copse, Waterleaze Copse and Gorse Covert) as part of the strategy for recreation across the site. Although there is the potential for increased recreational disturbance to fauna and trampling of flora, the recreational routes have been guided by the results of detailed woodland botanical surveys (*Appendix F17*) to identify the areas of lowest botanical value. These areas of lowest value are those identified as recreational routes. The woodlands will be managed in line with the EMMP (*Appendix F18*) to provide an overall enhancement as these woodlands indicate inappropriate management for a number of years. As part of the EMMP, there will be reassessment of public access impacts to the woodland, and if necessary further areas will be restricted to residents. Therefore, there is anticipated to be **no significant adverse effect** on these county value features in respect of recreation during operation. Using the matrix (*Table 6.1*) this equates to a **negligible** effect (negligible magnitude, county sensitivity).

There is potential for an increase in noise during the occupation phase to have an adverse on non-statutory designated sites within and adjacent to the site, primarily through disturbance to fauna supported by these sites such as birds. The noise chapter (Chapter 14) details the modelling of noise upon 42 receptors and predicts an increase of less than 1dB by 2021 and less than 3dB by 2029. It is concluded that this increase is negligible and there will be **no significant adverse effect** on these county value features in respect of noise during operation. Using the matrix (*Table 6.1*) this equates to a **negligible** effect (negligible magnitude, county sensitivity).

The air quality chapter (*Chapter 15*, includes an assessment of NO_2 and PM_{10} concentration within non-statutory sites on site as a result of future traffic during the occupation phase. This concludes that the increases in both NO_2 and PM_{10} are predicted to be negligible and therefore there is anticipated to be **no significant adverse effect** on these county value features in respect of air quality during occupation. Using the matrix (*Table 6.1*) this equates to a **negligible** effect (negligible magnitude, county sensitivity).

The proposed development will include a Sustainable Drainage System designed to mimic the existing hydrology of the site as far as possible, and to maintain surface water runoff at existing greenfield rates. This system will also include treatment stages for pollutants such as hydrocarbons from internal roads. The Water Resources chapter (*Chapter 11*) concludes that *the proposals will result in a minor beneficial effect on water quality following the implementation of the proposed mitigation measures.* Therefore, there is anticipated to be **no significant adverse effect** on these county value features in respect of water quality during occupation. Using the matrix (*Table 6.1*) this equates to a **negligible** effect (negligible magnitude, county sensitivity).

Semi-natural broadleaved woodland

The semi-natural broadleaved woodland on site falls within the numerous Wildlife Heritage Sites. The potential impacts are assessed above under *Non-statutory designated sites.*

Marshy grassland

As with the non-statutory sites discussed above, the marshy grassland is vulnerable to changes in hydrology or water quality during occupation. This includes areas of new marshy grassland which will be created around proposed SuDS features. As per *Non-statutory sites,* the SuDS will maintain existing greenfield runoff rates, provide treatment and filtration stages and attenuation to store water during flood events. As noted above, the Water Resources chapter (*Chapter 11*) concludes that *the proposals will result in a minor beneficial effect on water quality following the implementation of the proposed mitigation measures.* Therefore, there is anticipated to be **no significant adverse effect** on this local value feature in respect of water quality during occupation. Using the matrix (*Table 6.1*) this equates to a **negligible** effect (negligible magnitude, local sensitivity).

Acidic semi-improved grassland

This feature is located within the proposed Country Park and as such there will be an increase in recreational use during occupation. In the absence of mitigation this is likely to result in damage and erosion through trampling. There is also the potential for incorrect management of the feature to impede its possible recovery, or result in further loss of value. Therefore, in the absence of mitigation there is likely to be a **significant permanent adverse effect** at the **Local** level. Using the matrix (*Table 6.1*) this equates to a **moderate adverse** effect (high magnitude, local sensitivity).

Running water

As with the non-statutory sites discussed above, the running water is vulnerable to changes in hydrology or water quality during occupation. In particular because the surface water drainage for the site will ultimately discharge into these features. As per *Non-statutory sites,* the SuDS system will maintain existing greenfield runoff rates, provide treatment and filtration

stages and attenuation to store water during flood events, leading to a minor beneficial effect as noted in the Water Resources Chapter (*Chapter 11*). The surface water management proposals will minimise the hydrological impacts to existing springs and streams as well as mitigating the effects on groundwater recharge Therefore, there is anticipated to be **no significant adverse effect** on this local value feature in respect of water quality during occupation. Using the matrix (*Table 6.1*) this equates to a **negligible** effect (negligible magnitude, local sensitivity).

Species-rich hedgerows

Hedgerows require appropriate management in order to maximise their value to biodiversity. Inappropriate management, or lack of management during occupation is likely to result in reduced production of fruits and less dense growth (both resulting in adverse effects to dependent species). Therefore in the absence of actionable mitigation there is likely to be a **significant permanent adverse effect** at the **Local** level. Using the matrix (*Table 6.1*) this equates to a **moderate adverse** effect (high magnitude, local sensitivity).

Invasive species

There is no access proposed to areas of the site containing invasive species. Therefore it is considered unlikely that activities during occupation (such as recreation) would result in the spread of these species. Therefore, there is likely to be **no significant adverse effect** during occupation. Using the matrix (*Table 6.1*) this equates to a **negligible** effect (negligible magnitude).

Breeding birds

There is a risk of disturbance to breeding birds during occupation as a result of a likely increase in recreational pressure on habitats used by nesting birds (particularly woodland, hedgerows and arable mitigation areas / skylark plots) and an increase in noise (primarily due to traffic).

For woodland and hedgerows this is considered unlikely to be a significant effect due to the large area of habitat on site and the inherent resilience of these habitats (due to the density of foraging and nesting habitat and dispersal of noise). As discussed under *Non-statutory designated sites,* the noise chapter concludes that increases in noise to woodland in the short and long-term is likely to be negligible.

For the open areas (arable mitigation/grassland/skylark plots) there is a much greater chance of disturbance from recreation. Noise is considered likely to be negligible as these areas are located within the proposed Country Park, away from the developed area. In the absence of mitigation it is considered likely that there will be **significant adverse effect** at a **Local** level on breeding birds as a result of disturbance. Using the matrix (*Table 6.1*) this equates to a **moderate adverse** effect (high magnitude, local sensitivity).

In addition, cats residing within the development site will lead to increased predation on bird species. This is likely to be concentrated within the habitats closest to the developed area which includes areas of broadleaved woodland. In the absence of mitigation, it is considered likely that there will be a **significant adverse effect** at a **Local** level on breeding birds as a result of predation. Using the matrix (*Table 6.1*) this equates to a **moderate adverse** effect (high magnitude, local sensitivity).

Bats

The greatest potential effect upon bats during occupation is likely to be artificial lighting, which can have a wide range of effects from negatively affecting prey populations to altering commuting routes resulting in increased energy expenditure. The development will be subject to a sensitive lighting strategy which maintains an increase of no more than 1lux on bat foraging habitats (such as woodland and woodland buffers) and commuting routes (woodland edge and hedgerows). Following this it is considered that there will be **no significant adverse effect** on bats as a result of lighting. Using the matrix (*Table 6.1*) this equates to a **negligible** effect (negligible magnitude, local sensitivity).

Bats can suffer from increased mortality as a result of development, in particular from traffic collisions. The risk of collision is greatest when roads are high speed or pass through dense habitat such as woodland (where bats will be flying at low levels). The development does not include large or high-speed roads and links between parcels follow existing gaps between woodland blocks, with bat hop-overs (where trees grow tall to either side of the road) included within the design. Bats can also suffer from cat predation, however given the high density of potential roosts within the woodland on site (most of which will be inaccessible to cats) this risk is considered to be negligible. Overall it is anticipated that there will be **no significant adverse effect** on bats as a result of predation. Using the matrix (*Table 6.1*) this equates to a **negligible** effect (negligible magnitude, local sensitivity).

Badgers (Local value, legally protected)

Known badger setts are to be retained and protected through the construction phase. However, during the occupation phase there is the potential for disturbance to setts from recreation within the areas of woodland on site. Although low-speed there is also potential for increased mortality on internal roads during occupation. Taken together, and in the absence of mitigation, there is likely to be a **significant adverse effect** at a **Local** level upon badgers during occupation. Using the matrix (*Table 6.1*) this equates to a **moderate adverse** effect (high magnitude, local sensitivity).

Hazel dormouse (Local value, legally protected)

As discussed under *Species-rich hedgerows,* inappropriate management or lack of management of hedgerows is likely to result in a **significant adverse** effect at a **Local** level due to a reduction in value for foraging and nesting. Using the matrix (*Table 6.1*) this equates to a **moderate adverse** effect (high magnitude, local sensitivity).

As discussed under *Bats*, the development will be subject to a sensitive lighting strategy. This includes an increase of no more than 1lux on suitable habitat (woodland and hedgerows) and is likely to result in a **no significant adverse effect** from lighting. Using the matrix (*Table 6.1*) this equates to a **negligible** effect (negligible magnitude, local sensitivity).

As discussed under *Breeding birds,* the development is likely to result in an increase in cats, in particular close to the development which includes areas of broadleaved woodland and hedgerow suitable for hazel dormice. Due to the low population density the dormouse population is unlikely to be resilient to high levels of predation, although it is also likely that this low density will reduce the likelihood of individual dormice being caught by cats. In the absence of mitigation it is likely that there will be a **significant adverse effect** at a **Local** level due to predation. Using the matrix (*Table 6.1*) this equates to a **moderate adverse** effect (high magnitude, local sensitivity).

Terrestrial Invertebrates

Incorrect or unsympathetic management of habitats particularly woodland but also the grassland within the proposed Country Park during the occupation phase could lead to a reduction in habitat quality for invertebrate species. Therefore, in the absence of mitigation, there is likely to be a **significant adverse effect** on notable invertebrate species at a **County** level. Using the matrix (*Table 6.1*) this equates to a **substantial adverse** effect (high magnitude, county sensitivity).

Aquatic Invertebrates

The potential impacts from changes in hydrology or water quality during occupation are assessed above under *Running water* and *Marshy grassland* and it is concluded that following the in-built SuDS there is anticipated to be **no significant adverse effect** on this local value feature in respect of water quality during occupation. Using the matrix (*Table 6.1*) this equates to a **negligible** effect (negligible magnitude, local sensitivity).

Water vole

No access is proposed to the River Enborne during occupation, therefore it is considered that there will be **no significant adverse effect** on water voles as a result of disturbance. Using the matrix (*Table 6.1*) this equates to a **negligible** effect (negligible magnitude, local sensitivity).

Adverse effects on the river from changes in hydrology or pollutants (such as hydrocarbons and sediment) during occupation are assessed above under *Running water* and it is concluded that following the in-built SuDS there is anticipated to be **no significant adverse effect** on this local value feature in respect of water quality. Using the matrix (*Table 6.1*) this equates to a **negligible** effect (negligible magnitude, local sensitivity).

Otter

No access is proposed to the River Enborne during occupation. There is potential for otter holts to be present within nearby woodland, in particular Waterleaze Copse. No access is proposed into this area with the recreational route to include an area to newly created woodland. Therefore, it is considered that there will be **no significant adverse effect** to otter as a result of disturbance. Using the matrix (*Table 6.1*) this equates to a **negligible** effect (negligible magnitude, local sensitivity).

Adverse effects on the river from changes in hydrology or pollutants (such as hydrocarbons and sediment) during occupation are assessed above under *Running water* and it is concluded that following the in-built SuDS there is anticipated to be **no significant adverse effect** on this local value feature in respect of water quality during operation. Using the matrix (*Table 6.1*) this equates to a **negligible** effect (negligible magnitude, local sensitivity).

Brown Hare

Following construction of the development, it is anticipated that brown hare will utilise the grassland within the Country Park. A lack of suitable management of this area could impact the brown hare population by reducing the availability of foraging and refuge areas. In the absence of mitigation, it is possible that there will be a **significant adverse effect** at a **Local**

level on brown hare during occupation. Using the matrix (*Table 6.1*) this equates to a **moderate adverse** effect (high magnitude, local sensitivity).

Table 6.6 – Summary of Impact Assessment – Occupation Phase with Inherent & Standard Mitigation Measures Applied						
Receptor	**Sensitivity/ Importance/Value**	**Description of Impact**	**Inherent & Standard Mitigation Measures**	**Nature of Effect**	**Type of Effect**	**Significance of Effect**
Statutory designated sites	National	Recreation	Provision of Country Park as part of development – to be available upon first occupation.	Negligible	N/A	Not significant (Negligible)
Non-statutory sites	County	Noise and vibration	N/A	Negligible	N/A	Not significant (Negligible)
	County	Changes to air quality	N/A	Negligible	N/A	Not significant (Negligible)
	County	Changes to water quality	Surface water drainage strategy to provide treatment to surface water and maintain existing hydrology as far as possible	Negligible	N/A	Not significant (Negligible)
	County	Recreation	Provision of Country Park as part of development – to be available upon first occupation. EMMP to control long-term management of woodland with public access.	Negligible	N/A	Not significant (Negligible)
Marshy grassland	County	Changes to water quality	Surface water drainage strategy to provide treatment to surface water and maintain existing hydrology as far as possible	Negligible	N/A	Not significant (Negligible)

Acidic semi-improved grassland	Local	Recreation	N/A	Significant adverse (high adverse)	Permanent	Significant (Moderate adverse)
Species-rich hedgerows	Local	Inappropriate management	N/A	Significant adverse (high adverse)	Permanent	Significant (Moderate adverse)
Running water	Local	Changes to water quality	Surface water drainage strategy to provide treatment to surface water and maintain existing hydrology as far as possible	Negligible	N/A	Not significant (Negligible)
Invasive species	Legal offense	Potential spread of invasive species	Removal of invasive species in accessible areas during construction	Negligible	N/A	Not significant (Negligible)
Breeding birds	Local	Increased mortality (cat predation)	N/A	Significant adverse (high adverse)	Permanent	Significant (Moderate adverse)
	Local	Disturbance (recreation)	N/A	Significant adverse (high adverse)	Permanent	Significant (Moderate adverse)
Bats	Local	Disturbance (lighting)	In-built sensitive lighting strategy which maintains an increase of no more than 1lux on bat foraging habitats and commuting routes	Negligible	N/A	Not significant (Negligible)

	Local	Increased mortality (cat predation and traffic)	No large or high-speed roads proposed and links between parcels follow existing gaps between woodland blocks. High density of potential roost sites in woodland parcels likely to be inaccessible to cats	Negligible	N/A	Not significant (Negligible)
Badgers	Local	Sett disturbance	N/A	Significant adverse (high adverse)	Permanent	Significant (Moderate adverse)
	Local	Increased mortality (traffic)	N/A	Significant adverse (high adverse)	Permanent	Significant (Moderate adverse)
Hazel dormice	Local	Inappropriate management of hedgerows	N/A	Significant adverse (high adverse)	Permanent	Significant (Moderate adverse)
	Local	Disturbance (lighting)	In-built sensitive lighting strategy which maintains an increase of no more than 1lux on suitable habitat	Negligible	N/A	Not significant (Negligible)
	Local	Increased mortality (cat predation)	N/A	Significant adverse (high adverse)	Permanent	Significant (Moderate adverse)
Terrestrial invertebrates	County	Inappropriate management of habitat	N/A	Significant adverse (high adverse)	Permanent	Significant (Moderate adverse)

Aquatic invertebrates	Local	Changes to water quality	Surface water drainage strategy to provide treatment to surface water and maintain existing hydrology as far as possible	Negligible	N/A	Not significant (Negligible)
Water vole	Local	Disturbance	No access to be provided to River Enborne	Negligible	N/A	Not significant (Negligible)
	Local	Changes to water quality	Surface water drainage strategy to provide treatment to surface water and maintain existing hydrology as far as possible	Negligible	N/A	Not significant (Negligible)
Otter	Local	Disturbance	No access to be provided to River Enborne or Waterleaze Copse	Negligible	N/A	Not significant (Negligible)
	Local	Changes to water quality	Surface water drainage strategy to provide treatment to surface water and maintain existing hydrology as far as possible	Negligible	N/A	Not significant (Negligible)
Brown hare	Local	Inappropriate management of habitat	N/A	Significant adverse (high adverse)	Permanent	Significant (Moderate adverse)

6.6.2 Residual Impact Assessment

The assessments presented in *Table 6.5* and *Table 6.6* show that significant beneficial effects were predicted for the following receptors as a result of habitat creation during the construction phase:

- Non-statutory sites (Waterleaze Copse)
- Marshy grassland
- Barn owl
- Bats
- Hazel dormice
- Aquatic invertebrates

There were no beneficial effects predicted to occur during the occupation phase.

The beneficial effects above were predicted with the application of inherent and standard mitigation measures. Therefore, no actionable mitigation measures were considered necessary. All beneficial effects listed above should therefore, be considered as being residual.

In addition to the beneficial effects, significant adverse effects were predicted. For these effects, actionable mitigation will be implemented. The proposed actionable mitigation is provided in *Table 6.7* in relation to the construction phase and in *Table 6.8* in relation to the occupation phase.

These tables show that with the application of actionable mitigation, there will be no significant adverse effects on any ecological receptor.

Table 6.6 – Summary of Significant Adverse Construction Phase Effects with Actionable Mitigation Measures Applied						
Receptor	**Sensitivity / Importance / Value**	**Description of Impact**	**Significance of Effect with Inherent & Standard Mitigation Measures**	**Type of Effect**	**Actionable Mitigation Measures**	**Significance of Effect with Actionable Mitigation Measures**
Arable	Local	Habitat loss	Significant adverse (high adverse)	Permanent	Creation of skylark plots	Not significant (Negligible)
Bats	Local	Roost damage or disturbance	Significant (Moderate adverse)	Short-term	Pre-commencement surveys will confirm presence or likely absence of bats in trees with potential roosting features as set out in the EMMP. Where necessary EPSL will be obtained for works affecting roosts. This will detail how bats will be protected during works and how potential roosting features will be compensated for.	Not significant (Negligible)
Badgers	Local	Sett damage or disturbance	Significant (Moderate adverse)	Short-term	Pre-commencement survey will be completed to establish whether setts will be affected. Where necessary development licences from Natural England would be obtained detailing how badgers will be protected and the loss of sett compensated for (if necessary).	Not significant (Negligible)
Terrestrial invertebrates	County	Habitat loss	Significant (Moderate adverse)	Permanent	Host plant (goat's beard) translocation	Not significant (Negligible)

Table 6.7 – Summary of Impact Assessment – Occupation Phase						
Receptor	**Sensitivity / Importance / Value**	**Description of Impact**	**Significance of Effect with Inherent & Standard Mitigation Measures**	**Type of Effect**	**Actionable Mitigation Measures**	**Significance of Effect with Actionable Mitigation Measures**
Acidic semi-improved grassland	Local	Recreation	Significant (Moderate adverse)	Permanent	Footpaths will be located away from areas of sensitive habitats such as acidic semi-improved grassland. Signage and interpretation boards will be installed providing information to the public of the importance of the grassland habitat for wildlife. Appropriate management and monitoring detailed in the EMMP will be followed.	Not significant (Negligible)
Species-rich hedgerows	Local	Inappropriate management	Significant (Moderate adverse)	Permanent	Appropriate management and monitoring detailed in the EMMP will be followed, including prevention of colonization of invasive exotic plants.	Not significant (Negligible)
Breeding birds	Local	Increased mortality (cat predation)	Significant (Moderate adverse)	Permanent	Predation by cats will be mitigated as far as possible with open spaces screened and buffered by roads, and dwellings fronting on to open space, rather than back gardens. Homeowners will be provided with information to encourage further measures to reduce predation such as keeping cats inside at night.	Not significant (Negligible)
	Local	Disturbance (recreation)	Significant (Moderate adverse)	Permanent	Footpaths and signage within the Country Park are designed to manage recreation and minimise disturbance.	Not significant (Negligible)

Badgers	Local	Sett disturbance	Significant (Moderate adverse)	Permanent	Recreational routes have been designed to avoid badger setts.	Not significant (Negligible)
	Local	Increased mortality (traffic)	Significant (Moderate adverse)	Permanent	The proposed road network has been designed to avoid isolating setts from foraging habitat.	Not significant (Negligible)
Hazel dormice	Local	Inappropriate management of hedgerows	Significant (Moderate adverse)	Permanent	Appropriate management and monitoring detailed in the EMMP will be followed.	Not significant (Negligible)
	Local	Increased mortality (cat predation)	Significant (Moderate adverse)	Permanent	Predation will be mitigated by cats as far as possible with open spaces screened and buffered by roads, and dwellings fronting on to open space, rather than back gardens. Homeowners will be provided with information to encourage further measures to reduce predation such as keeping cats inside at night.	Not significant (Negligible)
Terrestrial invertebrates	County	Inappropriate management of habitat	Significant (Moderate adverse)	Permanent	The EMMP will detail the measures to manage the acidic semi-improved grassland appropriately for the species.	Not significant (Negligible)
Brown hare	Local	Inappropriate management of habitat	Significant (Moderate adverse)	Permanent	The EMMP will detail the measures to manage the acidic semi-improved grassland appropriately for the species.	Not significant (Negligible)

6.7 Cumulative Impact Assessment

6.7.1 Sandleford Park West

A set of 'Combined' Ecological Mitigation and Management Principles have been prepared (*Appendix F19*), to provide overarching principles to guide ecological mitigation and management across both the Sandleford Park and Sandleford Park West sites.

Construction Phase

Statutory designated sites

Both the proposed development and Sandleford Park West include built-in mitigation measures to avoid construction phase effects upon statutory designated sites such as Greenham Common SSSI. As such there are considered to be **no likely significant cumulative effects**. Using the matrix (*Table 6.1*) this equates to a **negligible** effect (negligible magnitude, national sensitivity).

Non-statutory designated sites

The Sandleford Park West development will result in the loss of part of Brick Kiln Copse LWS to accommodate the construction of SuDS features, and includes built-in mitigation to avoid adverse effects on other non-statutory sites. The proposed development includes built-in mitigation measures to avoid construction phase effects upon all statutory designated sites (including Brick Kiln Copse), therefore there are considered to be **no likely significant cumulative effects**. Using the matrix (*Table 6.1*) this equates to a **negligible** effect (negligible magnitude, county sensitivity).

Notable Habitats

Taking into account built-in mitigation measures, no significant effects have been identified upon habitats present within both the application site and Sandleford Park West. Therefore there are considered to be **no likely significant cumulative effects**. Using the matrix (*Table 6.1*) this equates to a **negligible** effect (negligible magnitude, local to county sensitivity).

Notable and Protected Species

Potentially significant adverse effects upon bats and badgers during the construction phase have been identified as a result of the proposed development and the Sandleford Park West development. Both developments include additional measures to mitigate for these effects and no residual effects have been identified for either development. Widening of Warren Road to facilitate the development at Sandleford Park Westmay result in the loss of bat roosts in trees and buildings to be removed. However, it is likely that appropriate avoidance, mitigation and enhancement measures can be incorporated so as to ensure the favourable conservation status of bats in the local area. As such, there are considered to be **no likely significant cumulative effects**. Using the matrix (*Table 6.1*) this equates to a **negligible** effect (negligible magnitude, local sensitivity).

Occupation Phase

Statutory designated sites

The proposed Country Park is intended to provide occupation phase mitigation in respect of recreation for both the proposed development and the Sandleford Park West development. Therefore, there are considered to be **no likely significant cumulative effects**. Using the matrix (*Table 6.1*) this equates to a **negligible** effect (negligible magnitude, national sensitivity).

Non-statutory designated sites

Both developments include built-in measures to avoid adverse effects as a result of anthropogenic disturbance or water pollution during the occupation phase. Therefore there are considered to be **no likely significant cumulative effects**. Using the matrix (*Table 6.1*) this equates to a **negligible** effect (negligible magnitude, county sensitivity).

Notable Habitats

Both the proposed development and the Sandleford Park West development identify potential adverse occupation phase effects upon notable habitats, hedgerows in particular. Both developments include additional measures to mitigate for these effects and no residual effects have been identified for either development. Therefore there are considered to be **no likely significant cumulative effects**. Using the matrix (*Table 6.1*) this equates to a **negligible** effect (negligible magnitude, local to county sensitivity).

Notable and Protected Species

Taking into account built-in mitigation measures, no significant effects have been identified upon notable or protected species present within either the application site or Sandleford Park West. Therefore there are considered to be **no likely significant cumulative effects**. Using the matrix (*Table 6.1*) this equates to a **negligible** effect (negligible magnitude, local sensitivity).

6.7.2 Other Developments

13. Highwood Copse Primary School - 17/00158/COMIND and 17/03434/COMIND

This is the closest of the cumulative impact sites to Sandleford Park, being immediately adjacent to the site, and incorporating some of the areas historically surveyed for Sandleford Park. Ecology reports are not available to view on the West Berkshire Council Planning and Building Control Solutions Portal. However, the proposals do not appear to result in the loss of mature trees. Impacts are possible on species such as reptiles and notable invertebrates, while there does not appear to be a retained 30m buffer from the ancient woodland.

However, the provision of the large Country Park to the south of the site as part of the Sandleford Park application and accompanying EMMP (*Appendix F18*) is considered to provide enhanced, managed habitat for reptiles and terrestrial invertebrates. As such, there are considered to be **no likely significant cumulative effects**. Using the matrix (*Table 6.1*) this equates to a **negligible** effect (negligible magnitude, local to county sensitivity).

With regards to the ancient woodland, additional planting is included in the Country Park, and woodland buffers are retained throughout Sandleford Park, therefore there are considered to be **no likely significant cumulative effects**. Using the matrix (*Table 6.1*) this equates to a **negligible** effect (negligible magnitude, county sensitivity).

The remaining developments outlined in *Chapter 4* to be assessed in combination are considered to be too remote from Sandleford Park, and lacking in habitat connectivity for there to be any cumulative impacts, other than the potential for increased recreational pressure on Greenham Common SSSI.

However, as the Sandleford Park proposal includes a Country Park, the vast majority of which is currently not available for public use, which will provide alternative accessible green space for residents of Newbury. As such, the provision of the Sandleford Park development would be likely to reduce cumulative recreational pressure on SSSI.

6.8 Summary

In the absence of mitigation, the proposed development has the potential to cause significant adverse effects on important ecological receptors (habitats and species) identified on site. Impacts associated with the development include the loss of habitats and direct and indirect effects on the wildlife supported in these areas, including the temporary loss of foraging and commuting habitats.

However, the development seeks to retain and enhance existing habitats where possible with new habitats created to mitigate for unavoidable loss and enhance ecological value in the long-term.

The retained broadleaved semi-natural woodland, hedgerows and proposed Country Park, incorporating further woodland, wetland and grassland, will provide a habitat mosaic which will support the range of species currently present including bats, birds, hazel dormice, reptiles, badgers and invertebrates.

Assuming that the inherent, standard and actionable mitigation measures are implemented, it is considered that the proposed development will have:

- no significant adverse residual effects;
- significant beneficial effects as a result of habitat creation on:
    - Non-statutory sites (Waterleaze Copse)
    - Marshy grassland
    - Barn owl
    - Bats
    - Hazel dormice
    - Aquatic invertebrates